EVANSVILLE WATER AND SEWER UTILITY
AND
FOUR RIVERS RESOURCE CONSERVATION
AND DEVELOPMENT AREA, INC.

Volume 3
APPENDICES

PIGEON CREEK WATERSHED DIAGNOSTIC STUDY

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT

January 2001

Property of
Lake and River Enhancement Section
Division of Fish and Wildlife/IDNR
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PIGEON CREEK
WATERSHED DIAGNOSTIC STUDY
VOL. 3 – APPENDICES

Prepared for

Evansville Water and Sewer Utility
And
Four Rivers Resource Conservation and Development
Area, Inc.

By

HARZA
Engineering Company

January 2001

APPENDICES

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Appendix B	Laboratory Analytical Reports
Appendix C	Bioassessment Field Notes
Appendix D	Agricultural Best Management Practices
Appendix E	Model Riparian Buffer Ordinance

APPENDIX A
INSTITUTIONAL RESOURCES ASSESSMENT

This study also included an institutional assessment. The objective was to assess the capacity of local institutions to implement watershed management projects in the basin, and to identify stakeholder organizations, their missions and resources.

Leading watershed management activities across the state are the Department of Natural Resources Division of Soil Conservation and the Indiana Department of Environmental Management Office of Water Management. At a staff level IDEM and IDNR work together well. In addition, the former Deputy Commissioner at DNR, Lauren Kaplan was appointed DEM's Commissioner, creating top-level integration between the two agencies.

A.1 Introduction

Watersheds mean different things to different interest groups. If you asked most people what a watershed is "good for," you would probably get as many different answers as there are people. For a farmer a stream means drainage, or flooding, depending on the location and the circumstances. For children, a stream is a neat place to play and explore. A birdwatcher could tell you about the eagles, geese and other waterfowl that inhabit the watershed. For local governments, a stream carries treated wastewater away from the community. Thus, a watershed is different things to different interests. Watershed stakeholders are a varied group.

Past stakeholder workshops have identified and prioritized watershed concerns for Pigeon Creek. In order of priority, these concerns are:

1. Pollution - especially water pollution and illegal dumping of refuse
2. Public Education – particularly convincing average taxpayers of the benefits of investments in watershed management
3. Maintenance of the Creek's Drainage Capacity
4. Land Rights
5. Interagency Coordination

6. Water Quality
7. Watershed Vision
8. Financial Resources
9. Lack of Regulatory Enforcement
10. Flood Control
11. Urban Encroachment
12. Public Involvement

Watersheds demand attention from a wide variety of stakeholders each with differing interests in the area. Some of Pigeon Creek's institutions are Indiana's leaders in watershed protection. The innovation and inclusive efforts of Vanderburg, Warrick and Gibson County's SWCDs have laid the groundwork for exciting institutional next steps.

Working from the findings of the Pigeon Creek Watershed Diagnostic Study, this section describes initiatives that stakeholders should do next to continue to improve Pigeon Creek Watershed. This appendix discusses the process of watershed action planning to meet these concerns. We also address the important role of education, and conclude with suggested institutional initiatives to maintain and improve the health of the Pigeon Creek watershed.

A.2 A *Process* of Watershed Action Planning—An Ideal Institutional Arrangement

Efforts to improve the Pigeon Creek watershed would benefit from a Watershed Action Plan to catalyze best management practices. This Plan will benefit from the Highland-Pigeon Watershed Restoration Action Strategy. However, it differs from it in that it is a conscious planning process, involving visioning, team building activities, discussing for results, goal setting, and evaluation with a variety of interested stakeholders. The planning team is a broad mix of stakeholders, working with local and state agencies to review existing data, including this diagnostic study, develop a plan of work, target areas that need attention, heighten public awareness, find funding sources, implement change plans, augment existing successful volunteer monitoring, and screen and evaluate. While Pigeon Creek has had some success with a Pigeon Creek Steering Committee in the past, a Watershed Action Plan involving some of the stakeholders noted at the end of this document could develop a very different process. Commencing implementation activities

with issues of interest to a majority of stakeholders, such as programs aimed at illegal dumping, implementing filter strips (soil conservation), and CSO long-term controls will increase stakeholders' commitment to the process. Many resources can assist in this planning process including the "Watershed Action Guide for Indiana," and "Getting in Step: A Guide to Effective Outreach in Your Watershed", both of which are available on-line.

The watershed action planning group might note that others' experience indicates that smaller watershed change generally will be simpler to implement and document. Pigeon Creek Watershed may wish to identify and prioritize the watershed's 5-10 acres for watershed treatment, targeting improvements one by one. For large watersheds, several pilot projects are recommended. Successful pilot projects can be scaled out to other areas. Small watersheds give a sense of ownership to stakeholders, allowing them to champion issues of greatest concern to them.

A.3 Education—Key to On-Going Watershed Health

A major role of the watershed action planning group is to assist with providing access to information and education. The watershed action planning group will play a primary role in effecting positive change in the health of Pigeon Creek through educational initiatives. Establishing an education committee or liaison with a focus, for instance, on raising awareness among land users about soil and water resource problems and their control, or urban development conservation will be an important part of the process. The committee should involve existing stakeholders in the watershed. For instance, the actions of the DNR Division of Soil and Water Conservation should coordinate with the Evansville Parks and Recreation Division to provide watershed education activities in the summer. An excellent example of information sharing and education for the Pigeon Creek watershed action group is the Indiana Biodiversity Initiative that includes a broad representation of institutions working together on educational programs, compiling information, and coordinating interests.

Building upon SWCD's existing efforts, the education committee can identify education priorities, identify the target audience(s), characterize each audience, establish measurable objectives, design effective education activities, determine constraints to

success, implement the education plan and evaluate progress. As a further step, it would be important that natural resource conservation information, including soil conservation, be incorporated into elementary and secondary school curricula. Thus the committee could use its influence and knowledge at the local and state levels, through IDEM and IDNR for instance, to work with school boards and educators to implement this into the science courses.

One of the best ways to educate is to show how integrated watershed planning has worked well. The Pigeon Creek Greenway, created as part of a public process, is a reminder to people that their actions affect their natural environment, and even though they live in a city, they are surrounded by nature. Effective education through the Pigeon Creek Greenway could help urban people better understand that their actions ramify on the natural environment. Further educational challenges include continued work with the Future Farmers of America and the Indiana 4-H, whose outward goals include education, to brainstorm rural and urban solutions to watershed problems. These groups, and others, can benefit from the structure of the Hoosier Riverwatch, which has created a public-awareness raising campaign by involving volunteers in river monitoring.

While the Pigeon Creek Steering Committee recognizes education as a central part of their mission, other stakeholders did not mention it in our interviews. Perhaps participating in the Watershed Action Planning process will encourage them to incorporate educational themes into their work. Solid Waste Management in Vanderburgh County has an excellent example of an informative and engaging mission statement about their education objectives. Other similar service-providing institutions within the watershed could greatly assist the watershed action planning effort if they were to provide similar educationally-oriented action-statements. Operation City Beautiful captures an important point in their mission statement—that is of enforcement of ordinances that help to protect the watershed. Further education can assist with these enforcement efforts, as the public becomes more aware and demands compliance with local law.

There are even more examples of excellent educational outreach. The IDNR has ten regional soil conservation education specialists to work with the SWCD's in identifying, developing and carrying out needed educational activities, directed primarily toward the

land user. Further, the SWCDs, IDNR, and USDA all have extraordinary education resources, as do extension services at Purdue University. The Water Resources Action Guide for Indiana includes a set of materials for watershed steering committees. Indiana has empowered watershed stakeholder groups even more by offering them an existing network of watershed partnership coordinators, developed in 1997 and sponsored by the Indiana Association of Soil & Water Conservation Districts. Education tools exist and can and should be distributed widely.

A.3.1 Education Leads To Behavioral Change

The purpose of education is to create behavioral change. A well-represented and well-respected watershed action planning group can create incentives for outside involvement in watershed activities and create momentum for success in establishing this behavioral change. What sort of incentives and disincentives further involve people in improving the watershed's environmental health?

There are leaders in every community, change agents with a bevy of knowledge and interest that can create excitement. Identifying and including them as catalysts for the watershed action planning process will help to make positive change, inspire the planning process and gain respect from the community for the watershed protection process. SWCD, with its broad network and scope, is well positioned to do select the most appropriate and catalytic group for initial watershed action planning efforts.

Institutions can be change-agents too. Examples of positive change can inspire other people and stakeholders to become involved. For instance, Environmental Management Corporation, with the city's aid, will tie in approximately 29 homes along the creek to the city sewer system, and they have recently repaired a broken sewer line under First Avenue that was discharging untreated wastewater to the creek. At the same time, all of Pigeon Creek Counties' Solid Waste Management Districts accomplished their waste management goal in half the time they had set for themselves. The Friends of the Ohio has recently been energized by the Mayor's wife's commitment. These examples, and others, can inspire other groups involved in positive change in the watershed to set specific goals and achieve them. The Watershed Action Planning group can scale-up the

The CSO Partnership. "Legislative Update." 28 Jan. 2000.

Evansville Water & Sewer "1999 Annual Report"

Gard, Young, Jr., Lawson, Wolf, Johnson. "Senate Bill No. 431." 1 Feb. 2000.

http://www.ctic.purdue.edu/cgi-bin....p420.map&US+MAP.x=280&US+Map.y=108. "Indiana Buffer Templates."

http://www.state.in.us/dnr/index.html. "Indiana Department of Natural Resources Web Site"

http://www.state.in.us/dnr/soilcons/index.htm. "Indiana Department of Natural Resources Soil and Water Conservation District Web Site."

http://www.state.in.us/dnr/soilcons/index.htm. "Division of Soil Conservation Lake and River Enhancement Program Manual."

Indiana Department of Environmental Management Office of Water Management. "Section 319 Nonpoint Source Program Grants." Sep. 1997.

Indiana Department of Environmental Management. "Indiana State of the Environment Report 2000". N.d.

Indiana Department of Environmental Management, Office of Water Management. "Highland-Pigeon Watershed Restoration Action Strategy. Draft March 2000.

Indiana Department of Environmental Management, Water Management Section, Watershed Action Guide. November 1998
Indiana Department of Natural Resources. "Hoosier Riverwatch"

Indiana Department of Natural Resources. "Indiana's T-by-2000 Lake and River Enhancement Program."

Indiana Department of Natural Resources. "Indiana's T-by-2000 Urban Conservation Program."

Indiana Department of Natural Resources. "Indiana State of the Environment Report 1998."

Indiana Riverwatch, "Hoosier Riverwatch"

Indiana Department of Natural Resources Division of Soil Conservation. "Twelve Question and Answers about Soil and Water Conservation Districts."

Vanderburgh County Code Title 15 Chapter 15.44, Erosion and Sediment Control.

Pigeon Creek, The Greenway Passage. "Pathways, The Newsletter of the Pigeon Creek Greenway Passage. Pigeon Creek Watershed Workplan." September, 2000.

Pigeon Creek, The Greenway Passage. "Pathways, The Newsletter of the Pigeon Creek Greenway Passage. Pigeon Creek Watershed Workplan." May 1999.

"Pigeon-Highland Steering Committee." South Gibson Star-Times. January 2000.

Purdue University Cooperative Extension Service. "Wetlands, Regulations and You. What Every Indiana Farmer Needs to Know."

Soil and Water Conservation Society. "A Guide for Profitable Fertilizer and Pesticide Use."

Steeples, Amy, "Recommendations made during the Pigeon Creek Watershed Stakeholders Meeting." Letter to David Pott. Evansville, IN. 9 Nov. 1998.

United States Department of Agriculture. "A Conservation Plan for a Developing Area."

- Scale out the successful River Watch program to school districts beyond Evansville.
- Submit a Report on Progress to Toyota and any other large corporations to inform them of activities in their community and set them up for assisting with an educational Grants Program to increase their profile in the community while assisting with the community's health. Note especially activities of Greenway Passage where many of employees live and where children of plant-workers play.

A.4 Conclusion

The community should be proud of its efforts to improve the health of its watershed. The watershed community faces rural and urban pollution challenges and has begun innovative and commendable programs in each such, as the Pigeon Creek Greenway and the Clean Water Indiana land treatment program efforts. Creating a process that would involve more of the institutions in the watershed in a productive learning and educating environment and would give voice to creative leaders will assist the Pigeon Creek watershed with scaling out the positive change of its success.

One way to help change behavior is to seek spokespeople from groups targeted to change. With such a large list of institutions involved in the watershed, it should not be hard to target the audiences to deliver the watershed quality improvement message.

A.5 REF ERENCES AND ADDITIONAL READING

City of Evansville, Department of Parks of Recreation. Pigeon Creek Greenway Passage, Evansville/Vanderburgh County, Indiana. Dec. 1994.

The Council of State Governments. Getting in Step: A Guide to Effective Outreach in your Watershed. N.d.

The CSO Partnership. "Legislative Update." 28 Jan. 2000.

Evansville Water & Sewer "1999 Annual Report"

Gard, Young, Jr., Lawson, Wolf, Johnson. "Senate Bill No. 431." 1 Feb. 2000.

http://www.ctic.purdue.edu/cgi-bin....p420.map&US+MAP.x=280&US+Map.y=108. "Indiana Buffer Templates."

http://www.state.in.us/dnr/index.html. "Indiana Department of Natural Resources Web Site"

http://www.state.in.us/dnr/soilcons/index.htm. "Indiana Department of Natural Resources Soil and Water Conservation District Web Site."

http://www.state.in.us/dnr/soilcons/index.htm. "Division of Soil Conservation Lake and River Enhancement Program Manual."

Indiana Department of Environmental Management Office of Water Management. "Section 319 Nonpoint Source Program Grants." Sep. 1997.

Indiana Department of Environmental Management. "Indiana State of the Environment Report 2000". N.d.

Indiana Department of Environmental Management, Office of Water Management. "Highland-Pigeon Watershed Restoration Action Strategy. Draft March 2000.

Indiana Department of Environmental Management, Water Management Section, Watershed Action Guide. November 1998

Indiana Department of Natural Resources. "Indiana's T-by-2000 Lake and River Enhancement Program."

Indiana Department of Natural Resources. "Indiana's T-by-2000 Urban Conservation Program."

Indiana Department of Natural Resources. "Indiana State of the Environment Report 1998."

Indiana Riverwatch, "Hoosier Riverwatch"

Indiana Department of Natural Resources Division of Soil Conservation. "Twelve Question and Answers about Soil and Water Conservation Districts."

Vanderburgh County Code Title 15 Chapter 15.44, Erosion and Sediment Control.

Pigeon Creek, The Greenway Passage. "Pathways, The Newsletter of the Pigeon Creek Greenway Passage. Pigeon Creek Watershed Workplan." September, 2000.

Pigeon Creek, The Greenway Passage. "Pathways, The Newsletter of the Pigeon Creek Greenway Passage. Pigeon Creek Watershed Workplan." May 1999.

"Pigeon-Highland Steering Committee." South Gibson Star-Times. January 2000.

Purdue University Cooperative Extension Service. "Wetlands, Regulations and You. What Every Indiana Farmer Needs to Know."

Soil and Water Conservation Society. "A Guide for Profitable Fertilizer and Pesticide Use."

Steeples, Amy, "Recommendations made during the Pigeon Creek Watershed Stakeholders Meeting." Letter to David Pott. Evansville, IN. 9 Nov. 1998.

United States Department of Agriculture. "A Conservation Plan for a Developing Area."

INSTITUTIONAL ASSESSMENT

Institutions Involved in Integrated Water Resources Management in Pigeon Creek

All Soil and Water Conservation District (SWCD) boards (Warrick & Gibson have none)
Audubon Society
Coal Companies
Conservation and Tillage Information Center (CTIC)
County Drainage Boards
Department of Natural Resources (DNR) Division of Reclamation
DNR Division of Oil and Gas
DNR Division of Soil Conservation
Elberfeld
Evansville Day School—water quality monitoring
Environmental Management Corporation
Evansville Levee Authority
Evansville Parks and Recreation Department
Evansville Sewer Pretreatment Lab
Evansville Water and Sewer Utility
Evansville/Vanderburgh School Corporation—water quality monitoring
Farm Bureau
Fitzgerald Environmental Associates
Friends of Ayrshire Group-local group formed to prevent old strip mine from being developed
Future Farmers of America
Gibson 4-H – All 4 H's Extensions etc. together
Health Departments –all counties (no mission statements)
Indiana Department of Environmental Management
Lynnville
Mesker Zoo (field days, compost animal dung)
Operation City Beautiful
Ohio River Valley Water Sanitation Commission (ORSANCO)
Pigeon Creek Greenway Passage
Pigeon Highland Steering Committee
Purdue Extension educators (pesticide/herbicide use, organic gardening, etc.)
Quail Unlimited
Sigeco, and other power companies
Solid Waste Management Districts (all counties)
Southwinds Maritime Center
Surveyors Office (each county)

SW Indiana Brine Coalition
Town of Darmstadt
Town of Haubstadt
Toyota—Gibson County, Grants, etc.
University of Evansville (UE)
University of Southern Indiana (USI)
Valley Watch
Vanderburgh 4-H ;- See Gibson Co. 4-H
Various mining companies within WS
Wagner's seed and fertilizer
Warrick 4-H – See Gibson Co. 4-H
Warrick Co. Co-op
Water and Sewer Utilities-all counties
Wesselman Woods
West Side Improvement
Wild Turkey Federation

Mission Statements

THE NATIONAL AUDUBON SOCIETY

The mission of the National Audubon Society is to conserve and restore natural ecosystems, focusing on birds and other wildlife for the benefit of humanity and the earth's biological diversity.

THE CONSERVATION TECHNOLOGY INFORMATION CENTER (CTIC)

CTIC envisions agriculture using environmentally beneficial and economically viable natural resource systems.

EVANSVILLE DAY SCHOOL

We help students develop a capacity for learning and growth that will last a lifetime, unlocking their potential to pursue whatever goals they set for themselves.

DNR DIVISION OF RECLAMATION

We, the employees of the Division of Reclamation, are dedicated to professional public service through effective administration of Indiana's mine reclamation laws. We are committed to ensuring optimum management of natural resources and public protection both during and after mining.

DNR DIVISION OF SOIL CONSERVATION

To ensure the protection, wise use and enhancement of Indiana's soil and water resources by coordinating implementation of the State's Clean Water Indiana soil conservation/water quality protection program and providing assistance to local soil and water conservation districts.

The Division of Soil conservation belongs to the Indiana Conservation Partnership. The partnership includes Indiana's 92 soil and water conservation districts (SWCDs), the USDA Natural Resources Conservation Service, and the Purdue University Cooperative Extension Service.

Working together, the Indiana Conservation Partnership provides technical, educational, and financial assistance to citizens in order to solve erosion and sediment-related problems occurring on the land or impacting public waters.

DNR DIVISION OF OIL AND GAS

The Division of Oil and Gas promotes the responsible development of oil and natural gas resources while protecting the environment. We serve the industry and the citizens of Indiana through professional leadership, management and education.

DNR DIVISION OF FISH AND WILDLIFE

To professionally manage Indiana's fish and wildlife for present and future generations, balancing ecological, recreational, and economic benefits.

We envision that the above mission will be realized by maintaining our focus upon fish and wildlife habitat, sound management, public involvement, and professional development of our fish and wildlife staff.

DUCKS UNLIMITED

The mission of Ducks Unlimited is to fulfill the annual life cycle needs of North American waterfowl by protecting, enhancing, restoring and managing important wetlands and associated uplands.

ENVIRONMENTAL MANAGEMENT CORPORATION

EMC's mission is to relieve our clients of their water, wastewater, and public works responsibility, and to preserve their capital investment. EMC links the know-how of our most valuable resource, our people, with the expectations of our customers. We then deliver service beyond those expectations because we understand the long-term benefits of a job well done.

EVANSVILLE LEVEE AUTHORITY

The City's flood control levee system began after the flood of 1937. The Evansville-Vanderburgh Levee Authority District was established in 1959. Earthen and concrete wall levees protect Evansville residents from the rising Ohio River and Pigeon Creek waters.

EVANSVILLE PARKS AND RECREATION DIVISION

Coordinates, oversees and facilitates the operations of 56 parks with over 2,200 acres of parkland and 21 special facilities. Employs 81 full-time and 160 part-time employees. During peak summer months, approximately 250 seasonal employees are added to staff pools, officiate softball games, supervise playgrounds, plan teen activities and assist with turf management and park maintenance.

EVANSVILLE SEWER PRETREATMENT LABORATORY

Operational Support – Conducts daily laboratory analyses for Evansville's two wastewater treatment facilities to ensure waters discharged into the Ohio River remains free of pollutants. Tests can range from the Federal NPDES (National Pollutant Discharge Elimination System) to those used for efficient operation of the treatment processes. Pollutants may range from actual conventional constituents to those of heavy metals, toxics, and organics. Test results are reported to the USEPA and IDEM (Indiana Department of Environmental Management.)

Industrial Pretreatment Program – Permits, monitors, and inspects various industrial users discharging to the sewer collection system. Ensures that compliance to the Federal, State and local city discharge limits are consistently being achieved. In addition, it allows the continuation of land application of generated biosolids to local farm grounds, thus providing a beneficial reuse of this material. Also institutes various enforcement action against those industries found to be in a non-compliant status.

EVANSVILLE WATER AND SEWER UTILITY

The Evansville Water and Sewer Utility will provide the Evansville metro area with high quality, safe, dependable water service as well as environmentally sound wastewater and solid waste management services at rates that encourage economic development. The Utility will manage land and water resources to ensure quality for future generations.

EVANSVILLE WATER & SEWER ENGINEERING DEPARTMENT

Responsible for long term planning, Geographic Information Systems (GIS) coordination, dye, smoke, pressure and hydrant flow tests and associated records; verification of fixtures and elevations for compliance with city ordinances; and for keeping abreast of all new Federal and State regulations impacting the Utility.

EVANSVILLE – VANDERBURGH SCHOOL CORP.

To provide the best education possible for our children so they can make the world a better place.

FUTURE FARMERS OF AMERICA

FFA makes a positive difference in the lives of students by developing their potential for premier leadership, personal growth and career success through agricultural education.

HOOSIER RIVERWATCH

Hoosier Riverwatch is a state-wide program that focuses on increasing public awareness of water quality issues by training volunteers to care for and monitor the health of Indiana's streams and rivers.

In addition to water quality monitoring volunteers may help protect and preserve the beauty of streams and rivers, as well as the quality of rivers and watersheds throughout Indiana through such programs as adopt-a-river and Indiana river's month.

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

The Indiana Department of Environmental Management (IDEM) is dedicated to conserving, protecting, enhancing, restoring, and managing Indiana's environment. We strive to fairly but vigorously enforce environmental laws and standards; promulgate regulations consistent with the law and public policy; and promote conservation, pollution prevention, and a healthy and sustainable ecosystem. We are committed to making Indiana a cleaner, healthier place to live.

INDIANA 4-H

To assist youth and adults in their development by conducting hands-on educational programs, using the knowledge base of Purdue University, other land grant universities and the United States Department of Agriculture.

INDIANA ASSOCIATION OF SOIL AND WATER CONSERVATION DISTRICTS

To present districts as one voice, and to assist the leadership of the local districts through coordination and education for the wise use and management of our natural resources.

INDIANA BIODIVERSITY INITIATIVE

The Indiana Biodiversity Initiative was started in 1996 by a group of scientist looking for ways to protect the biodiversity of Indiana. The Initiative has broadened and now includes representative from The Nature Conservancy, Hoosier Audubon Council, Hoosier Environmental Council, Indiana Department of Natural Resources, Natural Resources Conservation Service, Eli Lily and Company, Purdue University, Indiana University Schools of Public and Environmental Affairs, US Fish and Wildlife Service, and The Indiana Land Protection Alliance. The goal of the Initiative is to preserve, maintain and restore Indiana's natural diversity through educational programs and through compiling information needed to coordinate local biodiversity efforts statewide.

MESKER PARK ZOO AND BOTANIC GRADEN'S

The opportunity to learn directly from our living animal and plant collection is Mesker Park Zoo and Botanic Graden's unique offering for nurturing a responsible attitude

towards wildlife and wild places. Our mission is to strengthen that experience by providing a quality park promoting, through education, conservation and research, the importance and preservation of the many threatened species, cultures and ecosystems throughout the world.

OPERATION CITY BEAUTIFUL

Operation City Beautiful strives to educate the public – young and old – on the benefits of a clean community for Evansville's economic development efforts, and to its environment and health. With that, we work to involve persons in keeping our community clean and healthy. And to resolve issues where education and involvement do not reach, we encourage enforcement of various clean community ordinances to enhance the quality of life in our city for future years.

ORSANCO

The Ohio River Valley Water Sanitation Commission (ORSANCO), was established on June 30, 1948 to control and abate pollution in the Ohio River Basin. ORSANCO is an interstate commission representing eight states and the federal government. Member states include: Illinois, Indiana, Kentucky, New York, Ohio, Pennsylvania, Virginia, and West Virginia. ORSANCO operates programs to improve water quality in the Ohio River and its tributaries, including: setting waste water discharge standards; performing biological assessments; monitoring the chemical and physical properties of the waterways; and conducting special surveys and studies. ORSANCO also coordinates emergency response activities for spills or accidental discharges to the river, and promotes public participation in programs, such as the Ohio River Sweep and River Watchers volunteer monitoring programs.

POSEY COUNTY
SOIL & WATER CONSERVATION DISTRICT (SWCD)

Our Mission is to provide leadership and assistance in the proper use and management of soil, water, and related natural resources in Posey County.

PURDUE UNIVERSITY'S AGRICULTURE AND NATURAL RESOURCES EXTENSION TEAM

Purdue University's Agriculture and Natural Resources Extension Team is the premiere source of educational programs and information about Agriculture, Natural Resources and the Food System. We are a customer driven educational organization that assists Indiana citizens in achieving their goals of profit in agriculture, abundant and safe food, a clean environment and effective stewardship of natural resources.

We provide lifelong education, training, and technical assistance to people and businesses with agricultural and natural resource-related interests. Emphasis is on environmentally sound techniques for food and fiber production, competitive farm

business management, marketing and processing of agricultural products, and natural resource management.

QUAIL UNLIMITED, INC.

Quail Unlimited, Inc. is the only national, non-profit conservation organization dedicated to the wise management of America's wild quail as a valuable and renewable resource.

ALL COUNTIES' SOLID WASTE MANAGEMENT DISTRICTS (SWWMD)

To reduce the amount of materials going into landfills by 50% by the year 2000. (Note: This Mission Statement was written in 1992 and the goal was attained by 1996)

SOLID WASTE MANAGEMENT VANDERBURGH CO.

Education/Promotion – Develops and distributes educational materials to citizens and businesses on waste reduction and recycling, composting, hazardous waste, improper disposal and other issues; develops promotional materials on solid waste issues for distribution to media and advertising outlets (billboards, busses, shelters); publishes and distributes quarterly newsletters for 4th and 5th graders and the general public; operates, along with Weyerhaeuser, Enterprise Association and BFI, a recycling education center for schools and civic organizations; coordinates with Operation City Beautiful CLEAN Team program on solid waste reduction, litter awareness and recycling; establishes focus groups and waste reduction/recycling workshops for business and industry; establishes home, compost demonstration sites for education on yard waste management and composting; speaks to schools groups and civic organizations.

Programs/Activities – Conducts Household Hazardous Waste Collection Program (Tox – Away Day) for public in September for collection of paint, used motor oil, pesticides and other hazardous materials; conducts Tire Amnesty Day for public in April to collect and recycle tires; conducts Holiday Recycling Program for public in early January to collect and mulch Christmas trees and to collect and recycle other items; conducts Household Battery Recycling Program, an ongoing program with Juester's Hardware where public can drop-off household batteries for recycling; conducts Agricultural Pesticide Container Recycling Program in August for farmers to collect and recycle clean used pesticide containers; coordinates Civic Center Paper Recycling Program for Civic Center and courts offices to recycle office paper, newspapers and magazines; develops and implements programs along with businesses to recycle specialty items, such as batteries, motor oil and paint.

Information Clearinghouse – Provides information and explain details on City recycling program; provides information on drop-off recycling sites, including location, of what can be recycled and where; publishes and keeps up-to-date Recycling In Vanderburgh County brochure; provides information to business and industry on

waste reduction, how to do a waste assessment, companies to contact for recycling service; serves as an educational clearinghouse for government, business and industry, and citizens on waste reduction, recycling, markets, and other solid waste issues; coordinates with regional and statewide solid waste districts on programs and activities.

TOYOTA (Gibson Co. Plant)

"…. at Toyota our commitment to the environment extends beyond our products. Whether planting trees or helping renew our public parks, Toyota is working to make our communities cleaner."

VANDERBURGH CO. SWCD

An innovative conservation partnership dedicated to quality service resulting in a harmonious balance between profitability social change, and the natural resources within our environment.

WESSELMAN WOOD NATURE PRSERVE

To provide the community the opportunity to increase their appreciation understanding and enjoyment of the natural world. To preserve and protect the unique quantities of this old-growth mixed lowland forest, and to insure the continued status of the Wesselman Woods Nature Preserve as a National Natural Landmark and Indiana State Nature Preserve.

WEST SIDE IMPROVEMENT ASSOCIATION, INC. (Citizens Organization)

Existing influence upon public and private sectors to accomplish those objectives which shall enhance the natural environment of the west side of Vanderburgh County and serve the common good of the residents.

NATIONAL WILD TURKEY FEDERATION

Dedicated to conserving wild turkeys and preserving hunting traditions. Restoration and habitat enhancement.

Institutional Assessment: Pigeon Creek North and Pigeon Creek Evansville
Standard Form for case review

Date:
Name:
Title:
Organization:
Phone:
E-mail:
Fax:

History
Present
What has worked?
What looks as though it is going to
What needs to be improved?
What has plan of action been to date?
What do they think their plan of action should be in the near term versus the long term?

Agency Organization (structure or heirarchy)
General Type of Activity
Authority and Legislation
Specific Programs related to water quality management
Agency views on specific problems identified
Effectiveness of Programs
Controls or Techniques Applying or Responsible for Applying
Manpower and Budget Activities
Deficiencies in Existing Authorities, Manpower or Budget

I. History

A. **Case Background**
B. **Research Questions**
C. **Research Methodology**

II. Pigeon's Previous Water Supply and Indicators of its Transformation

A. **Pre-watershed work Basin**
   1. **Selected Indicators of Pigeon's Successful Transformation**
B. **Improved Performance**
C. **Improved Community impression**

D. **Improved Government impression**
E. **Improved Private Sector impression**

III. Local Level Innovations

A. **INDNR Administrative Arrangements**
B. **Private Sector Administrative Arrangements**
C. **Government Administrative Arrangements**

IV. Local Level Procedural Innovations

A. **Aware of Community Issues**
B. **Aware of Private Sector limitations**

V. Local Level Managerial Innovations

A. **Allegiance to the Community**
A. **Incentives for Industry**
B. **Incentives for government to monitor**

VI. Strategic Technical Innovation

A. **Managing Existing Resources Efficiently**
B. **Enforcing Technical Standards**

VII. Transitional Innovations: Implementation Strategy

A. **Scaling-Out to Similar Areas**
B. **Feedback Learning for Future Improvements**

VIII. Broader Implications: Institutional Lessons from Pigeon Creek Innovations?

A. **Community Involvement?**
B. **Private Sector Participation?**
C. **Government Information Sharing?**

APPENDIX B-1

AUGUST 1999 WATER QUALITY REPORTS

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received	8/6/99
Date Reported	9/8/99
Date Sampled	8/5/99
Sample ID #	NM59995

Client Reference PC 15
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	2.8	mg/L	1	8/11/99	SLS	SM 4500-N_{org} C
Nitrate as N	1.6	mg/L	0.05	8/10/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.47	mg/L	0.02	8/10/99	SAS	SM 3120 -
Biochemical Oxygen Demand	<2.8	mg/L	2.8	8/11/99	KLB	SM 5210
Total Suspended Solids	8	mg/L	1	8/10/99	MEH	SM 2540 D
Escherichia coli MF	< 4	colonies/100ml	4	8/6/99	KWJ	SM 9213 D
Ammonia by ISE	0.45	mg/L	0.03	8/28/99	KAT	SM 4500-NH_3 F

Reviewed and Approved by

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Date Received	8/6/99
Date Reported	9/8/99
Date Sampled	8/5/99
Sample ID #	NM59996

Client Reference PC 16
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	2.8	mg/L	1	8/11/99	SLS	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/10/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.4	mg/L	0.02	8/10/99	SAS	SM 3120
Biochemical Oxygen Demand	<2.8	mg/L	2.8	8/11/99	KLB	SM 5210
Total Suspended Solids	12	mg/L	1	8/10/99	MEH	SM 2540 D
Escherichia coli MF	< 4	colonies/100ml	4	8/6/99	KWJ	SM 9213 D
Ammonia by ISE	2.75	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Date Received	8/6/99
Date Reported	9/8/99
Date Sampled	8/6/99
Sample ID #	NM60065

Client Reference SA1
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	8/12/99	SLS	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/10/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.43	mg/L	0.02	8/10/99	SAS	SM 3120
Biochemical Oxygen Demand	<2.8	mg/L	2.8	8/11/99	KLB	SM 5210
Total Suspended Solids	10	mg/L	1	8/10/99	MEH	SM 2540 D
Escherichia coli MF	5	colonies/100ml	1	8/11/99	KWJ	SM 9213 D
Ammonia by ISE	0.56	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

Reviewed and Approved by

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Date Received	8/6/99
Date Reported	9/8/99
Date Sampled	8/6/99
Sample ID #	NM60066

Client Reference PC1
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	1	mg/L	1	8/12/99	SLS	SM 4500-N_{org} C
Nitrate as N	0.68	mg/L	0.05	8/10/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.41	mg/L	0.02	8/10/99	SAS	SM 3120
Biochemical Oxygen Demand	<2.8	mg/L	2.8	8/11/99	KLB	SM 5210
Total Suspended Solids	9	mg/L	1	8/10/99	MEH	SM 2540 D
Escherichia coli MF	12	colonies/100ml	1	8/11/99	KWJ	SM 9213 D
Ammonia by ISE	0.68	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Date Received	8/7/99
Date Reported	9/8/99
Date Sampled	8/7/99
Sample ID #	NM60095

Client Reference PC2
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	1.8	mg/L	1	8/12/99	SLS	SM 4500-N_{org} C
Nitrate as N	0.41	mg/L	0.05	8/10/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.66	mg/L	0.02	8/10/99	SAS	SM 3120
Total Suspended Solids	25	mg/L	1	8/10/99	MEH	SM 5210
Escherichia coli MF	36	colonies/100ml	1	8/11/99	KWJ	SM 2540 D
Biochemical Oxygen Demand	<2.1	mg/L	2.1	8/12/99	CAW	SM 9213 D
Ammonia by ISE	0.33	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Date Received	8/7/99
Date Reported	9/8/99
Date Sampled	8/7/99
Sample ID #	NM60096

Client Reference PC3
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	1	mg/L	1	8/12/99	SLS	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/10/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.68	mg/L	0.02	8/10/99	SAS	SM 3120
Total Suspended Solids	13	mg/L	1	8/10/99	MEH	SM 5210
Escherichia coli MF	92	colonies/100ml	1	8/11/99	KWJ	SM 2540 D
Biochemical Oxygen Demand	<2.1	mg/L	2.1	8/12/99	CAW	SM 9213 D
Ammonia by ISE	< 0.03	mg/L	0.03	8/27/99	KWJ	SM 4500-NH_3 F

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Date Received	8/7/99
Date Reported	9/8/99
Date Sampled	8/7/99
Sample ID #	NM60097

Client Reference PC4
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	1.1	mg/L	1	8/12/99	SLS	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/11/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.67	mg/L	0.02	8/10/99	SAS	SM 3120
Total Suspended Solids	13	mg/L	1	8/10/99	MEH	SM 5210
Escherichia coli MF	70	colonies/100ml	1	8/11/99	KWJ	SM 2540 D
Biochemical Oxygen Demand	<2.1	mg/L	2.1	8/12/99	CAW	SM 9213 D
Ammonia by ISE	0.95	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Date Received	8/7/99
Date Reported	9/8/99
Date Sampled	8/7/99
Sample ID #	NM60098

Client Reference PC5
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	1.4	mg/L	1	8/12/99	SLS	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/11/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.68	mg/L	0.02	8/10/99	SAS	SM 3120
Total Suspended Solids	14	mg/L	1	8/10/99	MEH	SM 5210
Escherichia coli MF	60	colonies/100ml	1	8/11/99	KWJ	SM 2540 D
Biochemical Oxygen Demand	<2.1	mg/L	2.1	8/12/99	CAW	SM 9213 D
Ammonia by ISE	0.15	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Date Received	8/8/99
Date Reported	9/8/99
Date Sampled	8/8/99
Sample ID #	NM60099

Client Reference LP1
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	2.1	mg/L	1	8/12/99	SLS	SM 4500-N_{org} C
Nitrate as N	1.2	mg/L	0.05	8/11/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.6	mg/L	0.02	8/10/99	SAS	SM 3120
Biochemical Oxygen Demand	4.3	mg/L	3	8/14/99	ASR	SM 5210
Total Suspended Solids	51	mg/L	1	8/10/99	MEH	SM 2540 D
Escherichia coli MF	1100	colonies/100ml	1	8/11/99	KWJ	SM 9213 D
Ammonia by ISE	0.34	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Date Received	8/8/99
Date Reported	9/8/99
Date Sampled	8/8/99
Sample ID #	NM60100

Client Reference LP2
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	2.4	mg/L	1	8/12/99	SLS	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/11/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.59	mg/L	0.02	8/10/99	SAS	SM 3120
Biochemical Oxygen Demand	<3.0	mg/L	3	8/14/99	ASR	SM 5210
Total Suspended Solids	9	mg/L	1	8/10/99	MEH	SM 2540 D
Escherichia coli MF	320	colonies/100ml	1	8/11/99	KWJ	SM 9213 D
Ammonia by ISE	0.61	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Date Received	8/11/99
Date Reported	9/7/99
Date Sampled	8/11/99
Sample ID #	NM60487

Client Reference SC1
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	1.8	mg/L	1	8/20/99	CGM	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/17/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.3	mg/L	0.02	8/18/99	SAS	SM 3120
Biochemical Oxygen Demand	<2.8	mg/L	2.8	8/16/99	CGM	SM 5210
Total Suspended Solids	8	mg/L	1	8/12/99	MEH	SM 2540 D
Escherichia coli MF	67	colonies/100ml	1	8/12/99	KWJ	SM 9213 D
Ammonia by ISE	1.04	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Date Received	8/10/99
Date Reported	9/8/99
Date Sampled	8/10/99
Sample ID #	NM60362

Client Reference BC2
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	1.4	mg/L	1	8/20/99	CGM	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/11/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.55	mg/L	0.02	8/16/99	SAS	SM 3120
Biochemical Oxygen Demand	<3.0	mg/L	3	8/15/99	ASR	SM 5210
Total Suspended Solids	19	mg/L	1	8/11/99	MEH	SM 2540 D
Escherichia coli MF	540	colonies/100ml	1	8/12/99	KWJ	SM 9213 D
Ammonia by ISE	1.15	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Date Received	8/10/99
Date Reported	9/8/99
Date Sampled	8/10/99
Sample ID #	NM60363

Client Reference LP9
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	1.7	mg/L	1	8/20/99	CGM	SM 4500-N_{org} C
Nitrate as N	1.4	mg/L	0.5	8/11/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.98	mg/L	0.02	8/16/99	SAS	SM 3120
Biochemical Oxygen Demand	<2.8	mg/L	2.8	8/16/99	CGM	SM 5210
Total Suspended Solids	72	mg/L	1	8/11/99	MEH	SM 2540 D
Escherichia coli MF	210	colonies/100ml	1	8/12/99	KWJ	SM 9213 D
Ammonia by ISE	0.41	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Date Received	8/10/99
Date Reported	9/8/99
Date Sampled	8/10/99
Sample ID #	NM60361

Client Reference LC2
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	3.2	mg/L	1	8/20/99	CGM	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/11/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.66	mg/L	0.02	8/16/99	SAS	SM 3120
Biochemical Oxygen Demand	<5.0	mg/L	5	8/15/99	ASR	SM 5210
Total Suspended Solids	140	mg/L	1	8/11/99	MEH	SM 2540 D
Escherichia coli MF	610	colonies/100ml	1	8/12/99	KWJ	SM 9213 D
Ammonia by ISE	1.14	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Date Received	8/9/99
Date Reported	9/8/99
Date Sampled	8/9/99
Sample ID #	NM60190

Client Reference DUP 89 PC8 dup
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	2.1	mg/L	1	8/12/99	SLS	SM 4500-N_{org} C
Nitrate as N	0.53	mg/L	0.05	8/11/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.78	mg/L	0.02	8/11/99	SAS	SM 3120
Biochemical Oxygen Demand	<3.0	mg/L	3	8/14/99	ASR	SM 5210
Total Suspended Solids	63	mg/L	1	8/11/99	MEH	SM 2540 D
Escherichia coli MF	300	colonies/100ml	1	8/11/99	KWJ	SM 9213 D
Ammonia by ISE	0.44	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Date Received	8/9/99
Date Reported	9/8/99
Date Sampled	8/9/99
Sample ID #	NM60189

Client Reference BC1
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	8/12/99	SLS	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/11/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.56	mg/L	0.02	8/11/99	SAS	SM 3120
Biochemical Oxygen Demand	<3.0	mg/L	3	8/14/99	ASR	SM 5210
Total Suspended Solids	5	mg/L	1	8/11/99	MEH	SM 2540 D
Escherichia coli MF	3500	colonies/100ml	1	8/11/99	KWJ	SM 9213 D
Ammonia by ISE	1.92	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Date Received	8/9/99
Date Reported	9/8/99
Date Sampled	8/9/99
Sample ID #	NM60188

Client Reference PC8
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	2.1	mg/L	1	8/12/99	SLS	SM 4500-N_{org} C
Nitrate as N	0.49	mg/L	0.05	8/11/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.78	mg/L	0.02	8/11/99	SAS	SM 3120
Biochemical Oxygen Demand	<3.0	mg/L	3	8/14/99	ASR	SM 5210
Total Suspended Solids	68	mg/L	1	8/11/99	MEH	SM 2540 D
Escherichia coli MF	1000	colonies/100ml	1	8/11/99	KWJ	SM 9213 D
Ammonia by ISE	2.27	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Date Received	8/8/99
Date Reported	9/8/99
Date Sampled	8/8/99
Sample ID #	NM60101

Client Reference LC1
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	2	mg/L	1	8/12/99	SLS	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/11/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.59	mg/L	0.02	8/10/99	SAS	SM 3120
Biochemical Oxygen Demand	<3.0	mg/L	3	8/14/99	ASR	SM 5210
Total Suspended Solids	27	mg/L	1	8/10/99	MEH	SM 2540 D
Escherichia coli MF	880	colonies/100ml	1	8/11/99	KWJ	SM 9213 D
Ammonia by ISE	0.55	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Date Received	8/11/99
Date Reported	9/7/99
Date Sampled	8/11/99
Sample ID #	NM60488

Client Reference BC3
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	8/20/99	CGM	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/17/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.29	mg/L	0.02	8/18/99	SAS	SM 3120
Biochemical Oxygen Demand	<2.8	mg/L	2.8	8/16/99	CGM	SM 5210
Total Suspended Solids	51	mg/L	1	8/12/99	MEH	SM 2540 D
Escherichia coli MF	27	colonies/100ml	1	8/12/99	KWJ	SM 9213 D
Ammonia by ISE	1.6	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Date Received	8/11/99
Date Reported	9/7/99
Date Sampled	8/11/99
Sample ID #	NM60489

Client Reference PC11
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	8/20/99	CGM	SM 4500-N_{org} C
Nitrate as N	0.68	mg/L	0.05	8/17/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.44	mg/L	0.02	8/18/99	SAS	SM 3120
Biochemical Oxygen Demand	<2.8	mg/L	2.8	8/16/99	CGM	SM 5210
Total Suspended Solids	34	mg/L	1	8/12/99	MEH	SM 2540 D
Escherichia coli MF	180	colonies/100ml	1	8/12/99	KWJ	SM 9213 D
Ammonia by ISE	1.01	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

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Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received	8/12/99
Date Reported	9/7/99
Date Sampled	8/12/99
Sample ID #	NM60610

Client Reference PC12
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	2.5	mg/L	1	8/20/99	CGM	SM 4500-N_{org} C
Nitrate as N	0.54	mg/L	0.05	8/17/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.16	mg/L	0.02	8/18/99	SAS	SM 3120
Biochemical Oxygen Demand	<2.8	mg/L	2.8	8/17/99	CGM	SM 5210
Total Suspended Solids	23	mg/L	1	8/13/99	MEH	SM 2540 D
Escherichia coli MF	295	colonies/100ml	1	8/13/99	JM	SM 9213 D
pH	8.37			8/17/99	MLB	SM 4500-H^+
Ammonia by ISE	0.67	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

Reviewed and Approved by

Kevin Jacobs, BS

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CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received	8/12/99
Date Reported	9/7/99
Date Sampled	8/12/99
Sample ID #	NM60611

Client Reference WDI
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	8/20/99	CGM	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/17/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.12	mg/L	0.02	8/18/99	SAS	SM 3120
Biochemical Oxygen Demand	3.7	mg/L	2.8	8/17/99	CGM	SM 5210
Total Suspended Solids	69	mg/L	1	8/13/99	MEH	SM 2540 D
Escherichia coli MF	200	colonies/100ml	1	8/13/99	JM	SM 9213 D
pH	7.63			8/17/99	MLB	SM 4500-H^+
Ammonia by ISE	1.55	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

Reviewed and Approved by

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Date Received	8/12/99
Date Reported	9/7/99
Date Sampled	8/12/99
Sample ID #	NM60612

Client Reference UNI
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	1.1	mg/L	1	8/20/99	CGM	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/17/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.08	mg/L	0.02	8/18/99	SAS	SM 3120
Biochemical Oxygen Demand	<2.8	mg/L	2.8	8/17/99	CGM	SM 5210
Total Suspended Solids	61	mg/L	1	8/13/99	MEH	SM 2540 D
Escherichia coli MF	43	colonies/100ml	1	8/13/99	JM	SM 9213 D
pH	8			8/17/99	MLB	SM 4500-H^+
Ammonia by ISE	0.96	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

Reviewed and Approved by

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Chicago, IL 60606

Date Received	8/14/99
Date Reported	9/7/99
Date Sampled	8/14/99
Sample ID #	NM60723

Client Reference SF1
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	1.3	mg/L	1	8/20/99	CGM	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/17/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.07	mg/L	0.02	8/18/99	SAS	SM 3120
Biochemical Oxygen Demand	<2.8	mg/L	2.8	8/20/99	ASR	SM 5210
Total Suspended Solids	5	mg/L	1	8/17/99	MEH	SM 2540 D
Escherichia coli MF	110	colonies/100ml	1	8/16/99	KWJ	SM 9213 D
pH	8.57			8/17/99	MLB	SM 4500-H^+
Ammonia by ISE	0.49	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

Reviewed and Approved by

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233 S. Wacker Dr.
Chicago, IL 60606

Date Received	8/14/99
Date Reported	9/7/99
Date Sampled	8/14/99
Sample ID #	NM60724

Client Reference BG1
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	8/20/99	CGM	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/17/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.05	mg/L	0.02	8/18/99	SAS	SM 3120
Biochemical Oxygen Demand	<2.8	mg/L	2.8	8/20/99	ASR	SM 5210
Total Suspended Solids	11	mg/L	1	8/17/99	MEH	SM 2540 D
Escherichia coli MF	98	colonies/100ml	1	8/16/99	KWJ	SM 9213 D
pH	8.26			8/17/99	MLB	SM 4500-H^+
Ammonia by ISE	0.36	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

Reviewed and Approved by

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Chicago, IL 60606

Date Received	8/14/99
Date Reported	9/7/99
Date Sampled	8/14/99
Sample ID #	NM60725

Client Reference SF2
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	8/20/99	CGM	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/17/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.07	mg/L	0.02	8/18/99	SAS	SM 3120
Biochemical Oxygen Demand	<2.8	mg/L	2.8	8/20/99	ASR	SM 5210
Total Suspended Solids	10	mg/L	1	8/17/99	MEH	SM 2540 D
Escherichia coli MF	25	colonies/100ml	1	8/16/99	KWJ	SM 9213 D
pH	8.6			8/17/99	MLB	SM 4500-H^+
Ammonia by ISE	0.22	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

Reviewed and Approved by

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Chicago, IL 60606

Date Received	8/14/99
Date Reported	9/7/99
Date Sampled	8/14/99
Sample ID #	NM60726

Client Reference SF3
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	8/20/99	CGM	SM 4500-N_{org} C
Nitrate as N	<0.05	mg/L	0.05	8/17/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.09	mg/L	0.02	8/18/99	SAS	SM 3120
Biochemical Oxygen Demand	<2.8	mg/L	2.8	8/20/99	ASR	SM 5210
Total Suspended Solids	1.5	mg/L	1	8/17/99	MEH	SM 2540 D
Escherichia coli MF	54	colonies/100ml	1	8/16/99	KWJ	SM 9213 D
pH	8.33			8/17/99	MLB	SM 4500-H^+
Ammonia by ISE	0.35	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

Reviewed and Approved by

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CSA *Central States Analytical*

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Chicago, IL 60606

Date Received	8/16/99
Date Reported	9/7/99
Date Sampled	8/15/99
Sample ID #	NM60819

Client Reference PC14
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	8/25/99	SLS	SM 4500-N_{org} C
Nitrate as N	1.6	mg/L	0.05	8/17/99	CGM	SM 4500-NO_3 C
Phosphorus as P	0.48	mg/L	0.02	8/20/99	SAS	SM 3120
Biochemical Oxygen Demand	<3.0	mg/L	3	8/21/99	CAW	SM 5210
Total Suspended Solids	20	mg/L	1	8/17/99	MEH	SM 2540 D
Escherichia coli MF	8	colonies/100ml	1	8/19/99	KWJ	SM 9213 D
pH	8.66			8/27/99	SLS	SM 4500-H^+
Ammonia by ISE	0.73	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

Reviewed and Approved by

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Chicago, IL 60606

Date Received	8/16/99
Date Reported	9/7/99
Date Sampled	8/15/99
Sample ID #	NM60820

Client Reference WF1
Project Comment

Analysis	Results	Units	MDL	Date	Analyst	Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	8/25/99	SLS	SM 4500-N_{org} C
Nitrate as N	2.4	mg/L	0.05	8/17/99	CGM	SM 4500-NO_3 C
Phosphorus as P	1.4	mg/L	0.02	8/20/99	SAS	SM 3120
Biochemical Oxygen Demand	<3.0	mg/L	3	8/21/99	CAW	SM 5210
Total Suspended Solids	24	mg/L	1	8/17/99	MEH	SM 2540 D
Escherichia coli MF	230	colonies/100ml	1	8/19/99	KWJ	SM 9213 D
pH	8.81			8/27/99	SLS	SM 4500-H^+
Ammonia by ISE	0.44	mg/L	0.03	8/27/99	KAT	SM 4500-NH_3 F

Reviewed and Approved by

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Central States Analytical

CHAIN OF CUSTODY

Rush turnaround subject to pre-approval and additional surcharge

2406 Lynch Road
Evansville, IN 47711
(812) 464-9000 Fax (812) 424-0667

Company: Ilarza Contact: P.O. # / Project:	Address: 233 S. Wacker Chicago, Ill 60606 Telephone #: 312-831-3000 Fax #: 831-3477	Samplers: CWB (If more than one sample, identify which samples taken)

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	Nitrate	Ammonia	TSS	E.Coli	TKN	T.Phos	BOD	pH	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
Dup815	60727	8/15/99	H_2O	X	X	X	X	X	X	X	X	Grab	5	H_2SO_4 / HNO_3
HC1	60728	8/15/99 14:10	H_2O	X	X	X	X	X	X	X	X	"	5	" "
WF3	60729	8/15/99 8:40	H_2O	X	X	X	X	X	X	X	X	"	5	" "
WF2	60730	8/15/99 12:15	H_2O	X	X	X	X	X	X	X	X	"	5	" "
		8/15/99	H_2O	X	X	X	X	X	X	X	X	"	5	" "

Relinquished by: [signature]	Date/Time: 8/15/99 15:10	Received by: [signature]	Date/Time: 8/15/99 15:13
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Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 8/15/99 15:27	Report Released By:	Date/Time:

Central States Analytical

2406 Lynch Road
Evansville, IN 47711
(812) 464-9000 Fax (812) 424-0667

CHAIN OF CUSTODY

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: Haza Engineering Contact: P.O. # / Project:	Address: 233 S. Wacker Dr. Chicago, IL 60606 Telephone #: Fax #:	Samplers: EJB, CWB (If more than one sample, identify which samples taken)

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	TKN	Nitrate	Ammonia	Total Phosphorus	BOD	TSS	E. Coli									Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
SA1	600065	8/6/99 11:20	Water																		
PC1	600066	8/6/99 15:40	Water																		

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Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 8/6/99 17:20	Report Released By:	Date/Time:

Central States Analytical

CHAIN OF CUSTODY

2406 Lynch Road
Evansville, IN 47711
(812) 464-9000 Fax (812) 424-0667

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: Harza **Contact:** **P.O. # / Project:**	**Address:** 233 S. Wacker Chicago, IL **Telephone #:** 312-831-3000 **Fax #:** 831-3997	**Samplers:** CWB (If more than one sample, identify which samples taken)

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	Nitrate	Ammonia	TSS	E. Coli	TKN	Ag Tr. Phos	BOD	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
PC2	60095	8/7/99 / 8:30	H_2O	X	X	X	X	X	X	X	Grab	5	H_2SO_4 / HNO_3
PC3	60096	8/7/99 / 7:45	H_2O	X	X	X	X	X	X	X	"	5	H_2SO_4 / HNO_3
PC4	60097	8/7/99 / 9:15	H_2O	X	X	X	X	X	X	X	"	5	H_2SO_4 / HNO_3
PC5	60098	8/7/99 / 9:45	H_2O	X	X	X	X	X	X	X	"	5	H_2SO_4 / HNO_3

Relinquished by: [signature]	Date/Time: 8/7/99 3:00	Received by: Michelle Sandal	Date/Time: 8-7-99 3:00
Relinquished by:	Date/Time:	Received by: [signature]	Date/Time: 8-7-99 16:40
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 8/7/99 16:45	Report Released By:	Date/Time:

Central States Analytical

CHAIN OF CUSTODY

2406 Lynch Road
Evansville, IN 47711
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_____ Rush turnaround
subject to pre-approval
and additional surcharge

Company: Harza Engineering
Contact:
P.O. # / Project:

Address: 233 S. Wacker Dr
Chicago IL 60606
Telephone #: Fax #:

Samplers: EDB, CWB
(If more than one sample, identify which samples taken)

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	TKN	Nitrate	Ammonia	Total phosphorus	BOD	TSS	E coli							Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
PC15	59995	8/5/99 16:30	Water	X	X	X	X	X	X	X							Grab	3	H_2SO_4
PC16	59996	8/5/99 11:15	Water	X	X	X	X	X	X	X							Grab	3	H_2SO_4

Relinquished by: [signature]	Date/Time: 8/5/99 17:20	Received by: [signature]	Date/Time: 8/5/99 1720
Relinquished by:	Date/Time:	Received by: [signature]	Date/Time: 8/6/99 9:08
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 8/6/99 9:08	Report Released By:	Date/Time:

Central States Analytical

CHAIN OF CUSTODY

2406 Lynch Road
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(812) 464-9000 Fax (812) 424-0667

_____ **Rush turnaround**
subject to pre-approval
and additional surcharge

Company: Horza **Contact:** **P.O. # / Project:**	**Address:** 233 S Wacker Chicago, Ill 60606 **Telephone #:** 312-831-3000 **Fax #:**	**Samplers:** CWB (If more than one sample, identify which samples taken)

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	Nitrate	Ammonia	TSS	E.Coli	TKN	T. Phos	BOD	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
PC6	60186	8/9/99 8:45	H_2O								Grab	5	H_2SO_4 / HNO_3
PC7	60187	8/9/99 10:45	H_2O								"	5	" "
PC8	60188	8/9/99 14:30	H_2O								"	5	" "
BC1	60189	8/9/99 14:15	H_2O								"	5	" "
Dup #1	60190	8/9/99	H_2O								"	5	" "

Relinquished by: Chris Bard	Date/Time: 8/9/99 16:40	Received by: [illegible]	Date/Time: 8/9/99 16:45
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [illegible]	Date/Time: 8/9/99 16:53	Report Released By:	Date/Time:

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CHAIN OF CUSTODY

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Evansville, IN 47711
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_____ **Rush turnaround**
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and additional surcharge

Company: Horizon **Contact:** **P.O. # / Project:**	**Address:** 2335 Walker Chicago, IL 60000 **Telephone #:** 312-831-3000 **Fax #:** 831-3999	**Samplers:** BwB (If more than one sample, identify which samples taken)

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	Nitrate	Ammonia	TSS	Fecal	TKN	T. Phos	(SOL)	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
LC 2	8:00	8/10/99	H_2O								Grab	5	H_2SO_4 /HNO3 60361
BC 2	9:30	8/10/99	"								"	"	" " 60360
PC 9) LP 9	10:15	8/10/99	"								"	"	" " 60362
			"										

Relinquished by: [signature]	Date/Time: 8/10/99 16:20	Received by: [signature]	Date/Time: 8/10/99 16:20
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 8/11/99 16:29	Report Released By:	Date/Time:

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CHAIN OF CUSTODY

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(812) 464-9000 Fax (812) 424-0667

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Company: Haza Contact: P.O. # / Project:	Address: 233 S. Wacker Chicago, Ill 60606 Telephone #: 312-831-3000 Fax #: 831-3999	Samplers: CWB (If more than one sample, identify which samples taken)

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	Nitrate	Ammonia	TSS	E Coli	TKN	T. Phos	BOD	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
	60059	8/8/99 11:15	LP1	Y	Y	Y	Y	Y	Y	Y	Grab	5	H_2SO_4 HNO_3
LP1	60100	8/8/99 8:30	LC1	Y	Y	Y	Y	Y	Y	Y	"	5	" "
LP2	60101	8/8/99 13:00	LP2	Y	Y	Y	Y	Y	Y	Y	"	5	" "
LC1													

Relinquished by: [signature]	Date/Time: 8/8/99 14:12	Received by: [signature]	Date/Time: 8/8/99 1412
Relinquished by:	Date/Time:	Received by: [signature]	Date/Time: 8/8/99 17:12
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Logged into LIMS: [signature]	Date/Time: 8/8/99 17:12	Report Released By:	Date/Time:

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CHAIN OF CUSTODY

Rush turnaround subject to pre-approval and additional surcharge

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Company: Harza **Contact:** **P.O. # / Project:**	**Address:** 233 S Wacker, Chicago, Ill **Telephone #:** 312 831-3000 **Fax #:** 831-3979	**Samplers:** CWB (If more than one sample, identify which samples taken)

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	Nitrate	Ammonia	TSS	E. coli	TKN	T. phos	BOD	pH	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
PC12	60610	8/12/99 16:00	H_2O	X	X	X	X	X	X	X	X	Grab	5	H_2SO_4/HNO_3
WD1	60611	8/12/99 8:30	"	X	X	X	X	X	X	X	X	"	5	
UN1	60612	8/12/99 12:05	"	X	X	X	X	X	X	X	X	"	5	
DUP812	60613	8/12/99	"	X	X	X	X	X	X	X	X	"	5	

Relinquished by: [signature]	Date/Time: 8/12/99 17:10	Received by: [signature]	Date/Time: 8/12/99 17:14
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 8/12/99 17:30	Report Released By:	Date/Time:

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Company: Nasza **Contact:** **P.O. # / Project:**	**Address:** 233 S. Wacker Dr. Chicago, Ill 60606 **Telephone #:** 312-831-3000 **Fax #:** 831-3799	**Samplers:** CWB (If more than one sample, identify which samples taken)

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	Nitrate	Ammonia	TSS	E-Coli	TKN	T. Phos	BOD	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
SC1	60487	8/11/99 15:30	H_2O	X	X	X	X	X	X	X	Grab	5	H_2SO_4 / HNO_3
BC3	60488	8/11/99 8:30	"	X	X	X	X	X	X	X	"	5	" "
PC11	60489	8/11/99 11:30	"	X	X	X	X	X	X	X	"	5	" "

16:30

Relinquished by: [signature]	Date/Time: 8/11/99 16:30	Received by: [signature]	Date/Time: 8/11/99
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 8/11/99 16:33	Report Released By:	Date/Time:

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Company: Horza	Address: 233 S. Wacker Chicago, Ill 60606	Samplers: CWB
Contact:		
P.O. # / Project:	Telephone #: 312 831-3000 Fax #: 831-3999	(If more than one sample, identify which samples taken)

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	Nitrate	Ammonia	TSS	E. Coli	TKN	T. Phos	BOD	DO	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
362	600707	8/13/99 14:45	H_2O	X	X	X	X	X	X	X	X	Grab	5	H_2SO_4 / HNO_3
S01	600708	8/13/99 8:35	H_2O	X	X	X	X	X	X	X	X	"	5	" "
PC13	600709	8/13/99 11:00	H_2O	X	X	X	X	X	X	X	X	"	5	" "

Relinquished by: [signature]	Date/Time: 8/13/99 17:30	Received by: [signature]	Date/Time: 8/13/99 17:30
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 8/13/99 17:31	Report Released By:	Date/Time:

Central States Analytical

CHAIN OF CUSTODY

2406 Lynch Road
Evansville, IN 47711
(812) 464-9000 Fax (812) 424-0667

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: Harza **Contact:** **P.O. # / Project:**	**Address:** 233 S. Wacker **Telephone #:** 312-831-3000 **Fax #:** 831-3999	**Samplers:** CWB (If more than one sample, identify which samples taken)

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	Nitrate	Ammonia	TSS	E Coli	TKN	T. Phos	Cond (301)	PH	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
SF1	60723	8/14/99 16:00	H_2O	X	X	X	X	X	X	X	X	Grab	5	H_2SO_4/NO_3
BG1	60724	8/14/99 8:30	"	X	X	X	X	X	X	X	X	"	5	" "
SF2	60725	8/14/99 13:45	"	X	X	X	X	X	X	X	X	"	5	" "
SF3	60726	8/14/99 10:40	"	X	X	X	X	X	X	X	X	"	5	" "

Relinquished by: Chris Bard	Date/Time: 8/14/99 5:10	Received by: [signature]	Date/Time: 8/14/99 17:13
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 8/14/99 17:15	Report Released By:	Date/Time:

APPENDIX B-2

MAY 2000
WATER QUALITY REPORTS

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76499
Received Date	5/4/00
Report Date	5/19/00

Client Reference SD1

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	10	mg/L	1	5/11/00	AHH	SM 4500 N B
Nitrate as N	5.7	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	0.95	mg/L	0.03	5/9/00	ADH	SM 4500NH3-F
Phosphorus as P	2.4	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	11	mg/L	2.5	5/9/00	ADH	SM 5210
Setup of BOD	Complete			5/4/00	AHH	SM 5210
Total Suspended Solids	34	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	4500	CFU/100ml	1	5/8/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76500
Received Date	5/4/00
Report Date	5/19/00

Client Reference UN1

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	8.4	mg/L	1	5/11/00	AHH	SM 4500 N B
Nitrate as N	0.05	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	0.36	mg/L	0.03	5/9/00	ADH	SM 4500NH3-F
Phosphorus as P	0.11	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/9/00	ADH	SM 5210
Setup of BOD	Complete			5/4/00	AHH	SM 5210
Total Suspended Solids	36	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	3000	CFU/100ml	1	5/8/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

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CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76501
Received Date	5/4/00
Report Date	5/19/00

Client Reference DUP1 (BC 3)

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	4.2	mg/L	1	5/11/00	AHH	SM 4500 N B
Nitrate as N	3.4	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	1.9	mg/L	0.03	5/9/00	ADH	SM 4500NH3-F
Phosphorus as P	0.62	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	3.6	mg/L	2.5	5/9/00	ADH	SM 5210
Setup of BOD	Complete			5/4/00	AHH	SM 5210
Total Suspended Solids	77	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	1000	CFU/100ml	1	5/8/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

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CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76502
Received Date	5/4/00
Report Date	5/19/00

Client Reference BC3 (Dupl 1)

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	4.2	mg/L	1	5/11/00	AHH	SM 4500 N B
Nitrate as N	3.7	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	1.9	mg/L	0.03	5/9/00	ADH	SM 4500NH3-F
Phosphorus as P	0.65	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	3.9	mg/L	2.5	5/9/00	ADH	SM 5210
Setup of BOD	Complete			5/4/00	AHH	SM 5210
Total Suspended Solids	76	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	830	CFU/100ml	1	5/8/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

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CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76503
Received Date	5/4/00
Report Date	5/19/00

Client Reference WD1

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	1.7	mg/L	1	5/11/00	AHH	SM 4500 N B
Nitrate as N	1.4	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	0.62	mg/L	0.03	5/9/00	ADH	SM 4500NH3-F
Phosphorus as P	0.25	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	4	mg/L	2.5	5/9/00	ADH	SM 5210
Setup of BOD	Completed			5/4/00	AHH	SM 5210
Total Suspended Solids	250	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	8800	CFU/100ml	1	5/8/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

HARZA Consulting Engineers and Scientists

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No 1036

SEARS TOWER • 233 South Wacker Drive • Chicago, Illinois 60606-6392 Tel: (312) 831-3800 • Fax: (312) 831-3999 • Telex: 25-3540

CHAIN OF CUSTODY RECORD

SITE: Pigeon Creek

SAMPLER: (Signature) Chris Bass

PROJECT No. 15267

COOLER No.

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	No. OF CONTAINERS	N. Nitrate	Ammonia	TSS	E. Coli	TKN	BOD					REMARKS
SD1	5/4/00	10:10		X		5	X	X	X	X	X	X					76499
UN1	5/4/00	8:40		X		5	X	X	X	X	X	X					76500
Dup1	5/4/00	--		X		5	X	X	X	X	X	X					76501
BC3	5/4/00	16:00		X		5	X	X	X	X	X	X					76502
WD1	5/4/00	13:50		X		5	X	X	X	X	X	X					76503

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Chris Bass	5/4/00	17:00	[signature]				

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Bardon

Sample ID #	NM76335
Received Date	5/3/00
Report Date	5/19/00

Client Reference SA1

Parameter	Results	Units	MDL	Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	SM 4500 N B
Nitrate as N	0.66	mg/L	0.05	SM 4500 C
Ammonia as N	4.3	mg/L	0.03	SM 4500NH3-F
Phosphorus as P	0.43	mg/L	0.02	SW-846 6010A
Biochemical Oxygen Demand	NA	mg/L	5	SM 5210 B
Setup of BOD	Completed			SM 5210 B
Total Suspended Solids	9	mg/L	1	SM2540 D
Escherichia coli MF	41	cfu/100ml	1	SM 9213 D

Reviewed and Approved By:
Kevin Jacobs, BS

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76336
Received Date	5/2/00
Report Date	5/19/00

Client Reference PC14

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	5/10/00	AHH	SM 4500 N B
Nitrate as N	1.4	mg/L	0.05	5/5/00	CGM	SM 4500 C
Ammonia as N	1	mg/L	0.03	5/8/00	AHH	SM 4500NH3-F
Phosphorus as P	0.39	mg/L	0.02	5/5/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	NA	mg/L	5	5/9/00	CGM	SM 5210
Setup of BOD	:ompleted			5/2/00	AHH	SM 5210
Total Suspended Solids	9	mg/L	1	5/4/00	MEH	SM 2540 D
Escherichia coli MF	134	CFU/100ml	1	5/3/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

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CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76337
Received Date	5/2/00
Report Date	5/19/00

Client Reference PC15

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	2.7	mg/L	1	5/10/00	AHH	SM 4500 N B
Nitrate as N	1.3	mg/L	0.05	5/5/00	CGM	SM 4500 C
Ammonia as N	0.82	mg/L	0.03	5/8/00	AHH	SM 4500NH3-F
Phosphorus as P	0.55	mg/L	0.02	5/5/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	NA	mg/L	5	5/9/00	CGM	SM 5210
Setup of BOD	Completed			5/2/00	AHH	SM 5210
Total Suspended Solids	4	mg/L	1	5/4/00	MEH	SM 2540 D
Escherichia coli MF	18	CFU/100ml	1	5/3/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

HARZA Consulting Engineers and Scientists

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COPY No 1034

CHAIN OF CUSTODY RECORD

SITE: Pagan Creek

SAMPLER: (Signature) Chris Baird

PROJECT No. 15269

COOLER No.

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	No. OF CONTAINERS	N Nitrate	Ammonia	TSS	E. Coli	TKN	T. Phos	BOD				REMARKS
SA1	5/2/00	14:45		X	SA1	5	X	X	X	X	X	X	X				76335
PC14	5/2/00	16:30		X	PC14	5	X	X	X	X	X	X	X				76336
PC15	5/2/00	13:00		X	PC15	5	X	X	X	X	X	X	X				76337

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Chris Baird	5/2/00	5:20					
	5/2/00	17:29					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76556
Received Date	5/5/00
Report Date	5/19/00

Client Reference: Pigeon Creek HC1

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	2.1	mg/L	1	5/11/00	AHH	SM 4500 N B
Nitrate as N	4.9	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	1	mg/L	0.03	5/9/00	ADH	SM 4500NH3-F
Phosphorus as P	2.5	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	3.9	mg/L	2.5	5/10/00	AHH	SM 5210
Setup of BOD	Complete			5/5/00	AHH	SM 5210
Total Suspended Solids	12	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	2300	CFU/100ml	1	5/8/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76557
Received Date	5/5/00
Report Date	5/19/00

Client Reference: Pigeon Creek WF3

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	5/11/00	AHH	SM 4500 N B
Nitrate as N	9.3	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	0.58	mg/L	0.03	5/9/00	ADH	SM 4500NH3-F
Phosphorus as P	0.1	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/10/00	AHH	SM 5210
Setup of BOD	Complete			5/5/00	AHH	SM 5210
Total Suspended Solids	21	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	310	CFU/100ml	1	5/8/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76558
Received Date	5/5/00
Report Date	5/19/00

Client Reference: Pigeon Creek WF2

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	5/11/00	AHH	SM 4500 N B
Nitrate as N	8.9	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	2.7	mg/L	0.03	5/9/00	ADH	SM 4500NH3-F
Phosphorus as P	0.23	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	2.5	mg/L	2.5	5/10/00	AHH	SM 5210
Setup of BOD	Complete			5/5/00	AHH	SM 5210
Total Suspended Solids	70	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	810	CFU/100ml	1	5/8/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76559
Received Date	5/5/00
Report Date	5/19/00

Client Reference: Pigeon Creek WF1

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	2.8	mg/L	1	5/17/00	ADH	SM 4500 N B
Nitrate as N	8	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	0.46	mg/L	0.03	5/9/00	ADH	SM 4500NH3-F
Phosphorus as P	0.71	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	3.9	mg/L	2.5	5/10/00	AHH	SM 5210
Setup of BOD	Complete			5/5/00	AHH	SM 5210
Total Suspended Solids	110	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	7500	CFU/100ml	1	5/8/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

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No 1037

CHAIN OF CUSTODY RECORD

SITE: Pigeon Creek

SAMPLER: (Signature) [signature]

PROJECT No. 15269

COOLER No.

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	No. OF CONTAINERS	Metals	Ammonia	TSS	BOD	TKN	T. Phos	BOD				REMARKS
HC1	~~[illegible]~~ 5/5/00	11:45		X		5	X	X	X	X	X	X	X				76556 ✓
WF3	5/5/00	14:00		X		5	X	X	X	X	X	X	X				76557 ✓
WF2	5/5/00	15:30		X		5	X	X	X	X	X	X	X				76558 ✓
WF1	5/5/00	9:45		X		5	X	X	X	X	X	X	X				76559 ✓

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
[signature]	5/5/00	17:15	[signature]				

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76569
Received Date	5/6/00
Report Date	5/19/00

Client Reference: Pigeon Creek LC1

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	5/17/00	ADH	SM 4500 N B
Nitrate as N	0.23	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	0.82	mg/L	0.03	5/9/00	ADH	SM 4500NH3-F
Phosphorus as P	0.07	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/12/00	CAW	SM 5210
Setup of BOD	Complete			5/7/00	CAW	SM 5210
Total Suspended Solids	6	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	190	CFU/100ml	1	5/8/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76570
Received Date	5/6/00
Report Date	5/19/00

Client Reference: Pigeon Creek LP2

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	5/17/00	ADH	SM 4500 N B
Nitrate as N	0.13	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	0.51	mg/L	0.03	5/9/00	ADH	SM 4500NH3-F
Phosphorus as P	0.11	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/12/00	CAW	SM 5210
Setup of BOD	Complete			5/7/00	CAW	SM 5210
Total Suspended Solids	15	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	390	CFU/100ml	1	5/8/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76571
Received Date	5/6/00
Report Date	5/19/00

Client Reference: Pigeon Creek LP1

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	1.4	mg/L	1	5/17/00	ADH	SM 4500 N B
Nitrate as N	0.09	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	0.37	mg/L	0.03	5/9/00	ADH	SM 4500NH3-F
Phosphorus as P	0.18	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/12/00	CAW	SM 5210
Setup of BOD	Complete			5/7/00	CAW	SM 5210
Total Suspended Solids	21	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	480	CFU/100ml	1	5/8/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

CSA *Central States Analytical*

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Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76572
Received Date	5/6/00
Report Date	5/19/00

Client Reference: Pigwon Creek LC2

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	5/17/00	ADH	SM 4500 N B
Nitrate as N	<0.05	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	0.28	mg/L	0.03	5/9/00	ADH	SM 4500NH3-F
Phosphorus as P	0.08	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/12/00	CAW	SM 5210
Setup of BOD	Complete			5/7/00	CAW	SM 5210
Total Suspended Solids	22	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	580	CFU/100ml	1	5/8/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

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№ 1038

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CHAIN OF CUSTODY RECORD

SITE: Pigeon Creek

SAMPLER: (Signature)

PROJECT No.

PARAMETERS

COOLER No.

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	No. OF CONTAINERS	Nitrate	Phosphate	TSS	E. Coli	TKN	T. Phos	BOD				REMARKS
LC1	5/6/00	8:10		X		5X	X	X	X	X	X	X	X				76569
IP2	5/6/00	13:15		X		5X	X	X	X	X	X	X	X				76570
IP1	5/6/00	14:40		X		5X	X	X	X	X	X	X	X				76571
LC2	5/6/00	11:15		X		5X	X	X	X	X	X	X	X				76572

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
[illegible]	5/6/00	41:35	[illegible]				

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:

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2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76575
Received Date	5/7/00
Report Date	5/19/00

Client Reference: Pigeon Creek SF2

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	5/17/00	ADH	SM 4500 N B
Nitrate as N	<0.05	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	0.78	mg/L	0.03	5/9/00	ADH	SM 4500NH3-F
Phosphorus as P	0.04	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/13/00	ADH	SM 5210
Setup of BOD	Complete			5/8/00	AHH	SM 5210
Total Suspended Solids	3	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	9	CFU/100ml	1	5/11/00	KWJ	SM 9213 D

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CSA *Central States Analytical*

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Attn: Chris Barden

Sample ID #	NM76576
Received Date	5/7/00
Report Date	5/19/00

Client Reference: Pigeon Creek BG1

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	1.4	mg/L	1	5/17/00	ADH	SM 4500 N B
Nitrate as N	0.43	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	1.1	mg/L	0.03	5/15/00	AHH	SM 4500NH3-F
Phosphorus as P	0.03	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/13/00	ADH	SM 5210
Setup of BOD	Complete			5/8/00	AHH	SM 5210
Total Suspended Solids	48	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	50	CFU/100ml	1	5/11/00	KWJ	SM 9213 D

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Attn: Chris Barden

Sample ID #	NM76577
Received Date	5/7/00
Report Date	5/19/00

Client Reference: Pigeon Creek BG2

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	1.1	mg/L	1	5/17/00	ADH	SM 4500 N B
Nitrate as N	0.16	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	0.21	mg/L	0.03	5/15/00	AHH	SM 4500NH3-F
Phosphorus as P	0.03	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/13/00	ADH	SM 5210
Setup of BOD	Complete			5/8/00	AHH	SM 5210
Total Suspended Solids	7	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	16	CFU/100ml	1	5/11/00	KWJ	SM 9213 D

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Attn: Chris Barden

Sample ID #	NM76578
Received Date	5/7/00
Report Date	5/19/00

Client Reference: Pigeon Creek SF3

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	1.4	mg/L	1	5/17/00	ADH	SM 4500 N B
Nitrate as N	0.12	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	0.33	mg/L	0.03	5/15/00	AHH	SM 4500NH3-F
Phosphorus as P	0.04	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/13/00	ADH	SM 5210
Setup of BOD	Complete			5/8/00	AHH	SM 5210
Total Suspended Solids	3	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	10	CFU/100ml	1	5/11/00	KWJ	SM 9213 D

Reviewed and Approved by
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Sample ID # NM76579
Received Date 5/7/00
Report Date 5/19/00

Client Reference Pigeon Creek DUP (SF3)

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	1.4	mg/L	1	5/17/00	ADH	SM 4500 N B
Nitrate as N	0.13	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	0.66	mg/L	0.03	5/15/00	AHH	SM 4500NH3-F
Phosphorus as P	0.04	mg/L	0.02	5/9/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/13/00	ADH	SM 5210
Setup of BOD	Complete			5/8/00	AHH	SM 5210
Total Suspended Solids	4	mg/L	1	5/9/00	MEH	SM 2540 D
Escherichia coli MF	16	CFU/100ml	1	5/11/00	KWJ	SM 9213 D

Reviewed and Approved by
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CHAIN OF CUSTODY RECORD

SITE: Pigeon

SAMPLER: (Signature) [signature]

PROJECT No. 15269

COOLER No.

PARAMETERS

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	No. OF CONTAINERS	Nitrate	Ammonia	TSS	Cl	TKN	T Phos	BOD				REMARKS
SF2	5/7/00	9:00		X		4	X	X	X	X	X	X	X				76575
BG 1	5/7/00	13:30		X		4	X	X	X	X	X	X	X				76576
BG 2	5/7/00	13:15		X		4	X	X	X	X	X	X	X				76577
SF3	5/7/00	11:00		X		4	X	X	X	X	X	X	X				76578
Dup	5/7/00	—		X		4	X	X	X	X	X	X	X				76579

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
[signature]	5/7/00	17:20	[signature]				

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:

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Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76702
Received Date	5/8/00
Report Date	5/19/00

Client Reference: Pigeon Creek PC 16

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	1.3	mg/L	1	5/17/00	ADH	SM 4500 N B
Nitrate as N	1.2	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	0.11	mg/L	0.03	5/15/00	AHH	SM 4500NH3-F
Phosphorus as P	0.5	mg/L	0.02	5/10/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/13/00	ADH	SM 5210
Setup of BOD	Complete			5/8/00	AHH	SM 5210
Total Suspended Solids	32	mg/L	1	5/10/00	MEH	SM 2540 D
Escherichia coli MF	230	CFU/100ml	1	5/11/00	KWJ	SM 9213 D

Reviewed and Approved by
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CSA *Central States Analytical*

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Attn: Chris Barden

Sample ID #	NM76703
Received Date	5/8/00
Report Date	5/19/00

Client Reference: Pigeon Creek PC 13

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	5/17/00	ADH	SM 4500 N B
Nitrate as N	2.9	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	0.82	mg/L	0.03	5/15/00	AHH	SM 4500NH3-F
Phosphorus as P	0.64	mg/L	0.02	5/10/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/13/00	ADH	SM 5210
Setup of BOD	Complete			5/8/00	AHH	SM 5210
Total Suspended Solids	54	mg/L	1	5/10/00	MEH	SM 2540 D
Escherichia coli MF	100	CFU/100ml	1	5/11/00	KWJ	SM 9213 D

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Attn: Chris Barden

Sample ID #	NM76704
Received Date	5/8/00
Report Date	5/19/00

Client Reference: Pigeon Creek PC 3

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	1.7	mg/L	1	5/17/00	ADH	SM 4500 N B
Nitrate as N	2	mg/L	0.05	5/9/00	CGM	SM 4500 C
Ammonia as N	0.43	mg/L	0.03	5/15/00	AHH	SM 4500NH3-F
Phosphorus as P	0.68	mg/L	0.02	5/10/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	2.6	mg/L	2.5	5/13/00	ADH	SM 5210
Setup of BOD	Complete			5/8/00	AHH	SM 5210
Total Suspended Solids	83	mg/L	1	5/10/00	MEH	SM 2540 D
Escherichia coli MF	110	CFU/100ml	1	5/11/00	KWJ	SM 9213 D

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Attn: Chris Barden

Sample ID #	NM77079
Received Date	5/12/00
Report Date	5/24/00

Client Reference: Pigeon Creek PC-5

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	5/18/00	AHH	SM 4500 N B
Nitrate as N	0.78	mg/L	0.05	5/22/00	CGM	SM 4500 C
Ammonia as N	1.8	mg/L	0.03	5/22/00	AHH	SM 4500NH3-F
Phosphorus as P	0.4	mg/L	0.02	5/17/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/17/00	ADH	SM 5210
Setup of BOD	Complete			5/12/00	AHH	SM 5210
Total Suspended Solids	51	mg/L	1	5/16/00	MEH	SM 2540 D
Escherichia coli MF	130	CFU/100ml	100	5/16/00	LMR	SM 9213 D

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Sample ID #	NM77080
Received Date	5/12/00
Report Date	5/24/00

Client Reference: Pigeon Creek PC-7

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	5/18/00	AHH	SM 4500 N B
Nitrate as N	0.96	mg/L	0.05	5/22/00	CGM	SM 4500 C
Ammonia as N	2	mg/L	0.03	5/22/00	AHH	SM 4500NH3-F
Phosphorus as P	0.43	mg/L	0.02	5/17/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/17/00	ADH	SM 5210
Setup of BOD	Complete			5/12/00	AHH	SM 5210
Total Suspended Solids	79	mg/L	1	5/16/00	MEH	SM 2540 D
Escherichia coli MF	48	CFU/100ml	1	5/16/00	LMR	SM 9213 D

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Sample ID # NM77081
Received Date 5/11/00
Report Date 5/18/00

Client Reference SA-1

Parameter	Result	Units	MDL	Analysis Date	Method
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/17/00 ADH	SM 4500 N B
Setup of BOD	Complete			5/12/00 AHH	SM 4500 C

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Attn: Chris Barden

Sample ID # NM77082
Received Date 5/11/00
Report Date 5/18/00

Client Reference Pigeon Creek PC14

Parameter	Result	Units	MDL	Analysis Date		Method
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/17/00	ADH	SM 4500 N B
Setup of BOD	Complete			5/12/00	AHH	SM 4500 C

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Sample ID # NM77083
Received Date 5/11/00
Report Date 5/18/00

Client Reference Pigeon Creek PC-15

Parameter	Result	Units	MDL	Analysis Date		Method
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/17/00	ADH	SM 4500 B
Setup of BOD	Complete			5/12/00	AHH	SM 4500 C

Reviewed and Approved by
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No 1043

CHAIN OF CUSTODY RECORD

SITE: Ragan Creek

SAMPLER: (Signature) [signature]

PROJECT No. 15 264

COOLER No.

PARAMETERS

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	No. OF CONTAINERS	TKN	NO_3 IC	NH_3	P	BOD	P	TSS	E Coli			REMARKS
PC-1	5/12/00	9:00		X		4	X	X	X	X	X	X	X	X			77077
PC-2	5/12/00	11:00		X		4	X	X	X	X	X	X	X	X			77078
PC-5	5/12/00	13:20		X		4	X	X	X	X	X	X	X	X			77079
PC-7	5/12/00	15:00		X		4	X	X	X	X	X	X	X	X			77080
SA1	5/11/00	17:50		X		1					X						77081
PC K1	5/11/00	18:10		X		1					X						77082
PC 15	5/11/00	15:15		X		1					X						77083

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
[signature]	5/12/00	16:15	[signature]				

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:

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233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM77107
Received Date	5/13/00
Report Date	5/26/00

Client Reference: Pigeon Creek 4

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	5	mg/L	1	5/25/00	AHH	SM 4500 N B
Nitrate as N	0.87	mg/L	0.05	5/22/00	CGM	SM 4500 C
Ammonia as N	0.36	mg/L	0.03	5/22/00	AHH	SM 4500NH3-F
Phosphorus as P	0.43	mg/L	0.02	5/17/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	5	5/19/00	AHH	SM 5210
Setup of BOD	Complete			5/14/00	AHH	SM 5210
Total Suspended Solids	65	mg/L	1	5/16/00	MEH	SM 2540 D
Escherichia coli MF	120	CFU/100ml	100	5/16/00	LMR	SM 9213 D

Reviewed and Approved by
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Sample ID #	NM77108
Received Date	5/13/00
Report Date	5/26/00

Client Reference: Pigeon Creek 6

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	5/25/00	AHH	SM 4500 N B
Nitrate as N	0.68	mg/L	0.05	5/22/00	CGM	SM 4500 C
Ammonia as N	0.11	mg/L	0.03	5/22/00	AHH	SM 4500NH3-F
Phosphorus as P	0.42	mg/L	0.02	5/17/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	5	5/19/00	AHH	SM 5210
Setup of BOD	Complete			5/14/00	AHH	SM 5210
Total Suspended Solids	200	mg/L	1	5/16/00	MEH	SM 2540 D
Escherichia coli MF	2000	CFU/100ml	100	5/16/00	LMR	SM 9213 D

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Sample ID #	NM76388
Received Date	5/3/00
Report Date	5/19/00

Client Reference PC8

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	3.5	mg/L	1	5/10/00	AHH	SM 4500 N B
Nitrate as N	0.52	mg/L	0.05	5/5/00	CGM	SM 4500 C
Ammonia as N	0.65	mg/L	0.03	5/8/00	AHH	SM 4500NH3-F
Phosphorus as P	0.59	mg/L	0.02	5/8/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/8/00	ADH	SM 5210
Setup of BOD	Complete			5/3/00	AHH	SM 5210
Total Suspended Solids	54	mg/L	1	5/4/00	MEH	SM 2540 D
Escherichia coli MF	63	CFU/100ml	1	5/5/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

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CSA *Central States Analytical*

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Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76389
Received Date	5/3/00
Report Date	5/19/00

Client Reference BC2

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1	5/10/00	AHH	SM 4500 N B
Nitrate as N	0.33	mg/L	0.05	5/5/00	CGM	SM 4500 C
Ammonia as N	0.42	mg/L	0.03	5/8/00	AHH	SM 4500NH3-F
Phosphorus as P	0.44	mg/L	0.02	5/8/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/8/00	ADH	SM 5210
Setup of BOD	Complete			5/3/00	AHH	SM 5210
Total Suspended Solids	29	mg/L	1	5/4/00	MEH	SM 2540 D
Escherichia coli MF	60	CFU/100ml	1	5/5/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606
Attn: Chris Barden

Sample ID #	NM76390
Received Date	5/3/00
Report Date	5/19/00

Client Reference BC1

Parameter	Result	Units	MDL	Analysis Date		Method
Total Kjeldahl Nitrogen	1.4	mg/L	1	5/10/00	AHH	SM 4500 N B
Nitrate as N	0.11	mg/L	0.05	5/5/00	CGM	SM 4500 C
Ammonia as N	0.22	mg/L	0.03	5/8/00	AHH	SM 4500NH3-F
Phosphorus as P	0.45	mg/L	0.02	5/8/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	5/8/00	ADH	SM 5210
Setup of BOD	completed			5/3/00	AHH	SM 5210
Total Suspended Solids	46	mg/L	1	5/4/00	MEH	SM 2540 D
Escherichia coli MF	86	CFU/100ml	1	5/5/00	KWJ	SM 9213 D

Reviewed and Approved by
Kevin Jacobs

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HARZA Consulting Engineers and Scientists

COPY

No 1035

SEARS TOWER • 233 South Wacker Drive • Chicago, Illinois 60606-6392 Tel: (312) 831-3800 • Fax: (312) 831-3999 • Telex: 25-3540

CHAIN OF CUSTODY RECORD

SITE: Pigeon Creek

SAMPLER: (Signature) Chris Barden

PROJECT No. 15269

COOLER No.

PARAMETERS

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	No. OF CONTAINERS	Nitrate	Ammonia	TSS	E.Coli	TKN	BOD				REMARKS
PC8	5/3/00	10:00		X		5	X	X	X	X	X	X				76388
BC2	5/3/00	15:30		X		5	X	X	X	X	X	X				76389
BC1	5/3/00	12:00		X		5	X	X	X	X	X	X				76390

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Chris Barden	5/3/00	17:30	5-3-00 17:22				5/4/00 08:00

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:

APPENDIX B-3

COMBINED SEWER OVERFLOW WATER QUALITY REPORTS

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA M-1
Project Comments:

Date Received: 02/14/00
Date Reported: 02/24/00
Date Sampled: 02/13/00
Sample ID#: NM71376

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	2.4	mg/L	0.03	02/22/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	31	mg/L	1.0	02/17/00	AHH	SM 4500 N C
Phosphorus as P	6.5	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	280	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	940	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	690,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.006	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.003	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.15	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.26	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.059	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.14	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.43	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA M-2
Project Comments:

Date Received: 02/14/00
Date Reported: 02/24/00
Date Sampled: 02/13/00
Sample ID#: NM71377

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	4.0	mg/L	0.03	02/21/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	22	mg/L	1.0	02/17/00	AHH	SM 4500 N C
Phosphorus as P	6.4	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	92	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	850	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	290,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.007	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.002	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.15	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.25	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.070	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.14	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.50	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Waker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA M-3
Project Comments:

Date Received: 02/14/00
Date Reported: 02/24/00
Date Sampled: 02/13/00
Sample ID#: NM71378

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	2.5	mg/L	0.03	02/22/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	5.6	mg/L	1.0	02/17/00	AHH	SM 4500 N C
Phosphorus as P	2.6	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	65	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	410	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	150,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.071	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.084	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.044	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.053	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.23	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA M-4
Project Comments:

Date Received: 02/14/00
Date Reported: 02/24/00
Date Sampled: 02/13/00
Sample ID#: NM71379

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	1.7	mg/L	0.03	02/22/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	17	mg/L	1.0	02/17/00	AHH	SM 4500 N C
Phosphorus as P	2.4	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	57	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	290	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	220,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.058	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.062	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.031	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.046	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.21	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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Harza Engineering
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Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA M-5
Project Comments:

Date Received: 02/14/00
Date Reported: 02/24/00
Date Sampled: 02/13/00
Sample ID#: NM71380

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	1.9	mg/L	0.03	02/21/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	10	mg/L	1.0	02/17/00	AHH	SM 4500 N C
Phosphorus as P	2.0	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	56	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	240	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	1,100,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.026	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.045	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.022	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.022	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.16	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA M-6
Project Comments:

Date Received: 02/14/00
Date Reported: 02/24/00
Date Sampled: 02/13/00
Sample ID#: NM71381

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	2.4	mg/L	0.03	02/22/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	9.2	mg/L	1.0	02/17/00	AHH	SM 4500 N C
Phosphorus as P	2.3	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	73	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	250	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	430,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.019	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.060	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.024	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.018	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.14	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA M-7
Project Comments:

Date Received: 02/14/00
Date Reported: 02/24/00
Date Sampled: 02/13/00
Sample ID#: NM71382

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	3.7	mg/L	0.03	02/22/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	11	mg/L	1.0	02/17/00	AHH	SM 4500 N C
Phosphorus as P	2.4	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	81	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	290	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	470,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.003	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.016	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.040	mg/L	0.001	02/18/00	ARP	EPA 200.7
Lead by ICP	0.020	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.026	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.13	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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Evansville, Indiana 47711

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233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA M-8
Project Comments:

Date Received: 02/14/00
Date Reported: 02/24/00
Date Sampled: 02/13/00
Sample ID#: NM71383

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	2.9	mg/L	0.03	02/22/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	13	mg/L	1.0	02/17/00	AHH	SM 4500 N C
Phosphorus as P	2.8	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	100	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	250	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	870,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.003	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.002	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.024	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.056	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.027	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.024	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.18	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA M-9
Project Comments:

Date Received: 02/14/00
Date Reported: 02/24/00
Date Sampled: 02/13/00
Sample ID#: NM71384

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	3.7	mg/L	0.03	02/22/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	16	mg/L	1.0	02/17/00	AHH	SM 4500 N C
Phosphorus as P	3.5	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	130	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	320	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	1,100,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.003	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.003	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.031	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.072	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.028	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.030	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.22	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA M-10
Project Comments:

Date Received: 02/14/00
Date Reported: 02/24/00
Date Sampled: 02/13/00
Sample ID#: NM71385

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	4.3	mg/L	0.03	02/22/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	15	mg/L	1.0	02/17/00	AHH	SM 4500 N C
Phosphorus as P	3.8	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	130	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	410	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	590,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.003	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.031	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.078	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.026	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.029	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.20	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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Central States Analytical

CHAIN OF CUSTODY

2406 Lynch Road
Evansville, IN 47711
(812) 464-9000 Fax (812) 424-0667

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: EMC
Contact: Joe Potts
P.O. # / Project: CSO / Harza

Address: 1500 Waterworks Rd
Telephone #: 428-0550 Fax #: 428-6941

Samplers: Joe Potts
(If more than one sample, identify which samples taken)

Per 3-1-99 Quote
Bottles identified as M1 thru M12
Maxwell CSO

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	Ammonia N	TKN	Phosphorus-Total	BOD 5	TSS	e-coli	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
M1	71376	2-13/start 4:00 pm	identified as M1 thru M12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Grab	12	None
M2	71377																		
M3	71378																		
M4	71379																		
M5	71380																		
M6	71381																		
M7	71382																		
M8	71383																		
M9	71384																		
M10	71385																		

Relinquished by: Joe Potts	Date/Time: 2-14 12:10 PM	Received by: [signature]	Date/Time: 2/14/00 12:10
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 2/14/00 14:30	Report Released By:	Date/Time:

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA M-11
Project Comments:

Date Received: 02/14/00
Date Reported: 02/24/00
Date Sampled: 02/13/00
Sample ID#: NM71386

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	5.3	mg/L	0.03	02/22/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	15	mg/L	1.0	02/17/00	AHH	SM 4500 N C
Phosphorus as P	3.8	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	160	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	380	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	760,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.022	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.060	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.015	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.021	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.17	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA M-12
Project Comments:

Date Received: 02/14/00
Date Reported: 02/24/00
Date Sampled: 02/13/00
Sample ID#: NM71387

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	5.2	mg/L	0.03	02/22/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	16	mg/L	1.0	02/17/00	AHH	SM 4500 N C
Phosphorus as P	3.7	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	130	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	250	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	590,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.005	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.013	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.060	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.010	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.013	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.17	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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Central States Analytical

CHAIN OF CUSTODY

2406 Lynch Road
Evansville, IN 47711
(812) 464-9000 Fax (812) 424-0667

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: EMC / Harza Contact: P.O. # / Project: CSO/Harza	Address: 1500 Waterworks Rd Telephone #: Fax #:	Samplers: (If more than one sample, identify which samples taken)

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	WHS	TKN	P	Lead	TSS	ECOLI	QS	CR	CU	SP	PB	NI	ZN	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
M11	71386																		
M12.	71387																		

Relinquished by: Joe Potts	Date/Time: 2-14-00 12:20 P	Received by: [signature]	Date/Time: 2/14/00 12:10
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 2/14/00 14:30	Report Released By:	Date/Time:

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA D-1
Project Comments:

Date Received: 02/14/00
Date Reported: 02/24/00
Date Sampled: 02/13/00
Sample ID#: NM71388

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	4.2	mg/L	0.03	02/22/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	8.3	mg/L	1.0	02/17/00	AHH	SM 4500 N C
Phosphorus as P	1.9	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	33	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	70	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	430,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.004	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.018	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.013	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.006	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.16	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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Harza Engineering
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Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA D-2
Project Comments:

Date Received: 02/14/00
Date Reported: 02/24/00
Date Sampled: 02/13/00
Sample ID#: NM71389

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	4.6	mg/L	0.03	02/22/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	7.7	mg/L	1.0	02/17/00	AHH	SM 4500 N C
Phosphorus as P	1.8	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	33	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	70	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	230,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.004	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.019	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.012	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.006	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.17	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA D-3
Project Comments:

Date Received: 02/14/00
Date Reported: 02/24/00
Date Sampled: 02/13/00
Sample ID#: NM71390

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	6.0	mg/L	0.03	02/22/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	9.1	mg/L	1.0	02/17/00	AHH	SM 4500 N C
Phosphorus as P	2.0	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	47	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	70	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	670,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.004	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.021	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.011	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.006	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.17	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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Harza Engineering
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Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA D-4
Project Comments:

Date Received: 02/14/00
Date Reported: 02/25/00
Date Sampled: 02/13/00
Sample ID#: NM71391

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	6.0	mg/L	0.03	02/23/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	9.7	mg/L	1.0	02/24/00	AHH	SM 4500 N C
Phosphorus as P	2.2	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	52	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	120	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	500,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.006	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.052	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.025	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.010	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.21	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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Attn: David Pott

Your Reference: CSO/HARZA D-5
Project Comments:

Date Received: 02/14/00
Date Reported: 02/25/00
Date Sampled: 02/13/00
Sample ID#: NM71392

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	4.3	mg/L	0.03	02/23/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	12	mg/L	1.0	02/24/00	AHH	SM 4500 N C
Phosphorus as P	2.7	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	79	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	200	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	530,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.006	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.010	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.039	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.034	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.010	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.26	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA D-6
Project Comments:

Date Received: 02/14/00
Date Reported: 02/25/00
Date Sampled: 02/13/00
Sample ID#: NM71393

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	2.1	mg/L	0.03	02/23/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	11	mg/L	1.0	02/24/00	AHH	SM 4500 N C
Phosphorus as P	3.2	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	230	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	330	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	340,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.003	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.002	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.018	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.085	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.054	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.014	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.44	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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Evansville, Indiana 47711

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233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA D-7
Project Comments:

Date Received: 02/14/00
Date Reported: 02/25/00
Date Sampled: 02/13/00
Sample ID#: NM71394

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	4.2	mg/L	0.03	02/23/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	11	mg/L	1.0	02/24/00	AHH	SM 4500 N C
Phosphorus as P	3.2	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	140	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	450	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	440,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.008	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.002	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.021	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.082	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.062	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.016	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.42	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

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233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA D-8
Project Comments:

Date Received: 02/14/00
Date Reported: 02/25/00
Date Sampled: 02/13/00
Sample ID#: NM71395

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	3.1	mg/L	0.03	02/23/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	11	mg/L	1.0	02/24/00	AHH	SM 4500 N C
Phosphorus as P	3.7	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	900	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	480	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	530,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.006	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.002	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.033	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.17	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.051	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.23	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.47	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA D-9
Project Comments:

Date Received: 02/14/00
Date Reported: 02/25/00
Date Sampled: 02/13/00
Sample ID#: NM71396

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	7.9	mg/L	0.03	02/23/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	17	mg/L	1.0	02/24/00	AHH	SM 4500 N C
Phosphorus as P	2.9	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	160	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	390	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	710,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.005	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.002	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.018	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.072	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.048	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.017	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.37	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA D-10
Project Comments:

Date Received: 02/14/00
Date Reported: 02/25/00
Date Sampled: 02/13/00
Sample ID#: NM71397

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	7.6	mg/L	0.03	02/23/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	2.1	mg/L	1.0	02/24/00	AHH	SM 4500 N C
Phosphorus as P	1.6	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	100	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	270	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	150,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.005	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.011	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.042	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.036	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.012	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.29	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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CHAIN OF CUSTODY

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: EMC / Harza Engineering Contact: Joe Potts / David Pott P.O. # / Project: CSO / Harza	Address: 1500 Waterworks Rd. Telephone #: 428-0550 Pager 463-7367 Fax #: 428-6941	Samplers: JOE Potts (If more than one sample, identify which samples taken)

Per 3-1-99 Quote
Bottles identified as D-1 thru D-12
Diamond CSO

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	Ammonia N	TKN	Phosphorus - Total	BOD 5	TSS	e-coli	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
D-1	71388	2-13/start 1:00pm	identified as D1 thru D12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Grab	12	None
D-2	71389																		
D-3	71390																		
D-4	71391																		
D-5	71392																		
D-6	71393																		
D-7	71394																		
D-8	71395																		
D-9	71396																		
D-10	71397																		

Relinquished by: Joe Potts	Date/Time: 2-14 12:10	Received by: [signature]	Date/Time: 2/14/00 12:10
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 2/14/00 ~~16:30~~ 14:30	Report Released By:	Date/Time:

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA D-11
Project Comments:

Date Received: 02/14/00
Date Reported: 02/25/00
Date Sampled: 02/13/00
Sample ID#: NM71398

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	1.4	mg/L	0.03	02/23/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	7.8	mg/L	1.0	02/24/00	AHH	SM 4500 N C
Phosphorus as P	3.4	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	160	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	540	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	280,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.008	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.003	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.027	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.11	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.069	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.021	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.44	mg/L	0.001	02/16/00	RAS	EPA 200.7

Reviewed and Approved by:
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CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Drive
Chicago, IL 60606-6392

Attn: David Pott

Your Reference: CSO/HARZA D-12
Project Comments:

Date Received: 02/14/00
Date Reported: 02/28/00
Date Sampled: 02/13/00
Sample ID#: NM71399

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Ammonia as N	1.7	mg/L	0.03	02/23/00	AHH	SM 4500NH3-E
Total Kjeldahl Nitrogen	2.2	mg/L	1.0	02/28/00	AHH	SM 4500 N C
Phosphorus as P	1.5	mg/L	0.02	02/16/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	33	mg/L	2	02/19/00	ASR	SM 5210
Total Suspended Solids	340	mg/L	1	02/15/00	MEH	EPA 160.2
Escherichia coli MF	710,000	colonies/100ml	1	02/15/00	JJM	SM 9213 D
Arsenic by ICP	0.008	mg/L	0.003	02/16/00	RAS	EPA 200.7
Cadmium by ICP	0.002	mg/L	0.001	02/16/00	RAS	EPA 200.7
Chromium by ICP	0.016	mg/L	0.001	02/16/00	RAS	EPA 200.7
Copper by ICP	0.043	mg/L	0.001	02/16/00	RAS	EPA 200.7
Lead by ICP	0.076	mg/L	0.002	02/16/00	RAS	EPA 200.7
Nickel by ICP	0.013	mg/L	0.001	02/16/00	RAS	EPA 200.7
Zinc by ICP	0.28	mg/L	0.001	02/16/00	RAS	EPA 200.7

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Chicago, IL 60606

Date Received: **03/16/00**
Date Reported: **03/30/00**
Date Sampled: **03/16/00**
Sample ID#: **NM73360**

Your Reference: **D1**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	2.5	mg/L	1.0	03/21/00	AHH	SM 4500 N C
Arsenic by ICP	0.004	mg/L	0.003	03/20/00	RAS	EPA 200.7
Ammonia as N	3.6	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	1.5	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	25	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	140	mg/L	1	03/20/00	MEH	EPA 160.2
Escherichia coli MF	93,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
Cadmium by ICP	0.001	mg/L	0.001	03/20/00	RAS	EPA 200.7
Chromium by ICP	0.008	mg/L	0.001	03/20/00	RAS	EPA 200.7
Copper by ICP	0.028	mg/L	0.001	03/20/00	RAS	EPA 200.7
Lead by ICP	0.027	mg/L	0.002	03/20/00	RAS	EPA 200.7
Nickel by ICP	0.009	mg/L	0.001	03/20/00	RAS	EPA 200.7
Zinc by ICP	0.13	mg/L	0.001	03/20/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: 03/16/00
Date Reported: 03/30/00
Date Sampled: 03/16/00
Sample ID#: NM73361

Your Reference: D2
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	5.2	mg/L	1.0	03/21/00	AHH	SM 4500 N C
Arsenic by ICP	0.005	mg/L	0.003	03/20/00	RAS	EPA 200.7
Ammonia as N	5.1	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	1.4	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	15	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	110	mg/L	1	03/20/00	MEH	EPA 160.2
Escherichia coli MF	110,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
Cadmium by ICP	<0.001	mg/L	0.001	03/20/00	RAS	EPA 200.7
Chromium by ICP	0.008	mg/L	0.001	03/20/00	RAS	EPA 200.7
Copper by ICP	0.022	mg/L	0.001	03/20/00	RAS	EPA 200.7
Lead by ICP	0.024	mg/L	0.002	03/20/00	RAS	EPA 200.7
Nickel by ICP	0.008	mg/L	0.001	03/20/00	RAS	EPA 200.7
Zinc by ICP	0.12	mg/L	0.001	03/20/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: **03/16/00**
Date Reported: **03/30/00**
Date Sampled: **03/16/00**
Sample ID#: **NM73362**

Your Reference: **D3**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1.0	03/21/00	AHH	SM 4500 N C
Arsenic by ICP	<0.003	mg/L	0.003	03/20/00	RAS	EPA 200.7
Ammonia as N	1.3	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	1.4	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.0	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	140	mg/L	1	03/20/00	MEH	EPA 160.2
Escherichia coli MF	130,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
Cadmium by ICP	0.001	mg/L	0.001	03/20/00	RAS	EPA 200.7
Chromium by ICP	0.008	mg/L	0.001	03/20/00	RAS	EPA 200.7
Copper by ICP	0.016	mg/L	0.001	03/20/00	RAS	EPA 200.7
Lead by ICP	0.020	mg/L	0.002	03/20/00	RAS	EPA 200.7
Nickel by ICP	0.007	mg/L	0.001	03/20/00	RAS	EPA 200.7
Zinc by ICP	0.11	mg/L	0.001	03/20/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: **03/16/00**
Date Reported: **03/30/00**
Date Sampled: **03/16/00**
Sample ID#: **NM73363**

Your Reference: **D4**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	2.1	mg/L	1.0	03/21/00	AHH	SM 4500 N C
Arsenic by ICP	0.004	mg/L	0.003	03/20/00	RAS	EPA 200.7
Ammonia as N	2.1	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	1.5	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	21	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	110	mg/L	1	03/20/00	MEH	EPA 160.2
Escherichia coli MF	160,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
Cadmium by ICP	<0.001	mg/L	0.001	03/20/00	RAS	EPA 200.7
Chromium by ICP	0.006	mg/L	0.001	03/20/00	RAS	EPA 200.7
Copper by ICP	0.029	mg/L	0.001	03/20/00	RAS	EPA 200.7
Lead by ICP	0.017	mg/L	0.002	03/20/00	RAS	EPA 200.7
Nickel by ICP	0.018	mg/L	0.001	03/20/00	RAS	EPA 200.7
Zinc by ICP	0.11	mg/L	0.001	03/20/00	RAS	EPA 200.7

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Date Received: **03/16/00**
Date Reported: **03/30/00**
Date Sampled: **03/16/00**
Sample ID#: **NM73364**

Your Reference: **D5**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	3.1	mg/L	1.0	03/21/00	AHH	SM 4500 N C
Ammonia as N	3.1	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	2.0	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	24	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	110	mg/L	1	03/20/00	MEH	EPA 160.2
Escherichia coli MF	110,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
Arsenic by ICP	0.005	mg/L	0.003	03/20/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	03/20/00	RAS	EPA 200.7
Chromium by ICP	0.011	mg/L	0.001	03/20/00	RAS	EPA 200.7
Copper by ICP	0.017	mg/L	0.001	03/20/00	RAS	EPA 200.7
Lead by ICP	0.041	mg/L	0.002	03/20/00	RAS	EPA 200.7
Nickel by ICP	0.010	mg/L	0.001	03/20/00	RAS	EPA 200.7
Zinc by ICP	0.12	mg/L	0.001	03/20/00	RAS	EPA 200.7

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CHAIN OF CUSTODY

_____ **Rush turnaround**
subject to pre-approval
and additional surcharge

Company: EMC/Harza Engineering Contact: Joe Potts/David Pett P.O. # / Project: CSO/Harza	Address: 1500 Water Works Rd Evansville, IN. Telephone #: 428-0550 Pager 463-7367 Fax #: 428-6941	Samplers: Joe Potts (if more than one sample, identify which samples taken)

Diamond

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	NH3	TKN	P	Bod	TSS	E Coli	As	Cd	Cr	Cu	Pb	Ni	Zn	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
D1	73360	3-16 9:00AM																	
D2	73361																		
D3	73362																		
D4	73363																		
D5	73364																		

Relinquished by: Joe Potts 3-16	Date/Time: 3:20 PM	Received by: [illegible]	Date/Time: 3/16/00 15:20
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [illegible]	Date/Time: 3/16/00 15:23	Report Released By:	Date/Time:

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: **03/16/00**
Date Reported: **03/30/00**
Date Sampled: **03/16/00**
Sample ID#: **NM73365**

Your Reference: **M1**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	4.1	mg/L	1.0	03/21/00	AHH	SM 4500 N C
Ammonia as N	3.6	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	1.2	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	15	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	28	mg/L	1	03/20/00	MEH	EPA 160.2
Escherichia coli MF	120,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	03/20/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	03/20/00	RAS	EPA 200.7
Chromium by ICP	0.003	mg/L	0.001	03/20/00	RAS	EPA 200.7
Copper by ICP	0.008	mg/L	0.001	03/20/00	RAS	EPA 200.7
Lead by ICP	0.004	mg/L	0.002	03/20/00	RAS	EPA 200.7
Nickel by ICP	0.003	mg/L	0.001	03/20/00	RAS	EPA 200.7
Zinc by ICP	0.045	mg/L	0.001	03/20/00	RAS	EPA 200.7

Reviewed and Approved by:
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es

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Chicago, IL 60606

Date Received: **03/16/00**
Date Reported: **03/30/00**
Date Sampled: **03/16/00**
Sample ID#: **NM73366**

Your Reference: **M2**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	7.0	mg/L	1.0	03/21/00	AHH	SM 4500 N C
Arsenic by ICP	<0.003	mg/L	0.003	03/20/00	RAS	EPA 200.7
Ammonia as N	1.4	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	1.4	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	31	mg/L	2	03/21/00	MDH	SM 5210
te **Setup of BOD**	Completed			03/16/00	ADH	
Total Suspended Solids	94	mg/L	1	03/20/00	MEH	EPA 160.2
Escherichia coli MF	260,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
Cadmium by ICP	<0.001	mg/L	0.001	03/20/00	RAS	EPA 200.7
Chromium by ICP	0.006	mg/L	0.001	03/20/00	RAS	EPA 200.7
Copper by ICP	0.015	mg/L	0.001	03/20/00	RAS	EPA 200.7
Lead by ICP	0.010	mg/L	0.002	03/20/00	RAS	EPA 200.7
Nickel by ICP	0.005	mg/L	0.001	03/20/00	RAS	EPA 200.7
Zinc by ICP	0.070	mg/L	0.001	03/20/00	RAS	EPA 200.7

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Date Received: **03/16/00**
Date Reported: **03/30/00**
Date Sampled: **03/16/00**
Sample ID#: **NM73369**

Your Reference: **M5**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	2.7	mg/L	1.0	03/21/00	AHH	SM 4500 N C
Arsenic by ICP	0.004	mg/L	0.003	03/20/00	RAS	EPA 200.7
Ammonia as N	2.0	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	1.3	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	18	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	58	mg/L	1	03/20/00	MEH	EPA 160.2
Escherichia coli MF	80,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
Cadmium by ICP	<0.001	mg/L	0.001	03/20/00	RAS	EPA 200.7
Chromium by ICP	0.004	mg/L	0.001	03/20/00	RAS	EPA 200.7
Copper by ICP	0.010	mg/L	0.001	03/20/00	RAS	EPA 200.7
Lead by ICP	0.007	mg/L	0.002	03/20/00	RAS	EPA 200.7
Nickel by ICP	0.004	mg/L	0.001	03/20/00	RAS	EPA 200.7
Zinc by ICP	0.053	mg/L	0.001	03/20/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: **03/16/00**
Date Reported: **03/30/00**
Date Sampled: **03/16/00**
Sample ID#: **NM73370**

Your Reference: **M6**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	1.1	mg/L	1.0	03/21/00	AHH	SM 4500 N C
Arsenic by ICP	<0.003	mg/L	0.003	03/20/00	RAS	EPA 200.7
Ammonia as N	1.2	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	1.2	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	16	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	56	mg/L	1	03/21/00	MEH	EPA 160.2
Escherichia coli MF	140,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
Cadmium by ICP	<0.001	mg/L	0.001	03/20/00	RAS	EPA 200.7
Chromium by ICP	0.005	mg/L	0.001	03/20/00	RAS	EPA 200.7
Copper by ICP	0.009	mg/L	0.001	03/20/00	RAS	EPA 200.7
Lead by ICP	0.007	mg/L	0.002	03/20/00	RAS	EPA 200.7
Nickel by ICP	0.004	mg/L	0.001	03/20/00	RAS	EPA 200.7
Zinc by ICP	0.049	mg/L	0.001	03/20/00	RAS	EPA 200.7

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Date Received: **03/16/00**
Date Reported: **03/30/00**
Date Sampled: **03/16/00**
Sample ID#: **NM73371**

Your Reference: **M7**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	1.5	mg/L	1.0	03/21/00	AHH	SM 4500 N C
Arsenic by ICP	<0.003	mg/L	0.003	03/20/00	RAS	EPA 200.7
Ammonia as N	1.7	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	1.2	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	18	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	53	mg/L	1	03/21/00	MEH	EPA 160.2
Escherichia coli MF	20,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
Cadmium by ICP	<0.001	mg/L	0.001	03/20/00	RAS	EPA 200.7
Chromium by ICP	0.005	mg/L	0.001	03/20/00	RAS	EPA 200.7
Copper by ICP	0.010	mg/L	0.001	03/20/00	RAS	EPA 200.7
Lead by ICP	0.007	mg/L	0.002	03/20/00	RAS	EPA 200.7
Nickel by ICP	0.004	mg/L	0.001	03/20/00	RAS	EPA 200.7
Zinc by ICP	0.052	mg/L	0.001	03/20/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: 03/16/00
Date Reported: 03/30/00
Date Sampled: 03/16/00
Sample ID#: NM73372

Your Reference: M8
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	3.3	mg/L	1.0	03/21/00	AHH	SM 4500 N C
Arsenic by ICP	0.003	mg/L	0.003	03/20/00	RAS	EPA 200.7
Ammonia as N	1.9	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	1.7	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	31	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	98	mg/L	1	03/21/00	MEH	EPA 160.2
Escherichia coli MF	160,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
Cadmium by ICP	<0.001	mg/L	0.001	03/20/00	RAS	EPA 200.7
Chromium by ICP	0.009	mg/L	0.001	03/20/00	RAS	EPA 200.7
Copper by ICP	0.025	mg/L	0.001	03/20/00	RAS	EPA 200.7
Lead by ICP	0.011	mg/L	0.002	03/20/00	RAS	EPA 200.7
Nickel by ICP	0.008	mg/L	0.001	03/20/00	RAS	EPA 200.7
Zinc by ICP	0.075	mg/L	0.001	03/20/00	RAS	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: 03/16/00
Date Reported: 03/30/00
Date Sampled: 03/16/00
Sample ID#: NM73373

Your Reference: M9
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	9.1	mg/L	1.0	03/23/00	AHH	SM 4500 N C
Ammonia as N	3.8	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	4.1	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	56	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	260	mg/L	1	03/21/00	MEH	EPA 160.2
Escherichia coli MF	80,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
Zinc by ICP	0.25	mg/L	0.001	03/20/00	RAS	EPA 200.7
Nickel by ICP	0.034	mg/L	0.001	03/20/00	RAS	EPA 200.7
Lead by ICP	0.032	mg/L	0.002	03/20/00	RAS	EPA 200.7
Copper by ICP	0.17	mg/L	0.001	03/20/00	RAS	EPA 200.7
Chromium by ICP	0.052	mg/L	0.001	03/20/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	03/20/00	RAS	EPA 200.7
Arsenic by ICP	0.004	mg/L	0.003	03/20/00	RAS	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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CSA *Central States Analytical*

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233 S. Wacker Dr.
Chicago, IL 60606

Date Received: **03/16/00**
Date Reported: **03/30/00**
Date Sampled: **03/16/00**
Sample ID#: **NM73374**

Your Reference: **M10**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	9.8	mg/L	1.0	03/23/00	AHH	SM 4500 N C
Ammonia as N	2.8	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	1.9	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	120	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	350	mg/L	1	03/21/00	MEH	EPA 160.2
Escherichia coli MF	80,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
Zinc by ICP	0.041	mg/L	0.001	03/20/00	RAS	EPA 200.7
Nickel by ICP	0.006	mg/L	0.001	03/20/00	RAS	EPA 200.7
Lead by ICP	0.004	mg/L	0.002	03/20/00	RAS	EPA 200.7
Copper by ICP	0.025	mg/L	0.001	03/20/00	RAS	EPA 200.7
Chromium by ICP	0.005	mg/L	0.001	03/20/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	03/20/00	RAS	EPA 200.7
Arsenic by ICP	0.004	mg/L	0.003	03/20/00	RAS	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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Central States Analytical

CHAIN OF CUSTODY

2406 Lynch Road
Evansville, IN 47711
(812) 464-9000 Fax (812) 424-0667

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: EMC / Harza Engineering Contact: Joe Potts / David Potts P.O. # / Project: CSO / Harza	Address: 1500 Waterworks Rd. Evansville, IN Telephone #: 428-0550 Pager 463-7367 Fax #: 428-6941	Samplers: Joe Potts (If more than one sample, identify which samples taken)

Maxwell CSO

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	NH3	TKN	P	Bod	TSS	E-Coli	CS	CD	CR	CU	PB	NI	ZN	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
M1	73365	3-16 7:30AM																1	✓
M2	73366																	1	✓
M3	73367																	1	✓
M4	73368																	1	✓
M5	73369																	1	✓
M6	73370																	1	✓
M7	73371																	1	✓
M8	73372																	1	✓
M9	73373																	1	✓
M10	73374																	1	✓

Relinquished by: Joe Potts	Date/Time: 3-16 3:20 PM	Received by: [signature]	Date/Time: 3/16/00 15:20
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 3/16/00 15:33	Report Released By:	Date/Time:

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: **03/16/00**
Date Reported: **03/30/00**
Date Sampled: **03/16/00**
Sample ID#: **NM73375**

Your Reference: **M11**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	4.2	mg/L	1.0	03/23/00	AHH	SM 4500 N C
Arsenic by ICP	0.003	mg/L	0.003	03/20/00	RAS	EPA 200.7
Ammonia as N	1.0	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	2.0	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	34	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	130	mg/L	1	03/21/00	MEH	EPA 160.2
Escherichia coli MF	660,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
Chromium by ICP	0.014	mg/L	0.001	03/20/00	RAS	EPA 200.7
Copper by ICP	0.035	mg/L	0.001	03/20/00	RAS	EPA 200.7
Lead by ICP	0.012	mg/L	0.002	03/20/00	RAS	EPA 200.7
Nickel by ICP	0.011	mg/L	0.001	03/20/00	RAS	EPA 200.7
Zinc by ICP	0.083	mg/L	0.001	03/20/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	03/20/00	RAS	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: 03/16/00
Date Reported: 03/30/00
Date Sampled: 03/16/00
Sample ID#: NM73376

Your Reference: M12
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	2.9	mg/L	1.0	03/23/00	AHH	SM 4500 N C
Arsenic by ICP	0.003	mg/L	0.003	03/20/00	RAS	EPA 200.7
Ammonia as N	3.6	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	1.6	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	15	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	60	mg/L	1	03/21/00	MEH	EPA 160.2
Escherichia coli MF	170,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
Chromium by ICP	0.004	mg/L	0.001	03/20/00	RAS	EPA 200.7
Copper by ICP	0.012	mg/L	0.001	03/20/00	RAS	EPA 200.7
Lead by ICP	0.004	mg/L	0.002	03/20/00	RAS	EPA 200.7
Nickel by ICP	0.004	mg/L	0.001	03/20/00	RAS	EPA 200.7
Zinc by ICP	0.042	mg/L	0.001	03/20/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	03/20/00	RAS	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

Central States Analytical

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(812) 464-9000 Fax (812) 424-0687

CHAIN OF CUSTODY

_____ **Rush turnaround**
subject to pre-approval
and additional surcharge

Company: EMC/Harza Engineering Contact: Joe Potts/ David Potts P.O. # / Project: CSO / Harza	Address: 1500 Waterworks Rd. Pager 463-7367 Telephone #: 428-0558 Fax #: 428-6941	Samplers: Joe Potts (If more than one sample, identify which samples taken)

Maxwell CSO

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	NH3	TKN	Bod	TSS	E-coli	Arsenic	Cd.	CR	CU	PB	NI	ZN	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
M11	73375	3-16 7:30AM															1	✓
M12	73376																1	✓

Relinquished by: Joe Potts	Date/Time: 3-16 3:20PM	Received by:	Date/Time: 3/16/00 15:20
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS:	Date/Time: 3/16/00 15:34	Report Released By:	Date/Time:

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: **03/16/00**
Date Reported: **03/30/00**
Date Sampled: **03/16/00**
Sample ID#: **NM73377**

Your Reference: **PC-7**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1.0	03/23/00	AHH	SM 4500 N C
Nitrate as N	1.5	mg/L	0.50	03/21/00	CGM	SM 4500
Ammonia as N	0.80	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	1.1	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	180	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	650	mg/L	1	03/21/00	MEH	EPA 160.2
Escherichia coli MF	3,100	colonies/100ml	1	03/17/00	JJM	SM 9213 D
pH	7.69			03/23/00	MDH	EPA 150.1

Reviewed and Approved by:
Kevin Jacobs, B.S.

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CSA *Central States Analytical*

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Evansville, Indiana 47711

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233 S. Wacker Dr.
Chicago, IL 60606

Date Received: **03/16/00**
Date Reported: **03/30/00**
Date Sampled: **03/16/00**
Sample ID#: **NM73378**

Your Reference: **PC-4**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	2.7	mg/L	1.0	03/23/00	AHH	SM 4500 N C
Nitrate as N	1.4	mg/L	0.50	03/21/00	CGM	SM 4500
Ammonia as N	0.75	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	0.92	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.0	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	320	mg/L	1	03/21/00	MEH	EPA 160.2
Escherichia coli MF	<10	colonies/100ml	1	03/20/00	JJM	SM 9213 D
pH	7.31			03/23/00	MDH	EPA 150.1

Reviewed and Approved by:
Kevin Jacobs, B.S.

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: **03/16/00**
Date Reported: **03/30/00**
Date Sampled: **03/16/00**
Sample ID#: **NM73379**

Your Reference: **PC-3**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	1.3	mg/L	1.0	03/22/00	AHH	SM 4500 N C
Nitrate as N	1.6	mg/L	0.50	03/21/00	CGM	SM 4500
Ammonia as N	1.3	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	1.2	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	5.2	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	390	mg/L	1	03/21/00	MEH	EPA 160.2
Escherichia coli MF	45,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
pH	7.59			03/23/00	MDH	EPA 150.1

Reviewed and Approved by:
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CSA *Central States Analytical*

2406 Lynch Road
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233 S. Wacker Dr.
Chicago, IL 60606

Date Received: **03/16/00**
Date Reported: **03/30/00**
Date Sampled: **03/16/00**
Sample ID#: **NM73380**

Your Reference: **PC-2**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	2.2	mg/L	1.0	03/22/00	AHH	SM 4500 N C
Nitrate as N	2.2	mg/L	0.50	03/21/00	CGM	SM 4500
Ammonia as N	1.1	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	0.94	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.0	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	240	mg/L	1	03/21/00	MEH	EPA 160.2
Escherichia coli MF	10,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
pH	7.57			03/23/00	MDH	EPA 150.1

Reviewed and Approved by:
Kevin Jacobs, B.S.

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

CSA *Central States Analytical*

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Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: **03/16/00**
Date Reported: **03/30/00**
Date Sampled: **03/16/00**
Sample ID#: **NM73381**

Your Reference: **HWY62**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	4.9	mg/L	1.0	03/22/00	AHH	SM 4500 N C
Nitrate as N	1.3	mg/L	0.50	03/21/00	CGM	SM 4500
Ammonia as N	1.5	mg/L	0.03	03/20/00	AHH	SM 4500NH3-E
Phosphorus as P	0.99	mg/L	0.02	03/20/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.0	mg/L	2	03/21/00	MDH	SM 5210
Setup of BOD	Completed			03/16/00	ADH	
Total Suspended Solids	610	mg/L	1	03/21/00	MEH	EPA 160.2
Escherichia coli MF	23,000	colonies/100ml	1	03/17/00	JJM	SM 9213 D
pH	7.57			03/23/00	MDH	EPA 150.1

Reviewed and Approved by:
Kevin Jacobs, B.S.

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Central States Analytical

CHAIN OF CUSTODY

2406 Lynch Road
Evansville, IN 47711
(812) 464-9000 Fax (812) 424-0667

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: (EMC) Harza Engr. Contact: (Joe Potts) David Pott P.O. # / Project:	Address: pager 463-7367 Telephone #: 428-0550 Fax #: 428-6941	Samplers: J. Potts (If more than one sample, identify which samples taken)

Manual In-Stream Samples
Pigeon Creek

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	Nitrate Nitrogen	TKN	Ammonia Nitrogen	pH	Phosphorus-total	BOD 5	TSS	e-coli	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
PC7	73377	3-16 12:00	Oak hill	X	X	X	X	X	X	X	X	Grab	1	
PC4	73378	12:30	S-town									Grab	1	
PC3	73379	12:45	1st Ave bridge east									Grab	1	
PC2	73380	1:32	W. of 6th Ave									Grab	1	
Hwy 62	73381	1:58	Ohio St.									Grab	1	

Relinquished by: Joe Potts	Date/Time: 3-16 3:20PM	Received by: [signature]	Date/Time: 3/16/00 15:20
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 3/16/00 15:43	Report Released By:	Date/Time:

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

May 24, 2000

David Pott
Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Dear Mr. Pott,

This letter is sent to inform you of a problem we experienced with the BOD/CBOD sample run performed at Central States Analytical on May 2, 2000. We determined that the BOD and CBOD test results for this run were not acceptable and these test results were not reported to you. These samples were taken on May 1, 2000 and the CSA sample number(s) for your sample(s) were as follows: NM76335, NM76336, and NM76337.

Our investigation indicated the BOD seed material used for the BOD sample run on May 2, 2000 was contaminated. We could not determine the source of contamination as all of the seed material had been consumed. This incident has been discussed with our analysts to emphasize the need to prevent contamination and to review the potential sources of contamination.

Attached is a copy of the Nonconformance Report (NCR) for this incident. CSA will repeat the BOD/CBOD test(s) on new samples in the situations where it is possible to resample. There will be no charge to you for this report testing.

Please accept our apology for this incident.

Sincerely,

Dan Lentz

CC: Steve Barnett
Kevin Jacobs
Cathy Miller
Roger Wilson

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

Central States Analytical Nonconformance Report (NCR)

Sample #: BOD SAMPLE RUN 5/2/2000
NCR Initiated by: DAN LENTZ Date: MAY 16, 2000

Area:
- ☐ Biological
- ☐ Organic
- ☐ Inorganic
- ☐ Industrial Process Support
- ☒ Raw Materials
- ☐ Reporting/Data Review
- ☐ _____

Nonconformance:

Laboratory Dependent
- ☐ Instrument failure
- ☐ Invalid instrument calibration
- ☐ Analyst error
- ☐ Incorrect procedure used
- ☐ Log-in error
- ☐ Out-of-specification (OOS)
- ☐ Miscommunication
- ☐ Holding time exceeded
- ☐ _____

Analysis
- ☐ Surrogates
- ☐ Internal standards
- ☐ Spike recoveries
- ☐ Blank contamination
- ☐ Duplicate RPD's
- ☐ Second column
- ☐ Contamination check
- ☐ Confirmation of matrix effects
- ☐ Insufficient sample for proper analysis
- ☒ BOD SEED MATERIAL

Comments/Explanation:
The sample run on May 2 2000 for BOD was not acceptable. BOD Test results for this sample run were not reported to clients as the test results were determined to be erroneous.

Incorrect or Incomplete Client Deliverable
- ☐ Hard copy deliverable error
- ☐ Electronic deliverable error
- ☐ _____

Central States Analytical Nonconformance Report (NCR)

Investigation

Investigation Results (Including Root Cause): Our investigation indicated The BOD Seed Material used for The 5/2/2000 sample run was contaminated. The source of The contamination could not be determined as all BOD Seed Material had been consumed.

Initial/Date:

Corrective Action	Responsibility	Date/Initial
This problem has been discussed with CSA analysts. The potential sources of contamination and The importance of prevention of contamination have been emphasized.	Cathy Miller	CCM 5-23-00

Group Leader Signature: Cathy Miller Date: 5-23-00

Corrective Action Verification

☒ Verified By and Date: Cathy Miller 5-23-00
☐ Cannot Verify (specify reason):

Quality Assurance Review

☐ Anomaly
☐ Further action required:
Assigned to:
☒ No further action

☒ Deficiency

QA/QC Signature: Dan Lentz Date: 5/23/00

Notification Required ☒ Yes ☐ No Dan Lentz 5/23/00 (Name/Date)

Client notified by (name/date): Various clients

☒ in writing ☐ by facsimile
☐ by telephone ☐ other (explain)

Client's name and response:
☐ no action required ☐ await new sample
☒ resample * ☒ repeat analysis *
* when possible

Nonconformance Report Closure

Laboratory Manager/Designee: 5/25/00

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77833**

Your Reference: **D1**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	19	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	0.53	mg/L	0.03	05/30/00	AHH	SM 4500NH3-E
Phosphorus as P	0.80	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	16	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	120	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	22000	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.005	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.016	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.018	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.006	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.11	mg/L	0.001	05/26/00	RAS	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77834**

Your Reference: **D2**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	6.7	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	2.1	mg/L	0.03	05/30/00	AHH	SM 4500NH3-E
Phosphorus as P	1.4	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	7.6	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	52	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	30000	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	0.010	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.027	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.063	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.089	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.023	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.48	mg/L	0.001	05/26/00	RAS	EPA 200.7

Reviewed and Approved by:
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Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77835**

Your Reference: **D3**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	7.0	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	0.66	mg/L	0.03	05/31/00	ADH	SM 4500NH3-E
Phosphorus as P	1.6	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	8.5	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	81	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	16500	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	0.009	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.024	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.070	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.085	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.020	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.44	mg/L	0.001	05/26/00	RAS	EPA 200.7

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Date Received: 05/24/00
Date Reported: 06/05/00
Date Sampled: 05/23/00
Sample ID#: NM77836

Your Reference: D4
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	5.2	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	1.2	mg/L	0.03	05/31/00	ADH	SM 4500NH3-E
Phosphorus as P	1.5	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	9.1	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	68	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	40000	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	0.010	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	0.002	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.031	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.077	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.13	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.025	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.50	mg/L	0.001	05/26/00	RAS	EPA 200.7

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Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77837**

Your Reference: **D5**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	4.9	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	0.21	mg/L	0.03	05/31/00	ADH	SM 4500NH3-E
Phosphorus as P	1.1	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	6.4	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	46	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	15200	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	0.008	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	0.002	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.026	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.055	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.088	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.017	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.36	mg/L	0.001	05/26/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77838**

Your Reference: **D6**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	5.2	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	0.18	mg/L	0.03	05/31/00	ADH	SM 4500NH3-E
Phosphorus as P	1.4	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	9.6	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	56	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	20200	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	0.008	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	0.002	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.023	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.061	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.084	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.017	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.34	mg/L	0.001	05/26/00	RAS	EPA 200.7

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Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77839**

Your Reference: **D7**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	4.4	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	0.47	mg/L	0.03	05/31/00	ADH	SM 4500NH3-E
Phosphorus as P	1.1	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	8.0	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	50	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	27000	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	0.002	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.020	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.052	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.074	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.014	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.29	mg/L	0.001	05/26/00	RAS	EPA 200.7

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Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77840**

Your Reference: **D8**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	4.1	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	0.29	mg/L	0.03	05/31/00	ADH	SM 4500NH3-E
Phosphorus as P	1.1	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	9.2	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	37	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	15400	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	0.006	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.012	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.033	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.054	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.012	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.21	mg/L	0.001	05/26/00	RAS	EPA 200.7

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Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77841**

Your Reference: **D9**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	4.8	mg/L	1.0	06/02/00	ADH	SM 4500 N C
Ammonia as N	0.51	mg/L	0.03	05/31/00	ADH	SM 4500NH3-E
Phosphorus as P	1.1	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	11	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	36	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	34000	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.009	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.026	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.037	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.013	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.16	mg/L	0.001	05/26/00	RAS	EPA 200.7

Reviewed and Approved by:
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Chicago, IL 60606

Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77842**

Your Reference: **D10**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	1.7	mg/L	1.0	06/02/00	ADH	SM 4500 N C
Ammonia as N	0.29	mg/L	0.03	05/31/00	ADH	SM 4500NH3-E
Phosphorus as P	0.63	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	7.6	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	43	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	13500	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	0.006	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.006	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.016	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.031	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.006	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.12	mg/L	0.001	05/26/00	RAS	EPA 200.7

Reviewed and Approved by:
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Central States Analytical

CHAIN OF CUSTODY

2406 Lynch Road
Evansville, IN 47711
(812) 484-9000 Fax (812) 424-0667

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: EMC/Harza Engr.	Address: 1500 Waterworks Rd	Samplers: Joe Potts
Contact: Joe Potts/David Pott	Telephone #: 428-0550 Fax #: 428-6941	(If more than one sample, identify which samples taken)
P.O. # / Project: CSO/Harza		

Diamond CSO

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	NH3	TKN	TP	BOD	TSS	E-Coli	As	Cd	Cr	Cu	Pb	Ni	Zn	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
D1	77833	5/23/00 8:30 PM																1	1500 ML Auto Sampler
D2	77834	5/23/00 8:45																	
D3	77835	5/23/00 9:00																	
D4	77836	9:15																	
D5	77837	9:30																	
D6	77838	9:45																	
D7	77839	10:00																	
D8	77840	10:15																	
D9	77841	10:45																	
D10	77842	11:15																	

E

Relinquished by: Joe Potts	Date/Time: 9:10 AM	Received by: [illegible]	Date/Time: 5/24/00 09:19
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [illegible]	Date/Time: 5/23/00	Report Released By:	Date/Time:

CSA *Central States Analytical*

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Evansville, Indiana 47711

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Chicago, IL 60606

Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77843**

Your Reference: **D11**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	5.5	mg/L	1.0	06/02/00	ADH	SM 4500 N C
Ammonia as N	0.58	mg/L	0.03	05/31/00	ADH	SM 4500NH3-E
Phosphorus as P	0.80	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	12	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	33	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	24000	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.004	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.013	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.017	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.006	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.086	mg/L	0.001	05/26/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77844**

Your Reference: **D12**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	11	mg/L	1.0	06/02/00	ADH	SM 4500 N C
Ammonia as N	3.4	mg/L	0.03	05/31/00	ADH	SM 4500NH3-E
Phosphorus as P	2.3	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	40	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	50	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	23300	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.005	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.015	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.016	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.005	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.10	mg/L	0.001	05/26/00	RAS	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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Central States Analytical

CHAIN OF CUSTODY

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Evansville, IN 47711
(812) 464-9000 Fax (812) 424-0667

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: EMC/Harza Eng. Contact: Joe Potts/David Pott P.O. # / Project: CSO/Harza	Address: 1500 Waterworks Rd. Telephone #: 428-0550 Fax #: 428-6941	Samplers: J. Potts (If more than one sample, identify which samples taken)

Analysis Requested

Diamond CSO

Client #	CSA Lab #	Sample Date/Time 5/23/00	Sample Type	NH3	TKN	P	BOD	TSS	E-coli	As	Cd	Cr	Cu	Pb	Ni	Zn	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
D11	77843	11:45 PM																1	1500 ml Auto Sampler
D12	77844	12:15 PM																1	

Relinquished by: Joe Potts	Date/Time: 9:10 AM	Received by: [signature]	Date/Time: 5/24/00 09:18
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 5/24/00 09:57	Report Released By:	Date/Time:

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Evansville, Indiana 47711

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Chicago, IL 60606

Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/24/00**
Sample ID#: **NM77822**

Your Reference: **M1**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	11	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	1.4	mg/L	0.03	05/30/00	AHH	SM 4500NH3-E
Phosphorus as P	1.2	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	22	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	30	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	40000	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.018	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.034	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.011	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.018	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.084	mg/L	0.001	05/26/00	RAS	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

CSA *Central States Analytical*

2406 Lynch Road
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Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: 05/24/00
Date Reported: 06/05/00
Date Sampled: 05/23/00
Sample ID#: NM77823

Your Reference: M2
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	12	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	2.3	mg/L	0.03	05/30/00	AHH	SM 4500NH3-E
Phosphorus as P	1.2	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	14	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	170	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	>80,000	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.014	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.031	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.020	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.015	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.098	mg/L	0.001	05/26/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77824**

Your Reference: **M3**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	13	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	2.3	mg/L	0.03	05/30/00	AHH	SM 4500NH3-E
Phosphorus as P	0.82	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	13	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	20	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	>80,000	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.006	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.012	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.006	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.006	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.040	mg/L	0.001	05/26/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: 05/24/00
Date Reported: 06/05/00
Date Sampled: 05/23/00
Sample ID#: NM77825

Your Reference: M4
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	16	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	1.4	mg/L	0.03	05/30/00	AHH	SM 4500NH3-E
Phosphorus as P	0.93	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	14	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	30	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	10900	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.008	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.015	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.010	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.008	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.060	mg/L	0.001	05/26/00	RAS	EPA 200.7

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Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77826**

Your Reference: **M5**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	11	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	0.15	mg/L	0.03	05/30/00	AHH	SM 4500NH3-E
Phosphorus as P	1.6	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	14	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	24	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	20000	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	0.003	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	0.002	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.021	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.040	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.028	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.017	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.15	mg/L	0.001	05/26/00	RAS	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77827**

Your Reference: **M6**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	5.6	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	0.25	mg/L	0.03	05/30/00	AHH	SM 4500NH3-E
Phosphorus as P	1.0	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	11	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	18	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	22000	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.011	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.033	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.014	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.009	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.088	mg/L	0.001	05/26/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77828**

Your Reference: **M7**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	4.5	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	2.3	mg/L	0.03	05/30/00	AHH	SM 4500NH3-E
Phosphorus as P	0.85	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	11	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	20	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	>80,000	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.007	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.023	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.008	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.006	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.064	mg/L	0.001	05/26/00	RAS	EPA 200.7

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Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77829**

Your Reference: **M8**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	8.8	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	1.5	mg/L	0.03	05/30/00	AHH	SM 4500NH3-E
Phosphorus as P	1.1	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	15	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	22	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	>80,000	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.009	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.017	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.006	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.006	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.051	mg/L	0.001	05/26/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77830**

Your Reference: **M9**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	7.4	mg/L	1.0	05/25/00	ADH	SM 4500 N C
Ammonia as N	2.2	mg/L	0.03	05/30/00	AHH	SM 4500NH3-E
Phosphorus as P	1.4	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	21	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	34	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	33200	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.012	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.029	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.009	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.008	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.064	mg/L	0.001	05/26/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/23/00**
Sample ID#: **NM77831**

Your Reference: **M10**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	4.9	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	0.63	mg/L	0.03	05/30/00	AHH	SM 4500NH3-E
Phosphorus as P	1.2	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	15	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	26	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	>80,000	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	0.003	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.012	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.022	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.011	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.008	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.062	mg/L	0.001	05/26/00	RAS	EPA 200.7

Reviewed and Approved by:
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Central States Analytical

CHAIN OF CUSTODY

2406 Lynch Road
Evansville, IN 47711
(812) 464-9000 Fax (812) 424-0667

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: EMC/Harza Engr. Contact: Joe Potts/David Pott P.O. # / Project: CSO/Harza	Address: 1500 Waterworks Rd. Telephone #: 428-0550 Fax #: 428-6941	Samplers: J. Potts (if more than one sample, identify which samples taken)

Analysis Requested

Maxwell
~~Garrett~~ CSO

Client #	CSA Lab #	Sample Date/Time	Sample Type	NH3	TKN	P	BOD	TSS	E.coli	As	Cd	Cr	Cu	Pb	Ni	Zn	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
																			sample Bottles
M1	77822	5/23/00 8:15PM																1	1500 ML None/P
M2	77823	8:30PM																	
M3	77824	8:45PM																	
M4	77825	9:00PM																	
M5	77826	9:15PM																	
M6	77827	9:30PM																	
M7	77828	9:45PM																	
M8	77829	10:00PM																	
M9	77830	10:30PM																	
M10	77831	11:00PM																	

Relinquished by: Joe Potts	Date/Time: 9:10 AM 5/24/00	Received by: [signature]	Date/Time: 5/24/00 09:19
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 5/24/00 09:29	Report Released By:	Date/Time:

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: 05/24/00
Date Reported: 06/05/00
Date Sampled: 05/23/00
Sample ID#: NM77832

Your Reference: M11
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	9.0	mg/L	1.0	06/01/00	ADH	SM 4500 N C
Ammonia as N	3.1	mg/L	0.03	05/30/00	AHH	SM 4500NH3-E
Phosphorus as P	1.2	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	17	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	21	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	>80,000	colonies/100ml	10	05/25/00	EDL	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	05/26/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	05/26/00	RAS	EPA 200.7
Chromium by ICP	0.008	mg/L	0.001	05/26/00	RAS	EPA 200.7
Copper by ICP	0.013	mg/L	0.001	05/26/00	RAS	EPA 200.7
Lead by ICP	0.005	mg/L	0.002	05/26/00	RAS	EPA 200.7
Nickel by ICP	0.005	mg/L	0.001	05/26/00	RAS	EPA 200.7
Zinc by ICP	0.038	mg/L	0.001	05/26/00	RAS	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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Central States Analytical

CHAIN OF CUSTODY

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_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: EMC/Harza Engr. Contact: Joe Potts/David Pott P.O. # / Project: CSO / Harza	Address: 1500 Waterworks Telephone #: 428-0550 Fax #: 428-6941	Samplers: J. Potts (if more than one sample, identify which samples taken)

Analysis Requested

Maxwell CSO

~~[illegible]~~

Client #	CSA Lab #	Sample Date/Time	Sample Type	NH3	TKN	P	BOD	TSS	E-coli	As	Cd	Cr	Cu	Pb	Ni	Zn	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
M11	77832	5/24/10 11:30 PM																1	1500 mL Auto Sampler

Relinquished by: Joe Potts	Date/Time: 9:15 AM	Received by: [illegible]	Date/Time: 5/24/10 09:19
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [illegible]	Date/Time: 5/24/10 09:46	Report Released By:	Date/Time:

CSA *Central States Analytical*

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Chicago, IL 60606

Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/24/00**
Sample ID#: **NM77861**

Your Reference: **PC 7**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1.0	06/02/00	ADH	SM 4500 N C
Nitrate as N	0.64	mg/L	0.50	05/26/00	CGM	SM 4500
Ammonia as N	1.2	mg/L	0.03	05/31/00	ADH	SM 4500NH3-E
Phosphorus as P	0.22	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	54	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	55	colonies/100ml	1	05/26/00	EDL	SM 9213 D
pH	8.42			05/24/00	TJW	EPA 150.1

Reviewed and Approved by:
Kevin Jacobs, B.S.

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Chicago, IL 60606

Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/24/00**
Sample ID#: **NM77862**

Your Reference: **PC 4**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	1.4	mg/L	1.0	06/02/00	ADH	SM 4500 N C
Nitrate as N	<0.50	mg/L	0.50	05/26/00	CGM	SM 4500
Ammonia as N	0.39	mg/L	0.03	05/31/00	ADH	SM 4500NH3-E
Phosphorus as P	0.21	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	3.8	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	79	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	15	colonies/100ml	1	05/26/00	EDL	SM 9213 D
pH	8.23			05/24/00	TJW	EPA 150.1

Reviewed and Approved by:
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Harza Engineering
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Chicago, IL 60606

Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/24/00**
Sample ID#: **NM77863**

Your Reference: **PC 3**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	1.4	mg/L	1.0	06/02/00	ADH	SM 4500 N C
Nitrate as N	0.60	mg/L	0.50	05/26/00	CGM	SM 4500
Ammonia as N	0.77	mg/L	0.03	05/31/00	ADH	SM 4500NH3-E
Phosphorus as P	0.34	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	5.8	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	24	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	25	colonies/100ml	1	05/26/00	EDL	SM 9213 D
pH	8.80			05/24/00	TJW	EPA 150.1

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Date Received: **05/24/00**
Date Reported: **06/05/00**
Date Sampled: **05/24/00**
Sample ID#: **NM77864**

Your Reference: **PC2**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	2.8	mg/L	1.0	06/02/00	ADH	SM 4500 N C
Nitrate as N	0.56	mg/L	0.50	05/26/00	CGM	SM 4500
Ammonia as N	0.71	mg/L	0.03	05/31/00	ADH	SM 4500NH3-E
Phosphorus as P	0.33	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	6.4	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	45	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	8	colonies/100ml	1	05/26/00	EDL	SM 9213 D
pH	8.51			05/24/00	TJW	EPA 150.1

Reviewed and Approved by:
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Date Received: 05/24/00
Date Reported: 06/05/00
Date Sampled: 05/24/00
Sample ID#: NM77865

Your Reference: Hwy 62
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	<1.0	mg/L	1.0	06/02/00	ADH	SM 4500 N C
Nitrate as N	0.63	mg/L	0.50	05/26/00	CGM	SM 4500
Ammonia as N	0.12	mg/L	0.03	05/31/00	ADH	SM 4500NH3-E
Phosphorus as P	0.13	mg/L	0.02	05/26/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	<2.5	mg/L	2.5	05/29/00	CGM	SM 5210
Setup of BOD	Completed			05/24/00	AHH	
Total Suspended Solids	20	mg/L	1	05/26/00	MEH	EPA 160.2
Escherichia coli MF	28	colonies/100ml	0.1	05/26/00	EDL	SM 9213 D
pH	8.53			05/24/00	TJW	EPA 150.1

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Central States Analytical

CHAIN OF CUSTODY

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(812) 464-9000 Fax (812) 424-0667

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: EMC/Harza Engr. Contact: Joe Potts/David Pott P.O. # / Project: CSO/Harza	Address: 1500 Waterworks Rd Telephone #: 428-0550 Fax #: 428-6941	Samplers: J. Potts/Steve Frey (If more than one sample, identify which samples taken)

Analysis Requested

Manual In-Stream Samples

Client #	CSA Lab #	Sample Date/Time	Sample Type	Nitrate N	TKN	NH3	PH	P	BOD	TSS	e-coli	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
PC7	77861	5-24 9:45AM	Oakhill bridge									grab	1	~~250~~ Mal Glass
PC4	77862	10:10 AM	S-town bridge									grab	1	
PC3	77863	10:20AM	1st Ave. bridge									grab	1	
PC2	77864	10:30 AM	W. of 6th Ave.									grab	1	
Hwy 62	77865	10:40AM	Ohio St. bridge									grab	1	

Relinquished by:	Date/Time: 5/24/00	Received by:	Date/Time: 5/24/00 11:30
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS:	Date/Time: 5/24/00 12:15	Report Released By:	Date/Time:

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Chicago, IL 60606

Date Received: **06/21/00**
Date Reported: **06/28/00**
Date Sampled: **06/21/00**
Sample ID#: **NM79671**

Your Reference: **CSO MAXWELL M1**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	7.0	mg/L	1.0	06/27/00	ADH	SM 4500 N C
Ammonia as N	1.9	mg/L	1.0	06/22/00	ADH	SM 4500NH3-E
Phosphorus as P	1.0	mg/L	0.02	06/23/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	18	mg/L	5	06/26/00	ADH	SM 5210
Setup of BOD	Completed			06/21/00	ADH	
Total Suspended Solids	20	mg/L	1	06/22/00	MEH	EPA 160.2
Escherichia coli MF	456000	colonies/100ml	1000	06/22/00	EDL	SM 9213 D
Lead by ICP	0.003	mg/L	0.002	06/23/00	RAS	EPA 200.7
Copper by ICP	0.009	mg/L	0.001	06/23/00	RAS	EPA 200.7
Zinc by ICP	0.032	mg/L	0.001	06/23/00	RAS	EPA 200.7
Nickel by ICP	0.003	mg/L	0.001	06/23/00	RAS	EPA 200.7
Arsenic by ICP	<0.003	mg/L	0.003	06/23/00	RAS	EPA 200.7
Chromium by ICP	0.004	mg/L	0.001	06/23/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	06/23/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: **06/21/00**
Date Reported: **06/28/00**
Date Sampled: **06/21/00**
Sample ID#: **NM79672**

Your Reference: **CSO MAXWELL M2**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	5.6	mg/L	1.0	06/27/00	ADH	SM 4500 N C
Ammonia as N	2.8	mg/L	1.0	06/22/00	ADH	SM 4500NH3-E
Phosphorus as P	1.1	mg/L	0.02	06/23/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	12	mg/L	5	06/26/00	ADH	SM 5210
Setup of BOD	Completed			06/21/00	ADH	
Total Suspended Solids	10	mg/L	1	06/22/00	MEH	EPA 160.2
Escherichia coli MF	285000	colonies/100ml	1000	06/22/00	EDL	SM 9213 D
Lead by ICP	0.002	mg/L	0.002	06/23/00	RAS	EPA 200.7
Copper by ICP	0.008	mg/L	0.001	06/23/00	RAS	EPA 200.7
Zinc by ICP	0.055	mg/L	0.001	06/23/00	RAS	EPA 200.7
Nickel by ICP	0.003	mg/L	0.001	06/23/00	RAS	EPA 200.7
Arsenic by ICP	<0.003	mg/L	0.003	06/23/00	RAS	EPA 200.7
Chromium by ICP	0.003	mg/L	0.001	06/23/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	06/23/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: 06/21/00
Date Reported: 06/28/00
Date Sampled: 06/21/00
Sample ID#: NM79673

Your Reference: CSO MAXWELL M3
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	15	mg/L	1.0	06/27/00	ADH	SM 4500 N C
Ammonia as N	4.7	mg/L	1.0	06/22/00	ADH	SM 4500NH3-E
Phosphorus as P	2.2	mg/L	0.02	06/23/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	20	mg/L	5	06/26/00	ADH	SM 5210
Setup of BOD	Completed			06/21/00	ADH	
Total Suspended Solids	15	mg/L	1	06/22/00	MEH	EPA 160.2
Escherichia coli MF	342000	colonies/100ml	1000	06/22/00	EDL	SM 9213 D
Lead by ICP	0.003	mg/L	0.002	06/23/00	RAS	EPA 200.7
Copper by ICP	0.018	mg/L	0.001	06/23/00	RAS	EPA 200.7
Zinc by ICP	0.056	mg/L	0.001	06/23/00	RAS	EPA 200.7
Nickel by ICP	0.008	mg/L	0.001	06/23/00	RAS	EPA 200.7
Arsenic by ICP	<0.003	mg/L	0.003	06/23/00	RAS	EPA 200.7
Chromium by ICP	0.009	mg/L	0.001	06/23/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	06/23/00	RAS	EPA 200.7

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Date Received: **06/21/00**
Date Reported: **06/28/00**
Date Sampled: **06/21/00**
Sample ID#: **NM79674**

Your Reference: **CSO MAXWELL M4**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	14	mg/L	1.0	06/27/00	ADH	SM 4500 N C
Ammonia as N	4.7	mg/L	1.0	06/22/00	ADH	SM 4500NH3-E
Phosphorus as P	1.9	mg/L	0.02	06/23/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	25	mg/L	5	06/26/00	ADH	SM 5210
Setup of BOD	Completed			06/21/00	ADH	
Total Suspended Solids	19	mg/L	1	06/22/00	MEH	EPA 160.2
Escherichia coli MF	513000	colonies/100ml	1000	06/22/00	EDL	SM 9213 D
Lead by ICP	0.002	mg/L	0.002	06/23/00	RAS	EPA 200.7
Copper by ICP	0.014	mg/L	0.001	06/23/00	RAS	EPA 200.7
Zinc by ICP	0.066	mg/L	0.001	06/23/00	RAS	EPA 200.7
Nickel by ICP	0.009	mg/L	0.001	06/23/00	RAS	EPA 200.7
Arsenic by ICP	<0.003	mg/L	0.003	06/23/00	RAS	EPA 200.7
Chromium by ICP	0.007	mg/L	0.001	06/23/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	06/23/00	RAS	EPA 200.7

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Date Received: 06/21/00
Date Reported: 06/28/00
Date Sampled: 06/21/00
Sample ID#: NM79675

Your Reference: CSO MAXWELL M5
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	18	mg/L	1.0	06/27/00	ADH	SM 4500 N C
Ammonia as N	7.8	mg/L	1.0	06/22/00	ADH	SM 4500NH3-E
Phosphorus as P	2.3	mg/L	0.02	06/23/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	23	mg/L	5	06/26/00	ADH	SM 5210
Setup of BOD	Completed			06/21/00	ADH	
Total Suspended Solids	17	mg/L	1	06/22/00	MEH	EPA 160.2
Escherichia coli MF	228000	colonies/100ml	1000	06/22/00	EDL	SM 9213 D
Lead by ICP	0.003	mg/L	0.002	06/23/00	RAS	EPA 200.7
Copper by ICP	0.019	mg/L	0.001	06/23/00	RAS	EPA 200.7
Zinc by ICP	0.070	mg/L	0.001	06/23/00	RAS	EPA 200.7
Nickel by ICP	0.010	mg/L	0.001	06/23/00	RAS	EPA 200.7
Arsenic by ICP	<0.003	mg/L	0.003	06/23/00	RAS	EPA 200.7
Chromium by ICP	0.010	mg/L	0.001	06/23/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	06/23/00	RAS	EPA 200.7

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Chicago, IL 60606

Date Received: **06/21/00**
Date Reported: **06/28/00**
Date Sampled: **06/21/00**
Sample ID#: **NM79676**

Your Reference: **CSO MAXWELL M6**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	17	mg/L	1.0	06/27/00	ADH	SM 4500 N C
Ammonia as N	4.7	mg/L	1.0	06/22/00	ADH	SM 4500NH3-E
Phosphorus as P	2.3	mg/L	0.02	06/23/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	24	mg/L	5	06/26/00	ADH	SM 5210
Setup of BOD	Completed			06/21/00	ADH	
Total Suspended Solids	18	mg/L	1	06/22/00	MEH	EPA 160.2
Escherichia coli MF	171000	colonies/100ml	1000	06/22/00	EDL	SM 9213 D
Lead by ICP	0.002	mg/L	0.002	06/23/00	RAS	EPA 200.7
Copper by ICP	0.025	mg/L	0.001	06/23/00	RAS	EPA 200.7
Zinc by ICP	0.062	mg/L	0.001	06/23/00	RAS	EPA 200.7
Nickel by ICP	0.019	mg/L	0.001	06/23/00	RAS	EPA 200.7
Arsenic by ICP	<0.003	mg/L	0.003	06/23/00	RAS	EPA 200.7
Chromium by ICP	0.015	mg/L	0.001	06/23/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	06/23/00	RAS	EPA 200.7

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Date Received: **06/21/00**
Date Reported: **06/28/00**
Date Sampled: **06/21/00**
Sample ID#: **NM79677**

Your Reference: **CSO MAXWELL M7**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	20	mg/L	1.0	06/27/00	ADH	SM 4500 N C
Ammonia as N	5.0	mg/L	1.0	06/22/00	ADH	SM 4500NH3-E
Phosphorus as P	3.1	mg/L	0.02	06/23/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	>38	mg/L	5	06/26/00	ADH	SM 5210
Setup of BOD	Completed			06/21/00	ADH	
Total Suspended Solids	92	mg/L	1	06/22/00	MEH	EPA 160.2
Escherichia coli MF	285000	colonies/100ml	1000	06/22/00	EDL	SM 9213 D
Lead by ICP	0.013	mg/L	0.002	06/23/00	RAS	EPA 200.7
Copper by ICP	0.094	mg/L	0.001	06/23/00	RAS	EPA 200.7
Zinc by ICP	0.13	mg/L	0.001	06/23/00	RAS	EPA 200.7
Nickel by ICP	0.063	mg/L	0.001	06/23/00	RAS	EPA 200.7
Arsenic by ICP	<0.003	mg/L	0.003	06/23/00	RAS	EPA 200.7
Chromium by ICP	0.055	mg/L	0.001	06/23/00	RAS	EPA 200.7
Cadmium by ICP	0.002	mg/L	0.001	06/23/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: **06/21/00**
Date Reported: **06/28/00**
Date Sampled: **06/21/00**
Sample ID#: **NM79678**

Your Reference: **CSO MAXWELL M8**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	13	mg/L	1.0	06/27/00	ADH	SM 4500 N C
Ammonia as N	5.1	mg/L	1.0	06/22/00	ADH	SM 4500NH3-E
Phosphorus as P	2.3	mg/L	0.02	06/23/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	27	mg/L	5	06/26/00	ADH	SM 5210
Setup of BOD	Completed			06/21/00	ADH	
Total Suspended Solids	20	mg/L	1	06/22/00	MEH	EPA 160.2
Escherichia coli MF	171000	colonies/100ml	1000	06/22/00	EDL	SM 9213 D
Lead by ICP	0.006	mg/L	0.002	06/23/00	RAS	EPA 200.7
Copper by ICP	0.034	mg/L	0.001	06/23/00	RAS	EPA 200.7
Zinc by ICP	0.096	mg/L	0.001	06/23/00	RAS	EPA 200.7
Nickel by ICP	0.024	mg/L	0.001	06/23/00	RAS	EPA 200.7
Arsenic by ICP	<0.003	mg/L	0.003	06/23/00	RAS	EPA 200.7
Chromium by ICP	0.019	mg/L	0.001	06/23/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	06/23/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: **06/21/00**
Date Reported: **06/28/00**
Date Sampled: **06/21/00**
Sample ID#: **NM79679**

Your Reference: **CSO MAXWELL M9**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	8.4	mg/L	1.0	06/27/00	ADH	SM 4500 N C
Ammonia as N	4.7	mg/L	1.0	06/22/00	ADH	SM 4500NH3-E
Phosphorus as P	2.2	mg/L	0.02	06/23/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	27	mg/L	5	06/26/00	ADH	SM 5210
Setup of BOD	Completed			06/21/00	ADH	
Total Suspended Solids	16	mg/L	1	06/22/00	MEH	EPA 160.2
Escherichia coli MF	285000	colonies/100ml	1000	06/22/00	EDL	SM 9213 D
Lead by ICP	0.005	mg/L	0.002	06/23/00	RAS	EPA 200.7
Copper by ICP	0.023	mg/L	0.001	06/23/00	RAS	EPA 200.7
Zinc by ICP	0.073	mg/L	0.001	06/23/00	RAS	EPA 200.7
Nickel by ICP	0.016	mg/L	0.001	06/23/00	RAS	EPA 200.7
Arsenic by ICP	<0.003	mg/L	0.003	06/23/00	RAS	EPA 200.7
Chromium by ICP	0.011	mg/L	0.001	06/23/00	RAS	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	06/23/00	RAS	EPA 200.7

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Date Received: **06/21/00**
Date Reported: **06/28/00**
Date Sampled: **06/21/00**
Sample ID#: **NM79680**

Your Reference: **CSO MAXWELL M10**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	8.4	mg/L	1.0	06/27/00	ADH	SM 4500 N C
Ammonia as N	7.3	mg/L	1.0	06/23/00	ADH	SM 4500NH3-E
Phosphorus as P	2.2	mg/L	0.02	06/23/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	22	mg/L	5	06/26/00	ADH	SM 5210
Setup of BOD	Completed			06/21/00	ADH	
Total Suspended Solids	16	mg/L	1	06/22/00	MEH	EPA 160.2
Escherichia coli MF	228000	colonies/100ml	1000	06/22/00	EDL	SM 9213 D
Lead by ICP	0.003	mg/L	0.002	06/23/00	RAS	EPA 200.7
Copper by ICP	0.020	mg/L	0.001	06/23/00	RAS	EPA 200.7
Zinc by ICP	0.052	mg/L	0.001	06/23/00	RAS	EPA 200.7
Nickel by ICP	0.013	mg/L	0.001	06/23/00	RAS	EPA 200.7
Arsenic by ICP	<0.003	mg/L	0.003	06/23/00	RAS	EPA 200.7
Chromium by ICP	0.010	mg/L	0.001	06/23/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	06/23/00	RAS	EPA 200.7

Reviewed and Approved by:
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CHAIN OF CUSTODY

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: EMC Contact: J. Potts P.O. # / Project: Harza	Address: 1500 Waterworks Rd. Telephone #: 428-0550 Fax #:	Samplers: J. Potts (If more than one sample, identify which samples taken)

Muxwell CSO

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	BOD	TSS	Pb	Cu	Zn	Nitrate Nitrite	TKN	Total P	Ni	As	Cr	CN	NH3	E. coli	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
M1	79671	6-21-00 8:00 AM		X	X	X	X	X	X	X	X	X	X	X	X	X	X	Grab	1	✓
M2	79672	8:15																" "	1	✓
M3	79673	8:30																		✓
M4	79674	8:45																		✓
M5	79675	9:00																		✓
M6	79676	9:15																		✓
M7	79677	9:30																		✓
M8	79678	9:45																		✓
M9	79679	10:15																		✓
M10	79680	10:45																" "	" "	✓

Relinquished by: Steve Fran	Date/Time: 6-21-00 1:30	Received by: [illegible]	Date/Time: 6/21/00 1:30
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [illegible]	Date/Time: 6/21/00 14:18	Report Released By:	Date/Time:

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Date Received: **06/21/00**
Date Reported: **07/05/00**
Date Sampled: **06/21/00**
Sample ID#: **NM79681**

Your Reference: **CSO Maxwell M11**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	7.0	mg/L	1.0	06/27/00	ADH	SM 4500 N C
Nitrate as N	<0.50	mg/L	0.50	06/28/00	CGM	SM 4500
Ammonia as N	4.7	mg/L	1.0	06/23/00	ADH	SM 4500NH3-E
Phosphorus as P	2.2	mg/L	0.02	06/23/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	22	mg/L	5	06/26/00	ADH	SM 5210
Setup of BOD	Completed			06/21/00	ADH	
Total Suspended Solids	17	mg/L	1	06/22/00	MEH	EPA 160.2
Escherichia coli MF	513000	colonies/100ml	1000	06/22/00	EDL	SM 9213 D
Lead by ICP	0.002	mg/L	0.002	06/23/00	RAS	EPA 200.7
Copper by ICP	0.016	mg/L	0.001	06/23/00	RAS	EPA 200.7
Zinc by ICP	0.045	mg/L	0.001	06/23/00	RAS	EPA 200.7
Nickel by ICP	0.010	mg/L	0.001	06/23/00	RAS	EPA 200.7
Arsenic by ICP	<0.003	mg/L	0.003	06/23/00	RAS	EPA 200.7
Chromium by ICP	0.008	mg/L	0.001	06/23/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	06/23/00	RAS	EPA 200.7

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Date Received: 06/21/00
Date Reported: 07/05/00
Date Sampled: 06/21/00
Sample ID#: NM79719

Your Reference: CSO Diamond D3
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	7.8	mg/L	1.0	06/29/00	ADH	SM 4500 N C
Ammonia as N	4.7	mg/L	1.0	06/26/00	ADH	SM 4500NH3-E
Phosphorus as P	2.2	mg/L	0.02	06/23/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	24	mg/L	5	06/26/00	ADH	SM 5210
Setup of BOD	Completed			06/21/00	ADH	
Total Suspended Solids	42	mg/L	1	06/23/00	MEH	EPA 160.2
Escherichia coli MF	210000	colonies/100ml	1000	06/23/00	LMR	SM 9213 D
Zinc by ICP	0.23	mg/L	0.001	06/23/00	RAS	EPA 200.7
Copper by ICP	0.012	mg/L	0.001	06/23/00	RAS	EPA 200.7
Lead by ICP	0.005	mg/L	0.002	06/23/00	RAS	EPA 200.7
Arsenic by ICP	<0.003	mg/L	0.003	06/23/00	RAS	EPA 200.7
Nickel by ICP	0.013	mg/L	0.001	06/23/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	06/23/00	RAS	EPA 200.7
Chromium by ICP	0.006	mg/L	0.001	06/23/00	RAS	EPA 200.7

Reviewed and Approved by:
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Date Received: **06/21/00**
Date Reported: **07/05/00**
Date Sampled: **06/21/00**
Sample ID#: **NM79720**

Your Reference: **CSO Diamond D4**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	9.8	mg/L	1.0	06/29/00	ADH	SM 4500 N C
Ammonia as N	<1.0	mg/L	1.0	06/26/00	ADH	SM 4500NH3-E
Phosphorus as P	2.9	mg/L	0.02	06/23/00	RAS	SW-846 6010A
Biochemical Oxygen Demand	>38	mg/L	5	06/26/00	ADH	SM 5210
Setup of BOD	Completed			06/21/00	ADH	
Total Suspended Solids	40	mg/L	1	06/23/00	MEH	EPA 160.2
Escherichia coli MF	272000	colonies/100ml	1000	06/23/00	LMR	SM 9213 D
Zinc by ICP	0.095	mg/L	0.001	06/23/00	RAS	EPA 200.7
Copper by ICP	0.014	mg/L	0.001	06/23/00	RAS	EPA 200.7
Lead by ICP	0.005	mg/L	0.002	06/23/00	RAS	EPA 200.7
Arsenic by ICP	<0.003	mg/L	0.003	06/23/00	RAS	EPA 200.7
Nickel by ICP	0.016	mg/L	0.001	06/23/00	RAS	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	06/23/00	RAS	EPA 200.7
Chromium by ICP	0.001	mg/L	0.001	06/23/00	RAS	EPA 200.7

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Date Received: **08/08/00**
Date Reported: **08/17/00**
Date Sampled: **08/08/00**
Sample ID#: **NM82871**

Your Reference: **DIAMOND CSO D1**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	5.6	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Cadmium by ICP	<0.001	mg/L	0.001	08/10/00	JEP	EPA 200.7
Ammonia as N	5.1	mg/L	1.0	08/14/00	ADH	SM 4500NH3-E
Phosphorus as P	1.9	mg/L	0.02	08/10/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	23	mg/L	2.8	08/13/00	ADH	SM 5210
Setup of BOD	Completed			08/08/00	ADH	
Total Suspended Solids	30	mg/L	1	08/09/00	MEH	EPA 160.2
Escherichia coli MF	165000	colonies/100ml	1	08/09/00	LMR	SM 9213 D
Chromium by ICP	0.004	mg/L	0.001	08/10/00	JEP	EPA 200.7
Copper by ICP	0.010	mg/L	0.001	08/10/00	JEP	EPA 200.7
Lead by ICP	0.007	mg/L	0.002	08/10/00	JEP	EPA 200.7
Nickel by ICP	0.017	mg/L	0.001	08/10/00	JEP	EPA 200.7
Zinc by ICP	0.10	mg/L	0.001	08/10/00	JEP	EPA 200.7
Arsenic by ICP	0.003	mg/L	0.003	08/10/00	JEP	EPA 200.7

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Date Received: 08/08/00
Date Reported: 08/17/00
Date Sampled: 08/08/00
Sample ID#: NM82872

Your Reference: DIAMOND CSO D2
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	9.8	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Cadmium by ICP	0.001	mg/L	0.001	08/10/00	JEP	EPA 200.7
Ammonia as N	5.6	mg/L	1.0	08/14/00	ADH	SM 4500NH3-E
Phosphorus as P	2.0	mg/L	0.02	08/10/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	37	mg/L	2.8	08/13/00	ADH	SM 5210
Setup of BOD	Completed			08/08/00	ADH	
Total Suspended Solids	44	mg/L	1	08/09/00	MEH	EPA 160.2
Escherichia coli MF	210000	colonies/100ml	1	08/09/00	LMR	SM 9213 D
Chromium by ICP	0.014	mg/L	0.001	08/10/00	JEP	EPA 200.7
Copper by ICP	0.015	mg/L	0.001	08/10/00	JEP	EPA 200.7
Lead by ICP	0.012	mg/L	0.002	08/10/00	JEP	EPA 200.7
Nickel by ICP	0.017	mg/L	0.001	08/10/00	JEP	EPA 200.7
Zinc by ICP	0.15	mg/L	0.001	08/10/00	JEP	EPA 200.7
Arsenic by ICP	0.005	mg/L	0.003	08/10/00	JEP	EPA 200.7

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Date Received: **08/08/00**
Date Reported: **08/17/00**
Date Sampled: **08/08/00**
Sample ID#: **NM82873**

Your Reference: **DIAMOND CSO D3**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	7.0	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Cadmium by ICP	0.001	mg/L	0.001	08/10/00	JEP	EPA 200.7
Ammonia as N	4.7	mg/L	1.0	08/14/00	ADH	SM 4500NH3-E
Phosphorus as P	1.3	mg/L	0.02	08/10/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	29	mg/L	2.8	08/13/00	ADH	SM 5210
Setup of BOD	Completed			08/08/00	ADH	
Total Suspended Solids	58	mg/L	1	08/09/00	MEH	EPA 160.2
Escherichia coli MF	166000	colonies/100ml	1	08/09/00	LMR	SM 9213 D
Chromium by ICP	0.007	mg/L	0.001	08/10/00	JEP	EPA 200.7
Copper by ICP	0.023	mg/L	0.001	08/10/00	JEP	EPA 200.7
Lead by ICP	0.014	mg/L	0.002	08/10/00	JEP	EPA 200.7
Nickel by ICP	0.005	mg/L	0.001	08/10/00	JEP	EPA 200.7
Zinc by ICP	0.20	mg/L	0.001	08/10/00	JEP	EPA 200.7
Arsenic by ICP	0.004	mg/L	0.003	08/10/00	JEP	EPA 200.7

Reviewed and Approved by:
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Date Received: **08/08/00**
Date Reported: **08/17/00**
Date Sampled: **08/08/00**
Sample ID#: **NM82874**

Your Reference: **DIAMOND CSO D4**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	6.3	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Cadmium by ICP	<0.001	mg/L	0.001	08/10/00	JEP	EPA 200.7
Ammonia as N	4.7	mg/L	1.0	08/14/00	ADH	SM 4500NH3-E
Phosphorus as P	1.0	mg/L	0.02	08/10/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	33	mg/L	2.8	08/13/00	ADH	SM 5210
Setup of BOD	Completed			08/08/00	ADH	
Total Suspended Solids	87	mg/L	1	08/09/00	MEH	EPA 160.2
Escherichia coli MF	228000	colonies/100ml	1	08/09/00	LMR	SM 9213 D
Chromium by ICP	0.006	mg/L	0.001	08/10/00	JEP	EPA 200.7
Copper by ICP	0.020	mg/L	0.001	08/10/00	JEP	EPA 200.7
Lead by ICP	0.023	mg/L	0.002	08/10/00	JEP	EPA 200.7
Nickel by ICP	0.006	mg/L	0.001	08/10/00	JEP	EPA 200.7
Zinc by ICP	0.15	mg/L	0.001	08/10/00	JEP	EPA 200.7
Arsenic by ICP	0.003	mg/L	0.003	08/10/00	JEP	EPA 200.7

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Date Received: **08/08/00**
Date Reported: **08/17/00**
Date Sampled: **08/08/00**
Sample ID#: **NM82875**

Your Reference: **DIAMOND CSO D5**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	6.3	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Cadmium by ICP	0.001	mg/L	0.001	08/10/00	JEP	EPA 200.7
Ammonia as N	5.6	mg/L	1.0	08/14/00	ADH	SM 4500NH3-E
Phosphorus as P	1.4	mg/L	0.02	08/10/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	29	mg/L	2.8	08/13/00	ADH	SM 5210
Setup of BOD	Completed			08/08/00	ADH	
Total Suspended Solids	85	mg/L	1	08/09/00	MEH	EPA 160.2
Escherichia coli MF	342000	colonies/100ml	1	08/09/00	LMR	SM 9213 D
Chromium by ICP	0.006	mg/L	0.001	08/10/00	JEP	EPA 200.7
Copper by ICP	0.021	mg/L	0.001	08/10/00	JEP	EPA 200.7
Lead by ICP	0.022	mg/L	0.002	08/10/00	JEP	EPA 200.7
Nickel by ICP	0.008	mg/L	0.001	08/10/00	JEP	EPA 200.7
Zinc by ICP	0.17	mg/L	0.001	08/10/00	JEP	EPA 200.7
Arsenic by ICP	0.003	mg/L	0.003	08/10/00	JEP	EPA 200.7

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Date Received: **08/08/00**
Date Reported: **08/17/00**
Date Sampled: **08/08/00**
Sample ID#: **NM82876**

Your Reference: **DIAMOND CSO D6**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	9.8	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Cadmium by ICP	0.001	mg/L	0.001	08/10/00	JEP	EPA 200.7
Ammonia as N	4.7	mg/L	1.0	08/14/00	ADH	SM 4500NH3-E
Phosphorus as P	1.1	mg/L	0.02	08/10/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	27	mg/L	2.8	08/13/00	ADH	SM 5210
Setup of BOD	Completed			08/08/00	ADH	
Total Suspended Solids	130	mg/L	1	08/09/00	MEH	EPA 160.2
Escherichia coli MF	109000	colonies/100ml	1	08/09/00	LMR	SM 9213 D
Chromium by ICP	0.005	mg/L	0.001	08/10/00	JEP	EPA 200.7
Copper by ICP	0.020	mg/L	0.001	08/10/00	JEP	EPA 200.7
Lead by ICP	0.020	mg/L	0.002	08/10/00	JEP	EPA 200.7
Nickel by ICP	0.009	mg/L	0.001	08/10/00	JEP	EPA 200.7
Zinc by ICP	0.23	mg/L	0.001	08/10/00	JEP	EPA 200.7
Arsenic by ICP	0.004	mg/L	0.003	08/10/00	JEP	EPA 200.7

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Date Received: **08/08/00**
Date Reported: **08/17/00**
Date Sampled: **08/08/00**
Sample ID#: **NM82877**

Your Reference: **DIAMOND CSO D7**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	7.0	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Cadmium by ICP	0.001	mg/L	0.001	08/10/00	JEP	EPA 200.7
Ammonia as N	4.7	mg/L	1.0	08/14/00	ADH	SM 4500NH3-E
Phosphorus as P	0.98	mg/L	0.02	08/10/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	29	mg/L	2.8	08/13/00	ADH	SM 5210
Setup of BOD	Completed			08/08/00	ADH	
Total Suspended Solids	100	mg/L	1	08/09/00	MEH	EPA 160.2
Escherichia coli MF	171000	colonies/100ml	1	08/09/00	LMR	SM 9213 D
Chromium by ICP	0.005	mg/L	0.001	08/10/00	JEP	EPA 200.7
Copper by ICP	0.019	mg/L	0.001	08/10/00	JEP	EPA 200.7
Lead by ICP	0.020	mg/L	0.002	08/10/00	JEP	EPA 200.7
Nickel by ICP	0.008	mg/L	0.001	08/10/00	JEP	EPA 200.7
Zinc by ICP	0.20	mg/L	0.001	08/10/00	JEP	EPA 200.7
Arsenic by ICP	0.005	mg/L	0.003	08/10/00	JEP	EPA 200.7

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Date Received: **08/08/00**
Date Reported: **08/17/00**
Date Sampled: **08/08/00**
Sample ID#: **NM82878**

Your Reference: **DIAMOND CSO D8**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	14	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Arsenic by ICP	0.003	mg/L	0.003	08/10/00	JEP	EPA 200.7
Ammonia as N	6.5	mg/L	1.0	08/14/00	ADH	SM 4500NH3-E
Phosphorus as P	1.3	mg/L	0.02	08/10/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	>37	mg/L	2.8	08/13/00	ADH	SM 5210
Setup of BOD	Completed			08/08/00	ADH	
Total Suspended Solids	120	mg/L	1	08/09/00	MEH	EPA 160.2
Escherichia coli MF	171000	colonies/100ml	1	08/10/00	EDL	SM 9213 D
Zinc by ICP	0.24	mg/L	0.001	08/10/00	JEP	EPA 200.7
Nickel by ICP	0.006	mg/L	0.001	08/10/00	JEP	EPA 200.7
Lead by ICP	0.020	mg/L	0.002	08/10/00	JEP	EPA 200.7
Copper by ICP	0.019	mg/L	0.001	08/10/00	JEP	EPA 200.7
Chromium by ICP	0.006	mg/L	0.001	08/10/00	JEP	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	08/10/00	JEP	EPA 200.7

Reviewed and Approved by:
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Date Received: 08/08/00
Date Reported: 08/17/00
Date Sampled: 08/08/00
Sample ID#: NM82879

Your Reference: DIAMOND CSO D9
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	14	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Arsenic by ICP	0.005	mg/L	0.003	08/10/00	JEP	EPA 200.7
Ammonia as N	7.5	mg/L	1.0	08/14/00	ADH	SM 4500NH3-E
Phosphorus as P	2.2	mg/L	0.02	08/10/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	>36	mg/L	2.8	08/13/00	ADH	SM 5210
Setup of BOD	Completed			08/08/00	ADH	
Total Suspended Solids	86	mg/L	1	08/09/00	MEH	EPA 160.2
Escherichia coli MF	228000	colonies/100ml	1	08/10/00	EDL	SM 9213 D
Zinc by ICP	0.23	mg/L	0.001	08/10/00	JEP	EPA 200.7
Nickel by ICP	0.010	mg/L	0.001	08/10/00	JEP	EPA 200.7
Lead by ICP	0.031	mg/L	0.002	08/10/00	JEP	EPA 200.7
Copper by ICP	0.024	mg/L	0.001	08/10/00	JEP	EPA 200.7
Chromium by ICP	0.006	mg/L	0.001	08/10/00	JEP	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	08/10/00	JEP	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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Central States Analytical

CHAIN OF CUSTODY

2406 Lynch Road
Evansville, IN 47711
(812) 464-9000 Fax (812) 424-0667

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: EMC / Harza Contact: J. Potts, David Pott P.O. # / Project: Harza	Address: 1500 Waterworks Telephone #: 428-0550 Fax #: 428-6941	Samplers: Steve Frey (If more than one sample, identify which samples taken)

Diamond CSO

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	Ammonia N	TKN	P-total	BOD	TSS	E-coli	As	Cd	Cr	Cu	Pb	Ni	Zn	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
D1	82871	12:45 PM		X	X	X	X	X	X	X	X	X	X	X	X	X	G	1	ice
D2	82872	1:00		X	X	X	X	X	X	X	X	X	X	X	X	X	G	1	ice
D3	82873	1:15		X	X	X	X	X	X	X	X	X	X	X	X	X	G	1	ice
D4	82874	1:30		X	X	X	X	X	X	X	X	X	X	X	X	X	G	1	ice
D5	82875	1:45		X	X	X	X	X	X	X	X	X	X	X	X	X	G	1	ice
D6	82876	2:00		X	X	X	X	X	X	X	X	X	X	X	X	X	G	1	ice
D7	82877	2:15		X	X	X	X	X	X	X	X	X	X	X	X	X	G	1	ice
D8	82878	2:30		X	X	X	X	X	X	X	X	X	X	X	X	X	G	1	ice
D9	82879	3:00		X	X	X	X	X	X	X	X	X	X	X	X	X	G	1	ice

Relinquished by: Joe Potts	Date/Time: 8-8-00	Received by:	Date/Time: 8/8/00 15:19
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS:	Date/Time: 8/8/00 15:22	Report Released By:	Date/Time:

CSA *Central States Analytical*

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Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: **08/08/00**
Date Reported: **08/17/00**
Date Sampled: **08/08/00**
Sample ID#: **NM82881**

Your Reference: **Diamond CSO D10**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	7.0	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Total Suspended Solids	130	mg/L	1	08/09/00	MEH	EPA 160.2
Ammonia as N	7.0	mg/L	1.0	08/14/00	ADH	SM 4500NH3-E
Phosphorus as P	1.4	mg/L	0.02	08/10/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	>37	mg/L	2.8	08/13/00	ADH	SM 5210
Setup of BOD	Completed			08/08/00	ADH	
Escherichia coli MF	228000	colonies/100ml	1	08/10/00	EDL	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	08/10/00	JEP	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	08/10/00	JEP	EPA 200.7
Chromium by ICP	0.006	mg/L	0.001	08/10/00	JEP	EPA 200.7
Copper by ICP	0.022	mg/L	0.001	08/10/00	JEP	EPA 200.7
Lead by ICP	0.020	mg/L	0.002	08/10/00	JEP	EPA 200.7
Nickel by ICP	0.008	mg/L	0.001	08/10/00	JEP	EPA 200.7
Zinc by ICP	0.13	mg/L	0.001	08/10/00	JEP	EPA 200.7

Reviewed and Approved by:
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Date Received: **08/08/00**
Date Reported: **08/17/00**
Date Sampled: **08/08/00**
Sample ID#: **NM82882**

Your Reference: **Diamond CSO D11**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	7.0	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Total Suspended Solids	70	mg/L	1	08/09/00	MEH	EPA 160.2
Ammonia as N	3.3	mg/L	1.0	08/14/00	ADH	SM 4500NH3-E
Phosphorus as P	1.4	mg/L	0.02	08/10/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	36	mg/L	2.8	08/13/00	ADH	SM 5210
Setup of BOD	Completed			08/08/00	ADH	
Escherichia coli MF	285000	colonies/100ml	1	08/10/00	EDL	SM 9213 D
Arsenic by ICP	0.003	mg/L	0.003	08/10/00	JEP	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	08/10/00	JEP	EPA 200.7
Chromium by ICP	0.005	mg/L	0.001	08/10/00	JEP	EPA 200.7
Copper by ICP	0.019	mg/L	0.001	08/10/00	JEP	EPA 200.7
Lead by ICP	0.015	mg/L	0.002	08/10/00	JEP	EPA 200.7
Nickel by ICP	0.005	mg/L	0.001	08/10/00	JEP	EPA 200.7
Zinc by ICP	0.11	mg/L	0.001	08/10/00	JEP	EPA 200.7

Reviewed and Approved by:
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Chicago, IL 60606

Date Received: **08/08/00**
Date Reported: **08/17/00**
Date Sampled: **08/08/00**
Sample ID#: **NM82883**

Your Reference: **Diamond CSO D12**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	8.4	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Total Suspended Solids	62	mg/L	1	08/09/00	MEH	EPA 160.2
Ammonia as N	4.5	mg/L	1.0	08/14/00	ADH	SM 4500NH3-E
Phosphorus as P	1.9	mg/L	0.02	08/10/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	>36	mg/L	2.8	08/13/00	ADH	SM 5210
Setup of BOD	Completed			08/08/00	ADH	
Escherichia coli MF	627000	colonies/100ml	1	08/10/00	EDL	SM 9213 D
Arsenic by ICP	0.005	mg/L	0.003	08/10/00	JEP	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	08/10/00	JEP	EPA 200.7
Chromium by ICP	0.006	mg/L	0.001	08/10/00	JEP	EPA 200.7
Copper by ICP	0.025	mg/L	0.001	08/10/00	JEP	EPA 200.7
Lead by ICP	0.017	mg/L	0.002	08/10/00	JEP	EPA 200.7
Nickel by ICP	0.009	mg/L	0.001	08/10/00	JEP	EPA 200.7
Zinc by ICP	0.15	mg/L	0.001	08/10/00	JEP	EPA 200.7

Reviewed and Approved by:
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CHAIN OF CUSTODY

_____ Rush turnaround
subject to pre-approval
and additional surcharge

Company: EMC / Harza Contact: J. Potts / David Pott P.O. # / Project: Harza	Address: 1500 Waterworks Rd. Telephone #: 428-0550 Fax #: 428-6941	Samplers: Steve Frey (if more than one sample, identify which samples taken)

Diamond CSO

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	Ammonia N	TKN	P-total	BOD	TSS	F. coli	As	Cd	Cr	Cu	Pb	Ni	Zn	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
[illegible]																	G		
D10	82881	8-8 3:30PM		X	X	X	X	X	X	X	X	X	X	X	X	X	G	1	ice ✓
D11	82882	4:00		X	X	X	X	X	X	X	X	X	X	X	X	X	G	1	ice ✓
D12	82883	4:30		X	X	X	X	X	X	X	X	X	X	X	X	X	G	1	ice ✓

Relinquished by: Joe Potts	Date/Time: 8-8-00	Received by: [illegible]	Date/Time: 8/8/00 16:34
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [illegible]	Date/Time: 8/8/00 16:37	Report Released By:	Date/Time:

CSA *Central States Analytical*

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Harza Engineering
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Chicago, IL 60606

Date Received: 08/09/00
Date Reported: 08/17/00
Date Sampled: 08/09/00
Sample ID#: NM82890

Your Reference: Manual Stream PC7
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	2.8	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Nitrate as N	0.96	mg/L	0.50	08/10/00	CGM	SM 4500
Total Suspended Solids	120	mg/L	1	08/10/00	MEH	EPA 160.2
Ammonia as N	2.0	mg/L	1.0	08/14/00	ADH	SM 4500NH3-E
Phosphorus as P	0.37	mg/L	0.02	08/11/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	4.6	mg/L	2.6	08/14/00	ADH	SM 5210
Setup of BOD	Completed			08/09/00	ADH	
Escherichia coli MF	570	colonies/100ml	1	08/10/00	EDL	SM 9213 D
pH	7.85			08/14/00	TJW	EPA 150.1

Reviewed and Approved by:
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Chicago, IL 60606

Date Received: **08/09/00**
Date Reported: **08/17/00**
Date Sampled: **08/09/00**
Sample ID#: **NM82891**

Your Reference: **Manual Stream PC4**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	3.5	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Nitrate as N	0.85	mg/L	0.50	08/10/00	CGM	SM 4500
Total Suspended Solids	280	mg/L	1	08/10/00	MEH	EPA 160.2
Ammonia as N	<1.0	mg/L	1.0	08/15/00	ADH	SM 4500NH3-E
Phosphorus as P	0.30	mg/L	0.02	08/11/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	4.7	mg/L	2.6	08/14/00	ADH	SM 5210
Setup of BOD	Completed			08/09/00	ADH	
Escherichia coli MF	510	colonies/100ml	1	08/10/00	EDL	SM 9213 D
pH	7.20			08/14/00	TJW	EPA 150.1

Reviewed and Approved by:
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Chicago, IL 60606

Date Received: **08/09/00**
Date Reported: **08/17/00**
Date Sampled: **08/09/00**
Sample ID#: **NM82892**

Your Reference: **Manual Stream PC3**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	3.5	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Nitrate as N	1.1	mg/L	0.50	08/10/00	CGM	SM 4500
Total Suspended Solids	66	mg/L	1	08/10/00	MEH	EPA 160.2
Ammonia as N	<1.0	mg/L	1.0	08/15/00	ADH	SM 4500NH3-E
Phosphorus as P	0.30	mg/L	0.02	08/11/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	4.1	mg/L	2.6	08/14/00	ADH	SM 5210
Setup of BOD	Completed			08/09/00	ADH	
Escherichia coli MF	580	colonies/100ml	1	08/10/00	EDL	SM 9213 D
pH	7.27			08/09/00	TJW	EPA 150.1

Reviewed and Approved by:
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Chicago, IL 60606

Date Received: **08/09/00**
Date Reported: **08/17/00**
Date Sampled: **08/09/00**
Sample ID#: **NM82893**

Your Reference: **Manual Stream PC2**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	2.4	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Nitrate as N	1.1	mg/L	0.50	08/10/00	CGM	SM 4500
Total Suspended Solids	300	mg/L	1	08/10/00	MEH	EPA 160.2
Ammonia as N	<1.0	mg/L	1.0	08/15/00	ADH	SM 4500NH3-E
Phosphorus as P	0.32	mg/L	0.02	08/11/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	3.6	mg/L	2.6	08/14/00	ADH	SM 5210
Setup of BOD	Completed			08/09/00	ADH	
Escherichia coli MF	360	colonies/100ml	1	08/10/00	EDL	SM 9213 D
pH	7.21			08/14/00	TJW	EPA 150.1

Reviewed and Approved by:
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Date Received: 08/09/00
Date Reported: 08/17/00
Date Sampled: 08/09/00
Sample ID#: NM82894

Your Reference: Manual Stream HWY 62
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	2.8	mg/L	1.0	08/16/00	ADH	SM 4500 N C
Nitrate as N	0.97	mg/L	0.50	08/10/00	CGM	SM 4500
Total Suspended Solids	83	mg/L	1	08/10/00	MEH	EPA 160.2
Ammonia as N	<1.0	mg/L	1.0	08/15/00	ADH	SM 4500NH3-E
Phosphorus as P	0.38	mg/L	0.02	08/11/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	5.5	mg/L	2.6	08/14/00	ADH	SM 5210
Setup of BOD	Completed			08/09/00	ADH	
Escherichia coli MF	240	colonies/100ml	1	08/10/00	EDL	SM 9213 D
pH	7.31			08/14/00	TJW	EPA 150.1

Reviewed and Approved by:
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Central States Analytical

CHAIN OF CUSTODY

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(812) 464-9000 Fax (812) 424-0667

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: EMC / Harza Contact: J. Potts / D. Pott P.O. # / Project: Harza	Address: 1500 Waterworks Telephone #: 428-0550 Fax #: 428-6941	Samplers: Steve Frey / Joe Potts (If more than one sample, identify which samples taken)

Analysis Requested

Manual Stream Samples

Client #	CSA Lab #	Sample Date/Time AM	Sample Type	Nitrate N	TKN	NH3 N	PH	P-total	BOD	TSS	E-coli	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
PC7	82890	8-9 9:00		X	X	X	X	X	X	X	X	G	1	none
PC4	82891	9:15		X	X	X	X	X	X	X	X	G	1	
PC3	82892	9:45		X	X	X	X	X	X	X	X	G	1	
PC2	82893	9:50		X	X	X	X	X	X	X	X	G	1	
Hwy 62	82894	10:00		X	X	X	X	X	X	X	X	G	1	

Relinquished by: Joe Potts	Date/Time: 8-9-00 10:15AM	Received by: [signature]	Date/Time: 8/9/00 10:15
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 8/9/00 10:16	Report Released By:	Date/Time:

CSA *Central States Analytical*

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Harza Engineering
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Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83506**

Your Reference: **DIAMOND CSO 1**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	7.0	mg/L	1.0	08/22/00	ADH	SM 4500 N C
Total Suspended Solids	41	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	4.7	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	2.0	mg/L	0.02	08/23/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	14	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	17100	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	08/23/00	JEP	EPA 200.7
Chromium by ICP	0.005	mg/L	0.001	08/23/00	JEP	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	08/23/00	JEP	EPA 200.7
Copper by ICP	0.013	mg/L	0.001	08/23/00	JEP	EPA 200.7
Lead by ICP	0.012	mg/L	0.002	08/23/00	JEP	EPA 200.7
Nickel by ICP	0.004	mg/L	0.001	08/23/00	JEP	EPA 200.7
Zinc by ICP	0.068	mg/L	0.001	08/23/00	JEP	EPA 200.7

Reviewed and Approved by:
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Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83507**

Your Reference: **DIAMOND CSO 2**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	7.7	mg/L	1.0	08/22/00	ADH	SM 4500 N C
Total Suspended Solids	48	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	2.8	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	1.4	mg/L	0.02	08/23/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	27	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	114000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.003	mg/L	0.003	08/23/00	JEP	EPA 200.7
Chromium by ICP	0.003	mg/L	0.001	08/23/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/23/00	JEP	EPA 200.7
Copper by ICP	0.016	mg/L	0.001	08/23/00	JEP	EPA 200.7
Lead by ICP	0.008	mg/L	0.002	08/23/00	JEP	EPA 200.7
Nickel by ICP	0.005	mg/L	0.001	08/23/00	JEP	EPA 200.7
Zinc by ICP	0.061	mg/L	0.001	08/23/00	JEP	EPA 200.7

Reviewed and Approved by:
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Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83508**

Your Reference: **DIAMOND CSO 3**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	4.2	mg/L	1.0	08/23/00	ADH	SM 4500 N C
Total Suspended Solids	47	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	<1.0	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	0.78	mg/L	0.02	08/23/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	14	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	114000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	08/23/00	JEP	EPA 200.7
Chromium by ICP	0.004	mg/L	0.001	08/23/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/23/00	JEP	EPA 200.7
Copper by ICP	0.010	mg/L	0.001	08/23/00	JEP	EPA 200.7
Lead by ICP	0.009	mg/L	0.002	08/23/00	JEP	EPA 200.7
Nickel by ICP	0.004	mg/L	0.001	08/23/00	JEP	EPA 200.7
Zinc by ICP	0.074	mg/L	0.001	08/23/00	JEP	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83509**

Your Reference: **DIAMOND CSO 4**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	5.6	mg/L	1.0	08/23/00	ADH	SM 4500 N C
Total Suspended Solids	58	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	3.7	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	2.2	mg/L	0.02	08/23/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	42	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	92000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.005	mg/L	0.003	08/23/00	JEP	EPA 200.7
Chromium by ICP	0.006	mg/L	0.001	08/23/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/23/00	JEP	EPA 200.7
Copper by ICP	0.019	mg/L	0.001	08/23/00	JEP	EPA 200.7
Lead by ICP	0.016	mg/L	0.002	08/23/00	JEP	EPA 200.7
Nickel by ICP	0.006	mg/L	0.001	08/23/00	JEP	EPA 200.7
Zinc by ICP	0.092	mg/L	0.001	08/23/00	JEP	EPA 200.7

Reviewed and Approved by:
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Chicago, IL 60606

Date Received: 08/18/00
Date Reported: 08/25/00
Date Sampled: 08/18/00
Sample ID#: NM83510

Your Reference: DIAMOND CSO 5
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	9.8	mg/L	1.0	08/23/00	ADH	SM 4500 N C
Total Suspended Solids	72	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	4.7	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	1.8	mg/L	0.02	08/23/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	27	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	46000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	08/23/00	JEP	EPA 200.7
Chromium by ICP	0.004	mg/L	0.001	08/23/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/23/00	JEP	EPA 200.7
Copper by ICP	0.021	mg/L	0.001	08/23/00	JEP	EPA 200.7
Lead by ICP	0.015	mg/L	0.002	08/23/00	JEP	EPA 200.7
Nickel by ICP	0.007	mg/L	0.001	08/23/00	JEP	EPA 200.7
Zinc by ICP	0.080	mg/L	0.001	08/23/00	JEP	EPA 200.7

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Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83511**

Your Reference: **DIAMOND CSO 6**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	6.3	mg/L	1.0	08/23/00	ADH	SM 4500 N C
Total Suspended Solids	71	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	1.4	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	2.5	mg/L	0.02	08/23/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	<2.7	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	32000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	08/23/00	JEP	EPA 200.7
Chromium by ICP	0.006	mg/L	0.001	08/23/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/23/00	JEP	EPA 200.7
Copper by ICP	0.014	mg/L	0.001	08/23/00	JEP	EPA 200.7
Lead by ICP	0.020	mg/L	0.002	08/23/00	JEP	EPA 200.7
Nickel by ICP	0.006	mg/L	0.001	08/23/00	JEP	EPA 200.7
Zinc by ICP	0.11	mg/L	0.001	08/23/00	JEP	EPA 200.7

Reviewed and Approved by:
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Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83512**

Your Reference: **DIAMOND CSO 7**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	7.7	mg/L	1.0	08/23/00	ADH	SM 4500 N C
Total Suspended Solids	120	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	2.5	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	1.8	mg/L	0.02	08/23/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	15	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	114000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	08/23/00	JEP	EPA 200.7
Chromium by ICP	0.005	mg/L	0.001	08/23/00	JEP	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	08/23/00	JEP	EPA 200.7
Copper by ICP	0.022	mg/L	0.001	08/23/00	JEP	EPA 200.7
Lead by ICP	0.020	mg/L	0.002	08/23/00	JEP	EPA 200.7
Nickel by ICP	0.008	mg/L	0.001	08/23/00	JEP	EPA 200.7
Zinc by ICP	0.12	mg/L	0.001	08/23/00	JEP	EPA 200.7

Reviewed and Approved by:
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Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83513**

Your Reference: **DIAMOND CSO 8**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	9.8	mg/L	1.0	08/23/00	ADH	SM 4500 N C
Total Suspended Solids	64	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	4.5	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	2.5	mg/L	0.02	08/23/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	47	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	114000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.003	mg/L	0.003	08/23/00	JEP	EPA 200.7
Chromium by ICP	0.005	mg/L	0.001	08/23/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/23/00	JEP	EPA 200.7
Copper by ICP	0.019	mg/L	0.001	08/23/00	JEP	EPA 200.7
Lead by ICP	0.020	mg/L	0.002	08/23/00	JEP	EPA 200.7
Nickel by ICP	0.008	mg/L	0.001	08/23/00	JEP	EPA 200.7
Zinc by ICP	0.11	mg/L	0.001	08/23/00	JEP	EPA 200.7

Reviewed and Approved by:
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Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83514**

Your Reference: **DIAMOND CSO 9**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	10	mg/L	1.0	08/23/00	ADH	SM 4500 N C
Total Suspended Solids	62	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	6.1	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	2.4	mg/L	0.02	08/23/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	29	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	117000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	08/23/00	JEP	EPA 200.7
Chromium by ICP	0.002	mg/L	0.001	08/23/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/23/00	JEP	EPA 200.7
Copper by ICP	0.017	mg/L	0.001	08/23/00	JEP	EPA 200.7
Lead by ICP	0.004	mg/L	0.002	08/23/00	JEP	EPA 200.7
Nickel by ICP	0.010	mg/L	0.001	08/23/00	JEP	EPA 200.7
Zinc by ICP	0.085	mg/L	0.001	08/23/00	JEP	EPA 200.7

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Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83515**

Your Reference: **DIAMOND CSO 10**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	11	mg/L	1.0	08/23/00	ADH	SM 4500 N C
Total Suspended Solids	74	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	7.0	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	2.9	mg/L	0.02	08/23/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	40	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	117000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	08/23/00	JEP	EPA 200.7
Chromium by ICP	0.003	mg/L	0.001	08/23/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/23/00	JEP	EPA 200.7
Copper by ICP	0.023	mg/L	0.001	08/23/00	JEP	EPA 200.7
Lead by ICP	0.026	mg/L	0.002	08/23/00	JEP	EPA 200.7
Nickel by ICP	0.015	mg/L	0.001	08/23/00	JEP	EPA 200.7
Zinc by ICP	0.11	mg/L	0.001	08/23/00	JEP	EPA 200.7

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Central States Analytical

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CHAIN OF CUSTODY

_____ **Rush turnaround**
subject to pre-approval
and additional surcharge

Company: EMC/Harza **Contact:** J Potts/David Pott **P.O. # / Project:** Harza	**Address:** 1500 Waterworks **Telephone #:** 428-0550 **Fax #** 428-6941	**Samplers:** S. Frey (If more than one sample, identify which samples taken)

Diamond CSO

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	NH3	TKN	P	BOD	TSS	E-coli	As	Cr	Cd	Cu	Pb	Ni	Zn	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
D1	83506	9:15AM 8-18		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	ice
D2	83507	9:30		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	" "
D3	83508	9:45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	" "
D4	83509	10:00		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	" "
D5	83510	10:15		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	" "
D6	83511	10:30		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	" "
D7	83512	10:45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	" "
D8	83513	11:00		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	" "
D9	83514	11:30		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	" "
D10	83515	12:00		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	" "

Relinquished by: Joe Potts	Date/Time: 8-18 2:10 PM	Received by:	Date/Time: 8/18/00 14:10
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS:	Date/Time: 8/18/00 14:43	Report Released By:	Date/Time:

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
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Date Received: 08/18/00
Date Reported: 08/29/00
Date Sampled: 08/18/00
Sample ID#: NM83516

Your Reference: Diamond CSO 11
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	15	mg/L	1.0	08/23/00	ADH	SM 4500 N C
Total Suspended Solids	76	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	11	mg/L	1.0	08/28/00	ADH	SM 4500NH3-E
Phosphorus as P	6.2	mg/L	0.02	08/23/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	86	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	285000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	08/23/00	JEP	EPA 200.7
Chromium by ICP	0.006	mg/L	0.001	08/23/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/23/00	JEP	EPA 200.7
Copper by ICP	0.021	mg/L	0.001	08/23/00	JEP	EPA 200.7
Lead by ICP	0.021	mg/L	0.002	08/23/00	JEP	EPA 200.7
Nickel by ICP	0.022	mg/L	0.001	08/23/00	JEP	EPA 200.7
Zinc by ICP	0.096	mg/L	0.001	08/23/00	JEP	EPA 200.7

Reviewed and Approved by:
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Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/29/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83517**

Your Reference: **Diamond CSO 12**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	22	mg/L	1.0	08/23/00	ADH	SM 4500 N C
Total Suspended Solids	130	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	12	mg/L	1.0	08/28/00	ADH	SM 4500NH3-E
Phosphorus as P	5.1	mg/L	0.02	08/24/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	75	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	456000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	08/24/00	JEP	EPA 200.7
Chromium by ICP	0.005	mg/L	0.001	08/24/00	JEP	EPA 200.7
Cadmium by ICP	0.001	mg/L	0.001	08/24/00	JEP	EPA 200.7
Copper by ICP	0.034	mg/L	0.001	08/24/00	JEP	EPA 200.7
Lead by ICP	0.011	mg/L	0.002	08/24/00	JEP	EPA 200.7
Nickel by ICP	0.049	mg/L	0.001	08/24/00	JEP	EPA 200.7
Zinc by ICP	0.19	mg/L	0.001	08/24/00	JEP	EPA 200.7

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Central States Analytical

CHAIN OF CUSTODY

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Evansville, IN 47711
(812) 464-9000 Fax (812) 424-0667

_____ Rush turnaround
subject to pre-approval
and additional surcharge

Company: EMC/Harza Contact: J Potts/David Pott P.O. # / Project: Harza	Address: Telephone #: Fax #:	Samplers: (If more than one sample, identify which samples taken)

Diamond CSO

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	NH3	TKN	P	BOD	TSS	E-Coli	As	Cr	Cd	Cu	Pb	Ni	Zn	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
D11	83576	8-18 12:30		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	ice ✓
D12	83577	1:00		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	ice ✓

Relinquished by: Joe Potts	Date/Time: 8-18 2:10PM	Received by:	Date/Time: 8/18/00 14:10
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS:	Date/Time: 8/18/00 14:15	Report Released By:	Date/Time:

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Evansville, Indiana 47711

Harza Engineering
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Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/24/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83494**

Your Reference: **Maxwell CSO (Oakhill) 1**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	9.1	mg/L	1.0	08/22/00	ADH	SM 4500 N C
Total Suspended Solids	140	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	2.8	mg/L	1.0	08/21/00	ADH	SM 4500NH3-E
Phosphorus as P	2.0	mg/L	0.02	08/22/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	36	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	ADH	
Escherichia coli MF	51300	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.003	mg/L	0.003	08/22/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/22/00	JEP	EPA 200.7
Chromium by ICP	0.014	mg/L	0.001	08/22/00	JEP	EPA 200.7
Copper by ICP	0.046	mg/L	0.001	08/22/00	JEP	EPA 200.7
Lead by ICP	0.007	mg/L	0.002	08/22/00	JEP	EPA 200.7
Nickel by ICP	0.020	mg/L	0.001	08/22/00	JEP	EPA 200.7
Zinc by ICP	0.13	mg/L	0.001	08/22/00	JEP	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/24/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83495**

Your Reference: **Maxwell CSO (Oakhill) 2**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	7.7	mg/L	1.0	08/22/00	ADH	SM 4500 N C
Total Suspended Solids	37	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	2.7	mg/L	1.0	08/21/00	ADH	SM 4500NH3-E
Phosphorus as P	1.7	mg/L	0.02	08/22/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	39	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	ADH	
Escherichia coli MF	285000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	08/22/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/22/00	JEP	EPA 200.7
Chromium by ICP	0.008	mg/L	0.001	08/22/00	JEP	EPA 200.7
Copper by ICP	0.012	mg/L	0.001	08/22/00	JEP	EPA 200.7
Lead by ICP	0.004	mg/L	0.002	08/22/00	JEP	EPA 200.7
Nickel by ICP	0.012	mg/L	0.001	08/22/00	JEP	EPA 200.7
Zinc by ICP	0.048	mg/L	0.001	08/22/00	JEP	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

CSA *Central States Analytical*

2406 Lynch Road
Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/24/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83496**

Your Reference: **Maxwell CSO (Oakhill) 3**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	7.0	mg/L	1.0	08/22/00	ADH	SM 4500 N C
Total Suspended Solids	34	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	5.0	mg/L	1.0	08/21/00	ADH	SM 4500NH3-E
Phosphorus as P	1.6	mg/L	0.02	08/22/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	20	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	ADH	
Escherichia coli MF	228000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	08/22/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/22/00	JEP	EPA 200.7
Chromium by ICP	0.007	mg/L	0.001	08/22/00	JEP	EPA 200.7
Copper by ICP	0.012	mg/L	0.001	08/22/00	JEP	EPA 200.7
Lead by ICP	0.004	mg/L	0.002	08/22/00	JEP	EPA 200.7
Nickel by ICP	0.013	mg/L	0.001	08/22/00	JEP	EPA 200.7
Zinc by ICP	0.051	mg/L	0.001	08/22/00	JEP	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83497**

Your Reference: **Maxwell CSO (Oakhill) 4**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	7.0	mg/L	1.0	08/22/00	ADH	SM 4500 N C
Total Suspended Solids	37	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	5.0	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	1.7	mg/L	0.02	08/22/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	21	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	ADH	
Escherichia coli MF	285000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	08/22/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/22/00	JEP	EPA 200.7
Chromium by ICP	0.008	mg/L	0.001	08/22/00	JEP	EPA 200.7
Copper by ICP	0.014	mg/L	0.001	08/22/00	JEP	EPA 200.7
Lead by ICP	0.004	mg/L	0.002	08/22/00	JEP	EPA 200.7
Nickel by ICP	0.011	mg/L	0.001	08/22/00	JEP	EPA 200.7
Zinc by ICP	0.044	mg/L	0.001	08/22/00	JEP	EPA 200.7

Reviewed and Approved by:
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Harza Engineering
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Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83498**

Your Reference: **Maxwell CSO (Oakhill) 5**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	9.8	mg/L	1.0	08/22/00	ADH	SM 4500 N C
Total Suspended Solids	35	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	4.2	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	2.2	mg/L	0.02	08/22/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	31	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	ADH	
Escherichia coli MF	228000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	08/22/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/22/00	JEP	EPA 200.7
Chromium by ICP	0.012	mg/L	0.001	08/22/00	JEP	EPA 200.7
Copper by ICP	0.015	mg/L	0.001	08/22/00	JEP	EPA 200.7
Lead by ICP	0.003	mg/L	0.002	08/22/00	JEP	EPA 200.7
Nickel by ICP	0.011	mg/L	0.001	08/22/00	JEP	EPA 200.7
Zinc by ICP	0.038	mg/L	0.001	08/22/00	JEP	EPA 200.7

Reviewed and Approved by:
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Harza Engineering
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Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83499**

Your Reference: **Maxwell CSO (Oakhill) 6**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	8.4	mg/L	1.0	08/22/00	ADH	SM 4500 N C
Total Suspended Solids	61	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	8.9	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	2.7	mg/L	0.02	08/22/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	35	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	ADH	
Escherichia coli MF	399000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.005	mg/L	0.003	08/22/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/22/00	JEP	EPA 200.7
Chromium by ICP	0.019	mg/L	0.001	08/22/00	JEP	EPA 200.7
Copper by ICP	0.012	mg/L	0.001	08/22/00	JEP	EPA 200.7
Lead by ICP	0.004	mg/L	0.002	08/22/00	JEP	EPA 200.7
Nickel by ICP	0.011	mg/L	0.001	08/22/00	JEP	EPA 200.7
Zinc by ICP	0.058	mg/L	0.001	08/22/00	JEP	EPA 200.7

Reviewed and Approved by:
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Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83500**

Your Reference: **Maxwell CSO (Oakhill) 7**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	4.2	mg/L	1.0	08/22/00	ADH	SM 4500 N C
Total Suspended Solids	42	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	2.8	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	2.5	mg/L	0.02	08/22/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	26	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	ADH	
Escherichia coli MF	45600	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.003	mg/L	0.003	08/22/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/22/00	JEP	EPA 200.7
Chromium by ICP	0.016	mg/L	0.001	08/22/00	JEP	EPA 200.7
Copper by ICP	0.011	mg/L	0.001	08/22/00	JEP	EPA 200.7
Lead by ICP	0.005	mg/L	0.002	08/22/00	JEP	EPA 200.7
Nickel by ICP	0.011	mg/L	0.001	08/22/00	JEP	EPA 200.7
Zinc by ICP	0.047	mg/L	0.001	08/22/00	JEP	EPA 200.7

Reviewed and Approved by:
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Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83501**

Your Reference: **Maxwell CSO (Oakhill) 8**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	15	mg/L	1.0	08/22/00	ADH	SM 4500 N C
Total Suspended Solids	35	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	7.5	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	2.1	mg/L	0.02	08/22/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	24	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	ADH	
Escherichia coli MF	513000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.003	mg/L	0.003	08/22/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/22/00	JEP	EPA 200.7
Chromium by ICP	0.012	mg/L	0.001	08/22/00	JEP	EPA 200.7
Copper by ICP	0.011	mg/L	0.001	08/22/00	JEP	EPA 200.7
Lead by ICP	0.003	mg/L	0.002	08/22/00	JEP	EPA 200.7
Nickel by ICP	0.010	mg/L	0.001	08/22/00	JEP	EPA 200.7
Zinc by ICP	0.045	mg/L	0.001	08/22/00	JEP	EPA 200.7

Reviewed and Approved by:
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Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83502**

Your Reference: **Maxwell CSO (Oakhill) 9**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	8.4	mg/L	1.0	08/22/00	ADH	SM 4500 N C
Total Suspended Solids	48	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	4.7	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	1.9	mg/L	0.02	08/22/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	26	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	ADH	
Escherichia coli MF	171000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.003	mg/L	0.003	08/22/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/22/00	JEP	EPA 200.7
Chromium by ICP	0.009	mg/L	0.001	08/22/00	JEP	EPA 200.7
Copper by ICP	0.012	mg/L	0.001	08/22/00	JEP	EPA 200.7
Lead by ICP	0.004	mg/L	0.002	08/22/00	JEP	EPA 200.7
Nickel by ICP	0.009	mg/L	0.001	08/22/00	JEP	EPA 200.7
Zinc by ICP	0.053	mg/L	0.001	08/22/00	JEP	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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2406 Lynch Road
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Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83503**

Your Reference: **Maxwell CSO (Oakhill) 10**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	11	mg/L	1.0	08/22/00	ADH	SM 4500 N C
Total Suspended Solids	53	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	5.6	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	2.5	mg/L	0.02	08/22/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	32	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	ADH	
Escherichia coli MF	74100	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.003	mg/L	0.003	08/22/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/22/00	JEP	EPA 200.7
Chromium by ICP	0.011	mg/L	0.001	08/22/00	JEP	EPA 200.7
Copper by ICP	0.017	mg/L	0.001	08/22/00	JEP	EPA 200.7
Lead by ICP	0.003	mg/L	0.002	08/22/00	JEP	EPA 200.7
Nickel by ICP	0.014	mg/L	0.001	08/22/00	JEP	EPA 200.7
Zinc by ICP	0.066	mg/L	0.001	08/22/00	JEP	EPA 200.7

Reviewed and Approved by:
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Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83504**

Your Reference: **Maxwell CSO (Oakhill) 11**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	13	mg/L	1.0	08/22/00	ADH	SM 4500 N C
Total Suspended Solids	100	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	9.3	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	3.4	mg/L	0.02	08/23/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	35	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	ADH	
Escherichia coli MF	399000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	0.004	mg/L	0.003	08/23/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/23/00	JEP	EPA 200.7
Chromium by ICP	0.017	mg/L	0.001	08/23/00	JEP	EPA 200.7
Copper by ICP	0.029	mg/L	0.001	08/23/00	JEP	EPA 200.7
Lead by ICP	0.005	mg/L	0.002	08/23/00	JEP	EPA 200.7
Nickel by ICP	0.016	mg/L	0.001	08/23/00	JEP	EPA 200.7
Zinc by ICP	0.055	mg/L	0.001	08/23/00	JEP	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

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Central States Analytical

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CHAIN OF CUSTODY

_____ Rush turnaround
subject to pre-approval
and additional surcharge

Company: EMC / Harza
Contact: J. Potts / David Pott
P.O. # / Project: HARZA

Address: 1500 Waterworks Rd
Telephone #: 428-0550 Fax #: 428-6941

Samplers: Joe Potts
(If more than one sample, identify which samples taken)

Maxwell (Oakhill) CSO

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	NH3	TKN	TP	BOD	TSS	E-coli	As	Cd	Cr	Cu	Pb	Ni	Zn	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
M1	83494	8-18 8:30 AM		X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	✓
M2	83495	8:45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	✓
M3	83496	9:00		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	✓
M4	83497	9:15		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	✓
M5	83498	9:30		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	✓
M6	83499	9:45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	✓
M7	83500	10:00		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	✓
M8	83501	10:15		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	✓
M9	83502	10:45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	✓
M10	83503	11:15		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	✓
M11	83504	11:45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	G	1	✓

Relinquished by: Joe Potts	Date/Time: 8-18	Received by: [signature]	Date/Time: 8/18/00 12:25
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by: [signature]	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 8/18/00 13:02	Report Released By:	Date/Time:

CSA *Central States Analytical*

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Evansville, Indiana 47711

Harza Engineering
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Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/25/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83505**

Your Reference: **Maxwell CSO (Oakhill) 12**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	13	mg/L	1.0	08/22/00	ADH	SM 4500 N C
Total Suspended Solids	33	mg/L	1	08/22/00	MEH	EPA 160.2
Ammonia as N	8.4	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
Phosphorus as P	3.1	mg/L	0.02	08/23/00	JEP	SW-846 6010A
Biochemical Oxygen Demand	27	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	ADH	
Escherichia coli MF	285000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Arsenic by ICP	<0.003	mg/L	0.003	08/23/00	JEP	EPA 200.7
Cadmium by ICP	<0.001	mg/L	0.001	08/23/00	JEP	EPA 200.7
Chromium by ICP	0.012	mg/L	0.001	08/23/00	JEP	EPA 200.7
Copper by ICP	0.016	mg/L	0.001	08/23/00	JEP	EPA 200.7
Lead by ICP	0.003	mg/L	0.002	08/23/00	JEP	EPA 200.7
Nickel by ICP	0.012	mg/L	0.001	08/23/00	JEP	EPA 200.7
Zinc by ICP	0.037	mg/L	0.001	08/23/00	JEP	EPA 200.7

Reviewed and Approved by:
Kevin Jacobs, B.S.

Phone: (812) 464-9000 *Fax: (812) 424-0667* *hstn@aol.com*

Central States Analytical

CHAIN OF CUSTODY

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Evansville, IN 47711
(812) 464-9000 Fax (812) 424-0667

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: HARZA Contact: P.O. # / Project:	Address: Telephone #: Fax #:	Samplers: (If more than one sample, identify which samples taken)

Analysis Requested

Maxwell
Oakhill CSO

Client #	CSA Lab #	Sample Date/Time	Sample Type	NH3	TKN	P	BOD	TSS	Ecoli	OS	CO	CR	CU	PB	NI	ZN	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
M12	83505	8/18															G	1	✓

Relinquished by: JC Potter	Date/Time: 8-18 13:05	Received by:	Date/Time: 8/18/00 12:29
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS:	Date/Time: 8/18/00 13:05	Report Released By:	Date/Time:

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Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/29/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83518**

Your Reference: **Manual In-Stream PC 7**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	2.8	mg/L	1.0	08/23/00	ADH	SM 4500 N C
Nitrate as N	<0.50	mg/L	0.50	08/22/00	CGM	SM 4500
Total Suspended Solids	61	mg/L	1	08/22/00	MEH	EPA 160.2
Biochemical Oxygen Demand	3.0	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	3500	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Ammonia as N	3.7	mg/L	1.0	08/24/00	ADH	SM 4500NH3-E
pH	7.79			08/23/00	TJW	EPA 150.1
Phosphorus as P	0.25	mg/L	0.02	08/23/00	JEP	SW-846 6010A

Reviewed and Approved by:
Kevin Jacobs, B.S.

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Evansville, Indiana 47711

Harza Engineering
233 S. Wacker Dr.
Chicago, IL 60606

Date Received: **08/18/00**
Date Reported: **08/29/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83519**

Your Reference: **Manual In-Stream PC 4**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	1.4	mg/L	1.0	08/23/00	ADH	SM 4500 N C
Nitrate as N	<0.50	mg/L	0.50	08/22/00	CGM	SM 4500
Total Suspended Solids	48	mg/L	1	08/22/00	MEH	EPA 160.2
Biochemical Oxygen Demand	3.5	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	27000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Ammonia as N	<1.0	mg/L	1.0	08/28/00	ADH	SM 4500NH3-E
pH	7.67			08/23/00	TJW	EPA 150.1
Phosphorus as P	0.27	mg/L	0.02	08/24/00	JEP	SW-846 6010A

Reviewed and Approved by:
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Date Received: **08/18/00**
Date Reported: **08/29/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83520**

Your Reference: **Manual In-Stream PC 3**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	4.2	mg/L	1.0	08/23/00	ADH	SM 4500 N C
Nitrate as N	<0.50	mg/L	0.50	08/22/00	CGM	SM 4500
Total Suspended Solids	72	mg/L	1	08/22/00	MEH	EPA 160.2
Biochemical Oxygen Demand	<2.7	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	39900	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Ammonia as N	<1.0	mg/L	1.0	08/28/00	ADH	SM 4500NH3-E
pH	7.74			08/23/00	TJW	EPA 150.1
Phosphorus as P	0.51	mg/L	0.02	08/24/00	JEP	SW-846 6010A

Reviewed and Approved by:
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Date Received: **08/18/00**
Date Reported: **08/29/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83521**

Your Reference: **Manual In-Stream PC 2**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	8.4	mg/L	1.0	08/23/00	ADH	SM 4500 N C
Nitrate as N	0.53	mg/L	0.50	08/22/00	CGM	SM 4500
Total Suspended Solids	74	mg/L	1	08/22/00	MEH	EPA 160.2
Biochemical Oxygen Demand	<2.7	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	50000	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Ammonia as N	<1.0	mg/L	1.0	08/28/00	ADH	SM 4500NH3-E
pH	7.86			08/23/00	TJW	EPA 150.1
Phosphorus as P	0.37	mg/L	0.02	08/24/00	JEP	SW-846 6010A

Reviewed and Approved by:
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Date Received: **08/18/00**
Date Reported: **08/29/00**
Date Sampled: **08/18/00**
Sample ID#: **NM83522**

Your Reference: **Manual In-Stream Hwy 62**
Project Comments:

Parameters	Results	Units	MDL	Analysis Date	Analyst	Method
Total Kjeldahl Nitrogen	2.8	mg/L	1.0	08/23/00	ADH	SM 4500 N C
Nitrate as N	0.53	mg/L	0.50	08/22/00	CGM	SM 4500
Total Suspended Solids	60	mg/L	1	08/22/00	MEH	EPA 160.2
Biochemical Oxygen Demand	<2.7	mg/L	2.7	08/23/00	ADH	SM 5210
Setup of BOD	Completed			08/18/00	TJW	
Escherichia coli MF	17100	colonies/100ml	1	08/19/00	EDK	SM 9213 D
Ammonia as N	1.7	mg/L	1.0	08/28/00	ADH	SM 4500NH3-E
pH	7.61			08/23/00	TJW	EPA 150.1
Phosphorus as P	0.27	mg/L	0.02	08/24/00	JEP	SW-846 6010A

Reviewed and Approved by:
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CHAIN OF CUSTODY

_____ **Rush turnaround** subject to pre-approval and additional surcharge

Company: EMC/Harza Contact: J. Potts/David Pott P.O. # / Project: Harza	Address: 1500 Waterworks Telephone #: 428-0550 Fax #: 428-6941	Samplers: J. Potts (If more than one sample, identify which samples taken)

Manual In-Stream Samples

Analysis Requested

Client #	CSA Lab #	Sample Date/Time	Sample Type	Nitrate N	TKN	NH3	PH	P	BOD	TSS	E-coli	Comp/Grab	# of Bottles	Preservatives Used/Type of Container (G/P), Comments
PC7	83518	8-18 12:42		✓	✓	✓	✓	✓	✓	✓	✓	G	1	ice ✓
PC4	83519	12:58		✓	✓	✓	✓	✓	✓	✓	✓	G	1	ice ✓
PC3	83520	1:15		✓	✓	✓	✓	✓	✓	✓	✓	G	1	ice ✓
PC2	83521	1:40		✓	✓	✓	✓	✓	✓	✓	✓	G	1	ice ✓
HWY62	83522	1:50		✓	✓	✓	✓	✓	✓	✓	✓	G	1	ice ✓

Relinquished by: Joe Potts	Date/Time: 8-18	Received by: [signature]	Date/Time: 8/18/00 14:02
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Logged into LIMS: [signature]	Date/Time: 8/18/00 14:50	Report Released By:	Date/Time:

APPENDIX C-1

INSPECTION PHOTOS

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Telex: 25-3540 HARZENG CGO

WATERSHED DIAGNOSTIC STUDY

Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/12/00

TIME: 9:00 am

DIRECTION: N

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Upstream view of upper reach of sample site PC1 on Pigeon Creek, just north of the Lloyd Expressway.

DATE: 5/12/00

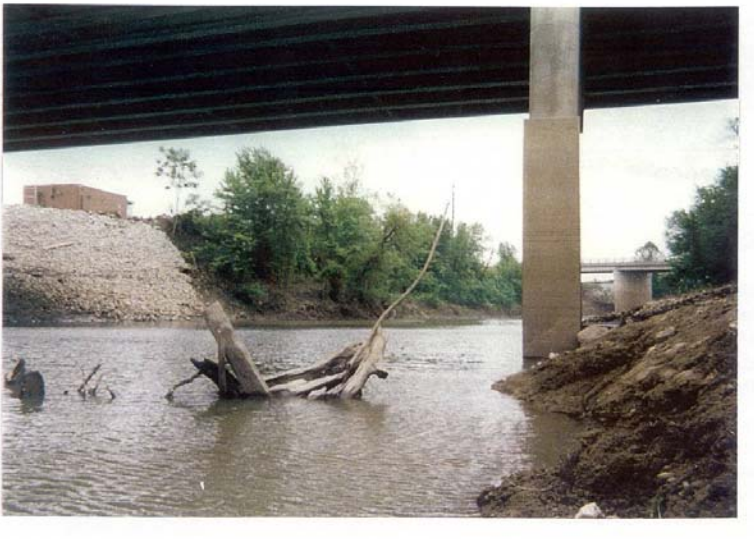
TIME: 9:00 am

DIRECTION: S

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Downstream view of lower reach of sample site PC1 on Pigeon Creek, just north of the Lloyd Expressway.



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WATERSHED DIAGNOSTIC STUDY

Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/12/00

TIME: 11:00 am

DIRECTION: N

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Upstream view of upper reach of sample site PC2 on Pigeon Creek, just south of Park St. bridge.

DATE: 5/12/00

TIME: 11:00 am

DIRECTION: S

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Downstream view of lower reach of sample site PC2 on Pigeon Creek, just south of Park St. bridge.

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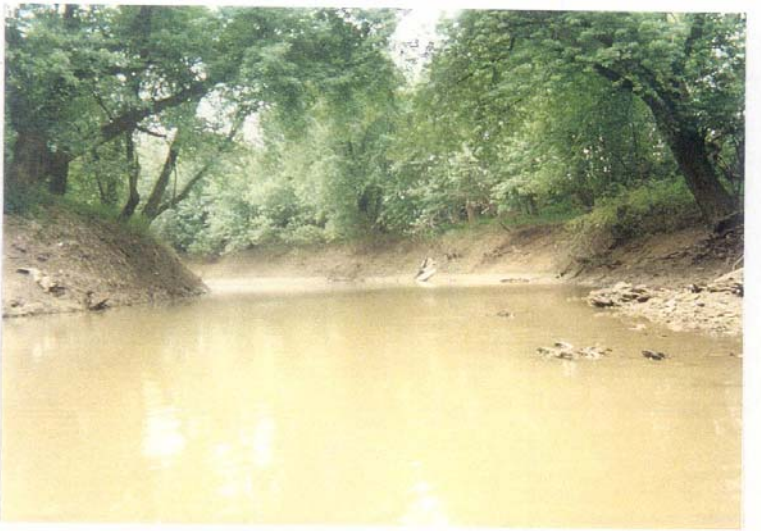
WATERSHED DIAGNOSTIC STUDY

Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/8/00
TIME: 9:00 am
DIRECTION: SE
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site PC3 on Pigeon Creek, just east of First Avenue bridge.



DATE: 5/8/00
TIME: 9:00am
DIRECTION: NW
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site PC3 on Pigeon Creek, just east of First Avenue bridge.

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WATERSHED DIAGNOSTIC STUDY

Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/14/00
TIME: 11:00 am
DIRECTION: E
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site PC4 on Pigeon Creek, just upstream of the Heidelbach boat ramp.

DATE: 5/14/00
TIME: 11:00 am
DIRECTION: W
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site PC4 on Pigeon Creek, just upstream of Heidelbach boat ramp.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/12/00

TIME: 1:20 pm

DIRECTION: NE

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Upstream view of upper reach of sample site PC5 on Pigeon Creek, just east of Stringtown Road.

DATE: 5/12/00

TIME: 1:20 pm

DIRECTION: SW

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Downstream view of lower reach of sample site PC5 on Pigeon Creek, just east of Stringtown Road.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/14/00

TIME: 8:00 am

DIRECTION: E

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Upstream view of upper reach of sample site PC6 on Pigeon Creek, just west of Highway 41 bridge.

DATE: 5/14/00

TIME: 8:00 am

DIRECTION: W

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Downstream view of lower reach of sample site PC6 on Pigeon Creek, just west of Highway 41 bridge.

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WATERSHED DIAGNOSTIC STUDY

Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/12/00

TIME: 3:00 pm

DIRECTION: E

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Upstream view of upper reach of sample site PC7 on Pigeon Creek, just west of Oak Hill Road.

DATE: 5/12/00

TIME: 3:00 pm

DIRECTION: W

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Downstream view of lower reach of sample site PC7 on Pigeon Creek, just west of Oak Hill Road.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/3/00
TIME: 10:00 am
DIRECTION: NE
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site PC8 on Pigeon Creek, just east of Green River Road.

DATE: 5/3/00
TIME: 10:00 am
DIRECTION: SW
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site PC8 on Pigeon Creek, just east of Green River Road.

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Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/10/00
TIME: 10:30 am
DIRECTION: NE
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site PC11 on Pigeon Creek, just south of Millerburg bridge.

DATE: 5/10/00
TIME: 10:30 am
DIRECTION: SW
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site PC11 on Pigeon Creek, just south of Stevenson Station Road.

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WATERSHED DIAGNOSTIC STUDY

Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/10/00
TIME: 3:30 pm
DIRECTION: N
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site PC12 on Pigeon Creek, just north of CR 875 N.

DATE: 5/10/00
TIME: 3:30 pm
DIRECTION: S
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site PC12 on Pigeon Creek, just north of CR 875 N.

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Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/8/00
TIME: 2:00 pm
DIRECTION: NW
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site PC13 on Pigeon Creek, just north of State Route 68., downstream of railroad bridge.

DATE: 5/8/00
TIME: 2:00 pm
DIRECTION: SW
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site PC13 on Pigeon Creek, just north of State Route 68.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/2/00
TIME: 4:30 pm
DIRECTION: N
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site PC14 on Pigeon Creek, just north of State Route 168.

DATE: 5/2/00
TIME: 4:30 pm
DIRECTION: S
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site PC14 on Pigeon Creek, just north of State Route 68.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/2/00
TIME: 1:00 pm
DIRECTION: N
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site PC15 on Pigeon Creek, just north of CR 450 Sand above Sand River confluence.

DATE: 5/2/00
TIME: 1:00 pm
DIRECTION: S
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site PC15 on Pigeon Creek, just north of CR 450 S and above Sand River confluence.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/8/00
TIME: 1:00 pm
DIRECTION: N
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site PC16 on Pigeon Creek, just north of Main Street.

DATE: 5/8/00
TIME: 1:00 pm
DIRECTION: S
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site PC16 on Pigeon Creek, just north of Main Street.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/6/00
TIME: 8:10 pm
DIRECTION: N
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site LC1 on Locust Creek, just north of Allen Lane.

DATE: 5/6/00
TIME: 8:10 pm
DIRECTION: S
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site LC1 on Locust Creek, just north of Allen Lane.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/6/00
TIME: 11:15 pm
DIRECTION: N
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site LC2 on Locust Creek, just north of Mohr Road.

DATE: 5/6/00
TIME: 11:15 pm
DIRECTION: S
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site LC2 on Locust Creek, just north of Mohr Road.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/6/00
TIME: 2:40 pm
DIRECTION: NE
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site LP1 on Little Pigeon Creek, just east of Kentucky Avenue.

DATE: 5/6/00
TIME: 2:40 pm
DIRECTION: SW
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site LP1 on Little Pigeon Creek, just east of Kentucky Avenue.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/6/00
TIME: 1:15 pm
DIRECTION: N
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site LP2 on Little Pigeon Creek, just north of Mount Pleasant Road.

DATE: 5/6/00
TIME: 1:15 pm
DIRECTION: S
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site LP2 on Little Pigeon Creek, just north of Mount Pleasant Road.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/3/00
TIME: 12:00 pm
DIRECTION: N
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site BC1 on Bluegrass Creek, just north of Heckel Road.

DATE: 5/3/00
TIME: 12:00 pm
DIRECTION: S
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site BC1 on Bluegrass Creek, just north of Heckel Road.

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WATERSHED DIAGNOSTIC STUDY

Page 20

Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/3/00

TIME: 3:30 pm

DIRECTION: NE

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Upstream view of upper reach of sample site BC2 on Bluegrass Creek, just east of County Line Road.

DATE: 5/3/00

TIME: 3:30 pm

DIRECTION: SW

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Downstream view of lower reach of sample site BC2 on Bluegrass Creek, just east of County Line Road.

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Chicago, Illinois 60606-6392 U.S.A.
Telex: 25-3540 HARZENG CGO

Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/4/00

TIME: 4:00 pm

DIRECTION: NE

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Upstream view of upper reach of sample site BC3 on Bluegrass Creek, just east of Warrick County Line Road.

DATE: 5/4/00

TIME: 4:00 pm

DIRECTION: SW

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Downstream view of lower reach of sample site BC3 on Bluegrass Creek, just east of Warrick County Line Road.

HARZA

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/4/00

TIME: 1:30 pm

DIRECTION: S

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Upstream view of upper reach of sample site WD1 on Weinsheiner Ditch, just south of State Route 62.

DATE: 5/4/00

TIME: 1:30 pm

DIRECTION: N

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Downstream view of lower reach of sample site WD1 on Weinsheiner Ditch, just south of State Route 62.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/4/00
TIME: 10:10 am
DIRECTION: E
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site SD1 on Stollberg Ditch, just east of State Route 62.

DATE: 5/4/00
TIME: 10:10 am
DIRECTION: W
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site SD1 on Stollberg Ditch, just west of State Route 62.

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Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/4/00
TIME: 8:40 am
DIRECTION: W
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site UN1 on Unnamed tributary, just north of Heims Road.

DATE: 5/4/00
TIME: 8:40 am
DIRECTION: E
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site UN1 on Unnamed tributary, just north of Heims Road.

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WATERSHED DIAGNOSTIC STUDY

Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/10/00
TIME: 8:10 am
DIRECTION: NE
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site SC1 on Squaw Creek, just east of CR 700 R.

DATE: 5/10/00
TIME: 8:10 am
DIRECTION: SW
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site SC1 on Squaw Creek, just east of CR 700 R.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/7/00

TIME: 3:30 pm

DIRECTION: SE

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Upstream view of upper reach of sample site BG1 on Big Creek, south of Buckskin.

DATE: 5/7/00

TIME: 3:30 pm

DIRECTION: NW

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Downstream view of lower reach of sample site BG1 on Big Creek, south of Bucksin.

HARZA

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/7/00
TIME: 1:15 pm
DIRECTION: SE
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site BG2 on Big Creek, north of Interstate 64.

DATE: 5/7/00
TIME: 3:30 pm
DIRECTION: NW
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site BG2 on Big Creek, just north of Interstate 64.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/7/00
TIME: 9:00 am
DIRECTION: E
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site SF2 on Smith Fork, just east of State Highway 57.

DATE: 5/7/00
TIME: 9:00 am
DIRECTION: W
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site SF2 on Smith Fork, just west of State Highway 57.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/7/00

TIME: 11:00 am

DIRECTION: NE

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Upstream view of upper reach of sample site SF3 on Smith Fork, just downstream from confluence of unnamed tributary.

DATE: 5/7/00

TIME: 11:00 am

DIRECTION: SW

PHOTOGRAPH TAKEN BY: EJB/CWB

COMMENTS:

Downstream view of lower reach of sample site SF3 on Smith Fork, just downstream from confluence of unnamed tributary.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/2/00
TIME: 2:45 pm
DIRECTION: N
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site SA1 on Sand Creek, just north of CR 450 S.

DATE: 5/2/00
TIME: 2:45 pm
DIRECTION: S
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site SA1 on Sand Creek, just north of CR 450 S.

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Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/5/00
TIME: 9:45 am
DIRECTION: SW
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site WF1 on West Fork of Pigeon Creek, just upstream of confluence with Pigeon Creek.

DATE: 5/5/00
TIME: 9:45 am
DIRECTION: NE
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site WF1 on West Fork of Pigeon Creek, just upstream of confluence with Pigeon Creek.

HARZA

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WATERSHED DIAGNOSTIC STUDY

Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/5/00
TIME: 3:30 pm
DIRECTION: NW
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site WF2 on West Fork of Pigeon Creek, just west of Highway 41.

DATE: 5/5/00
TIME: 3:30 pm
DIRECTION: SE
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site WF2 on West Fork of Pigeon Creek, just west of Highway 41.

HARZA

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Telex: 25-3540 HARZENG CGO

Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/5/00
TIME: 2:00 pm
DIRECTION: NW
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site WF3 on West Fork of Pigeon Creek, just north of CR 650 S.

DATE: 5/5/00
TIME: 2:00 pm
DIRECTION: S
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site WF3 on West Fork of Pigeon Creek, just north of CR 650 S.

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WATERSHED DIAGNOSTIC STUDY

Project No.: 15269

Project: Vanderburgh, Warrick, Gibson Co., Indiana

INSPECTION PHOTOS

DATE: 5/5/00
TIME: 11:15 am
DIRECTION: S
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Upstream view of upper reach of sample site HC1 on Hurricane Creek, just south of CR 900 S.

DATE: 5/5/00
TIME: 11:15 pm
DIRECTION: N
PHOTOGRAPH TAKEN BY: EJB/CWB
COMMENTS: Downstream view of lower reach of sample site HC1 on Hurricane Creek, just south of CR 900 S.

APPENDIX C-2

AUGUST 1999 FIELD DATA SHEETS

PC1
8/6/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

QHEI SCORE: 47

Stream: Pigeon Creek RM: ____ Date: 8/6/99 River Code: ____
Location: PC1 Crew: ESB/CLB

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*);

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
☐-BLDER /SLABS[10]			☐-GRAVEL [7]	X	
☐-BOULDER [9]	X		☐-SAND [6]	X	
☐-COBBLE [8]			☐-BEDROCK[5]		
☒-HARDPAN [4]	X		☐-DETRITUS[3]	X	
☐-MUCK [2]			☐-ARTIFIC.[0]		

TOTAL NUMBER OF SUBSTRATE TYPES: ☒ > 4 [2] ☐ <= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

SUBSTRATE QUALITY — Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☒-TILLS [1] ☒-HARDPAN [0] ☐-SANDSTONE [0] ☐-SHALE [-1] ☐-COAL FINES [-2]

SUBSTRATE SCORE: 8

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☒—MODERATE[-1] ☐—LOW[0] ☐—NONE[1]

2) INSTREAM COVER

TYPE (Check *All* That Apply): ☐-UNDERCUT BANKS [1] ☒-DEEP POOLS [2] ☐-OXBOWS [1] ☒-OVERHANGING VEGETATION [1] ☒-ROOTWADS [1] ☒-AQUATIC MACROPHYTES [1] ☒-SHALLOWS (IN SLOW WATER) [1] ☒-BOULDERS [1] ☒-LOGS OR WOODY DEBRIS [1]

COVER SCORE: 11

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): ☐ - EXTENSIVE > 75% [11] ☐ - MODERATE 25-75% [7] ☒ - SPARSE 5-25% [3] ☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3) CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

CHANNEL: 10

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ - LOW [2]	☒ - FAIR [3]	☒ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

RIPARIAN: 6

River Right Looking Downstream

RIPARIAN WIDTH (L R (Per Bank))	EROSION/RUNOFF - FLOOD PLAIN QUALITY (L R (Most Predominant Per Bank))	(L R (Per Bank))	BANK EROSION (L R (Per Bank))
☐ ☐-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☒ ☒-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY

POOL: 8

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☒ >1m [6]			
☐ - 0.7-1m [4]	☐ -POOL WIDTH > RIFFLE WIDTH [2]	☐ -TORRENTIAL[-1]	☐ -EDDIES[1]
☐ - 0.4-0.7m [2]	☒ -POOL WIDTH = RIFFLE WIDTH [1]	☐ -FAST[1]	☐ -INTERSTITIAL[-1]
☐ - < 0.4m [1]	☐ -POOL WIDTH < RIFFLE W. [0]	☐ -MODERATE [1]	☐ -INTERMITTENT[-2]
☐ —<0.2m [Pool = 0]		☒ -SLOW [1]	

☐ - NO POOL[0]

COMMENTS: ____

RIFFLE: 0

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☐-LOW. [1] ☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☐-UNSTABLE (Gravel,Sand) [0]	
☐ - GENERALLY < 5 cm [Riffle = 0]		

☒ - NO RIFFLE[0]

COMMENTS ____

GRADIENT: 4

6) Gradient (feet/mile): 1.100 %POOL: 100 %RIFFLE: ____ %RUN: ____

EPA 4520

PC2
8/7/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish — QHEI SCORE: 44

Stream: PC 2 RM: ____ Date: 8/7/99 River Code: ____

Location: Kiser Creek Crew: FSR/CWR

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); — SUBSTRATE SCORE: 11

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]			☐ ☐-GRAVEL [7]	X	
☐ ☐-BOULDER [9]			☒ ☐-SAND [6]	X	
☐ ☐-COBBLE [8]			☐ ☐-BEDROCK[5]		
☒ ☐-HARDPAN [4]	X		☐ ☐-DETRITUS[3]	X	
☐ ☐-MUCK [2]			☐ ☐-ARTIFIC.[0]	X	

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☒-TILLS [1] ☒-HARDPAN [0] ☐-SANDSTONE [0] ☐-SHALE [-1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☒ > 4 [2] ☐ <= 4 [0] ☐-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

Silt Cover (Check One): ☐ - SILT HEAVY [-2] ☒ - SILT MODERATE [-1] ☐ - SILT NORMAL [0] ☐ - SILT FREE [1]

Extent Of Embeddness (Check One): ☐ — EXTENSIVE [-2] ☒ — MODERATE [-1] ☐ — LOW [0] ☐ — NONE [1]

2) INSTREAM COVER — COVER SCORE: 12

TYPE (Check *All* That Apply)

☐ -UNDERCUT BANKS [1]
☒ -OVERHANGING VEGETATION [1]
☐ -SHALLOWS (IN SLOW WATER) [1]
☒ -DEEP POOLS [2]
☒ -ROOTWADS [1]
☐ -BOULDERS [1]
☐ -OXBOWS [1]
☐ -AQUATIC MACROPHYTES [1]
☒ -LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

☐ - EXTENSIVE > 75% [11]
☒ - MODERATE 25-75% [7]
☐ - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3) CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) — CHANNEL: 7

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☐ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ - LOW [2]	☐ - FAIR [3]	☒ - RECOVERING [3]	☒ - LOW [1]	☐ - CANOPY REMOVAL	☒ - LEVEED
☐ - NONE [1]	☒ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☒ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: Right upstream

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — RIPARIAN: 4

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)		BANK EROSION
		L R (Per Bank)	
☐ ☐'-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☒ ☒-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐'-MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐'-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☐ ☐'-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☒ ☒-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY — POOL: 8

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☒ > 1m [6]	☐'-POOL WIDTH > RIFFLE WIDTH [2]	☐'-TORRENTIAL[-1]	☐'-EDDIES[1]
☐ 0.7-1m [4]	☒ POOL WIDTH = RIFFLE WIDTH [1]	☐'-FAST[1]	☐'-INTERSTITIAL[-1]
☐ 0.4-0.7m [2]	☐'-POOL WIDTH < RIFFLE W. [0]	☐'-MODERATE [1]	☐'-INTERMITTENT[-2]
☐ < 0.4m [1]		☒'-SLOW [1]	
☐ <0.2m [Pool = 0]			

☐ - NO POOL [0]

COMMENTS: ____

RIFFLE/RUN — RIFFLE: 0

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☐-LOW. [1] ☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☐-UNSTABLE (Gravel,Sand) [0]	☒ NO RIFFLE[0]
☐ - GENERALLY < 5 cm [Riffle = 0]		

COMMENTS: ____

GRADIENT: 2

6) Gradient (feet/mile): 880 %POOL: 100 %RIFFLE: ____ %RUN: ____

EPA 4520

PC3 X
8/7/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

Stream: Pigeon RM: ____ Date: 8/7/99 River Code: ____ **QHEI SCORE:** 60 49

Location: PC3 Crew: EJR CWB

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); **SUBSTRATE SCORE:** 48 8

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
☐ ☒ BLDER /SLABS[10]	X	☐	☐ ☐-GRAVEL [7]	X	X
☐ ☐-BOULDER [9]		X	☐ ☐-SAND [6]	X	X
☐ ☒ COBBLE [8]		X	☐ ☐-BEDROCK[5]		☒
☐ ☐-HARDPAN [4]	X	X	☐ ☐-DETRITUS[3]		
☐ ☐-MUCK [2]			☐ ☐-ARTIFIC.[0]		

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☐-TILLS [1] ☒-HARDPAN [0] ☐-SANDSTONE [0] ☒-SHALE [-1] ☐-COAL FINES [-2]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☒—MODERATE[-1] ☐—LOW[0] ☐—NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: > 4 [2] ☐— <= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

2) INSTREAM COVER **COVER SCORE:** 10

TYPE (Check *All* That Apply): ☐-UNDERCUT BANKS [1]; ☐-OVERHANGING VEGETATION [1]; ☒-SHALLOWS (IN SLOW WATER) [1]; ☐-DEEP POOLS [2]; ☒-ROOTWADS [1]; ☒-BOULDERS [1]; ☐-OXBOWS [1]; ☒-AQUATIC MACROPHYTES [1]; ☒-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): ☐ - EXTENSIVE > 75% [11]; ☐ - MODERATE 25-75% [7]; ☒ SPARSE 5-25% [3]; ☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3) CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) **CHANNEL:** 12 11

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☒ MODERATE [3]	☐ - GOOD [5]	☒ RECOVERED [4]	☒ MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☐ - LOW [2]	☒ FAIR [3]	☐ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) **RIPARIAN:** 5

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐ ☐'-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☒ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐'-MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐'-NARROW 5-10m [2]	☐ ☒ RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☐ ☐'-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☒ ☒-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY **POOL:** 7

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)		
☐ - >1m [6]				
☒ 0.7-1m [4]	☒ -POOL WIDTH > RIFFLE WIDTH [2]	☐'-TORRENTIAL[-1]	☐'-EDDIES[1]	☐ - NO POOL[0]
☐ - 0.4-0.7m [2]	☐ -POOL WIDTH = RIFFLE WIDTH [1]	☐'-FAST[1]	☐'-INTERSTITIAL[-1]	
☐ - < 0.4m [1]	☐'-POOL WIDTH < RIFFLE W. [0]	☒ MODERATE [1]	☐'-INTERMITTENT[-2]	
☐—<0.2m [Pool = 0]		☐'-SLOW [1]		

COMMENTS: ____

RIFFLE: 4

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☒ STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☒ LOW. [1] ☐-NONE[2]
☒ GENERALLY 5-10 cm [1]	☐-UNSTABLE (Gravel,Sand) [0]	☐-NO RIFFLE[0]
☐ - GENERALLY < 5 cm [Riffle = 0]		

COMMENTS: ____

GRADIENT: 4

6) Gradient (feet/mile): 1.379 %POOL: 31 %RIFFLE: 8 %RUN: 61

EPA 4520

PC 4
8/7/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish — **QHEI SCORE: 51**

Stream: Pigeon RM: ____ Date: 8/7 River Code: ____
Location: PC4 Crew: ESB CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); **SUBSTRATE SCORE: 17**

TYPE	POOL	RIFFLE		POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]		X	☐-GRAVEL [7]	X	X
☐ ☐-BOULDER [9]	X	X	☐ ☐-SAND [6]	X	X
X ☐-COBBLE [8]	X	X	☐ ☐-BEDROCK[5]		X
☐ ☐-HARDPAN [4]	X	X	☐ ☐-DETRITUS[3]		
☐ ☐-MUCK [2]			☐ ☐-ARTIFIC.[0]		

TOTAL NUMBER OF SUBSTRATE TYPES: X 4 [2] ☐ <= 4 [0] ☐-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☐-TILLS [1] X-HARDPAN [0] ☐-SANDSTONE [0] ☐-SHALE [-1]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☐-SILT MODERATE [-1] X-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddedness (Check One): ☐—EXTENSIVE [-2] X-MODERATE[-1] ☐—LOW[0] ☐—NONE[1]

COMMENTS: ____

2] INSTREAM COVER — **COVER SCORE: 6**

TYPE (Check *All* That Apply): ☐-UNDERCUT BANKS [1] ☐-DEEP POOLS [2] ☐-OXBOWS [1] ☐-OVERHANGING VEGETATION [1] X-ROOTWADS [1] ☐-AQUATIC MACROPHYTES [1] X-SHALLOWS (IN SLOW WATER) [1] ☐-BOULDERS [1] X-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): ☐ - EXTENSIVE > 75% [11] ☐ - MODERATE 25-75% [7] X - SPARSE 5-25% [3] ☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) — **CHANNEL: 10**

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	X - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
X - LOW [2]	X - FAIR [3]	X - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	X - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — **RIPARIAN: 7**

"River Right Looking Downstream"

RIPARIAN WIDTH (L R (Per Bank))	EROSION/RUNOFF - FLOOD PLAIN QUALITY (L R (Most Predominant Per Bank))	(L R (Per Bank))	BANK EROSION
☐ ☐'-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	X ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐'-MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	X X-MODERATE [2]
☐ ☐'-NARROW 5-10m [2]	☐ X-RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
X X-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐'-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY — **POOL: 5**

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☐- >1m [6]	X-POOL WIDTH > RIFFLE WIDTH [2]	☐-TORRENTIAL[-1]	☐-EDDIES[1]
☐-0.7-1m [4]	☐-POOL WIDTH = RIFFLE WIDTH [1]	☐-FAST[1]	☐-INTERSTITIAL[-1]
X-0.4-0.7m [2]	☐-POOL WIDTH < RIFFLE W. [0]	☐-MODERATE [1]	☐-INTERMITTENT[-2]
☐- < 0.4m [1]		X-SLOW [1]	
☐—<0.2m [Pool = 0]			

☐-NO POOL[0]

COMMENTS: ____

RIFFLE: 2

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	X-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] X-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☐-LOW. [1] ☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☐-UNSTABLE (Gravel,Sand) [0]	
X- GENERALLY < 5 cm [Riffle = 0]		

☐-NO RIFFLE[0]

COMMENTS ____

GRADIENT: 4

6] Gradient (feet/mile): 1.571 %POOL: 0 %RIFFLE: 54 %RUN: 46

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PC5
8/7/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

Stream Pigeon RM ____ Date 8/7/99 River Code ____
Location PC5 Crew: SJB, CWB

QHEI SCORE: 53

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*);

SUBSTRATE SCORE: 16

TYPE	POOL	RIFFLE	POOL	RIFFLE
☐-BLDER /SLABS[10]			☒-GRAVEL [7]	X
☐-BOULDER [9]	X	X	☐-SAND [6]	X
☒-COBBLE [8]	X	X	☐-BEDROCK[5]	
☐-HARDPAN [4]	X		☐-DETRITUS[3]	
☐-MUCK [2]			☐-ARTIFIC.[0]	

X

☐-LIMESTONE [1] ☒-RIP/RAP [0]
☐-TILLS [1] ☐-HARDPAN [0]
☐-SANDSTONE [0]
☐-SHALE [-1]
☐-COAL FINES [-2]

TOTAL NUMBER OF SUBSTRATE TYPES: ☒-4 [2] ☐-<= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS ____

Substrate Origin (Check all)

Silt Cover (Check One)
☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1]
☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddedness (Check One)
☐-EXTENSIVE [-2] ☒-MODERATE[-1]
☐-LOW[0] ☐-NONE[1]

COVER SCORE: 11

2] INSTREAM COVER

TYPE (Check *All* That Apply)

☐-UNDERCUT BANKS [1]
☒-OVERHANGING VEGETATION [1]
☒-SHALLOWS (IN SLOW WATER) [1]
☒-DEEP POOLS [2]
☒-ROOTWADS [1]
☒-BOULDERS [1]
☒-OXBOWS [1]
☐-AQUATIC MACROPHYTES [1]
☒-LOGS OR WOODY DEBRIS [1]

AMOUNT(Check *ONLY* One or check 2 and *AVERAGE*)

☐-EXTENSIVE > 75% [11]
☐-MODERATE 25-75% [7]
☒-SPARSE 5-25% [3]
☐-NEARLY ABSENT < 5%[1]

COMMENTS: ____

CHANNEL: 10

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐-HIGH [4]	☐-EXCELLENT [7]	☐-NONE [6]	☐-HIGH [3]	☐-SNAGGING	☐-IMPOUND.
☐-MODERATE [3]	☐-GOOD [5]	☐-RECOVERED [4]	☒-MODERATE [2]	☐-RELOCATION	☐-ISLANDS
☒-LOW [2]	☒-FAIR [3]	☒-RECOVERING [3]	☐-LOW [1]	☐-CANOPY REMOVAL	☐-LEVEED
☐-NONE [1]	☐-POOR [1]	☐-RECENT OR NO RECOVERY [1]		☐-DREDGING	☐-BANK SHAPING
				☐-ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

RIPARIAN: 6

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)
"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank) L R (Per Bank)		BANK EROSION
☐-WIDE>50m [4]	☐-FOREST, SWAMP [3]	☒-URBAN OR INDUSTRIAL[0]	☐-NONE OR LITTLE [3]
☐-MODERATE 10-50 [3]	☐-OPEN PASTURE/ ROWCROP[0]	☐-SHRUB OR OLD FIELD[2]	☒-MODERATE [2]
☐-NARROW 5-10m [2]	☒-RESID.,PARK,NEW FIELD [1]	☐-CONSERV. TILLAGE [1]	☐-HEAVY OR SEVERE[1]
☒-VERY NARROW 1-5m [1]	☐-FENCED PASTURE [1]	☐-MINING/CONSTRUCTION [0]	
☐-NONE[0]			

COMMENTS: ____

POOL: 5

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☐-> 1m [6]	☒-POOL WIDTH > RIFFLE WIDTH [2]	☐-TORRENTIAL[-1]	☐-EDDIES[1]
☐-0.7-1m [4]	☐-POOL WIDTH = RIFFLE WIDTH [1]	☐-FAST[1]	☐-INTERSTITIAL[-1]
☒-0.4-0.7m [2]	☐-POOL WIDTH < RIFFLE W. [0]	☒-MODERATE [1]	☐-INTERMITTENT[-2]
☐-< 0.4m [1]		☐-SLOW [1]	
☐-<0.2m [Pool = 0]			

☐-NO POOL[0]

COMMENTS: ____

RIFFLE: 3

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐-GENERALLY >10 cm,MAX>50 [4]	☒-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1]
☐-GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☒-MODERATE[0]
☒-GENERALLY 5-10 cm [1]	☐-UNSTABLE (Gravel,Sand) [0]	☐-LOW. [1]
☐-GENERALLY < 5 cm [Riffle = 0]		☐-NONE[2]

☐-NO RIFFLE[0]

COMMENTS ____

GRADIENT: 2

6] Gradient (feet/mile): ____ %POOL: 25 %RIFFLE: 20 %RUN: 55

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PC6
8/9/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

Stream Pigeon RM _____ Date 8/9/99 River Code _____

Location PC6 Crew: CWB/ESR

QHEI SCORE: 46 ~~48~~ 42

1] **SUBSTRATE** (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); **SUBSTRATE SCORE:** ~~8~~ 7

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]	___	___	☐ ☐-GRAVEL [7]	___	___
☐ ☐-BOULDER [9]	___	___	☐ ☐-SAND [6]	___	___
☒ ☒-COBBLE [8]	X	___	☐ ☐-BEDROCK[5]	___	___
☐ ☐-HARDPAN [4]	___	___	☐ ☐-DETRITUS[3]	___	___
☐ ☒-MUCK [2]	X	___	☐ ☐-ARTIFIC.[0]	___	___

SUBSTRATE QUALITY

Substrate Origin (Check all)
☐-LIMESTONE [1] ☐-RIP/RAP [0] ☒-TILLS [1] ☒-HARDPAN [0] ☐-SANDSTONE [0] ☐-SHALE [-1]

Silt Cover (Check One)
☒-SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One)
☒-EXTENSIVE [-2] ☐-MODERATE [-1] ☐-LOW [0] ☐-NONE [1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐> 4 [2] ☒<= 4 [0] ☐-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS _____

COVER SCORE: 8

2] **INSTREAM COVER**

TYPE (Check *All* That Apply)
☐-UNDERCUT BANKS [1]
☒-OVERHANGING VEGETATION [1]
☐-SHALLOWS (IN SLOW WATER) [1]
☒-DEEP POOLS [2]
☒-ROOTWADS [1]
☐-BOULDERS [1]
☐-OXBOWS [1]
☐-AQUATIC MACROPHYTES [1]
☒-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)
☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5% [1]

COMMENTS: _____

3] **CHANNEL MORPHOLOGY:** (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) **CHANNEL:** 11

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☒ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☐ - LOW [2]	☒ - FAIR [3]	☒ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: _____

4] **RIPARIAN ZONE AND BANK EROSION** - (check ONE box per bank or check 2 and AVERAGE per bank) **RIPARIAN:** ~~12~~ 6

River Right Looking Downstream

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐ ☐-WIDE>50m [4]	☒ ☒-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐-NONE[0]			

COMMENTS: _____

POOL/GLIDE AND RIFFLE/RUN QUALITY **POOL:** 8

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1) No Riffles	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☒ - 1m [6]		☐-TORRENTIAL[-1]	☐-EDDIES[1]
☐- 0.7-1m [4]	☐-POOL WIDTH > RIFFLE WIDTH [2]	☐-FAST[1]	☐-INTERSTITIAL[-1]
☐- 0.4-0.7m [2]	☒-POOL WIDTH = RIFFLE WIDTH [1]	☐-MODERATE [1]	☐-INTERMITTENT[-2]
☐- < 0.4m [1]	☐-POOL WIDTH < RIFFLE W. [0]	☒-SLOW [1]	
☐-<0.2m [Pool = 0]			

☐-NO POOL[0]

COMMENTS: _____

RIFFLE: 0

No Riffles

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☐-LOW. [1] ☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☐-UNSTABLE (Gravel,Sand) [0]	☒-NO RIFFLE[0]
☐ - GENERALLY < 5 cm [Riffle = 0]		

COMMENTS _____

GRADIENT: 2

6] Gradient (feet/mile): 1.000 %POOL: 100 %RIFFLE: _____ %RUN: _____

EPA 4520

PC7 8/9/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 43 42

Stream Raccoon Creek RM _____ Date 8/9/99 River Code _____

Location PC7 Crew: CWB / ESB

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*):

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]			☐ ☐-GRAVEL [7]		
☐ ☐-BOULDER [9]			☐ ☐-SAND [6]	X	
☐ ☐-COBBLE [8]			☐ ☐-BEDROCK[5]		
☒ ☒-HARDPAN [4]	X		☒ ☒-DETRITUS[3]	X	
☐ ☐-MUCK [2]			☐ ☐-ARTIFIC.[0]		

TOTAL NUMBER OF SUBSTRATE TYPES: ☐> 4 [2] ☒ <= 4 [0] ☐-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: _____

☐-LIMESTONE [1] ☐-RIP/RAP [0] ☒-TILLS [1] ☒-HARDPAN [0] ☐-SANDSTONE [0] ☐-SHALE [-1]

Substrate Origin (Check all)

Silt Cover (Check One): ☒ SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☐ - SILT NORMAL [0] ☐ - SILT FREE [1]

Extent Of Embeddness (Check One): ☒ EXTENSIVE [-2] ☐—MODERATE[-1] ☐—LOW[0] ☐—NONE[1]

SUBSTRATE SCORE: 4

2) INSTREAM COVER — COVER SCORE: 8

TYPE (Check *All* That Apply)

☐ -UNDERCUT BANKS [1]
☐ -OVERHANGING VEGETATION [1]
☒ SHALLOWS (IN SLOW WATER) [1]
☒ DEEP POOLS [2]
☒ ROOTWADS [1]
☐ -BOULDERS [1]
☐ -OXBOWS [1]
☐ -AQUATIC MACROPHYTES [1]
☒ LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5% [1]

COMMENTS: _____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) — CHANNEL: 10

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ LOW [2]	☒ FAIR [3]	☒ RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☒ LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: _____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — RIPARIAN: 10

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐ ☐-WIDE>50m [4]	☒ ☒-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☒ ☒ RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐-NONE[0]			

COMMENTS: _____

POOL/GLIDE AND RIFFLE/RUN QUALITY — POOL: 8

MAX. DEPTH (Check 1)
☒ >1m [6]
☐ 0.7-1m [4]
☐ 0.4-0.7m [2]
☐ < 0.4m [1]
☐ —<0.2m [Pool = 0]

MORPHOLOGY (Check 1) No Riffles
☐ -POOL WIDTH > RIFFLE WIDTH [2]
☒ -POOL WIDTH = RIFFLE WIDTH [1]
☐ -POOL WIDTH < RIFFLE W. [0]

POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)
☐ -TORRENTIAL[-1]
☐ -FAST[1]
☐ -MODERATE [1]
☒ SLOW [1]
☐ -EDDIES[1]
☐ -INTERSTITIAL[-1]
☐ -INTERMITTENT[-2]

☐ NO POOL[0]

COMMENTS: _____

RIFFLE — RIFFLE: 0

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☐-LOW. [1] ☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☐-UNSTABLE (Gravel,Sand) [0]	☒ NO RIFFLE[0]
☐ - GENERALLY < 5 cm [Riffle = 0]		

COMMENTS _____

GRADIENT: 2

6] Gradient (feet/mile): .956 %POOL: 100 %RIFFLE: _____ %RUN: _____

EPA 4520

X

8/9/99
PC8

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

Stream Pigeon Creek RM _____ Date 8/9/99 River Code _____ **QHEI SCORE:** 44 45

Location PC8 Crew: CWB, ESB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); **SUBSTRATE SCORE:** 72 – 86

TYPE	POOL	RIFFLE		POOL	RIFFLE	SUBSTRATE QUALITY
☐-BLDER /SLABS[10]			☐-GRAVEL [7]			Substrate Origin (Check all)
☐-BOULDER [9]			☒-SAND [6]	X		☐-LIMESTONE [1] ☐-RIP/RAP [0] ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1]
☐-COBBLE [8]			☐-BEDROCK[5]			☒-TILLS [1] ☒-HARDPAN [0] ☐-SILT NORMAL [0] ☐-SILT FREE [1]
☐-HARDPAN [4]	X		☒-DETRITUS[3]	X		☐-SANDSTONE [0] Extent Of Embeddness (Check One)
☐-MUCK [2]			☐-ARTIFIC.[0]			☐-SHALE [-1] ☐—EXTENSIVE [-2] ☒—MODERATE[-1]
						☐—LOW[0] ☐—NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐> 4 [2] ☒< <= 4 [0] ☐-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS _____

COVER SCORE: 8

2] INSTREAM COVER

TYPE (Check *All* That Apply)			AMOUNT(Check *ONLY* One or check 2 and *AVERAGE*)
☐-UNDERCUT BANKS [1]	☒-DEEP POOLS [2]	☐-OXBOWS [1]	☐ - EXTENSIVE > 75% [11]
☐-OVERHANGING VEGETATION [1]	☒-ROOTWADS [1]	☐-AQUATIC MACROPHYTES [1]	☐ - MODERATE 25-75% [7]
☒-SHALLOWS (IN SLOW WATER) [1]	☐-BOULDERS [1]	☒-LOGS OR WOODY DEBRIS [1]	☒ - SPARSE 5-25% [3]
			☐ - NEARLY ABSENT < 5%[1]

COMMENTS: _____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) **CHANNEL:** 10

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ - LOW [2]	☒ - FAIR [3]	☒ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☒ - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: _____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) **RIPARIAN:** 7

River Right Looking Downstream

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐☐-WIDE>50m [4]	☒☐-FOREST, SWAMP [3]	☐☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐☐-MODERATE 10-50 [3]	☐☒-OPEN PASTURE/ ROWCROP[0]	☐☐-SHRUB OR OLD FIELD[2]	☒☒-MODERATE.[2]
☐☐-NARROW 5-10m [2]	☐☐- RESID.,PARK,NEW FIELD [1]	☐☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☐☐-VERY NARROW 1-5m [1]	☐☐-FENCED PASTURE [1]	☐☐-MINING/CONSTRUCTION [0]	
☒☒-NONE[0]			

COMMENTS: _____

POOL/GLIDE AND RIFFLE/RUN QUALITY **POOL:** 8

MAX. DEPTH (Check 1)	MORPHOLOGY No Riffle (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☒>1m [6]			
☐- 0.7-1m [4]	☐-POOL WIDTH > RIFFLE WIDTH [2]	☐-TORRENTIAL[-1]	☐-EDDIES[1]
☐- 0.4-0.7m [2]	☒-POOL WIDTH = RIFFLE WIDTH [1]	☐-FAST[1]	☐-INTERSTITIAL[-1]
☐- < 0.4m [1]	☐-POOL WIDTH < RIFFLE W. [0]	☐-MODERATE [1]	☐-INTERMITTENT[-2]
☐—<0.2m [Pool = 0]		☒-SLOW [1]	

☐- NO POOL[0]

COMMENTS: _____

RIFFLE: 0

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS	
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1]	☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☐-LOW. [1]	☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☐-UNSTABLE (Gravel,Sand) [0]		☒-NO RIFFLE[0]
☐ - GENERALLY < 5 cm [Riffle = 0]			

COMMENTS _____

GRADIENT: 4.

6] Gradient (feet/mile): 1.692 %POOL: 100 %RIFFLE: _____ %RUN: _____

EPA 4520

PC 9 8/10/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: ~~44~~ 42 c14

Stream: Pigeon Creek RM: _____ Date: 5/10/88 River Code: _____

Location: _____ Crew: IF SB/CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; *Check all types present*); SUBSTRATE SCORE: ~~8~~ 4

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
☐-BLDER /SLABS[10]			☐-GRAVEL [7]		
☐-BOULDER [9]			☒-SAND [6]	X	
☐-COBBLE [8]			☐-BEDROCK[5]		
☒-HARDPAN [4]	X		☐-DETRITUS[3]	X	
☐-MUCK [2]			☐-ARTIFIC.[0]		

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☒-TILLS [1] ☒-HARDPAN [0] ☐-SANDSTONE [0] ☐-SHALE [-1] ☐-COAL FINES [-2]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐-EXTENSIVE [-2] ☒-MODERATE[-1] ☐-LOW[0] ☐-NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐> 4 [2] ☒<= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: _____

2] INSTREAM COVER COVER SCORE: ~~8~~

TYPE (Check *All* That Apply): ☒-UNDERCUT BANKS [1]; ☐-OVERHANGING VEGETATION [1]; ☐-SHALLOWS (IN SLOW WATER) [1]; ☒-DEEP POOLS [2]; ☒-ROOTWADS [1]; ☐-BOULDERS [1]; ☐-OXBOWS [1]; ☐-AQUATIC MACROPHYTES [1]; ☒-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): ☐-EXTENSIVE > 75% [11]; ☐-MODERATE 25-75% [7]; ☒-SPARSE 5-25% [3]; ☐-NEARLY ABSENT < 5% [1]

COMMENTS: _____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) CHANNEL: ~~12~~ 10

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐-HIGH [4]	☐-EXCELLENT [7]	☐-NONE [6]	☐-HIGH [3]	☐-SNAGGING	☐-IMPOUND.
☒-MODERATE [3]	☐-GOOD [5]	☐-RECOVERED [4]	☒-MODERATE [2]	☐-RELOCATION	☐-ISLANDS
☐-LOW [2]	☒-FAIR [3]	☒-RECOVERING [3]	☐-LOW [1]	☐-CANOPY REMOVAL	☐-LEVEED
☐-NONE [1]	☒-POOR [1]	☐-RECENT OR NO RECOVERY [1]		☐-DREDGING	☐-BANK SHAPING
				☐-ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: _____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: ~~8~~ -12

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐☐-WIDE>50m [4]	☐☐-FOREST, SWAMP [3]	☐☐-URBAN OR INDUSTRIAL[0]	☐☐-NONE OR LITTLE [3]
☐☐-MODERATE 10-50 [3]	☒☒-OPEN PASTURE/ ROWCROP[0]	☐☐-SHRUB OR OLD FIELD[2]	☒☒-MODERATE [2]
☐☐-NARROW 5-10m [2]	☐☐- RESID.,PARK,NEW FIELD [1]	☐☐-CONSERV. TILLAGE [1]	☐☐-HEAVY OR SEVERE[1]
☒☒-VERY NARROW 1-5m [1]	☐☐-FENCED PASTURE [1]	☐☐-MINING/CONSTRUCTION [0]	
☐☐-NONE[0]			

COMMENTS: _____

POOL/GLIDE AND RIFFLE/RUN QUALITY POOL: ~~8~~

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)		
☒-> 1m [6]				
☐-0.7-1m [4]	☐-POOL WIDTH > RIFFLE WIDTH [2]	☐-TORRENTIAL[-1]	☐-EDDIES[1]	☐-NO POOL[0]
☐-0.4-0.7m [2]	☒-POOL WIDTH = RIFFLE WIDTH [1]	☐-FAST[1]	☐-INTERSTITIAL[-1]	
☐-< 0.4m [1]	☐-POOL WIDTH < RIFFLE W. [0]	☐-MODERATE [1]	☐-INTERMITTENT[-2]	
☐-<0.2m [Pool = 0]		☒-SLOW [1]		

COMMENTS: _____

RIFFLE/RUN DEPTH RIFFLE: ~~0~~

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS	
☐-GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1]	☐-MODERATE[0]
☐-GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☐-LOW. [1]	☐-NONE[2]
☐-GENERALLY 5-10 cm [1]	☐-UNSTABLE (Gravel,Sand) [0]		☒-NO RIFFLE[0]
☐-GENERALLY < 5 cm [Riffle = 0]			

COMMENTS _____

GRADIENT: ~~2~~

6] Gradient (feet/mile): 17 %POOL: 100 %RIFFLE: _____ %RUN: _____

EPA 4520

PC 11

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish — **QHEI SCORE: 53**

Stream: Pigeon Creek — RM: ____ Date: 8/11/99 — River Code: ____

Location: PC 11 — Crew: ESB/CWB

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; *Check all types present*);

TYPE	POOL	RIFFLE		POOL	RIFFLE	SUBSTRATE QUALITY
☐-BLDER /SLABS[10]			☒-GRAVEL [7]		X	Substrate Origin (Check all)
☐-BOULDER [9]			☒-SAND [6]		X	☐-LIMESTONE [1]
☐-COBBLE [8]			☐-BEDROCK[5]			☒-TILLS [1]
☐-HARDPAN [4]		X	☐-DETRITUS[3]			☐-SANDSTONE [0]
☐-MUCK [2]			☐-ARTIFIC.[0]			☐-SHALE [-1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐> 4 [2] ☒<= 4 [0] ☐-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

SUBSTRATE SCORE: 14

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☒-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddiness (Check One): ☐—EXTENSIVE [-2] ☐—MODERATE[-1] ☒-LOW[0] ☐—NONE[1]

COVER SCORE: 6

2) INSTREAM COVER

TYPE (Check *All* That Apply)

☐-UNDERCUT BANKS [1] ☐-DEEP POOLS [2] ☐-OXBOWS [1]
☐-OVERHANGING VEGETATION [1] ☒-ROOTWADS [1] ☐-AQUATIC MACROPHYTES [1]
☒-SHALLOWS (IN SLOW WATER) [1] ☐-BOULDERS [1] ☒-LOGS OR WOODY DEBRIS [1]

AMOUNT(Check *ONLY* One or check 2 and *AVERAGE*)
☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5%[1]

COMMENTS: ____

CHANNEL: 10

3) CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ - LOW [2]	☒ - FAIR [3]	☒ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

RIPARIAN: 10

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

River Right Looking Downstream

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐☐-WIDE>50m [4]	☒☒-FOREST, SWAMP [3]	☐☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐☐-MODERATE 10-50 [3]	☐☐-OPEN PASTURE/ ROWCROP[0]	☐☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE.[2]
☐☐-NARROW 5-10m [2]	☐☐- RESID.,PARK,NEW FIELD [1]	☐☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☐☐-VERY NARROW 1-5m [1]	☐☐-FENCED PASTURE [1]	☐☐-MINING/CONSTRUCTION [0]	
☒☒-NONE[0]			

COMMENTS: ____

POOL: 7

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☐- >1m [6]		☐-TORRENTIAL[-1]	☐-EDDIES[1]
☒-0.7-1m [4]	☒-POOL WIDTH > RIFFLE WIDTH [2]	☐-FAST[1]	☐-INTERSTITIAL[-1]
☐- 0.4-0.7m [2]	☐-POOL WIDTH = RIFFLE WIDTH [1]	☒-MODERATE [1]	☐-INTERMITTENT[-2]
☐- < 0.4m [1]	☐-POOL WIDTH < RIFFLE W. [0]	☐-SLOW [1]	
☐—<0.2m [Pool = 0]			

☐-NO POOL[0]

COMMENTS: ____

RIFFLE: 2

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS	
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1]	☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☒-LOW. [1]	☐-NONE[2]
☒-GENERALLY 5-10 cm [1]	☒-UNSTABLE (Gravel,Sand) [0]		
☐ - GENERALLY < 5 cm [Riffle = 0]			

☐-NO RIFFLE[0]

COMMENTS: ____

GRADIENT: 4

6) Gradient (feet/mile): 1.150 — %POOL: ____ — %RIFFLE: ____ — %RUN: 100

PC12
8/12/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 55

Stream Pigeon Creek RM ____ Date 8/12/99 River Code ____
Location PC12 Crew: AS CWB ESR

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*);

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE	SUBSTRATE QUALITY
☐ ☐-BLDER /SLABS[10]			☐ ☐-GRAVEL [7]	X	X	Substrate Origin (Check all)
☐ ☐-BOULDER [9]			X ☐-SAND [6]	X	X	☐-LIMESTONE [1] ☐-RIP/RAP [0]
☐ ☐-COBBLE [8]			☐ ☐-BEDROCK[5]		X	☐-TILLS [1] X-HARDPAN [0]
X ☐-HARDPAN [4]	X	X	☐ ☐-DETRITUS[3]			☐-SANDSTONE [0]
☐ ☐-MUCK [2]			☐ ☐-ARTIFIC.[0]		X	☐-SHALE [-1]

TOTAL NUMBER OF SUBSTRATE TYPES: X > 4 [2] ☐ <= 4 [0] ☐-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS ____

SUBSTRATE SCORE: 11

Silt Cover (Check One): ☐-SILT HEAVY [-2] X-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐-EXTENSIVE [-2] X-MODERATE [-1] ☐-LOW [0] ☐-NONE [1]

COVER SCORE: 8

2] INSTREAM COVER

TYPE (Check *All* That Apply)

☐-UNDERCUT BANKS [1] X-DEEP POOLS [2] ☐-OXBOWS [1]
☐-OVERHANGING VEGETATION [1] X-ROOTWADS [1] ☐-AQUATIC MACROPHYTES [1]
X-SHALLOWS (IN SLOW WATER) [1] ☐-BOULDERS [1] X-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
X - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

CHANNEL: 8

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	X - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
X - LOW [2]	☐ - FAIR [3]	X - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	X - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

RIPARIAN: 12

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)
"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐ ☐-WIDE>50m [4]	X X-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	X X-MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
X X-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐-NONE[0]			

COMMENTS: ____

POOL: 6

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☐ - >1m [6]		☐-TORRENTIAL[-1]	☐-EDDIES[1]
X 0.7-1m [4]	☐-POOL WIDTH > RIFFLE WIDTH [2]	☐-FAST[1]	☐-INTERSTITIAL[-1]
☐ - 0.4-0.7m [2]	X-POOL WIDTH = RIFFLE WIDTH [1]	X-MODERATE [1]	☐-INTERMITTENT[-2]
☐ - < 0.4m [1]	☐-POOL WIDTH < RIFFLE W. [0]	☐-SLOW [1]	
☐ - <0.2m [Pool = 0]			

☐-NO POOL[0]

COMMENTS: ____

RIFFLE: 6

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	X-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
X GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	X-LOW. [1] ☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☐-UNSTABLE (Gravel,Sand) [0]	☐-NO RIFFLE[0]
☐ - GENERALLY < 5 cm [Riffle = 0]		

COMMENTS ____

GRADIENT: 4

6] Gradient (feet/mile): 2 %POOL: 43 %RIFFLE: 22 %RUN: 35

EPA 4520

Dup 8D

PC13 X
8/13/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 54 52

Stream Pigeon Creek RM ____ Date 8/13/99 River Code ____

Location PC13 Crew: EB, CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*);

TYPE — POOL RIFLE — POOL RIFLE — SUBSTRATE QUALITY — SUBSTRATE SCORE: 16 14

- ☐ ☐-BLDER /SLABS[10] — ☐ ☒-GRAVEL [7] — X X — Substrate Origin (Check all)
- ☐ ☐-BOULDER [9] — ☐ ☒-SAND [6] — X X — ☐-LIMESTONE [1] ☐-RIP/RAP [0]
- ☐ ☐-COBBLE [8] — X — ☐ ☐-BEDROCK[5] — ☒-TILLS [1] ☐-HARDPAN [0]
- ☐ ☐-HARDPAN [4] — ☐ ☐-DETRITUS[3] — ☒-SANDSTONE [0]
- ☐ ☐-MUCK [2] — ☐ ☐-ARTIFIC.[0] — X X — ☐-SHALE [-1]
- TOTAL NUMBER OF SUBSTRATE TYPES: ☒- > 4 [2] ☐- <= 4 [0] ☐-COAL FINES [-2]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☒-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☐—MODERATE[-1] ☒-LOW[0] ☐—NONE[1]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS ____

COVER SCORE: 9

2] INSTREAM COVER

TYPE (Check *All* That Apply)

- ☒-UNDERCUT BANKS [1]
- ☐-OVERHANGING VEGETATION [1]
- ☒-SHALLOWS (IN SLOW WATER) [1]
- ☒-DEEP POOLS [2]
- ☒-ROOTWADS [1]
- ☐-BOULDERS [1]
- ☐-OXBOWS [1]
- ☐-AQUATIC MACROPHYTES [1]
- ☒-LOGS OR WOODY DEBRIS [1]

AMOUNT(Check *ONLY* One or check 2 and *AVERAGE*)

- ☐ - EXTENSIVE > 75% [11]
- ☐ - MODERATE 25-75% [7]
- ☒ - SPARSE 5-25% [3]
- ☐ - NEARLY ABSENT < 5%[1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) CHANNEL: 7

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☐ - LOW [2]	☐ - FAIR [3]	☒ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☒ - NONE [1]	☒ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
					☐ - ONE SIDE CHANNEL MODIFICATIONS

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 12

River Right Looking Downstream

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐ ☐-WIDE>50m [4]	☒ ☒-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY POOL: 6

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)		
☐- >1m [6]		☐-TORRENTIAL[-1]	☐-EDDIES[1]	
☒-0.7-1m [4]	☐-POOL WIDTH > RIFFLE WIDTH [2]	☐-FAST[1]	☐-INTERSTITIAL[-1]	☐-NO POOL[0]
☐- 0.4-0.7m [2]	☒-POOL WIDTH = RIFFLE WIDTH [1]	☒-MODERATE [1]	☐-INTERMITTENT[-2]	
☐- < 0.4m [1]	☐-POOL WIDTH < RIFFLE W. [0]	☐-SLOW [1]		
☐—<0.2m [Pool = 0]				

COMMENTS: ____

RIFFLE: 2

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS	
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1]	☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☒-LOW. [1]	☐-NONE[2]
☒ GENERALLY 5-10 cm [1]	☒-UNSTABLE (Gravel,Sand) [0]		☐-NO RIFFLE[0]
☐ - GENERALLY < 5 cm [Riffle = 0]			

COMMENTS ____

GRADIENT: 2

6] Gradient (feet/mile): .759 %POOL: 74 %RIFFLE: 8 %RUN: 18

EPA 4520

370

PC 14
8/16/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 42

Stream Green Creek RM ____ Date 8/16/99 River Code ____
Location PC14 Crew CWB/ESB

1] SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Check all types present); SUBSTRATE SCORE: 13

TYPE	POOL	RIFFLE		POOL	RIFFLE	SUBSTRATE QUALITY
☐ ☐-BLDER /SLABS[10]	____	____	☐ ☒-GRAVEL [7]	☒	☒	Substrate Origin (Check all)
☐ ☐-BOULDER [9]	____	____	☐ ☒-SAND [6]	☒	☒	☐-LIMESTONE [1] ☐-RIP/RAP [0]
☐ ☐-COBBLE [8]	____	____	☐ ☐-BEDROCK[5]	____	____	☒-TILLS [1] ☒-HARDPAN [0]
☐ ☐-HARDPAN [4]	☒	____	☐ ☐-DETRITUS[3]	____	____	☐-SANDSTONE [0]
☐ ☐-MUCK [2]	____	____	☐ ☐-ARTIFIC.[0]	____	____	☐-SHALE [-1]

Silt Cover (Check One): ☐ - SILT HEAVY [-2] ☒ SILT MODERATE [-1] ☐ - SILT NORMAL [0] ☐ - SILT FREE [1]

Extent Of Embeddiness (Check One): ☐—EXTENSIVE [-2] ☐—MODERATE[-1] ☒—LOW[0] ☐—NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐- 4 [2] ☒- <= 4 [0] ☐-COAL FINES [-2]
NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)
COMMENTS ____

2] INSTREAM COVER COVER SCORE: 8

TYPE (Check All That Apply)
☐-UNDERCUT BANKS [1]
☒-OVERHANGING VEGETATION [1]
☒-SHALLOWS (IN SLOW WATER) [1]
☒-DEEP POOLS [2]
☐-ROOTWADS [1]
☐-BOULDERS [1]
☐-OXBOWS [1]
☐-AQUATIC MACROPHYTES [1]
☒-LOGS OR WOODY DEBRIS [1]

AMOUNT(Check ONLY One or check 2 and AVERAGE)
☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5%[1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE) CHANNEL: 6

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☐ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☐ - LOW [2]	☐ - FAIR [3]	☒ - RECOVERING [3]	☒ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☒ - NONE [1]	☒ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 6
"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank) L R (Per Bank)		BANK EROSION
☐ ☐-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☒ ☒-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY POOL: 5

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check All That Apply)	
☐- >1m [6]			
☐- 0.7-1m [4]	☒-POOL WIDTH > RIFFLE WIDTH [2]	☐-TORRENTIAL[-1]	☐-EDDIES[1]
☒- 0.4-0.7m [2]	☐-POOL WIDTH = RIFFLE WIDTH [1]	☐-FAST[1]	☐-INTERSTITIAL[-1]
☐- < 0.4m [1]	☐-POOL WIDTH < RIFFLE W. [0]	☐-MODERATE [1]	☐-INTERMITTENT[-2]
☐—<0.2m [Pool = 0]		☒-SLOW [1]	

☐- NO POOL[0]

COMMENTS: ____

RIFFLE: 2

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS	
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1]	☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☒-LOW. [1]	☐-NONE[2]
☒ GENERALLY 5-10 cm [1]	☒-UNSTABLE (Gravel,Sand) [0]		
☐ - GENERALLY < 5 cm [Riffle = 0]			

☐-NO RIFFLE[0]

COMMENTS ____

GRADIENT: 2

6] Gradient (feet/mile): 8.46 %POOL: 47 %RIFFLE: 38 %RUN: 15
Glide

EPA 4520

PC-15
8/6/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish — **QHEI SCORE: 48**

Stream Pigeon RM ____ Date 8/6/99 River Code ____

Location PC 15 Crew EJB, CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*): — **SUBSTRATE SCORE: 15**

TYPE	POOL	RIFFLE		POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]			☒ ☐-GRAVEL [7]	X	X
☐ ☐-BOULDER [9]			☒ ☐-SAND [6]	X	X
☐ ☐-COBBLE [8]			☐ ☐-BEDROCK[5]		
☐ ☐-HARDPAN [4]			☐ ☐-DETRITUS[3]	X	
☐ ☐-MUCK [2]			☐ ☐-ARTIFIC.[0]		

TOTAL NUMBER OF SUBSTRATE TYPES: ☐- 4 [2] ☒ <= 4 [0] ☐-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS ____

SUBSTRATE QUALITY

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☐-TILLS [1] ☐-HARDPAN [0] ☒-SANDSTONE [0] ☐-SHALE [-1]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☐—MODERATE[-1] ☐—LOW[0] ☒—NONE[1]

COVER SCORE: 9

2] INSTREAM COVER

TYPE (Check *All* That Apply): ☐-UNDERCUT BANKS [1] ☒-OVERHANGING VEGETATION [1] ☒-SHALLOWS (IN SLOW WATER) [1] ☒-DEEP POOLS [2] ☐-ROOTWADS [1] ☐-BOULDERS [1] ☐-OXBOWS [1] ☒-AQUATIC MACROPHYTES [1] ☒-LOGS OR WOODY DEBRIS [1]

AMOUNT(Check *ONLY* One or check 2 and *AVERAGE*): ☐ - EXTENSIVE > 75% [11] ☐ - MODERATE 25-75% [7] ☒ - SPARSE 5-25% [3] ☐ - NEARLY ABSENT < 5%[1]

COMMENTS: ____

CHANNEL: 7

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☐ - LOW [2]	☐ - FAIR [3]	☒ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☒ - NONE [1]	☒ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

RIPARIAN: 6

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

"River Right Looking Downstream"

RIPARIAN WIDTH (L R (Per Bank))	EROSION/RUNOFF - FLOOD PLAIN QUALITY (L R (Per Bank))		BANK EROSION
☐ ☐'-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐'-MODERATE 10-50 [3]	☒ ☒-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE.[2]
☐ ☐'-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐'-NONE[0]			

COMMENTS: ____

POOL: 4

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX DEPTH: (Check 1): ☐- >1m [6] ☐- 0.7-1m [4] ☒- 0.4-0.7m [2] ☐- < 0.4m [1] ☐—<0.2m [Pool = 0]

MORPHOLOGY (Check 1): ☐'-POOL WIDTH > RIFFLE WIDTH [2] ☒-POOL WIDTH = RIFFLE WIDTH [1] ☐'-POOL WIDTH < RIFFLE W. [0]

POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply): ☐'-TORRENTIAL[-1] ☐'-FAST[1] ☐'-MODERATE [1] ☒-SLOW [1] ☐'-EDDIES[1] ☐'-INTERSTITIAL[-1] ☐'-INTERMITTENT[-2] ☐-NO POOL[0]

COMMENTS: ____

RIFFLE: 3

RIFFLE/RUN DEPTH: ☐ - GENERALLY >10 cm,MAX>50 [4] ☐ - GENERALLY >10 cm,MAX<50 [3] ☒-GENERALLY 5-10 cm [1] ☐ - GENERALLY < 5 cm [Riffle = 0]

RIFFLE/RUN SUBSTRATE: ☐-STABLE (e.g.,Cobble, Boulder) [2] ☐-MOD. STABLE (e.g.,Pea Gravel) [1] ☒-UNSTABLE (Gravel,Sand) [0]

RIFFLE/RUN EMBEDDEDNESS: ☐-EXTENSIVE [-1] ☐-MODERATE[0] ☐-LOW. [1] ☒-NONE[2] ☐-NO RIFFLE[0]

COMMENTS ____

GRADIENT: 4

6] Gradient (feet/mile): 1.517 %POOL: 3 %RIFFLE: 7 %RUN: 90

Glide

EPA 4520

PC16
8/5/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 43

Stream: Pigeon Creek RM: ____ Date: 8/5/99 River Code: ____

Location: PC-16 Crew: EJB, CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); SUBSTRATE SCORE: 14

TYPE	POOL	RIFFLE		POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]			☒ ☐-GRAVEL [7]	✓	
☐ ☐-BOULDER [9]			☒ ☐-SAND [6]		✓
☐ ☐-COBBLE [8]	✓		☐ ☐-BEDROCK[5]		
☐ ☐-HARDPAN [4]	✓		☐ ☐-DETRITUS[3]	✓	
☐ ☐-MUCK [2]			☐ ☐-ARTIFIC.[0]		

TOTAL NUMBER OF SUBSTRATE TYPES: ☒ > 4 [2] ☐ <= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☐-TILLS [1] ☒-HARDPAN [0] ☐-SANDSTONE [0] ☐-SHALE [-1] ☐-COAL FINES [-2]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐-EXTENSIVE [-2] ☒-MODERATE [-1] ☐-LOW [0] ☐-NONE [1]

2] INSTREAM COVER COVER SCORE: 7 7

TYPE (Check *All* That Apply)

☐ -UNDERCUT BANKS [1]
☒ -OVERHANGING VEGETATION [1]
☒ -SHALLOWS (IN SLOW WATER) [1]
☐ -DEEP POOLS [2]
☐ -ROOTWADS [1]
☒ -BOULDERS [1]
☐ -OXBOWS [1]
☐ -AQUATIC MACROPHYTES [1]
☒ -LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) CHANNEL: 8

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ - LOW [2]	☐ - FAIR [3]	☒ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☒ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
					☐ - ONE SIDE CHANNEL MODIFICATIONS

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 6

River Right Looking Downstream

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐ ☐ -WIDE > 50m [4]	☐ ☐-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL [0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐ -MODERATE 10-50 [3]	☒ ☒-OPEN PASTURE/ ROWCROP [0]	☐ ☐-SHRUB OR OLD FIELD [2]	☒ ☒-MODERATE [2]
☐ ☐ -NARROW 5-10m [2]	☐ ☐- RESID., PARK, NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE [1]
☒ ☒ -VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐ -NONE [0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY POOL: 4

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)		
☐ - >1m [-]	☒ -POOL WIDTH > RIFFLE WIDTH [2]	☐ -TORRENTIAL [-1]	☐ -EDDIES [1]	
☐ - 0.7-1m [4]	☐ -POOL WIDTH = RIFFLE WIDTH [1]	☐ -FAST [1]	☐ -INTERSTITIAL [-1]	☐ - NO POOL [0]
☐ - 0.4-0.7m [2]	☐ -POOL WIDTH < RIFFLE W. [0]	☐ -MODERATE [1]	☐ -INTERMITTENT [-2]	
☒ - < 0.4m [1]		☒ -SLOW [1]		
☐ - <0.2m [Pool = 0]				

COMMENTS: ____

RIFFLE/RUN RIFFLE: 0

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS	
☐ - GENERALLY >10 cm, MAX>50 [4]	☐ - STABLE (e.g., Cobble, Boulder) [2]	☐ - EXTENSIVE [-1]	☐ - MODERATE [0]
☐ - GENERALLY >10 cm, MAX<50 [3]	☐ - MOD. STABLE (e.g., Pea Gravel) [1]	☐ - LOW. [1]	☐ - NONE [2]
☐ - GENERALLY 5-10 cm [1]	☐ - UNSTABLE (Gravel, Sand) [0]		☒ - NO RIFFLE [0]
☐ - GENERALLY < 5 cm [Riffle = 0]			

NO RIFFLE

COMMENTS: ____

GRADIENT: 4

6] Gradient (feet/mile): 4 %POOL: 100 %RIFFLE: ____ %RUN: ____

EPA 4520

Cam #1 Photo 27 : DS end looking US
Photo 26 DS end looking DS
DS end where Riprap shore ends
Photo 24 + 25 Mosquitoe Fish schooling Near Bluegill beds

Rained overnight & morning (early) LC1 8/8/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 53

Stream Locust RM Date 8/8/99 River Code
Location LC1 Crew EDB, CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); SUBSTRATE SCORE: 18

TYPE	POOL	RIFFLE		POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]			☒ ☐-GRAVEL [7]	X	X
☐ ☐-BOULDER [9]			☐ ☐-SAND [6]	X	X
☐ ☐-COBBLE [8]	X	X	☐ ☐-BEDROCK[5]		
☒ ☐-HARDPAN [4]	X	X	☐ ☐-DETRITUS[3]		
☐ ☐-MUCK [2]			☐ ☐-ARTIFIC.[0]		

TOTAL NUMBER OF SUBSTRATE TYPES: ☒ > 4 [2] ☐ — <= 4 [0] ☐-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☐-TILLS [1] ☐-HARDPAN [0] ☐-SANDSTONE [0] ☐-SHALE [-1]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☒—MODERATE [-1] ☐—LOW [0] ☐—NONE [1]

COVER SCORE: 11

2] INSTREAM COVER

TYPE (Check *All* That Apply)

☐-UNDERCUT BANKS [1]
☒-OVERHANGING VEGETATION [1]
☒-SHALLOWS (IN SLOW WATER) [1]
☒-DEEP POOLS [2]
☒-ROOTWADS [1]
☒-BOULDERS [1]
☐-OXBOWS [1]
☒-AQUATIC MACROPHYTES [1]
☒-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5% [1]

COMMENTS:

CHANNEL: 11

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☒ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☐ - LOW [2]	☒ - FAIR [3]	☒ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS:

RIPARIAN: 6

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐ ☐-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☒ ☒-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐-NONE[0]			

COMMENTS:

POOL: 9

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)		
☒ >1m [6]	☒-POOL WIDTH > RIFFLE WIDTH [2]	☐-TORRENTIAL[-1]	☐-EDDIES[1]	☐-NO POOL[0]
☐- 0.7-1m [4]	☐-POOL WIDTH = RIFFLE WIDTH [1]	☐-FAST[1]	☐-INTERSTITIAL[-1]	
☐- 0.4-0.7m [2]	☐-POOL WIDTH < RIFFLE W. [0]	☐-MODERATE [1]	☐-INTERMITTENT[-2]	
☐- < 0.4m [1]		☒-SLOW [1]		
☐—<0.2m [Pool = 0]				

COMMENTS:

RIFFLE: 2

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☒-MOD. STABLE (e.g.,Pea Gravel) [1]	☒-LOW. [1] ☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☐-UNSTABLE (Gravel,Sand) [0]	☐-NO RIFFLE[0]
☒ - GENERALLY < 5 cm [Riffle = 0]		

COMMENTS

GRADIENT: 2

6] Gradient (feet/mile): %POOL: 85 %RIFFLE: 4 %RUN: 11

LC 2
8/10/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish — **QHEI SCORE: 49**

Stream: Locust Creek RM: ____ Date: 8/10/99 River Code: ____
Location: LC2 Crew: ____

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); — **SUBSTRATE SCORE: 12**

TYPE	POOL	RIFFLE		POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]	____	____	☒ ☐-GRAVEL [7]	X	____
☐ ☐-BOULDER [9]	____	____	☒ ☐-SAND [6]	X	____
☐ ☐-COBBLE [8]	____	____	☐ ☐-BEDROCK[5]	____	____
☐ ☐-HARDPAN [4]	____	____	☐ ☐-DETRITUS[3]	____	____
☐ ☐-MUCK [2]	____	____	☐ ☐-ARTIFIC.[0]	____	____

SUBSTRATE QUALITY
Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☐-TILLS [1] ☐-HARDPAN [0] ☒-SANDSTONE [0] ☐-SHALE [-1]
Silt Cover (Check One): ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]
Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☒—MODERATE [-1] ☐—LOW [0] ☐—NONE [1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐> 4 [2] ☒<= 4 [0] ☐-COAL FINES [-2]
NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)
COMMENTS: ____

2] INSTREAM COVER — **COVER SCORE: 9**

TYPE (Check *All* That Apply): ☐-UNDERCUT BANKS [1] ☒-OVERHANGING VEGETATION [1] ☒-SHALLOWS (IN SLOW WATER) [1] ☒-DEEP POOLS [2] ☒-ROOTWADS [1] ☐-BOULDERS [1] ☐-OXBOWS [1] ☐-AQUATIC MACROPHYTES [1] ☒-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): ☐-EXTENSIVE > 75% [11] ☐-MODERATE 25-75% [7] ☒-SPARSE 5-25% [3] ☐-NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) — **CHANNEL: 11**

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☒ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☐ - LOW [2]	☒ - FAIR [3]	☒ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — **RIPARIAN: 6**
"River Right Looking Downstream"

RIPARIAN WIDTH (Per Bank) L R	EROSION/RUNOFF - FLOOD PLAIN QUALITY (Most Predominant Per Bank) L R	FLOOD PLAIN QUALITY (Per Bank) L R	BANK EROSION L R
☐ ☐'-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐'-MODERATE 10-50 [3]	☒ ☒-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐'-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒'-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐'-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY — **POOL: 7**

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☐- >1m [6]	☒-POOL WIDTH > RIFFLE WIDTH [2]	☐'-TORRENTIAL[-1]	☐'-EDDIES[1]
☒- 0.7-1m [4]	☐-POOL WIDTH = RIFFLE WIDTH [1]	☐'-FAST[1]	☐'-INTERSTITIAL[-1]
☐- 0.4-0.7m [2]	☐'-POOL WIDTH < RIFFLE W. [0]	☐'-MODERATE [1]	☐'-INTERMITTENT[-2]
☐- < 0.4m [1]		☒-SLOW [1]	
☐—<0.2m [Pool = 0]			

☐- NO POOL[0]

COMMENTS: ____

RIFFLE: 0

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☒-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☐-LOW. [1] ☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☒-UNSTABLE (Gravel,Sand) [0]	
☒ - GENERALLY < 5 cm [Riffle = 0]		

☐-NO RIFFLE[0]

COMMENTS: ____

GRADIENT: 4

6] Gradient (feet/mile): 2.44 %POOL: 93 %RIFFLE: ____ %RUN: 7

Glide

EPA 4520

LP1
8/8/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

QHEI SCORE: 57 54 47

Stream Little Pigeon RM ____ Date 8/8/99 River Code ____

Location LP1 Crew: CWB/EJB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); SUBSTRATE SCORE: 14.5

TYPE	POOL	RIFFLE		POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]			☒ ☐-GRAVEL [7]	X	X
☐ ☐-BOULDER [9]		X	☒ ☐-SAND [6]		X
☐ ☐-COBBLE [8]		X	☐ ☐-BEDROCK[5]		
☒ ☐-HARDPAN [4]	X		☐ ☐-DETRITUS[3]		
☐ ☐-MUCK [2]			☐ ☐-ARTIFIC.[0]	X	X

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☒-TILLS [1] ☒-HARDPAN [0]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐-EXTENSIVE [-2] ☒-MODERATE[-1] ☐-LOW[0] ☐-NONE[1]

☐-SHALE [-1] ☐-SANDSTONE [0]

TOTAL NUMBER OF SUBSTRATE TYPES: ☒ > 4 [2] ☐ <= 4 [0] ☐-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS ____

2] INSTREAM COVER COVER SCORE: 8

TYPE (Check *All* That Apply)

☐-UNDERCUT BANKS [1] ☒-DEEP POOLS [2] ☐-OXBOWS [1]
☒-OVERHANGING VEGETATION [1] ☐-ROOTWADS [1] ☐-AQUATIC MACROPHYTES [1]
☐-SHALLOWS (IN SLOW WATER) [1] ☒-BOULDERS [1] ☒-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) CHANNEL: 8

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ - LOW [2]	☐ - FAIR [3]	☒ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☒ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 5 10

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	FLOOD PLAIN QUALITY L R (Per Bank)	BANK EROSION
☐ ☐'-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☒ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐'-MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐'-NARROW 5-10m [2]	☒ ☒-RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☐ ☐'-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☒ ☒-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY POOL: 9

MAX. DEPTH: (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☒ >1m [6]			
☐ 0.7-1m [4]	☒ POOL WIDTH > RIFFLE WIDTH [2]	☐'-TORRENTIAL[-1]	☐'-EDDIES[1]
☐ 0.4-0.7m [2]	☐ -POOL WIDTH = RIFFLE WIDTH [1]	☐'-FAST[1]	☐'-INTERSTITIAL[-1]
☐ < 0.4m [1]	☐'-POOL WIDTH < RIFFLE W. [0]	☒ -MODERATE [1]	☐'-INTERMITTENT[-2]
☐ <0.2m [Pool = 0]		☐'-SLOW [1]	

☐ NO POOL[0]

COMMENTS: ____

RIFFLE: 3

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE (artificial)	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☒ STABLE (e.g.,Cobble, Boulder) [2]	☐ EXTENSIVE [-1]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐ MOD. STABLE (e.g.,Pea Gravel) [1]	☒ MODERATE[0]
☒ - GENERALLY 5-10 cm [1]	☐ UNSTABLE (Gravel,Sand) [0]	☐ LOW. [1]
☐ - GENERALLY < 5 cm [Riffle = 0]		☐ NONE[2]

☐ NO RIFFLE[0]

COMMENTS ____

GRADIENT: 4

6] Gradient (feet/mile): 2.640 %POOL: 92 %RIFFLE: 8 %RUN: ____

EPA 4520

Procedure No.	WQPA–SWS–3	Date Issued	9-30-89
Revision No.	6	Date Effective	9-30-89

LP2 8/8/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

Stream: Little Pigeon RM: _____ Date: 8/8/99 River Code: _____

Location: LP2 Crew: CWB, EJB

QHEI SCORE: 46 46

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*);

SUBSTRATE SCORE: 9

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]			☐ ☐-GRAVEL [7]	X	X
☐ ☐-BOULDER [9]			☒ ☒-SAND [6]	X	X
☐ ☐-COBBLE [8]			☐ ☐-BEDROCK[5]		
☒ ☐-HARDPAN [4]	X		☐ ☐-DETRITUS[3]		
☐ ☐-MUCK [2]			☐ ☐-ARTIFIC.[0]		

Riffles were gravel and sand but hard no water

SUBSTRATE QUALITY

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1] ☒-TILLS [1] ☒-HARDPAN [0] ☐-SILT NORMAL [0] ☐-SILT FREE [1] ☐-SANDSTONE [0] ☐-SHALE [-1] ☐-COAL FINES [-2]

Silt Cover (Check One): ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☒—MODERATE [-1] ☐—LOW [0] ☐—NONE [1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐- 4 [2] ☒ <= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: _____

COVER SCORE: 9

2] INSTREAM COVER

TYPE (Check *All* That Apply)

☐ -UNDERCUT BANKS [1]
☒ -OVERHANGING VEGETATION [1]
☒ -SHALLOWS (IN SLOW WATER) [1]
☒ -DEEP POOLS [2]
☒ -ROOTWADS [1]
☐ -BOULDERS [1]
☐ -OXBOWS [1]
☐ -AQUATIC MACROPHYTES [1]
☒ -LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5% [1]

COMMENTS: _____

CHANNEL: 10

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ - LOW [2]	☒ - FAIR [3]	☒ RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: _____

RIPARIAN: 6 12

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

"River Right Looking Downstream"

RIPARIAN WIDTH (L R (Per Bank))	EROSION/RUNOFF - FLOOD PLAIN QUALITY (L R (Most Predominant Per Bank))	FLOOD PLAIN QUALITY (L R (Per Bank))	BANK EROSION
☐ ☐-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☒ ☒-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐-NONE[0]			

COMMENTS: _____

POOL: 4

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☐ - >1m [6]			
☒ 0.7-1m [4]	☒ POOL WIDTH > RIFFLE WIDTH [2]	☐ -TORRENTIAL[-1]	☐ -EDDIES[1]
☐ 0.4-0.7m [2]	☐ -POOL WIDTH = RIFFLE WIDTH [1]	☐ -FAST[1]	☐ -INTERSTITIAL[-1]
☐ < 0.4m [1]	☐ -POOL WIDTH < RIFFLE W. [0]	☐ -MODERATE [1]	☒ -INTERMITTENT[-2]
☐ <0.2m [Pool = 0]		☐ -SLOW [1]	

No Flow

☐ - NO POOL [0]

COMMENTS: _____

RIFFLE: 0

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☒-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☐-LOW. [1] ☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☒-UNSTABLE (Gravel,Sand) [0]	☒ NO RIFFLE [0]
☒ - GENERALLY < 5 cm [Riffle = 0] No Water		

COMMENTS _____

GRADIENT: 2

6] Gradient (feet/mile): 1.379 %POOL: 100 %RIFFLE: _____ %RUN: _____

4

1

Glide

EPA 4520

BC1
8/9/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish — **QHEI SCORE:** 53 SC

Stream: Blue Grass Creek RM: ____ Date: 8/9/99 River Code: ____
Location: BC1 Crew: CWB/ESB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*): — **SUBSTRATE SCORE:** 9

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]	____	____	☐ ☐-GRAVEL [7]	____	____
☐ ☐-BOULDER [9]	____	____	☒ ☒-SAND [6]	X	____
☐ ☐-COBBLE [8]	____	____	☐ ☐-BEDROCK[5]	____	____
☐ ☐-HARDPAN [4]	____	____	☐ ☐-DETRITUS[3]	____	____
☐ ☐-MUCK [2]	____	____	☐ ☐-ARTIFIC.[0]	____	____

TOTAL NUMBER OF SUBSTRATE TYPES: ☐- 4 [2] ☐— <= 4 [0]

SUBSTRATE QUALITY

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☐-HARDPAN [0] ☐-TILLS [1] ☒-SANDSTONE [0] ☐-SHALE [-1] ☒-COAL FINES [-2]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☒-MODERATE[-1] ☐—LOW[0] ☐—NONE[1]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

COVER SCORE: 8

2] INSTREAM COVER

TYPE (Check *All* That Apply): ☐-UNDERCUT BANKS [1] ☐-OVERHANGING VEGETATION [1] ☒-SHALLOWS (IN SLOW WATER) [1] ☒-DEEP POOLS [2] ☒-ROOTWADS [1] ☐-BOULDERS [1] ☐-OXBOWS [1] ☐-AQUATIC MACROPHYTES [1] ☒-LOGS OR WOODY DEBRIS [1]

AMOUNT(Check *ONLY* One or check 2 and *AVERAGE*): ☐ - EXTENSIVE > 75% [11] ☐ - MODERATE 25-75% [7] ☒ - SPARSE 5-25% [3] ☐ - NEARLY ABSENT < 5%[1]

COMMENTS: ____

CHANNEL: 14 -11

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☒ MODERATE [3]	☒ - GOOD [5]	☒ - RECOVERED [4]	☒ MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☐ - LOW [2]	☐ - FAIR [3]	☐ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

RIPARIAN: 12

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)
"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐ ☐'-WIDE>50m [4]	☒ ☒-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐'-MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐'-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐'-NONE[0]			

COMMENTS: ____

POOL: 6

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH (Check 1): ☐- >1m [6] ☒-0.7-1m [4] ☐- 0.4-0.7m [2] ☐- < 0.4m [1] ☐—<0.2m [Pool = 0]

MORPHOLOGY (Check 1): No Riffle ☐'-POOL WIDTH > RIFFLE WIDTH [2] ☒-POOL WIDTH = RIFFLE WIDTH [1] ☐'-POOL WIDTH < RIFFLE W. [0]

POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply): ☐'-TORRENTIAL[-1] ☐'-EDDIES[1] ☐'-FAST[1] ☐'-INTERSTITIAL[-1] ☐'-MODERATE [1] ☐'-INTERMITTENT[-2] ☒-SLOW [1]

☐- NO POOL[0]

COMMENTS: ____

RIFFLE: 0

RIFFLE/RUN DEPTH: ☐ - GENERALLY >10 cm,MAX>50 [4] ☐ - GENERALLY >10 cm,MAX<50 [3] ☐ - GENERALLY 5-10 cm [1] ☐ - GENERALLY < 5 cm [Riffle = 0]

RIFFLE/RUN SUBSTRATE: ☐-STABLE (e.g.,Cobble, Boulder) [2] ☐-MOD. STABLE (e.g.,Pea Gravel) [1] ☐-UNSTABLE (Gravel,Sand) [0]

RIFFLE/RUN EMBEDDEDNESS: ☐-EXTENSIVE [-1] ☐-MODERATE[0] ☐-LOW. [1] ☐-NONE[2] ☒-NO RIFFLE[0]

COMMENTS: ____

GRADIENT: 4

6] Gradient (feet/mile): 1.692 %POOL: 92 %RIFFLE: 0 %RUN: 8
Glide

EPA 4520

350

Procedure No.	WQPA-SWS-3	Date Issued	9-30-89
Revision No.	6	Date Effective	9-30-89

BC 2
9/10/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: ~~47~~ 45 41

Stream Chuquesse RM ____ Date 8/10/99 River Code ____
Location BC 2 Crew P. W. S. SB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*):

TYPE	POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]	____	____
☐ ☐-BOULDER [9]	____	____
☐ ☐-COBBLE [8]	____	____
☐ ☐-HARDPAN [4]	____	____
☐ ☐-MUCK [2]	____	____
☐ ☒-GRAVEL [7]	X	____
☐ ☒-SAND [6]	X	____
☐ ☐-BEDROCK[5]	____	____
☐ ☐-DETRITUS[3]	____	____
☐ ☐-ARTIFIC.[0]	____	____

SUBSTRATE QUALITY

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☒-TILLS [1] ☐-HARDPAN [0] ☒-SANDSTONE [0] ☐-SHALE [-1]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☐ - SILT NORMAL [0] ☐ - SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☒—MODERATE[-1] ☐—LOW[0] ☐—NONE[1]

SUBSTRATE SCORE: ~~18~~ 14 7

TOTAL NUMBER OF SUBSTRATE TYPES: ☐- 4 [2] ☒- <= 4 [0] ☐-COAL FINES [-2]
NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)
COMMENTS ____

COVER SCORE: 9

2] INSTREAM COVER

TYPE (Check *All* That Apply)
☒-UNDERCUT BANKS [1]
☒-OVERHANGING VEGETATION [1]
☐ -SHALLOWS (IN SLOW WATER) [1]
☒-DEEP POOLS [2]
☒-ROOTWADS [1]
☒-BOULDERS [1]
☐ -OXBOWS [1]
☐ -AQUATIC MACROPHYTES [1]
☒-LOGS OR WOODY DEBRIS [1]

AMOUNT(Check *ONLY* One or check 2 and *AVERAGE*)
☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5%[1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) CHANNEL: 11

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☒ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☐ - LOW [2]	☒ - FAIR [3]	☒ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 6
"River Right Looking Downstream"

RIPARIAN WIDTH (L R (Per Bank)):
☐ ☐-WIDE>50m [4]
☐ ☐-MODERATE 10-50 [3]
☐ ☐-NARROW 5-10m [2]
☒ ☒-VERY NARROW 1-5m [1]
☐ ☐-NONE[0]

EROSION/RUNOFF - FLOOD PLAIN QUALITY (L R (Most Predominant Per Bank)):
☐ ☐-FOREST, SWAMP [3]
☒ ☒-OPEN PASTURE/ ROWCROP[0]
☐ ☐- RESID.,PARK,NEW FIELD [1]
☐ ☐-FENCED PASTURE [1]
☐ ☐-URBAN OR INDUSTRIAL[0]
☐ ☐-SHRUB OR OLD FIELD[2]
☐ ☐-CONSERV. TILLAGE [1]
☐ ☐-MINING/CONSTRUCTION [0]

BANK EROSION (L R (Per Bank)):
☐ ☐-NONE OR LITTLE [3]
☒ ☒-MODERATE [2]
☐ ☐-HEAVY OR SEVERE[1]

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY POOL: 6

MAX. DEPTH (Check 1):
☐ - >1m [6]
☒ - 0.7-1m [4]
☐ - 0.4-0.7m [2]
☐ - < 0.4m [1]
☐ —<0.2m [Pool = 0]

MORPHOLOGY (Check 1):
☐ -POOL WIDTH > RIFFLE WIDTH [2]
☒ -POOL WIDTH = RIFFLE WIDTH [1]
☐ -POOL WIDTH < RIFFLE W. [0]

POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply):
☐ -TORRENTIAL[-1]
☐ -FAST[1]
☐ -MODERATE [1]
☒ -SLOW [1]
☐ -EDDIES[1]
☐ -INTERSTITIAL[-1]
☐ -INTERMITTENT[-2]

☐ NO POOL[0]

COMMENTS: ____

RIFFLE: 0

RIFFLE/RUN DEPTH
☐ - GENERALLY >10 cm,MAX>50 [4]
☐ - GENERALLY >10 cm,MAX<50 [3]
☐ - GENERALLY 5-10 cm [1]
☐ - GENERALLY < 5 cm [Riffle = 0]

RIFFLE/RUN SUBSTRATE
☐-STABLE (e.g.,Cobble, Boulder) [2]
☐-MOD. STABLE (e.g.,Pea Gravel) [1]
☐-UNSTABLE (Gravel,Sand) [0]

RIFFLE/RUN EMBEDDEDNESS
☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐-LOW. [1] ☐-NONE[2]
☒ ☐-NO RIFFLE[0]

COMMENTS ____

GRADIENT: 2

6] Gradient (feet/mile): .733 %POOL: 100 %RIFFLE: ____ %RUN: ____

EPA 4520

BC3
8/11/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 48

Stream: Bluegrass Creek RM: Date: 8/11/99 River Code:
Location: BC3 Crew: CWB/EJR

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; *Check all types present*): SUBSTRATE SCORE: 13

TYPE	POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]		
☐ ☐-BOULDER [9]	X	
☐ ☐-COBBLE [8]	X	
☐ ☐-HARDPAN [4]		
☐ ☐-MUCK [2]		
☐ ☐-GRAVEL [7]	X	X
☐ ☐-SAND [6]	X	X
☐ ☐-BEDROCK[5]		
☐ ☐-DETRITUS[3]		
☐ ☐-ARTIFIC.[0]	X	

SUBSTRATE QUALITY

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☐-TILLS [1] ☐-HARDPAN [0] ☐-SANDSTONE [0] ☐-SHALE [-1] ☐-COAL FINES [-2]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☐—MODERATE[-1] ☐—LOW[0] ☐—NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐-> 4 [2] ☐—<= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS:

2] INSTREAM COVER — COVER SCORE: 9

TYPE (Check *All* That Apply): ☐-UNDERCUT BANKS [1] ☐-DEEP POOLS [2] ☐-OXBOWS [1] ☐-OVERHANGING VEGETATION [1] ☐-ROOTWADS [1] ☐-AQUATIC MACROPHYTES [1] ☐-SHALLOWS (IN SLOW WATER) [1] ☐-BOULDERS [1] ☐-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): ☐ - EXTENSIVE > 75% [11] ☐ - MODERATE 25-75% [7] ☐ - SPARSE 5-25% [3] ☐ - NEARLY ABSENT < 5%[1]

COMMENTS:

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) — CHANNEL: 10

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING ☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☐ - MODERATE [2]	☐ - RELOCATION ☐ - ISLANDS
☐ - LOW [2]	☐ - FAIR [3]	☐ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL ☐ - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING ☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS

COMMENTS:

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — RIPARIAN: 6

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Per Bank)	BANK EROSION
☐ ☐-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-HEAVY OR SEVERE[1]
☐ ☐-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	
☐ ☐-NONE[0]	☐ ☐-CONSERV. TILLAGE [1]	
	☐ ☐-MINING/CONSTRUCTION [0]	

COMMENTS:

POOL/GLIDE AND RIFFLE/RUN QUALITY — POOL: 5

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)
☐- >1m [6]	☐-POOL WIDTH > RIFFLE WIDTH [2]	☐-TORRENTIAL[-1] ☐-EDDIES[1]
☐-0.7-1m [4]	☐-POOL WIDTH = RIFFLE WIDTH [1]	☐-FAST[1] ☐-INTERSTITIAL[-1]
☐- 0.4-0.7m [2]	☐-POOL WIDTH < RIFFLE W. [0]	☐-MODERATE [1] ☐-INTERMITTENT[-2]
☐- < 0.4m [1]		☐-SLOW [1]
☐—<0.2m [Pool = 0]		

☐-NO POOL[0]

COMMENTS:

RIFFLE — RIFFLE: 1

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☐-LOW. [1] ☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☐-UNSTABLE (Gravel,Sand) [0]	
☐ - GENERALLY < 5 cm [Riffle = 0]		

☐-NO RIFFLE[0]

COMMENTS

GRADIENT: 4

6] Gradient (feet/mile): 1.294 %POOL: 87 %RIFFLE: %RUN: 11

Glide

EPA 4520

3/13

WD1
8/12/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: [31]

Stream Winnesenheimer Ditch RM _____ Date 8/12/99 River Code _____

Location WD1 Crew: CWB/ESB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); **SUBSTRATE SCORE:** [1]

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE	SUBSTRATE QUALITY
☐ O-BLDER /SLABS[10]			☐ O-GRAVEL [7]			Substrate Origin (Check all)
☐ O-BOULDER [9]			☐ O-SAND [6]			O-LIMESTONE [1]
☐ O-COBBLE [8]			☐ O-BEDROCK[5]			O-TILLS [1]
☐ O-HARDPAN [4]			☐ O-DETRITUS[3]			O-SANDSTONE [0]
☐ O-MUCK [2]	X		☐ O-ARTIFIC.[0]	X		O-SHALE [-1]

O-RIP/RAP [0] O-HARDPAN [0]

TOTAL NUMBER OF SUBSTRATE TYPES: O- > 4 [2] X- <= 4 [0] O-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS _____

Silt Cover (Check One): O-SILT HEAVY [-2] X-SILT MODERATE [-1] O - SILT NORMAL [0] O - SILT FREE [1]

Extent Of Embeddness (Check One): O—EXTENSIVE [-2] X-MODERATE[-1] O—LOW[0] O—NONE[1]

COVER SCORE: [5]

2] INSTREAM COVER

TYPE (Check *All* That Apply): O -UNDERCUT BANKS [1]; O -OVERHANGING VEGETATION [1]; X-SHALLOWS (IN SLOW WATER) [1]; X-DEEP POOLS [2]; O -ROOTWADS [1]; O -BOULDERS [1]; O -OXBOWS [1]; O -AQUATIC MACROPHYTES [1]; X-LOGS OR WOODY DEBRIS [1]

AMOUNT(Check *ONLY* One or check 2 and *AVERAGE*): O - EXTENSIVE > 75% [11]; O - MODERATE 25-75% [7]; O - SPARSE 5-25% [3]; X - NEARLY ABSENT < 5%[1]

COMMENTS: _____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) **CHANNEL:** [9]

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
X - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	X-MODERATE [2]	O - RELOCATION	O - ISLANDS
O - LOW [2]	O - FAIR [3]	X-RECOVERING [3]	O - LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	X-POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: _____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) **RIPARIAN:** [12]

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank) L R (Per Bank)	BANK EROSION
O-WIDE>50m [4]	X-FOREST, SWAMP [3]	O-URBAN OR INDUSTRIAL[0]
O-MODERATE 10-50 [3]	O-OPEN PASTURE/ ROWCROP[0]	O-SHRUB OR OLD FIELD[2]
O-NARROW 5-10m [2]	O- RESID.,PARK,NEW FIELD [1]	O-CONSERV. TILLAGE [1]
X-VERY NARROW 1-5m [1]	O-FENCED PASTURE [1]	O-MINING/CONSTRUCTION [0]
O-NONE[0]		

O-NONE OR LITTLE [3]; X-MODERATE [2]; O-HEAVY OR SEVERE[1]

COMMENTS: _____

POOL/GLIDE AND RIFFLE/RUN QUALITY **POOL:** [2]

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
O- >1m [6]	O-POOL WIDTH > RIFFLE WIDTH [2]	O-TORRENTIAL[-1]	O-EDDIES[1]
O- 0.7-1m [4]	X-POOL WIDTH = RIFFLE WIDTH [1]	O-FAST[1]	X-INTERSTITIAL[-1]
X-0.4-0.7m [2]	O-POOL WIDTH < RIFFLE W. [0]	O-MODERATE [1]	O-INTERMITTENT[-2]
O- < 0.4m [1]		O-SLOW [1]	
O—<0.2m [Pool = 0]			

O-NO POOL[0]

COMMENTS: _____

RIFFLE: [0]

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
O - GENERALLY >10 cm,MAX>50 [4]	O-STABLE (e.g.,Cobble, Boulder) [2]	O-EXTENSIVE [-1]
O - GENERALLY >10 cm,MAX<50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	O-LOW. [1]
O - GENERALLY 5-10 cm [1]	O-UNSTABLE (Gravel,Sand) [0]	O-NONE[2]
O - GENERALLY < 5 cm [Riffle = 0]		

O-MODERATE[0]; X-NO RIFFLE[0]

COMMENTS _____

GRADIENT: [2]

6] Gradient (feet/mile): .629 %POOL: 100 %RIFFLE: _____ %RUN: _____

EPA 4520

SD1
8/13/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish — QHEI SCORE: 45

Stream: Stollberg Ditch — RM: ____ Date: 8/13/99 — River Code: ____

Location: SD1 — Crew: ESB · CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; *Check all types present*); — SUBSTRATE SCORE: 12

TYPE	POOL	RIFFLE
☐ ☐-BLDER./SLABS[10]	____	____
☐ ☐-BOULDER [9]	____	____
☐ ☐-COBBLE [8]	____	X
☐ ☐-HARDPAN [4]	____	____
☐ ☐-MUCK [2]	____	____

☐ ☒-GRAVEL [7]	____	X
☐ ☒-SAND [6]	____	X
☐ ☐-BEDROCK[5]	____	____
☐ ☐-DETRITUS[3]	____	____
☐ ☐-ARTIFIC.[0]	____	____

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☐-TILLS [1] ☐-HARDPAN [0] ☒-SANDSTONE [0] ☐-SHALE [-1]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☒—MODERATE[-1] ☐—LOW[0] ☐—NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐> 4 [2] ☒ <= 4 [0] ☐-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

2] INSTREAM COVER — COVER SCORE: 6

TYPE (Check *All* That Apply)

☐-UNDERCUT BANKS [1]
☐-OVERHANGING VEGETATION [1]
☒-SHALLOWS (IN SLOW WATER) [1]
☒-ROOTWADS [1]
☐-BOULDERS [1]
☐-OXBOWS [1]
☐-AQUATIC MACROPHYTES [1]
☒-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) — CHANNEL: 10

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ - LOW [2]	☒ - FAIR [3]	☒ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — RIPARIAN: 12

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	FLOOD PLAIN QUALITY L R (Per Bank)	BANK EROSION
☐ ☐'-WIDE>50m [4]	☒ ☒-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐'-MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE.[2]
☐ ☐'-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐'-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY — POOL: 0

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☐- >1m [6]	☐'-POOL WIDTH > RIFFLE WIDTH [2]	☐'-TORRENTIAL[-1]	☐'-EDDIES[1]
☐- 0.7-1m [4]	☐-POOL WIDTH = RIFFLE WIDTH [1]	☐'-FAST[1]	☐'-INTERSTITIAL[-1]
☐- 0.4-0.7m [2]	☐'-POOL WIDTH < RIFFLE W. [0]	☐'-MODERATE [1]	☐'-INTERMITTENT[-2]
☐- < 0.4m [1]		☐'-SLOW [1]	
☐—<0.2m [Pool = 0]			

☒ NO POOL[0]

COMMENTS: ____

RIFFLE/RUN — RIFFLE: 1

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☒-MODERATE[0]
☒-GENERALLY 5-10 cm [1]	☒-UNSTABLE (Gravel,Sand) [0]	☐-LOW. [1]
☐ - GENERALLY < 5 cm [Riffle = 0]		☐-NONE[2]

☐-NO RIFFLE[0]

COMMENTS: ____

GRADIENT: 4

6] Gradient (feet/mile): .0002 — %POOL: 0 — %RIFFLE: 14 — %RUN: 86

EPA 4520

UN 1 8/12/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

QHEI SCORE: 32

Stream: Un Named trib RM: ____ Date: 8/12/ River Code: ____
Location: ____ Crew: EFB/CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*);

SUBSTRATE SCORE: 8

TYPE	POOL	RIFFLE		POOL	RIFFLE	SUBSTRATE QUALITY
☐ ☐-BLDER /SLABS[10]			☐ ☒-GRAVEL [7]	✓		Substrate Origin (Check all)
☐ ☐-BOULDER [9]			☐ ☐-SAND [6]			☐-LIMESTONE [1] ☐-RIP/RAP [0]
☐ ☐-COBBLE [8]			☐ ☐-BEDROCK[5]			☒-TILLS [1] ☐-HARDPAN [0]
☐ ☐-HARDPAN [4]			☐ ☐-DETRITUS[3]			☐-SANDSTONE [0]
☒ ☐-MUCK [2]	✓		☐ ☐-ARTIFIC.[0]			☐-SHALE [-1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐> 4 [2] ☒< <= 4 [0] ☐-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☒—MODERATE[-1] ☐—LOW[0] ☐—NONE[1]

2] INSTREAM COVER

COVER SCORE: 2

TYPE (Check *All* That Apply)

☐ -UNDERCUT BANKS [1] ☐ -DEEP POOLS [2] ☐ -OXBOWS [1]
☐ -OVERHANGING VEGETATION [1] ☐ -ROOTWADS [1] ☐ -AQUATIC MACROPHYTES [1]
☐ -SHALLOWS (IN SLOW WATER) [1] ☐ -BOULDERS [1] ☒ -LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)
☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☐ - SPARSE 5-25% [3]
☒ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

CHANNEL: 10

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ - LOW [2]	☒ - FAIR [3]	☒ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

RIPARIAN: 9

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐ ☐-WIDE>50m [4]	☐ ☒-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☒ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY

POOL: 1

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)		
☐ - >1m [6]				
☐ - 0.7-1m [4]	☐ -POOL WIDTH > RIFFLE WIDTH [2]	☐ -TORRENTIAL[-1]	☐ -EDDIES[1]	
☐ - 0.4-0.7m [2]	☒ -POOL WIDTH = RIFFLE WIDTH [1]	☐ -FAST[1]	☒ -INTERSTITIAL[-1]	☐ NO POOL[0]
☒ - < 0.4m [1]	☐ -POOL WIDTH < RIFFLE W. [0]	☐ -MODERATE [1]	☐ -INTERMITTENT[-2]	
☐ —<0.2m [Pool = 0]		☐ -SLOW [1]		

COMMENTS: ____

RIFFLE: 10

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☐-LOW. [1] ☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☐-UNSTABLE (Gravel,Sand) [0]	☒ NO RIFFLE[0]
☐ - GENERALLY < 5 cm [Riffle = 0]		

COMMENTS ____

GRADIENT: 2

6] Gradient (feet/mile): ____ %POOL: 100 %RIFFLE: ____ %RUN: ____

X

SC 1

8/11/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish — **QHEI SCORE:** [57]

Stream: Squaw Creek RM: _____ Date: 8/11/99 River Code: _____

Location: SC 1 Crew: ESB, CWB, AS

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); **SUBSTRATE SCORE:** [15]

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE	SUBSTRATE QUALITY
☐ ☐-BLDER /SLABS[10]			☐ ☒-GRAVEL [7]	X		Substrate Origin (Check all)
☐ ☐-BOULDER [9]			☐ ☒-SAND [6]	X		☐-LIMESTONE [1] ☐-RIP/RAP [0]
☐ ☐-COBBLE [8]			☐ ☐-BEDROCK[5]		X	☒-TILLS [1] ☒-HARDPAN [0]
☐ ☐-HARDPAN [4]	X		☐ ☐-DETRITUS[3]			☐-SANDSTONE [0]
☐ ☐-MUCK [2]	X		☐ ☐-ARTIFIC.[0]	X		☐-SHALE [-1]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐-EXTENSIVE [-2] ☐-MODERATE[-1] ☒-LOW[0] ☐-NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: [X] 4 [2] ☐ <= 4 [0] ☐-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: _____

2] INSTREAM COVER — **COVER SCORE:** [10]

TYPE (Check *All* That Apply)

☐-UNDERCUT BANKS [1]
☒-OVERHANGING VEGETATION [1]
☒-SHALLOWS (IN SLOW WATER) [1]
☒-DEEP POOLS [2]
☒-ROOTWADS [1]
☐-BOULDERS [1]
☐-OXBOWS [1]
☒-AQUATIC MACROPHYTES [1]
☒-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

☐-EXTENSIVE > 75% [11]
☐-MODERATE 25-75% [7]
☒-SPARSE 5-25% [3]
☐-NEARLY ABSENT < 5% [1]

COMMENTS: _____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) — **CHANNEL:** [10]

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐-HIGH [4]	☐-EXCELLENT [7]	☐-NONE [6]	☐-HIGH [3]	☐-SNAGGING	☐-IMPOUND.
☐-MODERATE [3]	☐-GOOD [5]	☐-RECOVERED [4]	☒-MODERATE [2]	☐-RELOCATION	☐-ISLANDS
☒-LOW [2]	☒-FAIR [3]	☒-RECOVERING [3]	☐-LOW [1]	☐-CANOPY REMOVAL	☐-LEVEED
☐-NONE [1]	☐-POOR [1]	☐-RECENT OR NO RECOVERY [1]		☐-DREDGING	☐-BANK SHAPING
				☐-ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: _____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — **RIPARIAN:** [12]

River Right Looking Downstream

RIPARIAN WIDTH (L R) (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY (L R) (Most Predominant Per Bank)	(L R) (Per Bank)	BANK EROSION
☐ ☐-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☒ ☒-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐-NONE[0]			

COMMENTS: _____

POOL/GLIDE AND RIFFLE/RUN QUALITY — **POOL:** [6]

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☐-> 1m [6]	☐-POOL WIDTH > RIFFLE WIDTH [2]	☐-TORRENTIAL[-1]	☐-EDDIES[1]
☒-0.7-1m [4]	☒-POOL WIDTH = RIFFLE WIDTH [1]	☐-FAST[1]	☐-INTERSTITIAL[-1]
☐-0.4-0.7m [2]	☐-POOL WIDTH < RIFFLE W. [0]	☐-MODERATE [1]	☐-INTERMITTENT[-2]
☐-< 0.4m [1]		☒-SLOW [1]	
☐-<0.2m [Pool = 0]			

☐-NO POOL[0]

COMMENTS: _____

RIFFLE: [0]

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐-GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐-GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☐-LOW. [1] ☐-NONE[2]
☐-GENERALLY 5-10 cm [1]	☐-UNSTABLE (Gravel,Sand) [0]	☒-NO RIFFLE[0]
☐-GENERALLY < 5 cm [Riffle = 0]		

COMMENTS: _____

GRADIENT: [4]

6] Gradient (feet/mile): 1.158 %POOL: 100 %RIFFLE: _____ %RUN: _____

BG1
8/14/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

QHEI SCORE: ~~47~~ 45

Stream: Big Creek RM: ____ Date: 8/14/99 River Code: ____

Location: BG1 Crew: CWB/ESB

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); SUBSTRATE SCORE: ~~14~~ 12

TYPE	POOL	RIFFLE		POOL	RIFFLE	SUBSTRATE QUALITY
☐ ☐-BLDER /SLABS[10]			☒-GRAVEL [7]	X	X	Substrate Origin (Check all)
☐ ☐-BOULDER [9]			☐-SAND [6]	X	X	☐-LIMESTONE [1] ☐-RIP/RAP [0]
☐ ☐-COBBLE [8]		X	X	☐-BEDROCK[5]		☒-TILLS [1] ☒-HARDPAN [0]
☐ ☐-HARDPAN [4]		X	X	☐-DETRITUS[3]		☐-SANDSTONE [0]
☐ ☐-MUCK [2]				☐-ARTIFIC.[0]		☐-SHALE [-1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☒ > 4 [2] ☒ <= 4 [0] ☐-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☐—MODERATE[-1] ☒—LOW[0] ☐—NONE[1]

COVER SCORE: 8

2) INSTREAM COVER

TYPE (Check *All* That Apply)

☐-UNDERCUT BANKS [1]
☐-OVERHANGING VEGETATION [1]
☒-SHALLOWS (IN SLOW WATER) [1]
☒-DEEP POOLS [2]
☐-ROOTWADS [1]
☐-BOULDERS [1]
☐-OXBOWS [1]
☒-AQUATIC MACROPHYTES [1]
☒-LOGS OR WOODY DEBRIS [1]

AMOUNT(Check *ONLY* One or check 2 and *AVERAGE*)

☐-EXTENSIVE > 75% [11]
☐-MODERATE 25-75% [7]
☒-SPARSE 5-25% [3]
☐-NEARLY ABSENT < 5%[1]

COMMENTS: ____

CHANNEL: 8

3) CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐-HIGH [4]	☐-EXCELLENT [7]	☐-NONE [6]	☐-HIGH [3]	☐-SNAGGING	☐-IMPOUND.
☐-MODERATE [3]	☐-GOOD [5]	☐-RECOVERED [4]	☒-MODERATE [2]	☐-RELOCATION	☐-ISLANDS
☒-LOW [2]	☐-FAIR [3]	☒-RECOVERING [3]	☐-LOW [1]	☐-CANOPY REMOVAL	☐-LEVEED
☐-NONE [1]	☒-POOR [1]	☐-RECENT OR NO RECOVERY [1]		☐-DREDGING	☐-BANK SHAPING
				☐-ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

RIPARIAN: 6

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

"River Right Looking Downstream"

RIPARIAN WIDTH (Per Bank) L R	EROSION/RUNOFF - FLOOD PLAIN QUALITY (Most Predominant Per Bank) L R	BANK EROSION (Per Bank) L R
☐-WIDE>50m [4]	☐-FOREST, SWAMP [3]	☐-URBAN OR INDUSTRIAL[0]
☐-MODERATE 10-50 [3]	☒-OPEN PASTURE/ ROWCROP[0]	☐-SHRUB OR OLD FIELD[2]
☐-NARROW 5-10m [2]	☐-RESID.,PARK,NEW FIELD [1]	☐-CONSERV. TILLAGE [1]
☒-VERY NARROW 1-5m [1]	☐-FENCED PASTURE [1]	☐-MINING/CONSTRUCTION [0]
☐-NONE[0]		

☐-NONE OR LITTLE [3]
☒-MODERATE.[2]
☐-HEAVY OR SEVERE[1]

COMMENTS: ____

POOL: 5

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *all* That Apply)	
☐-> 1m [6]	☒-POOL WIDTH > RIFFLE WIDTH [2]	☐-TORRENTIAL[-1]	☐-EDDIES[1]
☐-0.7-1m [4]	☐-POOL WIDTH = RIFFLE WIDTH [1]	☐-FAST[1]	☐-INTERSTITIAL[-1]
☒-0.4-0.7m [2]	☐-POOL WIDTH < RIFFLE W. [0]	☐-MODERATE [1]	☐-INTERMITTENT[-2]
☐-< 0.4m [1]		☒-SLOW [1]	
☐—<0.2m [Pool = 0]			

☐-NO POOL[0]

COMMENTS: ____

RIFFLE: 2

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐-GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐-GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☒-LOW. [1] ☐-NONE[2]
☒-GENERALLY 5-10 cm [1]	☒-UNSTABLE (Gravel,Sand) [0]	
☐-GENERALLY < 5 cm [Riffle = 0]		

☐-NO RIFFLE[0]

COMMENTS: ____

GRADIENT: 4

6) Gradient (feet/mile): 1.630 %POOL: 30 %RIFFLE: 2 %RUN: 28

EPA 4520

310

Glider

BG2

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish — **QHEI SCORE:** [68] 56

Stream: Big Creek — RM: ____ Date: 6/13/99 — River Code: ____

Location: BG2 — Crew: EJB / CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); — **SUBSTRATE SCORE:** [8] 13

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
☐-BLDER /SLABS[10]			☒-GRAVEL [7]		
☐-BOULDER [9]	X		☒-SAND [6]		
☐-COBBLE [8]	X		☐-BEDROCK[5]		
☐-HARDPAN [4]	X		☐-DETRITUS[3]	X	
☐-MUCK [2]			☐-ARTIFIC.[0]		

TOTAL NUMBER OF SUBSTRATE TYPES: ☒ 4 [2] ☒ <= 4 [0]

SUBSTRATE QUALITY

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☐-TILLS [1] ☒-HARDPAN [0] ☒-SANDSTONE [0] ☐-SHALE [-1] ☐-COAL FINES [-2]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☒-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☐—MODERATE[-1] ☒—LOW[0] ☐—NONE[1]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

COVER SCORE: [6] 14

2] INSTREAM COVER

TYPE (Check *All* That Apply): ☐-UNDERCUT BANKS [1] ☒-OVERHANGING VEGETATION [1] ☒-SHALLOWS (IN SLOW WATER) [1] ☒-DEEP POOLS [2] ☒-ROOTWADS [1] ☒-BOULDERS [1] ☐-OXBOWS [1] ☐-AQUATIC MACROPHYTES [1] ☒-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): ☐ - EXTENSIVE > 75% [11] ☒ - MODERATE 25-75% [7] ☐ - SPARSE 5-25% [3] ☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) — **CHANNEL:** [13]

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☒ - GOOD [5]	☒ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ - LOW [2]	☐ - FAIR [3]	☐ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☒ - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — **RIPARIAN:** [6] 6

River Right Looking Downstream

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐☐-WIDE>50m [4]	☐☐-FOREST, SWAMP [3]	☐☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐☐-MODERATE 10-50 [3]	☒☒-OPEN PASTURE/ ROWCROP[0]	☐☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐☐-NARROW 5-10m [2]	☐☐- RESID.,PARK,NEW FIELD [1]	☐☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒☒-VERY NARROW 1-5m [1]	☐☐-FENCED PASTURE [1]	☐☐-MINING/CONSTRUCTION [0]	
☐☐-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY — **POOL:** [6]

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☒ >1m [6]		☐-TORRENTIAL[-1]	☐-EDDIES[1]
☐- 0.7-1m [4]	☐-POOL WIDTH > RIFFLE WIDTH [2]	☐-FAST[1]	☒-INTERSTITIAL[-1]
☐- 0.4-0.7m [2]	☒-POOL WIDTH = RIFFLE WIDTH [1]	☐-MODERATE [1]	☐-INTERMITTENT[-2]
☐- < 0.4m [1]	☐-POOL WIDTH < RIFFLE W. [0]	☐-SLOW [1]	
☐—<0.2m [Pool = 0]			

☐-NO POOL[0]

COMMENTS: ____

RIFFLE: [0]

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☐-LOW. [1] ☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☐-UNSTABLE (Gravel,Sand) [0]	
☐ - GENERALLY < 5 cm [Riffle = 0]		

☒-NO RIFFLE[0]

COMMENTS ____

GRADIENT: [4]

6] Gradient (feet/mile): 1.200 — %POOL: 100 — %RIFFLE: ____ — %RUN: ____

EPA 4520

61-16

SF1
8/14/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 50 48

Stream: Smith Fork RM: Date: 8/14/99 River Code:
Location: SF1 Crew: EJB/EWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; *Check all types present*);

TYPE	POOL	RIFFLE	POOL	RIFFLE	SUBSTRATE QUALITY
☐ ☐-BLDER /SLABS[10]		☐ ☒-GRAVEL [7]	X	X	Substrate Origin (Check all)
☐ ☐-BOULDER [9]		☐ ☐-SAND [6]	X	X	☐-LIMESTONE [1] ☐-RIP/RAP [0]
☐ ☐-COBBLE [8]	X	X	☐ ☐-BEDROCK[5]		☒-TILLS [1] ☒-HARDPAN [0]
☐ ☒-HARDPAN [4]	X	X	☐ ☐-DETRITUS[3]		☐-SANDSTONE [0]
☐ ☐-MUCK [2]			☐ ☐-ARTIFIC.[0]		☐-SHALE [-1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☒ > 4 [2] ☒ <= 4 [0] ☐-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS

SUBSTRATE SCORE: 13 11

Silt Cover (Check One): ☐ - SILT HEAVY [-2] ☒ SILT MODERATE [-1] ☐ - SILT NORMAL [0] ☐ - SILT FREE [1]

Extent Of Embeddness (Check One): ☐ EXTENSIVE [-2] ☐ MODERATE [-1] ☒ LOW [0] ☐ NONE [1]

COVER SCORE: 7

2] INSTREAM COVER

TYPE (Check *All* That Apply): ☐-UNDERCUT BANKS [1] ☒-DEEP POOLS [2] ☐-OXBOWS [1] ☐-OVERHANGING VEGETATION [1] ☐-ROOTWADS [1] ☐-AQUATIC MACROPHYTES [1] ☒-SHALLOWS (IN SLOW WATER) [1] ☐-BOULDERS [1] ☒-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): ☐ - EXTENSIVE > 75% [11] ☐ - MODERATE 25-75% [7] ☒ SPARSE 5-25% [3] ☐ - NEARLY ABSENT < 5% [1]

COMMENTS:

CHANNEL: 18

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ LOW [2]	☐ - FAIR [3]	☒ RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☒ POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS:

RIPARIAN: 12

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

River Right Looking Downstream

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐ ☐-WIDE>50m [4]	☒ ☒-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐-NONE[0]			

COMMENTS:

POOL: 5

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☐ - >1m [6]			
☐ - 0.7-1m [4]	☒-POOL WIDTH > RIFFLE WIDTH [2]	☐'-TORRENTIAL[-1]	☐'-EDDIES[1]
☒ 0.4-0.7m [2]	☐ -POOL WIDTH = RIFFLE WIDTH [1]	☐'-FAST[1]	☐'-INTERSTITIAL[-1]
☐ - < 0.4m [1]	☐'-POOL WIDTH < RIFFLE W. [0]	☐'-MODERATE [1]	☐'-INTERMITTENT[-2]
☐ —<0.2m [Pool = 0]		☒ SLOW [1]	

☐ - NO POOL [0]

COMMENTS:

RIFFLE: 1

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☒ LOW. [1] ☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☒ UNSTABLE (Gravel,Sand) [0]	
☒ GENERALLY < 5 cm [Riffle = 0]		

☐-NO RIFFLE[0]

COMMENTS

GRADIENT: 4

6] Gradient (feet/mile): 1.100 %POOL: 74 %RIFFLE: %RUN: 26

Glide

EPA 4520

SF2
8/14/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish — QHEI SCORE: [X] 49

Stream: Smith Fork — RM: ____ Date: 8/14/99 — River Code: ____

Location: SF2 — Crew: BSD/CLA

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; Check all types present); SUBSTRATE SCORE: [X] 11

TYPE	POOL	RIFFLE			
☐ ☐-BLDER /SLABS[10]			☒ ☐-GRAVEL [7]	X	X
☐ ☐-BOULDER [9]			☐ ☐-SAND [6]	X	X
☐ ☐-COBBLE [8]	X	X	☐ ☐-BEDROCK[5]		
☐ ☒-HARDPAN [4]		X	☐ ☐-DETRITUS[3]		
☐ ☐-MUCK [2]			☐ ☐-ARTIFIC.[0]		

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☒-TILLS [1] ☒-HARDPAN [0] ☐-SANDSTONE [0] ☐-SHALE [-1] ☐-COAL FINES [-2]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☐—MODERATE[-1] ☒—LOW[0] ☐—NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: [X] > 4 [2] [X] <= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

2] INSTREAM COVER — COVER SCORE: 10

TYPE (Check *All* That Apply): ☐-UNDERCUT BANKS [1]; ☒-OVERHANGING VEGETATION [1]; ☒-SHALLOWS (IN SLOW WATER) [1]; ☒-DEEP POOLS [2]; ☒-ROOTWADS [1]; ☐-BOULDERS [1]; ☐-OXBOWS [1]; ☒-AQUATIC MACROPHYTES [1]; ☒-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): ☐ - EXTENSIVE > 75% [11]; ☐ - MODERATE 25-75% [7]; ☒ - SPARSE 5-25% [3]; ☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) — CHANNEL: 10

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING ☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION ☐ - ISLANDS
☒ - LOW [2]	☒ - FAIR [3]	☒ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL ☐ - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING ☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — RIPARIAN: 6

"River Right Looking Downstream"

RIPARIAN WIDTH (L R (Per Bank))	EROSION/RUNOFF - FLOOD PLAIN QUALITY (L R (Per Bank))	BANK EROSION
☐ ☐-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☒ ☒-OPEN PASTURE/ ROWCROP[0]	☒ ☒-MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	
☐ ☐-NONE[0]	☐ ☐-MINING/CONSTRUCTION [0]	

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY — POOL: 7

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)		
☐ - >1m [6]		☐-TORRENTIAL[-1]	☐-EDDIES[1]	
☒ - 0.7-1m [4]	☒-POOL WIDTH > RIFFLE WIDTH [2]	☐-FAST[1]	☐-INTERSTITIAL[-1]	☐ - NO POOL[0]
☐ - 0.4-0.7m [2]	☐ -POOL WIDTH = RIFFLE WIDTH [1]	☐-MODERATE [1]	☐-INTERMITTENT[-2]	
☐ - < 0.4m [1]	☐-POOL WIDTH < RIFFLE W. [0]	☒-SLOW [1]		
☐—<0.2m [Pool = 0]				

COMMENTS: ____

RIFFLE — RIFFLE: 1

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☒-LOW. [1] ☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☒-UNSTABLE (Gravel,Sand) [0]	☐-NO RIFFLE[0]
☒ - GENERALLY < 5 cm [Riffle = 0]		

COMMENTS: ____

GRADIENT: 4

6] Gradient (feet/mile): 1.913 — %POOL: 89 — %RIFFLE: 2 — %RUN: 9

circle 382

EPA 4520

SF3
8/14/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: ~~63~~ 61

Stream Smith fork RM ____ Date 8/14/99 River Code ____
Location ____ Crew: ESG / EWB

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; Check *all types present*); SUBSTRATE SCORE: ~~11~~ 12

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
☐ O-BLDER /SLABS[10]			☒ O-GRAVEL [7]	X	
☐ O-BOULDER [9]			☐ O-SAND [6]	X	
☐ O-COBBLE [8]	X	X	☐ O-BEDROCK[5]		
☒ O-HARDPAN [4]	X	X	☐ O-DETRITUS[3]		
☐ O-MUCK [2]			☐ O-ARTIFIC.[0]		

TOTAL NUMBER OF SUBSTRATE TYPES: ☒ > 4 [2] ☒ <= 4 [0] O-COAL FINES [-2]

Substrate Origin (Check all): O-LIMESTONE [1] O-RIP/RAP [0] ☒ O-TILLS [1] ☒ O-HARDPAN [0] O-SANDSTONE [0] O-SHALE [-1]

SUBSTRATE QUALITY: O-SILT HEAVY [-2] O-SILT MODERATE [-1] ☒ - SILT NORMAL [0] O - SILT FREE [1]

Silt Cover (Check One): O—EXTENSIVE [-2] O—MODERATE[-1] ☒—LOW[0] O—NONE[1]

Extent Of Embeddness (Check One): O—EXTENSIVE [-2] O—MODERATE[-1] ☒—LOW[0] O—NONE[1]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)
COMMENTS ____

2) INSTREAM COVER COVER SCORE: 13

TYPE (Check *All* That Apply): O-UNDERCUT BANKS [1] ☒-DEEP POOLS [2] O-OXBOWS [1] ☒-OVERHANGING VEGETATION [1] ☒-ROOTWADS [1] O-AQUATIC MACROPHYTES [1] ☒-SHALLOWS (IN SLOW WATER) [1] O-BOULDERS [1] ☒-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): O - EXTENSIVE > 75% [11] ☒ - MODERATE 25-75% [7] O - SPARSE 5-25% [3] O - NEARLY ABSENT < 5%[1]

COMMENTS: ____

3) CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) CHANNEL: 11

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
☒ - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	☒ - MODERATE [2]	O - RELOCATION	O - ISLANDS
O - LOW [2]	☒ - FAIR [3]	☒ - RECOVERING [3]	O - LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	O - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 10
River Right Looking Downstream

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
O O-WIDE>50m [4]	☒ O-FOREST, SWAMP [3]	O O-URBAN OR INDUSTRIAL[0]	O O-NONE OR LITTLE [3]
O O-MODERATE 10-50 [3]	☒ O-OPEN PASTURE/ ROWCROP[0]	O O-SHRUB OR OLD FIELD[2]	☒ O-MODERATE[2]
☒ O-NARROW 5-10m [2]	O O- RESID.,PARK,NEW FIELD [1]	O O-CONSERV. TILLAGE [1]	O O-HEAVY OR SEVERE[1]
O O-VERY NARROW 1-5m [1]	O O-FENCED PASTURE [1]	O O-MINING/CONSTRUCTION [0]	
O O-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY POOL: 9

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☒ >1m [6]		O-TORRENTIAL[-1]	O-EDDIES[1]
O- 0.7-1m [4]	☒-POOL WIDTH > RIFFLE WIDTH [2]	O-FAST[1]	O-INTERSTITIAL[-1]
O- 0.4-0.7m [2]	O -POOL WIDTH = RIFFLE WIDTH [1]	O-MODERATE [1]	O-INTERMITTENT[-2]
O- < 0.4m [1]	O-POOL WIDTH < RIFFLE W. [0]	☒-SLOW [1]	
O—<0.2m [Pool = 0]			

O-NO POOL[0]

COMMENTS: ____

RIFFLE: 2

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
O - GENERALLY >10 cm,MAX>50 [4]	O-STABLE (e.g.,Cobble, Boulder) [2]	O-EXTENSIVE [-1] O-MODERATE[0]
O - GENERALLY >10 cm,MAX<50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	☒-LOW. [1] O-NONE[2]
☒ - GENERALLY 5-10 cm [1]	☒-UNSTABLE (Gravel,Sand) [0]	
O - GENERALLY < 5 cm [Riffle = 0]		

O-NO RIFFLE[0]

COMMENTS ____

GRADIENT: 4

6) Gradient (feet/mile): 1.692 %POOL: 93 %RIFFLE: 7 %RUN: ____

chdr

EPA 4520

WF1
8/16/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish — QHEI SCORE: 41

Stream: West Fork of Pigeon — RM: ____ Date: 8/16/99 — River Code: ____

Location: WF1 — Crew: EJB/KWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*);

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]			☐ ☒-GRAVEL [7]	X	X
☐ ☐-BOULDER [9]			☐ ☒-SAND [6]	X	X
☐ ☐-COBBLE [8]			☐ ☐-BEDROCK[5]		
☐ ☐-HARDPAN [4]			☐ ☐-DETRITUS[3]		
☐ ☐-MUCK [2]			☐ ☐-ARTIFIC.[0]		

SUBSTRATE QUALITY — Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☐-TILLS [1] ☐-HARDPAN [0] ☒-SANDSTONE [0] ☐-SHALE [-1] ☐-COAL FINES [-2]

SUBSTRATE SCORE: 4

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☒-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☐—MODERATE[-1] ☒—LOW[0] ☐—NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐> 4 [2] ☒<= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

2] INSTREAM COVER — COVER SCORE: 9

TYPE (Check *All* That Apply):
☐-UNDERCUT BANKS [1]
☒-OVERHANGING VEGETATION [1]
☒-SHALLOWS (IN SLOW WATER) [1]
☒-DEEP POOLS [2]
☐-ROOTWADS [1]
☐-BOULDERS [1]
☐-OXBOWS [1]
☒-AQUATIC MACROPHYTES [1]
☒-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*):
☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) — CHANNEL: 4

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☐ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☐ - LOW [2]	☐ - FAIR [3]	☐ - RECOVERING [3]	☒ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☒ - NONE [1]	☒ - POOR [1]	☒ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box ~~per bank or~~ check 2 and AVERAGE per bank) — RIPARIAN: 6

"River Right Looking Downstream"

RIPARIAN WIDTH (Per Bank) L R	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	BANK EROSION L R
☐ ☐-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☒ ☒-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☒ ☒-MODERATE,[2]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-HEAVY OR SEVERE[1]
☐ ☐-NONE[0]	☐ ☐-MINING/CONSTRUCTION [0]	

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY — POOL: 4

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☐- > 1m [6]		☐-TORRENTIAL[-1]	☐-EDDIES[1]
☐- 0.7-1m [4]	☒-POOL WIDTH > RIFFLE WIDTH [2]	☐-FAST[1]	☐-INTERSTITIAL[-1]
☐- 0.4-0.7m [2]	☐-POOL WIDTH = RIFFLE WIDTH [1]	☐-MODERATE [1]	☐-INTERMITTENT[-2]
☒- < 0.4m [1]	☐-POOL WIDTH < RIFFLE W. [0]	☒-SLOW [1]	
☐—<0.2m [Pool = 0]			

☐-NO POOL[0]

COMMENTS: ____

RIFFLE: 2

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☒-LOW. [1] ☐-NONE[2]
☒ - GENERALLY 5-10 cm [1]	☒-UNSTABLE (Gravel,Sand) [0]	
☐ - GENERALLY < 5 cm [Riffle = 0]		☐-NO RIFFLE[0]

COMMENTS: ____

GRADIENT: 2

6] Gradient (feet/mile): 1.048 — %POOL: 47 — %RIFFLE: 38 — %RUN: 15

glide

EPA 4520

565

WF2
8/15/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish — **QHEI SCORE:** [~~46~~] 46

Stream: West Fork — RM: ____ Date: 8/15/99 — River Code: ____

Location: WF2 — Crew: ESB / CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); — **SUBSTRATE SCORE:** [~~14~~] 12

TYPE	POOL	RIFFLE		POOL	RIFFLE	SUBSTRATE QUALITY
O-BLDER /SLABS[10]			O-GRAVEL [7]		X	Substrate Origin (Check all)
O-BOULDER [9]			O-SAND [6]			O-LIMESTONE [1] O-RIP/RAP [0]
O-COBBLE [8]	X	X	O-BEDROCK[5]			O-TILLS [1] X-HARDPAN [0]
X-HARDPAN [4]	X	X	O-DETRITUS[3]			O-SANDSTONE [0]
O-MUCK [2]			O-ARTIFIC.[0]		X	O-SHALE [-1]

TOTAL NUMBER OF SUBSTRATE TYPES: X 4 [2] X <= 4 [0] O-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

Silt Cover (Check One): O-SILT HEAVY [-2] O-SILT MODERATE [-1] X-SILT NORMAL [0] O - SILT FREE [1]

Extent Of Embeddness (Check One): O—EXTENSIVE [-2] O—MODERATE[-1] X-LOW[0] O—NONE[1]

COVER SCORE: [9]

2] INSTREAM COVER

TYPE (Check *All* That Apply): O-UNDERCUT BANKS [1] X-DEEP POOLS [2] O-OXBOWS [1] X-OVERHANGING VEGETATION [1] O-ROOTWADS [1] X-AQUATIC MACROPHYTES [1] X-SHALLOWS (IN SLOW WATER) [1] O-BOULDERS [1] X-LOGS OR WOODY DEBRIS [1]

AMOUNT(Check *ONLY* One or check 2 and *AVERAGE*): O - EXTENSIVE > 75% [11] O - MODERATE 25-75% [7] X-SPARSE 5-25% [3] O - NEARLY ABSENT < 5%[1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) — **CHANNEL:** [7]

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
X-LOW [2]	O - FAIR [3]	X-RECOVERING [3]	X-LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	X-POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — **RIPARIAN:** [6]

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
O O-WIDE>50m [4]	O O-FOREST, SWAMP [3]	O O-URBAN OR INDUSTRIAL[0]	O O-NONE OR LITTLE [3]
O O-MODERATE 10-50 [3]	X X-OPEN PASTURE/ ROWCROP[0]	O O-SHRUB OR OLD FIELD[2]	X X-MODERATE [2]
O O-NARROW 5-10m [2]	O O- RESID.,PARK,NEW FIELD [1]	O O-CONSERV. TILLAGE [1]	O O-HEAVY OR SEVERE[1]
X X-VERY NARROW 1-5m [1]	O O-FENCED PASTURE [1]	O O-MINING/CONSTRUCTION [0]	
O O-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY — **POOL:** [6]

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
O - >1m [6]		O-TORRENTIAL[-1]	O-EDDIES[1]
X-0.7-1m [4]	O-POOL WIDTH > RIFFLE WIDTH [2]	O-FAST[1]	O-INTERSTITIAL[-1]
O- 0.4-0.7m [2]	X-POOL WIDTH = RIFFLE WIDTH [1]	O-MODERATE [1]	O-INTERMITTENT[-2]
O- < 0.4m [1]	O-POOL WIDTH < RIFFLE W. [0]	X-SLOW [1]	
O—<0.2m [Pool = 0]			

O-NO POOL[0]

COMMENTS: ____

RIFFLE/RUN DEPTH

O - GENERALLY >10 cm,MAX>50 [4]
O - GENERALLY >10 cm,MAX<50 [3]
X - GENERALLY 5-10 cm [1]
O - GENERALLY < 5 cm [Riffle = 0]

RIFFLE/RUN SUBSTRATE → bridge abutment riprap

X-STABLE (e.g.,Cobble, Boulder) [2]
O-MOD. STABLE (e.g.,Pea Gravel) [1]
O-UNSTABLE (Gravel,Sand) [0]

RIFFLE/RUN EMBEDDEDNESS

O-EXTENSIVE [-1] O-MODERATE[0]
X-LOW. [1] O-NONE[2]

O-NO RIFFLE[0]

RIFFLE: [4]

COMMENTS: ____

GRADIENT: [2]

6] Gradient (feet/mile): 1.046 %POOL: 52 %RIFFLE: 5 %RUN: 43

EPA 4520

UNF3 8/15/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 40

Stream: West Fork of Pigeon RM: ____ Date: ____ River Code: ____

Location: WF3 Crew: ____

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; *Check all types present*); SUBSTRATE SCORE: 13 11

TYPE	POOL	RIFFLE	SUBSTRATE QUALITY
☐-BLDER /SLABS[10]	____	☒-GRAVEL [7]	☒ Substrate Origin (Check all)
☐-BOULDER [9]	____	☐-SAND [6]	☒-LIMESTONE [1] ☐-RIP/RAP [0]
☐-COBBLE [8]	____	☐-BEDROCK[5]	☒-TILLS [1] ☒-HARDPAN [0]
☒-HARDPAN [4]	☒	☐-DETRITUS[3]	☒ ☒-SANDSTONE [0]
☐-MUCK [2]	____	☐-ARTIFIC.[0]	☐-SHALE [-1]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☐—MODERATE[-1] ☒—LOW[0] ☐—NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☒ 4 [2] ☒ <= 4 [0] ☐-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

2] INSTREAM COVER COVER SCORE: 8

TYPE (Check *All* That Apply)

☐-UNDERCUT BANKS [1]
☒-OVERHANGING VEGETATION [1]
☐-SHALLOWS (IN SLOW WATER) [1]
☒-DEEP POOLS [2]
☐-ROOTWADS [1]
☐-BOULDERS [1]
☐-OXBOWS [1]
☒-AQUATIC MACROPHYTES [1]
☒-LOGS OR WOODY DEBRIS [1]

AMOUNT(Check *ONLY* One or check 2 and *AVERAGE*)

☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5%[1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) CHANNEL: 4

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☐ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☐ - LOW [2]	☐ - FAIR [3]	☐ - RECOVERING [3]	☒ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☒ - NONE [1]	☒ - POOR [1]	☒ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: ~~8~~ 4

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐ ☐-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☒ ☒-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☐ ☐-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☒ ☒-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY POOL: 7

MAX. DEPTH: (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☐- >1m [6]		☐-TORRENTIAL[-1]	☐-EDDIES[1]
☒- 0.7-1m [4]	☒-POOL WIDTH > RIFFLE WIDTH [2]	☐-FAST[1]	☐-INTERSTITIAL[-1]
☐- 0.4-0.7m [2]	☐-POOL WIDTH = RIFFLE WIDTH [1]	☐-MODERATE [1]	☐-INTERMITTENT[-2]
☐- < 0.4m [1]	☐-POOL WIDTH < RIFFLE W. [0]	☒-SLOW [1]	
☐—<0.2m [Pool = 0]			☐-NO POOL[0]

COMMENTS: ____

RIFFLE: 2

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☒-LOW. [1] ☐-NONE[2]
☒ - GENERALLY 5-10 cm [1]	☒-UNSTABLE (Gravel,Sand) [0]	☐-NO RIFFLE[0]
☐ - GENERALLY < 5 cm [Riffle = 0]		

COMMENTS: ____

GRADIENT: 4

6] Gradient (feet/mile): 2.000 %POOL: 95 %RIFFLE: ____ %RUN: 5

HC1
8/15/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 44

Stream Hurricane Creek RM ____ Date 8/15/99 River Code ____
Location HC1 Crew: EJR/CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); SUBSTRATE SCORE: 14 | 14

TYPE	POOL	RIFFLE	POOL	RIFFLE	SUBSTRATE QUALITY
☐ ☐-BLDER /SLABS[10]			☐ ☒-GRAVEL [7]	X	X Substrate Origin (Check all)
☐ ☐-BOULDER [9]			☐ ☒-SAND [6]	X	X ☐-LIMESTONE [1] ☐-RIP/RAP [0]
☐ ☐-COBBLE [8]			☐ ☐-BEDROCK[5]		☒-TILLS [1] ☐-HARDPAN [0]
☐ ☐-HARDPAN [4]	X		☐ ☐-DETRITUS[3]		☐-SANDSTONE [0]
☐ ☐-MUCK [2]			☐ ☐-ARTIFIC.[0]		☐-SHALE [-1]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☒-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☐—MODERATE[-1] ☒—LOW[0] ☐—NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐- 4 [2] ☒- <= 4 [0] ☐-COAL FINES [-2]
NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)
COMMENTS ____

2] INSTREAM COVER — COVER SCORE: 5

TYPE (Check *All* That Apply) — AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

☐-UNDERCUT BANKS [1] ☐-DEEP POOLS [2] ☐-OXBOWS [1] ☐-EXTENSIVE > 75% [11]
☐-OVERHANGING VEGETATION [1] ☐-ROOTWADS [1] ☐-AQUATIC MACROPHYTES [1] ☐-MODERATE 25-75% [7]
☒-SHALLOWS (IN SLOW WATER) [1] ☐-BOULDERS [1] ☒-LOGS OR WOODY DEBRIS [1] ☒-SPARSE 5-25% [3]
☐-NEARLY ABSENT < 5%[1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) CHANNEL: 8

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING ☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION ☐ - ISLANDS
☒ - LOW [2]	☐ - FAIR [3]	☒ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL ☐ - LEVEED
☐ - NONE [1]	☒ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING ☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 6
"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Per Bank)	BANK EROSION
☐ ☐-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☒ ☒-OPEN PASTURE/ ROWCROP[0] ☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE.[2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1] ☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1] ☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐-NONE[0]		

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY — POOL: 5 | 5

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☐- >1m [6]			
☐- 0.7-1m [4]	☒-POOL WIDTH > RIFFLE WIDTH [2]	☐-TORRENTIAL[-1]	☐-EDDIES[1]
☒-0.4-0.7m [2]	☐ -POOL WIDTH = RIFFLE WIDTH [1]	☐-FAST[1]	☐-INTERSTITIAL[-1]
☐- < 0.4m [1]	☐-POOL WIDTH < RIFFLE W. [0]	☐-MODERATE [1]	☐-INTERMITTENT[-2]
☐—<0.2m [Pool = 0]		☒-SLOW [1]	

☐- NO POOL[0]

COMMENTS: ____

RIFFLE: 2

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☐-LOW. [1] ☒-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☒-UNSTABLE (Gravel,Sand) [0]	
☒ - GENERALLY < 5 cm [Riffle = 0]		

☐-NO RIFFLE[0]

COMMENTS ____

GRADIENT: 4

6] Gradient (feet/mile): 1.833 %POOL: 98 %RIFFLE: ____ %RUN: 2

Glide

EPA 4520

SA1 X
8/6/99

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish — **QHEI SCORE: 37**

Stream Sand Creek RM ____ Date 8/6/99 River Code ____

Location SA1 Crew ____

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); **SUBSTRATE SCORE: 12**

TYPE	POOL	RIFFLE	POOL	RIFFLE
☐-BLDER /SLABS[10]		☒-GRAVEL [7]	X	
☐-BOULDER [9]		☒-SAND [6]	X	
☐-COBBLE [8]		☐-BEDROCK[5]		☒-TILLS [1]
☐-HARDPAN [4]		☐-DETRITUS[3]		
☐-MUCK [2]		☐-ARTIFIC.[0]		

TOTAL NUMBER OF SUBSTRATE TYPES: ☐- 4 [2] ☒ <= 4 [0] ☐-COAL FINES [-2]

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☐-SANDSTONE [0] ☐-SHALE [-1]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddness (Check One): ☐—EXTENSIVE [-2] ☒—MODERATE[-1] ☐—LOW[0] ☐—NONE[1]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS ____

2] INSTREAM COVER — **COVER SCORE: 9**

TYPE (Check *All* That Apply): ☐-UNDERCUT BANKS [1]; ☒-OVERHANGING VEGETATION [1]; ☒-SHALLOWS (IN SLOW WATER) [1]; ☐-DEEP POOLS [2]; ☐-ROOTWADS [1]; ☐-BOULDERS [1]; ☐-OXBOWS [1]; ☒-AQUATIC MACROPHYTES [1]; ☒-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): ☐ - EXTENSIVE > 75% [11]; ☐ - MODERATE 25-75% [7]; ☒ SPARSE 5-25% [3]; ☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) — **CHANNEL: 6**

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING ☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☐ - MODERATE [2]	☐ - RELOCATION ☐ - ISLANDS
☐ - LOW [2]	☐ - FAIR [3]	☒ - RECOVERING [3]	☒ - LOW [1]	☐ - CANOPY REMOVAL ☐ - LEVEED
☒ - NONE [1]	☒ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING ☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — **RIPARIAN: 6**

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Per Bank)		BANK EROSION
☐-WIDE>50m [4]	☐-FOREST, SWAMP [3]	☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐-MODERATE 10-50 [3]	☒-OPEN PASTURE/ ROWCROP[0]	☐-SHRUB OR OLD FIELD[2]	☒-MODERATE [2]
☐-NARROW 5-10m [2]	☐- RESID.,PARK,NEW FIELD [1]	☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒-VERY NARROW 1-5m [1]	☐-FENCED PASTURE [1]	☐-MINING/CONSTRUCTION [0]	
☐-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY — **POOL: 2**

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☐- >1m [6]		☐-TORRENTIAL[-1]	☐-EDDIES[1]
☐- 0.7-1m [4]	☐-POOL WIDTH > RIFFLE WIDTH [2]	☐-FAST[1]	☒-INTERSTITIAL[-1]
☒- 0.4-0.7m [2]	☒-POOL WIDTH = RIFFLE WIDTH [1]	☐-MODERATE [1]	☐-INTERMITTENT[-2]
☐- < 0.4m [1]	☐-POOL WIDTH < RIFFLE W. [0]	☐-SLOW [1]	
☐—<0.2m [Pool = 0]			

☐-NO POOL[0]

COMMENTS: ____

RIFFLE: 0

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☐-LOW. [1] ☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☐-UNSTABLE (Gravel,Sand) [0]	
☐ - GENERALLY < 5 cm [Riffle = 0]		

☒-NO RIFFLE[0]

No RIF

COMMENTS ____

GRADIENT: 2

6] Gradient (feet/mile): .88 %POOL: 97 %RIFFLE: ____ %RUN: 3

EPA 4520

X

PC 1
8/6/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta — II (2)

Anisoptera — II (2) Aeshnidae X

Gastropoda — 卌 卌 II - physa (12)

Coleoptera — 卌 卌 ~~II~~ Elmidae - 6 (4) Dryopidae - 6 (6)

Zygoptera — 卌 卌 卌 卌 卌 卌 III - Coenagronidae (33)

Bivalvia

Plecoptera

Diptera — 卌 卌 III Blood red - (3) (3) other - (5) (5) Culicidae - (5) (5)

Ephemeroptera — 卌 - Caenidae (5)

Trichoptera

Other Hemiptera - 卌 卌 卌 卌 Corixidae (25) Gerridae (5) Arachnid? Daphnia? - 卌 卌 卌 卌 - Seed Shrimp X Ostracoda (20)

RIFFLE SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers

Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 4

Total Org. in Sample 60

Observations

woody debris & roots only thing available

X

PC 2
8/7/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	(0)	1	2	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	(0)	1	2	3	4	Macroinvertebrates	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4	Fish	0	1	(2)	3	4

Algea scum on surface

0 = Absent/Not Observed   1 = Rare   2 = Common   3 = Abundant   4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST   List Families Present/Indicate Abundance

Oligochaeta || (2)

Anisoptera | Aeshnidae (1)

Gastropoda

Coleoptera [tally marks] Elmidae (7) Dryopidae (12)

Zygoptera || - Coenagionidae (2)

Bivalvia ||| (3)

Diptera [tally marks] Blood red (18) other (5) Culicidae (6)

Plecoptera

Ephemeroptera

Trichoptera ||| Hydropsychidae (3)

Other Annelid | (1) daphnia [tally marks] (19) Amphipod ||| (3) Hemiptera ||| - Corix. (3)

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers   Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 2   Total Org. in Sample 50

Observations

PC 3
8/7/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	0	(1)	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	2	(3)	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

		List Families Present/Indicate Abundance
Oligochaeta | (1)		
	Anisoptera	
Gastropoda \ - limpet (1)		Coleoptera ~~IIII~~ ~~IIII~~ ~~IIII~~ |||| |
	Zygoptera	Dryopidae - (15)
Bivalvia ~~IIII~~ ~~IIII~~ ||| (12)		Elimidae - (6)
	Plecoptera	Diptera ~~IIII~~ ~~IIII~~ ~~IIII~~ |
		Bloodred - (5)
Ephemeroptera ~~IIII~~ | - Caenidae - (4)	all Hydropsychidae	other - (9)
Baetidae - (2)	Trichoptera ~~IIII~~ ~~IIII~~ ~~IIII~~	Culicidae - (2)
	~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ (90)	

Other Isopoda - ~~IIII~~ (5) Annelid - \|\| (2) Megaloptera - \| (1)

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 3

Observations | Total Org. in Sample 60

PC4
8/7/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4

Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

		List Families Present/Indicate Abundance
Oligochaeta		
	Anisoptera – 1 – Aeschnidae (1)	
Gastropoda		
		Coleoptera – ~~IIII~~ ~~IIII~~ II
		Dryopidae – (12)
Bivalvia	Zygoptera	
		Diptera – ~~IIII~~
	Plecoptera	
		Blood red (3)
All Baetidae Ephemeroptera – ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ II (27)	All Hydropsychidae ~~IIII~~ ~~IIII~~ ~~IIII~~ II	other – (2)
	Trichoptera – ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ (73)	
Other Annelida – 1 (1)		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 0	Total Org. in Sample 60
Observations	

X

PC 5
8/7/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

	0	1	2	3	4
Periphyton	0	1	(2)	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	2	(3)	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta	Anisoptera	Coleoptera – ~~HHT~~ ~~HHT~~ ||||
Gastropoda	Zygoptera – 1 Coenagrionida (1)	Elmidae – (6)
Bivalvia	Plecoptera	Dryopidae – (9)
Ephemeroptera – ~~HHT~~ ~~HHT~~ |	All Hydropsychidae (92)	Diptera – ~~HHT~~ |
Caenidae – (2)	Trichoptera – [tally marks]	Bloodred – (3)
Baetidae – (9)		other – (3)
Scraping – 1 (1)		

Other – Decopoda – 1 (1) Hemiptera – 1 (1) Annelid – 1 (1) Megaloptera – 1 (1)

RIFFLE SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 0 | Total Org. in Sample 60

Observations

X

PC6
8/9/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

Included bridge abutment area for biotic sampling

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	(1)	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta ||| (3)

Gastropoda – ~~||||~~ ||| – Limpets
Ancylidae (8)

Bivalvia || (2)

Ephemeroptera – ~~||||~~ |
Caenidae – (6)
Scraping – ||| Heptageniidae – (3)

Anisoptera || – Aeshnidae – (2)

Zygoptera – ~~||||~~ ||||
Coenagrionidae – (9)

Plecoptera

Trichoptera

Coleoptera – ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ||||
crawling (2)
Elmidae – (13)
dytiscid – (9)

Diptera – ~~||||~~ ~~||||~~ ~~||||~~ | ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ||
Bloodred – (5)
other – (31)

Other Isopoda – ~~||||~~ ~~||||~~ ~~||||~~ |||| ~~||||~~ ~~||||~~ || (31)
Seed Shrimp (12) daphnia ~~||||~~ ~~||||~~ ||
Hemipteran || Boatman (2)
Leeches ||| (3)

RIFFLE SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers

Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 12

Total Org. in Sample 60

Observations

X

PCD
5/9/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	(2)	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta ~~IIII~~ I (6)		
	Anisoptera	
Gastropoda		Coleoptera ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ IIII ~~IIII~~
	Zygoptera ~~IIII~~ III	
Bivalvia	Coenagrionidae (8)	Diptera ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~
	Plecoptera	
Ephemeroptera		
Heptagenidae (1)	Trichoptera ~~IIII~~ ~~IIII~~ II	Blackfly (4)
Seapins I	Hydropsy (12)	Others (57)
Other annalid ~~IIII~~ (5) Isopoda I (1)		

Crowding (2)
Elmidae (12)
Dytiscidae (19)

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders	Total Org. in Sample 60

Observations

X

PC 8
8/9/99
Water Duplicate Sampl
DUP89 taken Here

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

Biota sampling included bridge abutment

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	(2)	3	4		Slimes	(0)	1	2	3	4
Filamentous Algae	0	(1)	2	3	4		Macroinvertebrates	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4		Fish	0	(1)	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta ‖ (2)

[illegible] – (4)
[illegible] – (6)
[illegible] – (17)

Anisoptera

Gastropoda

Coleoptera ~~ЖЖ~~ ЖЖ ЖЖ |||

Zygoptera

Bivalvia

Diptera — ~~ЖЖ ЖЖ~~ ЖЖ ЖЖ ЖЖ ЖЖ |||

Plecoptera

Ephemeroptera ЖЖ ||||
Caenidae (9)

[illegible] (3)
[illegible] (26)

~~ЖЖ ЖЖ ЖЖ ЖЖ ЖЖ ЖЖ ЖЖ~~

Trichoptera ЖЖ ЖЖ ЖЖ ЖЖ
~~ЖЖ ЖЖ ЖЖ ЖЖ~~
[illegible] (35)

Other Hemipteran – ‖ (2) Isopoda – ЖЖ (5) Grass Shrimp Daphnia – ‖ (2) Megaloptera – ‖ (2)

RIFFLE SAMPLE [illegible]
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers

Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 4

Total Org. in Sample 60

Observations

X

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

DC9

8/10/99

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta		
	Anisoptera	
Gastropoda		
		Coleoptera (29)
		Elmidae
	Zygoptera	Fish
Bivalvia	Coenagrionidae (11)	Dytisticides - (9)
	Plecoptera	Diptera
		Blandrei (21)
Ephemeroptera		Other (10)
Caenidae (5)	Trichoptera	
Batadea (1)	Hydropsy (1)	
Other Amphopoda (9), Beatman (1), H2O Strider (1), H2O penny (1), Megalotesani (1), Psephenidae (1)		

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (17) (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 5	Total Org. in Sample 60
Observations	

X

PC 11
8/11/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta		
	Anisoptera	
Gastropoda physa - 11 (2)		Coleoptera Riffle beetle - 卌 卌 卌 11 (17)
	Zygoptera	
Bivalvia		Diptera Blood red - 卌 卌 1 (11)
	Plecoptera	other - 1111 (4)
Ephemeroptera Baetidae - 111 (4)	other type - → Polycentrop - (1)	
Canidae - 卌 卌 卌 1 (16)	Trichoptera Hydropsychidae - 卌 卌 (62)	
Scrapers → Hept - 卌 1 (6)	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌	
Other	→ organic house - 111 → Leptoceridae - (3)	Megaloptera - 111 (3)

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 2	Total Org. in Sample 60

Observations

X

PC12
8/12/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	(2)	3	4
Filamentous Algae	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	(1)	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST — List Families Present/Indicate Abundance

Oligochaeta		
Gastropoda	Anisoptera	~~HHT~~ 11 (37) ✓
		Coleoptera Riffle beetle - ~~HHT HHT HHT HHT HHT HHT HHT~~
Bivalvia ~~HHT~~ (5) ✓	Zygoptera Coenagrionidae - 1 (1)	Dytiscidae - 1 (1) ✓
	Plecoptera	Diptera ~~Blackfly~~ -
		other - ~~HHT HHT~~ 1 (11) ✓
Ephemeroptera (17)	(70) ✓ Hydropsychids	
Caenidae - ~~HHT HHT HHT~~ 11	Trichoptera - ~~HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT~~	
Other Megaloptera - 11 (2) ✓		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 0	Total Org. in Sample 60

Observations

X

PC13
8/13/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta		
	Anisoptera	* Gyrinidae (1)
Gastropoda physa - III (3)		Coleoptera Riffle - ~~IIII~~ ~~IIII~~ \ (11)
		Dytiscidae - III (3)
Bivalvia - ~~IIII~~ IIII (9)	Zygoptera Coenegrionidae - II (2)	Lexed - I Haliplidae - (1)
	Plecoptera	Diptera Bloodred - IIII (4)
		other - ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ III (23)
Ephemeroptera		Hairy - I
Caenidae - ~~IIII~~ ~~IIII~~ ~~IIII~~ III (18)	Trichoptera - ~~Hydropsychid~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ III (43)	↳ Haliplidae
Baetidae - III (3)		
Other Megaloptera - II (2)		

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 0	Total Org. in Sample 60

Observations

PC 14
8/16/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	(0)	1	2	(3)	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

		List Families Present/Indicate Abundance
Oligochaeta		
		(1)
	Anisoptera long body - 1 - Aeshnidae	
Gastropoda physa - IIII (4)		Coleoptera crawling - IIII (4)
		Riffle - II (2)
(21)	Zygoptera	
Bivalvia - ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ II		Diptera Bloodred - 1 (1)
	Plecoptera	other - ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ II
(46)		
~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~		(27)
Ephemeroptera Caenid - ~~IIII~~ ~~IIII~~ ~~IIII~~		
		(3)
~~Other~~ Baetid - ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ IIII	Trichoptera Hydropsychid - III	
Heptageniidae - III (3) (27)		
Other Planaria - II (2)		

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders	Total Org. in Sample 60
Observations	

X

PC15
8-6

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	(2)	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	0	(1)	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

		List Families Present/Indicate Abundance
Oligochaeta 1 (1)		
	Anisoptera	
Gastropoda + physa (1)		Coleoptera ~~IIII~~ Drycopidae - II (2) Elmidae - I (1) Dyt. - II (2)
	Zygoptera ~~IIII~~ Calopterygidae - III (3) Coenagrionidae - IIII (5)	
Bivalvia ~~IIII IIII IIII IIII IIII~~ ~~IIII~~ IIII (44)		Diptera III Blood-Red - II (2) Other - II (2)
	Plecoptera	
Ephemeroptera Baetidae (20) ~~IIII IIII IIII~~ Caenidae ~~IIII~~ II (12)		
	Trichoptera ~~IIII IIII IIII~~ (20) all hydropsychidae	
Other II annelid leech (2)	Nepidae - (1)	

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 2	Total Org. in Sample 60
Observations	

X

PC-16
8/5/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	2	(3)	4
Fish	0	1	2	(3)	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

madtom
misquitoe fish
Blue gill
Large mouth bass
(spotted or rockeye)

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta 1 (1)		
	Anisoptera 6 Aeshnidae	
Physa (84) Gastropoda limpet (5)		Coleoptera Dryopidae - 9 Elmidae - 3
	Zygoptera Calopterygidae - (3) Coenagrionidae - (14)	
Bivalvia		Diptera
	Plecoptera	
Ephemeroptera 2 - Baetidae		
	Trichoptera 1 - Hydropsychidae	
Other 1 (hemipteran) Boatman (1)		

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 1	Total Org. in Sample 61

Observations

LCI
8/8/95

X

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta 14		
	Anisoptera	
Gastropoda -physa 13		Coleoptera Dryopidae - 15 Elimidae - 9
Bivalvia 13	Zygoptera - Coenagrionidae 7	
	Plecoptera	Diptera Bloodred - 12 other - 6
Ephemeroptera		
	Trichoptera 19 -Hydropsychidae	

Other 2 Ieeel, Beatman (Corixidae - 3) Isopoda 2

RIFFLE SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 2 | Total Org. in Sample 60

Observations

X

LC 2
8/10/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta 19

Anisoptera 1 - Aeshnidae 1

Gastropoda

Physa 6

Ramhorn 20

Bivalvia 9

Zygoptera

Coenagrionidae 1 1

Plecoptera

Ephemeroptera

Hept - 1 - Scraper 1

Trichoptera

pointed tail - 11

Coleoptera

riffle 20

dytiscidae 25

Diptera

Blood red 36

other 3

Tipulidae - 1 1

Other Amphipod 5, Isopoda, Nepidae 1, H_2O scorp - 1, Seed shrimp, Daphnia - 11 2

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS 19 (Indicate No. of Individuals Representing Group)

Scrapers

Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 30

Total Org. in Sample 60

Observations

X

Rapid Bioassessment Protocol II

LP1

Biosurvey Field Data Sheet

8/8/99

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	(2)	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4

Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	(1)	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta ||| (3)		
	Anisoptera	
Gastropoda 卌 卌 | (11) - physa		Coleoptera ||| - Dryopidae (3)
	Zygoptera	
Bivalvia 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 (65)	Plecoptera	Diptera 卌 卌 卌 卌 ||
Ephemeroptera 卌 卌 卌 卌 卌 Caenidae (8) ← Baetidae - (1) ←	Trichoptera 卌 || - Hydropsychidae (7)	Bloodred - (13) ← other - (7) ← Culicidae - (2) ←

Other amphipod 卌, nepmitemam 1 Corixidae (1) decapoda \|\| (2)

RIFFLE SAMPLE 1 (6)

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 3	Total Org. in Sample 60

Observations

Sample taken in broken concrete, and not indicative of stream, only riffle available

X

LP2
8/8/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	(1)	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta - || (2)		
	Anisoptera	
Gastropoda		Coleoptera - ||| - crawling - (4) ✓ dytiscidae - (1) ✓ elmidae - (2) ✓
	Zygoptera	
Bivalvia		Diptera - ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ||
	Plecoptera	
Ephemeroptera - ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ (56) ✓		Bloodred - (23) ✓ other - (15) ✓
Scraping - ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ || (27) ✓	Trichoptera - |||| - Hydropsychid - (4) ✓	
Other Hemiptera - ~~||||~~ | (6) Isopoda - ||| (4) Amphipoda - | (1) Daphnia ? - ~~||||~~ (5) Seed Shrimp		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 6	Total Org. in Sample 60

Observations

Walked up to Bulkhead structure on the West Bank with green pipe in close proximity - purpose unknown

BC 1
8/9/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	(0)	1	2	3	4	Macroinvertebrates	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4	Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

		List Families Present/Indicate Abundance
Oligochaeta ||| (3)		
		Dytiscidae - (9)
	Anisoptera	Elmidae - (4)
Gastropoda - ~~||||~~ |||		Coleoptera - ~~||||~~ ~~||||~~ ~~||||~~ |||
Physa - (8) ✓		
	Zygoptera ~~||||~~ ||	
Bivalvia ~~||||~~ ~~||||~~ (16)	Coenagrionidae (7)	Diptera - ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~
	Plecoptera	|||| Blood red - (17)
		other - (7)
Ephemeroptera	Hydropsychidae - (40) ✓	
	Trichoptera - ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~	
Corixidae (2)	~~||||~~ ~~||||~~ |||| ~~||||~~	
Other Hemipteran - 11	Megalopteran - ~~||||~~ ||| (8)	

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 0	Total Org. in Sample 60

Observations

X

BC 2
8/10/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta		
	→ Cordulegastridae - (1)	
	Anisoptera 1 - long leg (1st one)	
Gastropoda limpet - 卌 (5)	→ 1 → Aeshnidae - (1)	Coleoptera Dytiscidae - 𝍸 (4)
physa - 卌 卌 卌 (16)	卌 卌 卌	
Ramhorn - 𝍸 (2)	卌 卌 卌 卌 卌 卌 卌 卌	→ Riffle - (1)
Bivalvia - 卌 卌 卌 卌	Zygoptera coenagrionidae - 卌 (60)	
(21)	Plecoptera	Diptera Bloodred - 卌 卌 卌 卌 卌 𝍸 (28)
		other - 卌 𝍸 (7)
Ephemeroptera	→ pointed tail - 1	
caenid 1 (1)	Trichoptera Hydropsychid - 1 (1)	

Other Decapoda - 1 (1) Isopoda - 1 (1)

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 1	Total Org. in Sample 60

Observations

X

BC3
8/11/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta

Gastropoda physa - 19 ~~IIII~~ ~~IIII~~ ~~IIII~~ IIII
ramhorn - 1 Planorbidae 1

Bivalvia ~~IIII~~ IIII 9

Ephemeroptera Baetidae - IIII 4
Scraper Heptagenidae - ~~IIII~~ I 6
Canidae - ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ 55

Anisoptera → Aeshnidae - ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ II 22

Zygoptera Coenagronidae - ~~IIII~~ ~~IIII~~ IIII 14

Plecoptera

Trichoptera

Coleoptera Dytiscidae - II 2
crawling 4

Diptera bloodred - ~~IIII~~ I 6
other - ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ II 32
longhaired - IIII

Other Isopoda - I 1 Seed Shrimp 5
Daphnia - ~~IIII~~ IIII Amphipoda - II 2

RIFFLE SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers

Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 3

Total Org. in Sample 60

Observations

X

WD1
8/12/95

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

	0	1	2	3	4
Periphyton	0	1	(2)	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta

Anisoptera — // — Aeshnidae (2)

Gastropoda
Physia ||||| | (6)

Coleoptera
dytisids ||||| ||||| ||||| ||||| ||| (23)
riffle ||||| ||||| ||||| ||||| ||| (23)

Zygoptera

Bivalvia ||| (3)

Diptera
Blood — |||| (4)
other ||||| ||||| (10)

Plecoptera

Ephemeroptera Baetidae — |||| (4)
Caenidae ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||| (44)

Trichoptera

Other Leeches ||||| ||||| ||| (13) Amphipoda — |||| (4) Water boatman — ||||| ||||| || (12)

RIFFLE SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers

Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 2

Observations

Total Org. in Sample 60

SDI X
8/13/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	(2)	3	4
Filamentous Algae	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	2	(3)	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta

Anisoptera

Gastropoda physa - HHT/// (8)

Coleoptera Dytiscidae - HHT/ (6)
Riffle beetle - / (1)

Zygoptera

Bivalvia

Diptera Bloodred - HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT /// (93)
other - HHT/ (6)
Culicidae - / (1)

Plecoptera

Ephemeroptera

Trichoptera Hydropsych - //// (4)

Other Isopoda - / (1) Annelid - / (1)

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers

Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 1

Total Org. in Sample 60

Observations

X

~~SDT~~ UNI
8/12/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

		List Families Present/Indicate Abundance
Oligochaeta II (2)		
Hirudinea I (1)		
	Anisoptera	
Gastropoda		Predaceous beetle I
		Coleoptera
Mysida ~~IIII IIII IIII IIII~~ II (32)		Amphipoda ~~IIII IIII IIII IIII IIII~~ (48)
Bivalvia I (1)	Zygoptera II Coenagrionidae (2)	Isopoda ~~IIII IIII~~ III (13)
		Diptera
	Plecoptera	Bloodred I (1)
Ephemeroptera		Other III (4)
	Trichoptera	Culicidae - I (1)
(2)	(2)	(4)

Other Isopod II, Leech II, H2O strider II, Amphipod IIII, H2O penny/H2O Boatman II (2)

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders M	Total Org. in Sample 60
Observations	

SC1
8/11/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	(2)	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST — List Families Present/Indicate Abundance

Oligochaeta

Anisoptera

Gastropoda

Coleoptera Riffle beetle – ~~HH~~ || (7)
Crawling (1)

Zygoptera Coenagrionidae – ~~HH~~ ~~HH~~ ~~HH~~ ~~HH~~ ~~HH~~ ~~HH~~ |||| (34)

Bivalvia – ~~HH~~ ~~HH~~ ~~HH~~ ~~HH~~ ~~HH~~ ~~HH~~ ||| (33)

Calopteridae – | (1)

Diptera Bloodred – || (2)
other – ~~HH~~ ~~HH~~ ~~HH~~ ||| (18)
Hairy – |

Plecoptera

Ephemeroptera
Caenidae – |||| (4)

Trichoptera Hydropsychidae – ~~HH~~ ~~HH~~ ~~HH~~ ~~HH~~ ~~HH~~ ||| (28)

Other Isopoda – ||| (3) Decapoda – | (1) Megaloptera – ~~HH~~ | (6)

RIFFLE SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers

Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 3

Total Org. in Sample 60

Observations

X

BG 1
8/14/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta

Anisoptera longleg - 1 - Cordulidae (1)

Gastropoda physa - III (3)

Coleoptera

Elmidae (50)

Zygoptera calopterydia - I (1)

Crawling - 卌 卌 I (11) Haliplidae

Bivalvia 卌 卌 III (13)

Corgum (13) 卌 卌 卌 III

Diptera Bloodred - II (2)

Plecoptera

Other 卌 卌 卌 卌 卌 卌 I (31)

Culicidae - II (2)

Ephemeroptera Caenidae - 卌 III (5)

Trichoptera Hydrophychidae - III (3)

Organic - 1 - Leptoceridae (1)

Other megalobt III (3)

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers

Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 1

Total Org. in Sample 60

Observations

X

BG 2
6/13/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	(2)	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	(1)	2	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta II (2)		
	Anisoptera -1 Aeshnidae x (1)	
Gastropoda		Coleoptera
physial (1)		riffle ~~IIII IIII IIII IIII IIII~~ (25)
	Zygoptera Coeg ~~IIII IIII~~ (25)	dytisid III (3)
Bivalvia ~~IIII IIII IIII IIII~~ III (23)	Colopt. -IIII (4)	Diptera
	Plecoptera	nairy -1 Haliplidae (1) x
Ephemeroptera		Blood Red ~~IIII~~ (6)
Candelaes ~~IIII IIII~~ (10)	Trichoptera Hydroxyidae -II (2)	Other ~~IIII IIII~~ III (13)
Other Leech 1 (1), decapodia -1 (1) -double Dock 3	mesalabteria -III (3)	

RIFFLE SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 0	Total Org. in Sample 60
Observations	

X

SF 1
8/14/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	(2)	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta		
	Anisoptera Aeschnidae (1) long body - 1	~~Big Swimmers - 11~~
Gastropoda Physa - 卌 卌 | (16)	White long - 11 - Condulid (2)	Dytiscid - 卌 卌 | (11)
limpet - 1 (1)		Coleoptera Riffle beetle - 卌 卌 ||| (14)
	Zygoptera Coenegrionid - ||| (3)	4-eyed - 1
Bivalvia - 卌 卌 ||| (14)		Diptera Bloodred || (2)
	Plecoptera	other - 卌 卌 卌 卌 | (21)
Ephemeroptera Canidae - 卌 卌 (10)	卌 卌 卌 (25)	Culicid - 1 (1)
	Trichoptera Hydropsychid - 卌 卌	Tabanidae - ||| (3)
		Tipulidae - || (2)

Other Megaloptera - \|\|\| (3) Annelid - \|\| (2)

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 0	Total Org. in Sample 60

Observations

SF2 X
8/14/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta		
	Anisoptera Aeshnidae (2) longleg - 11	
Gastropoda Physa - 卌 卌 卌 |||| (19)	Long body - 1 Cordulegast (1)	Coleoptera Predacious - 11 (2) Riffle B - 卌 11 (7)
	Zygoptera ~~卌 卌 卌 ||~~ (27) Coenagrionidae - ~~卌 卌~~	Crawling - 卌 卌 卌 || (17) ~~light body dark spots - 11~~
Bivalvia	Calopterydae - 11 (2)	Diptera Bloodred - 卌 || (8)
	Plecoptera	other - 卌 卌 卌 卌 卌 |||| (26)
Ephemeroptera Caenidae - ~~卌~~ 卌 || (11)		
Baetid - 11 (2)	Trichoptera	
Other Megaloptera - |||| (4)	Water penny - 1 (1)	

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 0 | Total Org. in Sample 60

Observations

SF3
8/14/95

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta		
	Anisoptera (1)	riffle beetle / (1)
Gastropoda	long leg / - Cordulidae	Coleoptera
physia ~~////~~ (5)		Crawling H2O Beetles ~~////~~ ~~////~~ Haliplidae (10)
large lefthanded snail	Zygoptera (17)	dytiscids // (5)
Bivalvia	Calopt ~~longant~~ ~~////~~ ~~////~~ ~~////~~ /	Diptera
	Plecoptera	Blood ~~////~~ (5)
		other ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ (19)
Ephemeroptera	1 - Philopotam	
	4 - Polycentr	many prolegs // - Tipulidae (2)
Cantidea ~~////~~ ~~////~~ (15)	Trichoptera other ~~////~~ (4)	
Baetid / (1)	Hydros ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ (40)	
Other Isoprodia ~~////~~ megalotera // (2)	H2O strider / (1) leech / (1)	

RIFFLE SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 20	Total Org. in Sample 60

Observations

X

WF 1
8/16/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	0	(1)	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta - 1 (1)

Gastropoda Lymnaeidae righthand - 1 (1)
Physa - 1111 (4)

Bivalvia - 卌 卌 1 (11)

Ephemeroptera Caenid - 卌 卌 11 (47)
~~卌 卌 卌 卌 卌 卌 卌~~

~~other~~ Baetid - 111 (3)

Other Planaria - 111 (3)

Anisoptera longleg - 1 - Cordulegastridae (1)

Zygoptera coenagrionidae - 卌 1111 (9)
calopteryidae - 卌 卌 1

Plecoptera (11)

Trichoptera Hydropsychid - 卌 卌 卌 (22)

Coleoptera Predacious - 11 (3)
Riffle - 11 (2) Same
crawling - 11 (2)
Dytiscid - 1

Diptera Bloodred - 1 (1)
others - 卌 卌 卌 卌 卌 卌 1 (31)
Simulidae - 1 Yes (1)

Horsehair - 11 Nematomorpha (2)

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers

Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 0

Total Org. in Sample 60

Observations

X

WF2
8/15/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	(2)	3	4
Filamentous Algae	0	1	2	(3)	4
Macrophytes	0	(1)	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

Oligochaeta (1)		List Families Present/Indicate Abundance
	Anisoptera	
Gastropoda physa - III (4)		Predacious - 1
limpet - 1 (1)	Ancylidae (1)	Coleoptera Riffle B - IIII I (6)
		Crawling - IIII (5)
Bivalvia — III (3)	Zygoptera Coenagrionidae - IIII II	Dytiscid - II (3)
	Calopterygidae - I (1)	Diptera Bloodred
	Plecoptera	other - IIII IIII IIII IIII IIII IIII IIII
Ephemeroptera Caenid - II (2)	III (43) IIII IIII IIII IIII IIII IIII	IIII IIII III (48)
	Trichoptera Hydropsychid - IIII IIII	
Other Planaria - III (3)	Horsehair - I (1)	

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders (0)	Total Org. in Sample 60

Observations

X

Rapid Bioassessment Protocol II

W F3
8/15/99

Biosurvey Field Data Sheet

used bridge abutment riprap

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta 1 (1)		
	Anisoptera	
Gastropoda		Coleoptera Gyrinus 111 (3)
physia 11 (2)	Calopter 1 (1)	clytiolus 111 111 111 111 (21)
	Zygoptera	riffle 11 (2)
Bivalvia 1 (1)	Coenagrionaes 111 111 111 111 111	Diptera
	Plecoptera (40)	Blood 111 (5)
Ephemeroptera		Other 111 111 111 111 (20)
~~Other~~ Pectid 1 (1)	Trichoptera	
Other (5) daphnia 111, (1) dacapod 1, (2) planarian 11, (1) Horse hair 1, (1) Bogtman 1		

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 0 | Total Org. in Sample 60

Observations

X

HCI
8/15/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	(2)	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	0	(1)	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

Oligochaeta		List Families Present/Indicate Abundance
Gastropoda Physa - 34	Anisoptera longbody - 11 - Aeschnidae (2) ~~Earbody - 1~~	Riffle Beetle - 7
		Coleoptera predacious - 21
	Zygoptera Coenagrionidae - 7	Dytiscidae - 21
Bivalvia		Crawling - 9
	Plecoptera	Diptera Bloodred - 1 (1)
		other - 34
Ephemeroptera other Bactid - 2		Culicidea - 1 (1)
	Trichoptera Hydropsychid - 2	
Other Daphnia - 2		

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 0	Total Org. in Sample 60

Observations

X

SAI
8/6/99

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	0	1	2	(3)	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta

Gastropoda |||| - physa (4)
| - limpet (1)

Bivalvia

Ephemeroptera || - Caenidae (2)

Other Annelid → || (2)

Anisoptera

Zygoptera | - Coenagrionidae (1)

Plecoptera

Trichoptera |||| - Hydropsychidae (4)

Coleoptera HHT HHT HHT |||
Dryopidae - (16)
Elmidae - (2)

Diptera HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT |
Blood red - (36)
other - (60)

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers

Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 2

Total Org. in Sample 42

Observations

Procedure No.	WQPA–SWS–3	Date Issued	9-30-89
Revision No.	6	Date Effective	9-30-89

PC1
8-6-99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 60% GRADIENT: O-LOW O-MODERATE O-HIGH PHOTOS: 18 – 100 ft upstream 19 –

STREAM MEASUREMENTS: AVERAGE WIDTH: 80' (eye ball) AVERAGE DEPTH: _____ MAX. DEPTH _____

LENGTH	WIDTH	DEPTHS									POOL:GLD:RIF:RUN
300'											POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

DT 80699 TM 154930
TMP 30.74 SpC 889.00
TDS .0578 DO% 67.3
DO 5.53 Dep. .221
pH 8.87 ORP 51.6

Too deep to do transect – over 5' deep from 4' from shore

Photo –
18 ~~18~~ 100 ft up stream from down DS END – looking US } opposite order
19 ~~18~~ 100 ft up stream from DS END – looking DS } from usual

PC2

8-7-99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 20% GRADIENT: Ó–LOW Ó–MODERATE Ó–HIGH PHOTOS: 4 & 13

STREAM MEASUREMENTS: AVERAGE WIDTH: _____ AVERAGE DEPTH: _____ MAX. DEPTH _____

LENGTH	WIDTH	DEPTHS D	2	3	4						POOL:GLD:RIF:RUN
300'	40'	1	1	2	4	>4					Pool

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

DT 80799
TEMP 27.64
TDS 1.288
DO 5.15
PH 8.58

TM 114155
SPC 1980.
DO% 65.8
DEP .729
ORP 72.3

Photos
15 ~~14~~ → upstream end looking upstream
14 ~~15~~ → upstream end looking downstream

Procedure No.	WQPA-SWS-3	Date Issued	9-30-89
Revision No.	6	Date Effective	9-30-89

PC3
8-7-99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) AESTHETIC RATING (1-10)

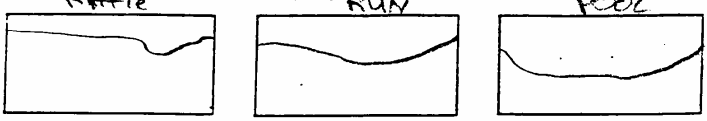
CANOPY (%OPEN) 60 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 16 + 15

STREAM MEASUREMENTS: AVERAGE WIDTH: 30 AVERAGE DEPTH: 1.0 MAX. DEPTH 2.0

LENGTH	WIDTH	0 DEPTHS	5	10	15	20	25	30	35	40		POOL:GLD:RIF:RUN
60	20	.5"	2"	1.5								RUN
15	50	5"	8"	7"	6"	4"	2"					RIF
62	25	.5"	1.0	2.0	1.0							RUN
12	10	(6")	(8")	(12")	(8")	(4")						RIF
70	40	.5"	1.0"	2.0"	2.0	1.5	1.0"	.3"	.2"			RUN
100	40											POOL

CROSS-SECTIONS OF STREAM

Riffle RUN POOL



DRAWING OF STREAM

Dist from LWE (ft)	Vel (ft/sec)	Depth (ft)
0	–	–
2	0.14	.6
4	0.14	.7
6	0.16	.8
8	0.16	1.6
10	0.20	1.9
12	0.16	2.1
14	0.17	2.1
16	0.17	2.3
18	0.18	2.2
20	0.17	2.0
22	0.15	2.0
25	0.17	1.9
28	0.14	1.8
31	0.13	1.7
34	0.08	0.8
37	0.06	0.5
40	[illegible]	0.4

Dist from LWE	Vel	Depth
43	0.03	0.4
46	—	0.1
47 RWE	—	—

DT 80799
Temp 25.35
TDS 1.376
DO 4.08
pH 8.52

TM 93945
SpC 2117.80
DEP .342
ORP 64.6

Photo ~~16~~ 17 = 50' upstream of DS END looking DS
Photo ~~15~~ 16 = 50' upstream of DS END looking US

Procedure No.	WQPA-SWS-3	Date Issued	9-30-89
Revision No.	6	Date Effective	9-30-89

PC4
8/7/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

(Began Raining)

Is Reach Representative of Stream? (Y/N) ✓ If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 55 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 9+10

STREAM MEASUREMENTS: AVERAGE WIDTH: 55 AVERAGE DEPTH: 6" MAX. DEPTH 10"

LENGTH	WIDTH	DEPTHS 10	20	30	40	50	60				POOL:GLD:RIF:RUN
92	55	7"	8"	8"	6"	3"					RUN
64	25	2"	4"								RIF
55	35	4"	6"	4"							RUN
106	30	3"	3"	2"							RIF
											RUN
											POOL

Pool with Point Bar Having Exposed Redrock

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist from LWE	Depth (ft)	Velocity ft/sec
LWE	—	—
2	.5	0.38
4	.6	0.44
6	.7	0.43
8	.7	0.45
10	.7	0.47
12	.7	0.52
14	.7	0.60
16	.7	0.50
18	.7	0.45
20	.7	0.44
22	.6	0.20
24	.7	0.52
26	.7	0.60
28	.7	0.37
31	.7	0.48
34	.7	0.34
37	.6	0.28

Dist	Depth	Vel
40	.3	0.25
43	.3	0.22
46	.4	0.04
49	.3	0.03
52	.1	
56	RUNE	

DT 80799
TMP 28.27
TDS 1.394
DO 4.89
DH 8.65

TM 162831
SPC 2144.0
DO% 62.9
DEP .225
ORP 57.3

Photo 10 - DS END Looking US
photo 9 - DS END Looking DS

8/7/99
PC5

X

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) AESTHETIC RATING (1-10)

CANOPY (%OPEN) 25% GRADIENT: X LOW O MODERATE O HIGH PHOTOS: 11 n/2

STREAM MEASUREMENTS: AVERAGE WIDTH: 50 AVERAGE DEPTH: .7' MAX. DEPTH 1.4'

LENGTH	WIDTH	DEPTHS 10	20	30	40	50	60				POOL:GLD:RIF:RUN
160	55	.5	1.0	.5	.5	.6	.2				RUN
79	45	.1	.2	.2	.1						RIF
61	50	.2	.3	.4	.3	.1					RUN
100	55	.3	.5	1.2	1.4	0.7					POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

DT 80799
TMP 27.81
TDS 1.397
DO 5.08
pH 8.53

TM 144020
SPC 2153.0
DO% 65.0
DEP .171
ORP 687

photo ~~12~~ 13 → looking US from ' from DS END
photo ~~11~~ 12 → looking DS from ' from DS END

Dist from LWE (ft)	Depth (ft)	Velocity ft/sec
LWE	–	–
2	.1	0
4	.1	0
5	.2	.13
6	.4	0.11
8	.4	0.17
10	.6	0.26
12	.6	0.34
14	.9	0.54
16	1.0	0.64
18	.9	0.70
20	1.0	0.70
22	0.6	0.50
24	0.7	—
26	0.8	0.10
28	0.7	0.28
30	0.5	0.28
32	0.4	0.34

Dist from LWE	Depth	Veloc
36	0.4	0.32
38	0.4	0.54
40	0.5	0.54
42	0.6	0.34
44	0.6	0.46
46	0.7	0.16
48	0.6	0.35
50	0.6	0.23
52	0.7	0.31
54	0.7	0.31
56	0.7	0.16
58	0.4	0.0
60	0.2	—
62	RWE	—

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X

PCG
8/9/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

Included bridge for macroinvert sampling

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 10 GRADIENT: ~~O~~-LOW O-MODERATE O-HIGH PHOTOS: 1 & 2 – 1st Camera

STREAM MEASUREMENTS: AVERAGE WIDTH: 50 AVERAGE DEPTH: _____ MAX. DEPTH _____

LENGTH	WIDTH	DEPTHS 10	20	30	40.	50					POOL:GLD:RIF:RUN
300	50	1.0	3.5	>5	?	1.0					POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

DT 80999 TM 72850
TMP 24.92 SpC 1599.0
TDS 1.036 DO% 16.0
DO 1.41 DEP 2.112
pH 8.45 ORP 99.4

Velocities not taken too deep (>5')

picture 2 - upstream looking upstream
picture 1 upstream looking downstream

PC7
6-9-95

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 20 GRADIENT: ☒ LOW ☐ MODERATE ☐ HIGH PHOTOS: 27 + 26 2nd Camera

STREAM MEASUREMENTS: AVERAGE WIDTH: 50 AVERAGE DEPTH: 3' MAX DEPTH 6'

LENGTH	WIDTH	DEPTHS 10	20	30	40	50					POOL:GLD:RIF:RUN
300	50	1'	3'	6'	3'	1'					POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist from bank (A)	Depth (ft)	Velocity (ft/sec)

Too Deep No Velocity Readings

DT 80999
TMP 24.92
TDS 1.154
DO 2.46
pH 8.44

TM 102204
SPC 1776.0
DO 292
DEP .532
ORP 9.2

2nd Camera
photo 27 DS END looking US
photo 26 DS END looking DS

X

PC 8

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

8/9/99

Is Reach Representative of Stream? (Y/N) Y If No: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 25 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 24, 25

STREAM MEASUREMENTS: AVERAGE WIDTH: 40 AVERAGE DEPTH: 2' MAX. DEPTH 6'

LENGTH	WIDTH	DEPTHS 0	20	30	40	50					POOL:GLD:RIF:RUN
300	45	1.5'	3.5'	5.5'	5.5	2.5					POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

DT 80999 TM 134551

TEMP 25.57 SpC 2136

TDS 1.391 DO% 36.5

DO 3.02 DEP .335

PH 8.49 ORP 60.4

Reading

No flow! too deep

photo 24 DS END looking US

photo 25 DS END looking DS

PC9 8/10/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) _____ GRADIENT: O–LOW O–MODERATE O–HIGH PHOTOS: 16 & 17

STREAM MEASUREMENTS: AVERAGE WIDTH: 20 AVERAGE DEPTH: 3 MAX. DEPTH 5+

LENGTH	WIDTH	DEPTHS D 10	15	20	25	30	35				POOL-GLD-RIF-RUN
300'	35	2'	3	4	5+						POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

DT - 81099
TMP - 27.57
TDS 1067
DO 4.51
pH 8.56

TM 165311
SPC 1641.0
DO 5.75
DEP .257
ORP 33.6

photo 17 - DS END looking US
photo 16 - DS END looking DS

PC 11
8/11/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If No: _____

Additional Comments/Pollution Impacts: Downstream of bridge, no riffle/run US of bridge

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 15 GRADIENT: O–LOW O–MODERATE O–HIGH PHOTOS: 12 + 13

STREAM MEASUREMENTS: AVERAGE WIDTH: 20 AVERAGE DEPTH: .4 MAX. DEPTH 1.1

Cond = 1,900 µmhos
DO = 5.3 mg/L
WTemp = 26°C

LENGTH	WIDTH	DEPTHS 5	10	15	20	25	30					POOL:GLD:RIF:RUN
300	30	1.0	.6	.4	.3	.4	.3					RUN

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

photo 11 – garbage at bridge

photo 13 DS END looking US
photo 12 DS END looking DS

Dist from LWE (ft)	Depth (ft)	Velocity (ft/sec)
LWE	—	—
1	0.9	.63
3	0.8	.81
5	0.6	.75
7	0.4	.98
9	0.5	.96
11	0.5	1.23
13	0.5	1.27
15	0.4	1.03
17	0.5	1.10
19	0.3	0.76
21	0.4	1.08
23	0.5	0.65
25	0.3	0.56
26	RWE	

X

PC12 8/12/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 40 GRADIENT: ☒-LOW ☐-MODERATE ☐-HIGH PHOTOS: 2 & 3

STREAM MEASUREMENTS: AVERAGE WIDTH: 20 AVERAGE DEPTH: 1.0' MAX DEPTH 2.5'

LENGTH	WIDTH	DEPTHS ▷ 5	10	15	20						POOL-GLD-RIF-RUN
75	20	.1	.2	.4	.8						RIF
120	20	.4	.6	.4	.5						RUN
150	20	2.0	2.2	1.8	1.2						POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Temp 29.5°C

Cond 1,500 umhos

DO 7.4 mg/L

photo 3 DSEND looking US

photo 2 DSEND looking DS

photo 1 – Concretion formations in hardpan

Dist from RWE (ft)	Depth (ft)	Velocity (ft/sec)
RWE	–	–
1	.4	0.02
3	1.1	~~0.06~~
5	1.7	0.13
7	1.8	0.14
9	1.8	0.18
11	2.0	0.16
13	2.1	0.13
15	2.2	0.20
17	2.3	0.18
19	2.2	0.11
21	1.5	0.04
23	0.8	
24	LWE	

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

PC 13
8/13/99

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 55 GRADIENT: X LOW O-MODERATE O-HIGH PHOTOS: _____

STREAM MEASUREMENTS: AVERAGE WIDTH: 20 AVERAGE DEPTH: .5 MAX. DEPTH 2.1

LENGTH	WIDTH	DEPTHS 3	6	9	12	15	18	21				POOL-GLD-RIF-RUN
20	12	.4	.6	.5	.3							RUN
75	20	.3	.6	.9	1.0	1.1	.4					POOL
30	20	.2	.2	.3	.6	.3	.2					RUN
30	20	.3	.2	.2	.1	.1	.1					RIF
15	20	.4	.5	.6	.6	.2	.1					RUN
200	20	1.5	1.8	1.2	1.0	0.5	0.2					POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist (ft) from RWE	Depth (ft)	Velocity
RWE	—	—
1	1.1	0.58
2	1.2	0.58
3	1.1	0.49
4	1.0	0.61
5	0.9	0.69
6	0.9	0.85
7	0.7	0.43

DO = 6.80 mg/L
Temp = 28°C
Cond = 1,250 µmhos

8/15/99 PC 14

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) AESTHETIC RATING (1-10)

CANOPY (%OPEN) 95 GRADIENT: ☒-LOW O-MODERATE O-HIGH PHOTOS: 20 21

STREAM MEASUREMENTS: AVERAGE WIDTH: 12 AVERAGE DEPTH: .5 MAX DEPTH 1.2

LENGTH	WIDTH	DEPTHS 2	4	6	8	10	12				POOL:GLD:RIF:RUN
20	10	.3	.6	.7	.5	.3					RUN
170	13	.7	1.0	1.1	.9	.8	.7				GLD
35	15	.2	.3	.6	.3	.2	.3				RUN
140	8	.6	.1	.3	.1						RIF

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist from LWE (ft)	Depth (ft)	Velocity (ft/sec)
RWE	—	—
.5	.8	.12
1.0	.8	.21
1.5	.8	.53
2.0	.8	.77
2.5	.7	.94
3.0	.7	.88
3.5	.7	.73
4.0	.6	.66
4.5	.6	.55
5.0	.5	.68
5.5	.4	.64
6.0	.3	.31
6.5	.2	—
7.0	.1	—
7.5	RWE	—

Conductivity 590 umhos

Temp 28°C

DO 16 mg/L

photo 21 DS END looking US

photo 20 DS END looking DS

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LCI
8/8/97

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) AESTHETIC RATING (1-10)

CANOPY (%OPEN) 40 GRADIENT: O-LOW X-MODERATE O-HIGH PHOTOS: 8-7 – Camera ①

STREAM MEASUREMENTS: AVERAGE WIDTH: 25 AVERAGE DEPTH: 1' MAX DEPTH 6+'

LENGTH	WIDTH	DEPTHS 5	10	15	20	25					POOL:GLD:RIF:RUN
200	25	.6	1.0	1.0	1.0						POOL
40	25	.3	.2	.1	.4						RUN
100	15	1.5	6.0	2.0							POOL
		RIFFLES SAMPLED WERE ≈ 500 ft further up									
		(1ft)	(2ft)	(3ft)							
15	3	1"	3"	1"							RIF

CROSS-SECTIONS OF STREAM

DT 80899
TEMP 23.58
TDS .268
DO 3.01
PH 9.02

TM 74526
SpC 412
DO% 35.4
DEP .634
ORP

photo ~~8~~ 9 DS END looking US

photo ~~7~~ 8 DS END looking DS

DRAWING OF STREAM

Dist from LWE (ft)	(ft) Depth	(ft/sec) Vel
LWE	—	—
1	.4	—
3	.7	.03
5	.8	.16
7	.8	.22
9	.9	.16
11	1.0	.13
13	1.0	.08
15	1.0	.08
17	1.0	.14
19	0.9	.11
21	.7	.08
23	.7	.04
24	.7	—
25	— RWE	—

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8/10/99

KC 2

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) AESTHETIC RATING (1-10)

CANOPY (%OPEN) 5% GRADIENT: ~~O~~-LOW O-MODERATE O-HIGH PHOTOS: 21 & 20

STREAM MEASUREMENTS: AVERAGE WIDTH: _____ AVERAGE DEPTH: _____ MAX. DEPTH _____

LENGTH	WIDTH	DEPTHS 2	4	6	8	10	12	14	16	18	POOL:GLD:RIF:RUN
150	15	.2	1.1	1.2	1.0	1.0	.6	.3	.1		POOL
5	1'	1"									RUN
42	5'	2"	4"	2"							GLD
7	8"	1/4"									RUN
52	7'	4"	10"	4"							GLD
15	1'	1/2"									RUN
100	10	.5	.8	.8	.5						GLD

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

DT 81099
TEMP 23.69
TDS .256
DO 2.77
pH 8.51

TM 111318
SpC 394.00
DO% 32.0
Dep .280
ORP -11.4

photo of DS END
21 150 upstream photo looking upstream
20 150 upstream photo looking downstream

No velocity taken, slight velocity in riffle area

371

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LPI
8/8/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) N If Not: _____

Additional Comments/Pollution Impacts: – Stream is a ditch, only bridge and artificial fill are the only riffle

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 10 GRADIENT: O-LOW O-MODERATE O-HIGH PHOTOS: 6 & 5

STREAM MEASUREMENTS: AVERAGE WIDTH: _____ AVERAGE DEPTH: _____ MAX. DEPTH _____

LENGTH	WIDTH	DEPTHS	10	15	20	25	30	35	40	POOL:GLD:RIF:RUN
25'	20'	.2	.1	.2	.1	.2				R Rif
300'	40'	.5	1.5	2.5	4	4	2	1.5	1	Pool

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist from LWE (ft)	Depth (ft)	Velocity (ft/sec)
LWE	—	—
1	.7	.02
3	1.3	.04
5	1.5	.04
7	1.6	—
9	1.8	.03
11	1.9	.07
13	2.1	.15
15	1.4	.27
17	1.1	.40
19	1.2	.32
20	1.6	.17
21	1.5	—
23	1.0	.04
25	RWE	

DT	80899	TM	102045
TMP	24.11	SpC	201.00
TDS	0.131	DO%	39.9
DO	3.38	DEP	0.258
pH	8.82	ORP	74.8

Photo

7 - downstream end looking upstream

6 5 - downstream end looking downstream

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

No flow

Is Reach Representative of Stream? (Y/N)____ If Not: ____

Additional Comments/Pollution Impacts: Riffle habitat but dry

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 5 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 4 & 3

STREAM MEASUREMENTS: AVERAGE WIDTH: 20 AVERAGE DEPTH: .5 MAX. DEPTH 1.7

LENGTH	WIDTH	DEPTHS ▷									POOL-GLD-RIF-RUN
200'	20'	.5	1	2	1	.5					POOL
40'	15'	.1	.2	.1	.2						Glide
100'	20'	.5	2	1	1	.5					Pool
habitat	present	but	no	flow							Riffle

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

DT	80899	TM	123442
TMP	23.48	SpC	327.00
DS	0.215	DO%	18.3
DO	1.57	DEP	0.428
pH	8.43	ORP	85.1

No flow

Photo

5A- downstream looking upstream

4B- downstream looking downstream

BCI 8/19/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If No:

Additional Comments/Pollution Impacts:

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10)

AESTHETIC RATING (1-10)

CANOPY (%OPEN) 5 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 22 + 23

STREAM MEASUREMENTS: AVERAGE WIDTH: 10" AVERAGE DEPTH: 7" MAX DEPTH 2.8'

LENGTH	WIDTH	DEPTHS 5	10	15	20	25	30				POOL:GLD:RIF:RUN
50	30	3"	5"	8"	6"	3"	2"				GLD
35	20	4"	8"	14"	3"						POOL
105	25	4"	6"	7"	7"	3"					GLD
160	15	2.8'	1.5'	.3'							POOL
30	20	3"	5"	4"	2"						RUN

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

DT 80999
TEMP 29.17
TDS 1.266
DO 4.87
pH 8.56

TM 152428
SPC 19960
DO% 58.0
DEP .253
ORP 61.3

photo 23 DS END looking US
photo 22 DS END looking DS

Dist from RWE (ft)	Depth (ft)	Vel
RWE	—	—
1	1.7	0.06
2	2.4	0.03
3	2.8	0.02
4	3.0	0.02
5	2.8	0.02
6	2.1	0.04
7	1.8	0.07
8	1.7	0.04
9	1.5	0.06
10	1.5	0.03
11	1.5	0.06
12	1.4	0.07
13	1.2	0.08
14	1.0	0.09

Dist from	Depth	Velocity
15	1.0	.07
16	0.8	.05
17	0.6	—
18	0.2	-0.05
19	LWE	—

BC 2 9/10/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If No:

Additional Comments/Pollution Impacts:

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10)

AESTHETIC RATING (1-10)

CANOPY (%OPEN) 15 GRADIENT: X LOW O-MODERATE O-HIGH PHOTOS: 18 & 19

STREAM MEASUREMENTS: AVERAGE WIDTH: 6 AVERAGE DEPTH: .5 MAX DEPTH 2.2

LENGTH	WIDTH	DEPTHS ▷ 2	3	4	.5	6	7				POOL:GLD:RIF:RUN
300	7	.3	.6	1.4	1.2	.8	.4	.4			POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist from RWE (ft)	Depth (ft)	Velocity (ft/sec)
RWE	0	—
.5	.2	.05
1.0	.9	.11
1.5	1.2	.21
2.0	1.5	.21
2.5	1.7	.18
3.0	1.7	.17
3.5	1.5	.15
4.0	1.5	.14
4.5	1.5	.12
5.0	1.0	.18
5.5	0.8	.16
6.0	0.7	.15
6.5	0.4	.13
7.0	0.3	.08
7.5	LWE	—

DT 81099 TM 144809
TEMP 33.9 SpC 2191.0
TDS 1.429 %DO 90.2
DO 6.34 DEP .0413
pH 9.35 ORP -14.7

photo 19 DS END looking US
photo 18 DS END looking DS

8/11/99
3C3

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 95 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 14 & 15

STREAM MEASUREMENTS: AVERAGE WIDTH: 20 AVERAGE DEPTH: .3 MAX DEPTH 2'

LENGTH	WIDTH	DEPTHS 5	10	15	20	25					POOL-GLD-RIF-RUN
140	25	1.1	1.6	2.0	1.1	0.6					POOL
70	20	0.8	0.6	0.5	0.2						GLD
38	20	.05	.1	.2	.3						RIF
100	15	.8	.5	.2							GLD

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

DT - 81199
TMP 25.90
TDS .316
DO 3.63
pH 8.59

TM .75029
SPC 478.00
DO% 44.5
DEP .233
ORP 81.1

No flow

photo 15 DS END looking US
photo 14

WDI 8/12/95

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) [ ] AESTHETIC RATING (1-10) [ ]

CANOPY (%OPEN) 85 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 6 & 7

STREAM MEASUREMENTS: AVERAGE WIDTH: 20 AVERAGE DEPTH: 0.8' MAX. DEPTH 2'

LENGTH	WIDTH	DEPTHS 5	10	15	20						POOL:GLD:RIF:RUN
300	20	.6	1.5	1.1	.6						POOL

CROSS-SECTIONS OF STREAM

[ ] [ ] [ ]

DRAWING OF STREAM

Temp 25.5

Conduct - 400.0

DO - 2.80

No Flow

photo 7 DS END looking US

photo 6 DS END looking DS

SD1
8/13/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: Appears to have a lot of flocculated solids drifting in the water column

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 5 GRADIENT: ☒-LOW O-MODERATE O-HIGH PHOTOS: 27 + 26 - Camera 3

STREAM MEASUREMENTS: AVERAGE WIDTH: 12' AVERAGE DEPTH: .2' MAX DEPTH .6'

LENGTH	WIDTH	DEPTHS 3	6	9	12	15					POOL:GLD:RIF:RUN
65	15	.2	.2	.2	.1	.1					RUN
50	10	.2	.1	.1							RIF
100	6	.4	.6	.2							RUN
150	15	.8	.1	.2	.2	.1					RUN

8/13/99
RC11
Cond: 1,900 µmhos
DO: 5.3 mg/L
Temp = 26°C

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist (m) from LWE	Depth (m)	Velocity (m/sec)
LWE	—	—
1	.1	—
2	.1	—
~~2.5~~	~~.6~~	~~.12~~
3	.6	.12
4	.5	.26
5	.5	.42
6	.4	.24
7	.4	.34
8	.3	.35
9	.2	.22
10	.1	—
11	.1	—
12	RWE	—

Cond = 1130 µmhos
DO = 2.10 mg/L
W. Temp = 25°C

photo 27 - US END looking US
photo 26 - US END looking DS

8/12/95

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If No: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

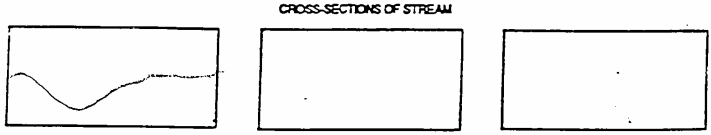
SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) _____ GRADIENT: O-LOW O-MODERATE O-HIGH PHOTOS: 5 + 4

STREAM MEASUREMENTS: AVERAGE WIDTH: _____ AVERAGE DEPTH: _____ MAX DEPTH _____

LENGTH	WIDTH	DEPTHS 1	2	3							POOL:GLD:RIF:RUN
200'	3'	7"	4"	2"							GLD

CROSS-SECTIONS OF STREAM



DRAWING OF STREAM

Photo
5 – downstream looking upstream
4 – downstream looking downstream

Temp 25°C
Cond 1120 umhos
DO. 6.5 mg/L

SC1
8/11/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) _____ GRADIENT: O–LOW O–MODERATE O–HIGH PHOTOS: 9 10

STREAM MEASUREMENTS: AVERAGE WIDTH: 20 AVERAGE DEPTH: 0.8 MAX DEPTH 2'

LENGTH	WIDTH	DEPTHS 5	10	15	20						POOL-GLD-RIF-RUN
300	20	0.6	1.0	2.0	1.5						POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

photo 10 - DS END looking US
photo 9 - DS END looking DS
photo 8 - INDIANA BANANA

Temp - 25°C
DO - 7.70 mg/L
Cond - 3,800 µmhos

Dist from LWE (ft)	Depth (ft)	Velocity ft/sec
1.0	0.4	0
2.0	1.0	0
3.0	0.7	0
4.0	0.9	-.01
5.0	1.0	.01
6.0	1.1	.06
7.0	1.3	.06
8.0	1.3	.06
9.0	1.3	.10
10.0	1.4	0.13
11.0	1.4	0.13
12.0	1.5	0.16
13.0	1.6	0.15
14.0	1.8	0.09

Dist LWE	Depth	Vel.
16.0	1.7	0.11
17.0	1.5	0.10
18.0	1.2	0.10
19.0	0.6	0.08
RWE-20.0	–	—

BGI
8/14/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 80 GRADIENT: X LOW O-MODERATE O-HIGH PHOTOS: 20, 21 Camera 3

STREAM MEASUREMENTS: AVERAGE WIDTH: 15 AVERAGE DEPTH: .8 MAX DEPTH 2.0'

LENGTH	WIDTH	DEPTHS 3	6	9	12	15	18	21				POOL-GLD-RIF-RUN
88	20	.7	1.0	1.5	2.0	1.7	1.1	.5				POOL
37	10	.3	.5	.4								RUN
7	10	.1	.2	.2								RIF
20	6	.6	.8									RUN
28	10	.5	1.0	.8								POOL
30	8	.3	.6	.4								RUN
100	20	.5	.8	1.8	2.0	1.6	1.1	.5				POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist (ft) from LWE	Depth (ft)	Velocity (ft/sec)
LWE	—	—
.5	.2	.14
1.0	.3	.01
1.5	.5	.01
2.0	.5	-.03
2.5	.5	.13
3.0	.5	.94
3.5	.2	.89
4.0	.3	.74
4.5	.2	.54
5.0	.2	.47
5.5	.3	.46
6.0	.2	.42
6.5	.1	—
7.0	RWE	—

Conductiv - 3225 umhos

Temp - 28.5°C

DO - 5.6 mg/L

photo 21 DS END looking US

photo 20 DS END looking DS

BG2
8/15/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

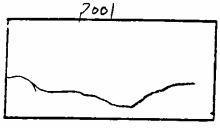
CANOPY (%OPEN) 10% GRADIENT: O-LOW O-MODERATE O-HIGH PHOTOS: 23, 22

STREAM MEASUREMENTS: AVERAGE WIDTH: _____ AVERAGE DEPTH: _____ MAX. DEPTH _____

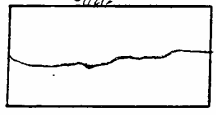
LENGTH	WIDTH	DEPTHS D 6'	9'	12'	15'	18'	21'	24'	POOL-GLD-RIF-RUN
100'	25'	.8	1.1	1.1	1.1	1.2	1.3	1.6	2.1	2.9	Pool
50'	25	.6	.6	.5	.4	.5	.2	.3	.3	.4	Glide
>70											Pool

CROSS-SECTIONS OF STREAM

Pool



Glide



DRAWING OF STREAM

Cond 3,200 umh
Temp 27.5 °C
DO 7.0 mg/L

Flow - very slight but heading North

Photo
23 → upstream, taking picture of downstream
22 → same spot taking picture of upstream

SF1
8/14/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 10 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 14 + 15

STREAM MEASUREMENTS: AVERAGE WIDTH: 25 AVERAGE DEPTH: .6 MAX. DEPTH 1.5

LENGTH	WIDTH	DEPTHS 3	6	9	12	15	18	21	24	27	POOL:GLD:RIF:RUN
90	12	.1	.2	.3	.1						RUN
50	32	.4	.5	.6	.4	.3	.3	.3	.3	.3	GLD
120	27	.1	.3	.8	1.0	1.2	1.1	1.3	1.0	.8	POOL
85	35	.3	.3	.4	.5	.5	.3	.2	.5	.5	GLD

CROSS-SECTIONS OF STREAM

☐ ☐ ☐

DRAWING OF STREAM

W Temp = 25°C
DO = 11.30 mg/L
Cond = 1,400 µmhos

photo 15 DS END looking US
photo 14 DS END looking DS

~~Dist from RWE~~	Depth	ft/sec Velocity
RWE	—	—
1	.1	—
2	.1	
3	.1	—
4	.1	—
5	.2	.05
5.5	.3	.10
6.0	.3	.09
7.0	.2	.16
8.0	.2	.16
9.0	.3	.19
10.0	.4	.18
11.0	.4	.19
12.0	.4	.18
13.0	.2	.09
14.0	.1	—
15.0	LWE	

SFR
8/14/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) AESTHETIC RATING (1-10)

CANOPY (%OPEN) 65 GRADIENT: X LOW O-MODERATE O-HIGH PHOTOS: 17 / 16

STREAM MEASUREMENTS: AVERAGE WIDTH: 22 AVERAGE DEPTH: .5 MAX DEPTH 1.5

LENGTH	WIDTH	DEPTHS @ 5	10	15	20	25	30					POOL:GLD:RIF:RUN
75	22	.9	1.2	1.4	1.2	1.3						POOL
9	2	.2	.2									RUN
145	25	1.2	.9	.9	.5	.2						POOL
120	28	.5	.6	.6	.8	.7	.4					GLD
24	5	.2	.3									RUN
9	5	.1	.2									RIF

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

W Temp = 29°C
DO = 9.8 mg/L
Cond = 1,780 µmhos

Photo
17 - upstream looking upstream
16 - upstream looking downstream

Dist from LWE (ft)	Depth (ft)	Velocity (ft/sec)
LWE	—	—
.4	.1	—
.8	.2	.33
1.2	.2	.36
1.6	.3	.47
2.0	.3	.49
2.4	.3	.57
2.8	.3	.56
3.2	.3	.54
3.6	.3	.60
4.0	.3	.47
4.4	.2	.33
4.8	.1	—
5.0	RWE	

X

SF3
8/14/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 30 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 18, 19

STREAM MEASUREMENTS: AVERAGE WIDTH: 12 AVERAGE DEPTH: .7 MAX. DEPTH 2.1

LENGTH	WIDTH	DEPTHS 2	4	6	8	10	12	14	16	18	POOL-GLD-RIF-RUN
25	4	.2	.2								RIF
85	15	.4	.4	.5	.5	.4	.3	.3	.2		GLD
40	12	.3	0.8	1.2	2.0	1.8	1.6				POOL
90	20	.1	.2	.3	.3	.5	.5	.4	.4	.2	GLD
60	10	.5	1.6	2.1	1.5	.5					POOL
50	6	.2	.4	.4							GLD

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist from LWE (ft)	Depth (ft)	Velocity (ft/sec)
LWE	—	—
.5	.1	—
1.0	.1	—
1.5	.3	.23
2.0	.4	.32
2.5	.4	.36
3.0	.6	.34
3.5	.6	.36
4.0	.5	.40
4.5	.4	.36
5.0	.3	.32
5.5	.2	.31
6.0	.1	—
6.5	RWE	

Conduct - 2,000 umhos

Temp - 28°C

DO - 7.10 mg/L

photo 19 DS END looking US

photo 18 DS END looking DS

WF1 8/16/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 90 GRADIENT: X LOW O-MODERATE O-HIGH PHOTOS: 22, 23

STREAM MEASUREMENTS: AVERAGE WIDTH: 12 AVERAGE DEPTH: .6 MAX DEPTH 1.3

LENGTH	WIDTH	DEPTHS 2	4	6	8	10	12	14	16	18	POOL-GLD-RIF-RUN
30	10	.2	.1	.1	.2	.1					RIF
205	12	.2	.2	.3	.3	.4	.2				RUN
15	8	.1	.1	.1	.1						RIF
25	10	.2	.3	.3	.2	.2					RUN
60	20	1.0	1.1	1.0	.7	.6	.6	.5	.5	.5	POOL

CROSS-SECTIONS OF STREAM

☐ ☐ ☐

DRAWING OF STREAM

Dist from RWE (ft)	Depth (ft)	Velocity (ft/sec)
RWE	—	—
.5	.2	.00
1.0	.3	.00
1.5	.3	.12
2.0	.4	.21
2.5	.4	.34
3.0	.4	.57
3.5	.4	.75
4.0	.4	.79
4.5	.4	.74
5.0	.4	.72
5.5	.3	.71
6.0	.3	.65
6.5	.2	.48
7.0	.2	.30
7.5	.2	.23
8.0	.1	—
8.5	.1	—

WTemp : 24°C
DO : 13.5 mg/L
Cond = 830 µmhos

photo 23 DS END looking US
photo 22 DS END looking DS

WF2 X
8/15/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 85 GRADIENT: X LOW O-MODERATE O-HIGH PHOTOS: 26 + 27 Camera 4

STREAM MEASUREMENTS: AVERAGE WIDTH: 15 AVERAGE DEPTH: .8 MAX. DEPTH 1.9

LENGTH	WIDTH	DEPTHS 3	6	9	12	15					POOL:GLD:RIF:RUN
15	15	.3	.1	.2	.2	.1					RIF
165	15	.8	1.5	1.7	.7	.5					POOL
140	15	.01	.2	.5	.4	.3					RUN

CROSS-SECTIONS OF STREAM

☐ ☐ ☐

DRAWING OF STREAM

Dist from LWE (ft)	Depth (ft)	Velocity (ft/sec)
LWE	—	—
1.0	.3	.04
2.0	.7	.08
3.0	.8	.13
4.0	.6	.16
5.0	.7	.18
6.0	1.1	.20
7.0	1.2	.26
8.0	1.1	.20
9.0	1.0	.15
10.0	.7	.16
11.0	.5	.08
12.0	.3	.00
13.0	RWE	

Temp = 28°C
DO = OFF Scale (>20mg/L)
Cond = 960 µmhos

photo 27 - DS END looking US
photo 26 - DS END looking DS

WF3
8/15/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If No:

Additional Comments/Pollution Impacts:

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

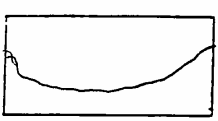
SUBJECTIVE RATING (1-10) AESTHETIC RATING (1-10)

CANOPY (%OPEN) 95% GRADIENT: O-LOW O-MODERATE O-HIGH PHOTOS: Finishing Camera 3 due to not getting wet

STREAM MEASUREMENTS: AVERAGE WIDTH: AVERAGE DEPTH: MAX DEPTH

LENGTH	WIDTH	DEPTHS D 2	4	6	8	10	12	14	16		POOL:GLD:RIF:RUN
+ 300'	17'	1.4	1.6	1.6	1.8	1.6	1.4	1.4	1.2	1.2	POOL
15	10	.6	.7	.7	.8						RUN + very little flow

CROSS-SECTIONS OF STREAM



DRAWING OF STREAM

Dist from LWE (ft)	Depth (ft)	Velocity (ft/sec)
LWE	—	—
.5	.4	—
1.0	.6	.06
1.5	1.0	.06
2.0	1.3	.10
2.5	1.4	.08
3.0	1.5	.08
3.5	1.6	.07
4.0	1.5	.10
4.5	1.4	.09
5.0	1.3	.07
5.5	1.3	.10
6.0	1.3	.08
6.5	1.3	.08
7.0	1.4	.04
8.0	1.1	.09
9.0	.8	.03
10.0	.5	.01

DO = 6.70 mg/L
wTemp = 27°C
Cond = 700 µmhos

photo 14, 12, 10, 8, 6 = DS END looking US

photo 13, 11, 9, 7, 5 = DS END looking DS

HCI 8/15/99 X

Dep 8/15

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If No:

Additional Comments/Pollution Impacts:

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) AESTHETIC RATING (1-10)

CANOPY (%OPEN) 85 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 24, 25

STREAM MEASUREMENTS: AVERAGE WIDTH: 8 AVERAGE DEPTH: .5 MAX DEPTH 1.2

LENGTH	WIDTH	DEPTHS 2	4	6	8	10					POOL-GLD-RIF-RUN
235	6	.6	1.2	.8							POOL
20	10	.4	.6	.5	.3	.3					GLD
40	8	.4	.6	1.0	1.0						POOL
70	10										GLD
30	10										POOL
30	8										GLD
10	8	.1	.1	.1	.1						RUN

CROSS-SECTIONS OF STREAM

W Temp = 30°C
DO = 15.2 mg/L (supersaturated)
Cond = 1,060 µmhos

photo 25 DS END looking US
photo 24

(A) DRAWING OF STREAM

Dist from RWE	Depth (m)	Velocity (m/sec)
RWE	—	—
.5	.6	-.01
1.0	.6	.00
1.5	.6	-.01
2.0	.5	.04
2.5	.5	.06
3.0	.5	.07
3.5	.5	.12
4.0	.5	.14
4.5	.5	.19
5.0	.5	.14
5.5	.5	.14
6.0	.5	.06
6.5	.4	-.02
7.0	.2	-.02
7.5	.1	—
8.0	.1	—

Procedure No.	WQPA–SWS–3	Date Issued	9-30-89
Revision No.	6	Date Effective	9-30-89

SAI
8/6/99

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If No:

Additional Comments/Pollution Impacts:

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10)

AESTHETIC RATING (1-10)

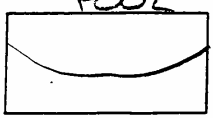
CANOPY (%OPEN) 95 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 19 + 20

STREAM MEASUREMENTS: AVERAGE WIDTH: AVERAGE DEPTH: MAX. DEPTH 1.8'

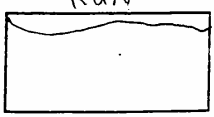
LENGTH	WIDTH	DEPTHS 1	2	3	4	5	6	7				POOL:GLD:RIF:RUN
70	6	3"	4"	5"	6"	3"						GLD
180	6	6"	7"	8"	7"	15	6"					POOL
8	5	3	3	1		3						RUN
38	3	→	MAX	1.8	FI							POOL
20	6											GLD

GLD

CROSS-SECTIONS OF STREAM POOL



RUN



DRAWING OF STREAM

DT - 80699
Temp 26.63
TDS .0317
DO. 5.84
pH 8.75

TM, 110114
SPC 488.00
DO 72.9
DEP .259
ORD 40.6

Flow is very slight - Flow Readings Not TAKEN

photos 19+20
DS End looking US: ~~20~~ 21
DS End looking DS: ~~19~~ 20

APPENDIX C-3

MAY 2000
FIELD DATA SHEETS

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

QHEI SCORE: ~~46~~ 43

Stream: Finney Creek RM: ____ Date: ____ River Code: ____

Location: RM-1 Crew: E-E-/C-W-E

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; Check *all types present*);

SUBSTRATE SCORE: ~~8~~ 7

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
O-BLDER /SLABS[10]			O-GRAVEL [7]	X	
O-BOULDER [9]			O-SAND [6]	X	
O-COBBLE [8]			O-BEDROCK[5]		
X-HARDPAN [4]	X		O-DETRITUS[3]		
X-MUCK [2]	X		O-ARTIFIC.[0]	X	

SUBSTRATE QUALITY

Substrate Origin (Check One)

O-LIMESTONE [1] X-RIP/RAP [0] X-TILLS [1] X-HARDPAN [0] O-SANDSTONE [0] O-SHALE [-1] O-COAL FINES [-2]

Silt Cover (Check One)

O-SILT HEAVY [-2] X-SILT MODERATE [-1] O-SILT NORMAL [0] O-SILT FREE [1]

Extent Of Embeddness (Check One)

O—EXTENSIVE [-2] X-MODERATE[-1] O—LOW[0] O—NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: X 4 [2] O— <= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

COVER SCORE: 8

2) INSTREAM COVER

TYPE (Check *All* That Apply)

O -UNDERCUT BANKS [1]
X-OVERHANGING VEGETATION [1]
O -SHALLOWS (IN SLOW WATER) [1]
X-DEEP POOLS [2]
O -BOULDERS [1]
O -OXBOWS [1]
X-ROOTWADS [1]
X-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

O - EXTENSIVE > 75% [11]
O - MODERATE 25-75% [7]
O - SPARSE 5-25% [3]
O - NEARLY ABSENT < 5%[1]

COMMENTS: ____

CHANNEL: 7

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
X - LOW [2]	O - FAIR [3]	X - RECOVERING [3]	X - LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	X - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

RIPARIAN: 5

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

"River Right Looking Downstream"

RIPARIAN WIDTH (L R (Per Bank))	EROSION/RUNOFF - FLOOD PLAIN QUALITY (L R (Most Predominant Per Bank))	(L R (Per Bank))	BANK EROSION
O -WIDE> 50m [4]	O-FOREST, SWAMP [3]	O-URBAN OR INDUSTRIAL[0]	O -NONE OR LITTLE [3]
O -MODERATE 10-50 [2]	O-OPEN PASTURE/ ROWCROP[0]	O-SHRUB OR OLD FIELD[2]	X -MODERATE [2]
O -NARROW 5-10m [2]	O- RESID.,PARK,NEW FIELD [1]	O-CONSERV. TILLAGE [1]	X -HEAVY OR SEVERE[1]
X -VERY NARROW 1-5m [1]	O-FENCED PASTURE [1]	O-MINING/CONSTRUCTION [0]	
O -NONE[0]			

COMMENTS: ____

POOL: 8

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX DEPTH (Check 1)

X >1m [6]
O- 0.7-1m [4]
O- 0.4-0.7m [2]
O- < 0.4m [1]
O—<0.2m [Pool = 0]

MORPHOLOGY (Check 1)

O -POOL WIDTH > RIFFLE WIDTH [2]
X -POOL WIDTH = RIFFLE WIDTH [1]
O -POOL WIDTH < RIFFLE W. [0]

POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)

O -TORRENTIAL[-1]
O -FAST[1]
O -MODERATE [1]
X -SLOW [1]
O -EDDIES[1]
O -INTERSTITIAL[-1]
O -INTERMITTENT[-2]

O -NO POOL[0]

COMMENTS: ____

RIFFLE: 4

RIFFLE/RUN DEPTH

X - GENERALLY >10 cm,MAX>50 [4]
O - GENERALLY >10 cm,MAX<50 [3]
O - GENERALLY 5-10 cm [1]
O - GENERALLY < 5 cm [Riffle = 0]

RIFFLE/RUN SUBSTRATE

O-STABLE (e.g.,Cobble, Boulder) [2]
O-MOD. STABLE (e.g.,Pea Gravel) [1]
X-UNSTABLE (Gravel,Sand) [0]

RIFFLE/RUN EMBEDDEDNESS

O-EXTENSIVE [-1] X-MODERATE[0] O-LOW. [1] O-NONE[2]

O-NO RIFFLE[0]

COMMENTS ____

GRADIENT: 4

6] Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

PC-2
5/12/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: ~~46~~ 46

Stream: Green Creek RM: ____ Date: 5/12/00 River Code: ____
Location: PC-2 Crew: ESB/CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; *Check all types present*);

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE	SUBSTRATE QUALITY
O-BLDER /SLABS[10]			O-GRAVEL [7]			Substrate Origin (Check all)
O-BOULDER [9]			O-SAND [6]			O-LIMESTONE [1] O-RIP/RAP [0]
O-COBBLE [8]			O-BEDROCK[5]			☒-TILLS [1] ☒-HARDPAN [0]
☒-HARDPAN [4]	X		O-DETRITUS[3]	X		O-SANDSTONE [0]
☒-MUCK [2]	X		O-ARTIFIC.[0]			O-SHALE [-1]
						O-COAL FINES [-2]

TOTAL NUMBER OF SUBSTRATE TYPES: O-> 4 [2] ☒-<= 4 [0]

Sit Cover (Check One)
O-SILT HEAVY [-2] O-SILT MODERATE [-1]
☒-SILT NORMAL [0] O-SILT FREE [1]

Extent Of Embeddness (Check One)
O-EXTENSIVE [-2] ☒-MODERATE[-1]
O-LOW[0] O-NONE[1]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

SUBSTRATE SCORE: 6

2] INSTREAM COVER

TYPE (Check *All* That Apply)
☒-UNDERCUT BANKS [1] ☒-DEEP POOLS [2] O-OXBOWS [1]
☒-OVERHANGING VEGETATION [1] O-ROOTWADS [1] O-AQUATIC MACROPHYTES [1]
O-SHALLOWS (IN SLOW WATER) [1] O-BOULDERS [1] ☒-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)
O - EXTENSIVE > 75% [11]
O - MODERATE 25-75% [7]
☒ - SPARSE 5-25% [3]
O - NEARLY ABSENT < 5% [1]

COMMENTS: ____

COVER SCORE: 8

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	☒ - MODERATE [2]	O - RELOCATION	O - ISLANDS
☒ - LOW [2]	O - FAIR [3]	☒ - RECOVERING [3]	O - LOW [1]	O - CANOPY REMOVAL	☒ - LEVEED
O - NONE [1]	☒ - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
					O - ONE SIDE CHANNEL MODIFICATIONS

COMMENTS: ____

CHANNEL: 8

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)
"River Right Looking Downstream"

RIPARIAN WIDTH (L R (Per Bank))	EROSION/RUNOFF - FLOOD PLAIN QUALITY (L R (Most Predominant Per Bank))	(L R (Per Bank))	BANK EROSION
O O-WIDE> 50m [4]	☒ ☒-FOREST, SWAMP [3]	O O-URBAN OR INDUSTRIAL[0]	O O-NONE OR LITTLE [3]
O O-MODERATE 10-50 [3]	O O-OPEN PASTURE/ ROWCROP[0]	O O-SHRUB OR OLD FIELD[2]	O O-MODERATE[2]
O O-NARROW 5-10m [2]	O O- RESID.,PARK,NEW FIELD [1]	O O-CONSERV. TILLAGE [1]	☒ ☒-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	O O-FENCED PASTURE [1]	O O-MINING/CONSTRUCTION [0]	
O O-NONE[0]			

COMMENTS: ____

RIPARIAN: ~~12~~ ~~10~~ 4

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☒ - >1m [6]		O-TORRENTIAL[-1]	O-EDDIES[1]
O- 0.7-1m [4]	O-POOL WIDTH > RIFFLE WIDTH [2]	O-FAST[1]	O-INTERSTITIAL[-1]
O- 0.4-0.7m [2]	☒-POOL WIDTH = RIFFLE WIDTH [1]	O-MODERATE [1]	O-INTERMITTENT[-2]
O- < 0.4m [1]	O-POOL WIDTH < RIFFLE W. [0]	☒-SLOW [1]	
O—<0.2m (Pool = 0)			

O-NO POOL[0]

COMMENTS: ____

POOL: 8

RIFFLE/RUN DEPTH
☒ - GENERALLY >10 cm,MAX>50 [4]
O - GENERALLY >10 cm,MAX<50 [3]
O - GENERALLY 5-10 cm [1]
O - GENERALLY < 5 cm (Riffle = 0)

RIFFLE/RUN SUBSTRATE
O-STABLE (e.g.,Cobble, Boulder) [2]
O-MOD. STABLE (e.g.,Pea Gravel) [1]
☒-UNSTABLE (Gravel,Sand) [0]

RIFFLE/RUN EMBEDDEDNESS
O-EXTENSIVE [-1] ☒-MODERATE[0]
O-LOW. [1] O-NONE[2]

O-NO RIFFLE[0]

COMMENTS ____

RIFFLE: 4

GRADIENT: 2

6] Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

PC-3
5/8/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

Stream Pigeon Creek RM ____ Date ____ River Code ____

Location PC-3 Crew EB/LWE

QHEI SCORE: [X] 40

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; Check all types present);

SUBSTRATE SCORE: [D] 3

TYPE	POOL	RIFFLE	SUBSTRATE QUALITY
☐ O-BLDER /SLABS[10]	____	____	☐ O-GRAVEL [7]
☐ O-BOULDER [9]	____	____	☐ O-SAND [6]
☐ O-COBBLE [8]	____	____	☒ O-BEDROCK[5]
☐ O-HARDPAN [4]	____	____	☐ O-DETRITUS[3]
☐ O-MUCK [2]	____	____	☐ O-ARTIFIC.[0]

Substrate Origin (Check all): ☐ O-LIMESTONE [1] ☐ O-RIP/RAP [0] ☐ O-TILLS [1] ☐ O-HARDPAN [0] ☐ O-SANDSTONE [0] ☒ O-SHALE [-1]

Silt Cover (Check One): ☒ SILT HEAVY [-2] ☐ O-SILT MODERATE [-1] ☐ O - SILT NORMAL [0] ☐ O - SILT FREE [1]

Extent Of Embeddedness (Check One): ☒ EXTENSIVE [-2] ☐ MODERATE [-1] ☐ LOW [0] ☐ NONE [1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐ > 4 [2] ☒ <= 4 [0] ☒ COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS ____

COVER SCORE: [7]

2) INSTREAM COVER

TYPE (Check *All* That Apply)

☐ -UNDERCUT BANKS [1]
☐ -OVERHANGING VEGETATION [1]
☒ -SHALLOWS (IN SLOW WATER) [1]
☒ -DEEP POOLS [2]
☐ -ROOTWADS [1]
☐ -BOULDERS [1]
☐ -OXBOWS [1]
☐ -AQUATIC MACROPHYTES [1]
☒ -LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

CHANNEL: [8]

3) CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☒ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☐ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☐ - LOW [2]	☐ - FAIR [3]	☒ - RECOVERING [3]	☒ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☒ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

RIPARIAN: [X] 5

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

River Right Looking Downstream

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)		BANK EROSION L R (Per Bank)
☐ ☐ -WIDE > 50m [4]	☒ ☒ -FOREST, SWAMP [3]	☐ ☐ -URBAN OR INDUSTRIAL [0]	☐ ☐ -NONE OR LITTLE [3]
☐ ☐ -MODERATE 10-50 [3]	☐ ☐ -OPEN PASTURE/ ROWCROP [0]	☐ ☐ -SHRUB OR OLD FIELD [2]	☐ ☐ -MODERATE [2]
☐ ☐ -NARROW 5-10m [2]	☐ ☐ -RESID., PARK, NEW FIELD [1]	☐ ☐ -CONSERV. TILLAGE [1]	☒ ☒ -HEAVY OR SEVERE [1]
☒ ☒ -VERY NARROW 1-5m [1]	☐ ☐ -FENCED PASTURE [1]	☐ ☐ -MINING/CONSTRUCTION [0]	
☐ ☐ -NONE [0]			

COMMENTS: ____

POOL: [8]

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☒ > 1m [6]		☐ -TORRENTIAL [-1]	☐ -EDDIES [1]
☐ - 0.7-1m [4]	☐ -POOL WIDTH > RIFFLE WIDTH [2]	☐ -FAST [1]	☐ -INTERSTITIAL [-1]
☐ - 0.4-0.7m [2]	☒ -POOL WIDTH = RIFFLE WIDTH [1]	☐ -MODERATE [1]	☐ -INTERMITTENT [-2]
☐ - < 0.4m [1]	☐ -POOL WIDTH < RIFFLE W. [0]	☒ -SLOW [1]	
☐ - < 0.2m [Pool = 0]			

☐ NO POOL [0]

COMMENTS: ____

RIFFLE: [5]

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☒ - GENERALLY > 10 cm, MAX > 50 [4]	☒ STABLE (e.g., Cobble, Boulder) [2]	☒ EXTENSIVE [-1] ☐ MODERATE [0]
☐ - GENERALLY > 10 cm, MAX < 50 [3]	☐ - MOD. STABLE (e.g., Pea Gravel) [1]	☐ - LOW. [1] ☐ NONE [2]
☐ - GENERALLY 5-10 cm [1]	☐ - UNSTABLE (Gravel, Sand) [0]	
☐ - GENERALLY < 5 cm [Riffle = 0]		

☐ NO RIFFLE [0]

COMMENTS: ____

GRADIENT: [X] 4

6) Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

PC-4
5/14/00
DuP-3 water quality sampling taken

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

QHEI SCORE: [XX] ~~61~~ 56

Stream: Singer Creek RM: Date: River Code:
Location: PC-4 upstream Crew: EB/CWB

1] SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Check all types present):

SUBSTRATE SCORE: [XX] 12

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE	SUBSTRATE QUALITY
O-BLDER/SLABS[10]			X-GRAVEL [7]	X	X	Substrate Origin (Check all)
O-BOULDER [9]			O-SAND [6]	X	X	O-LIMESTONE [1] X-RIP/RAP [0]
X-COBBLE [8]	X	X	O-BEDROCK[5]			X-TILLS [1] O-HARDPAN [0]
O-HARDPAN [4]			O-DETRITUS[3]			O-SANDSTONE [0]
O-MUCK [2]			O-ARTIFIC.[0]	X	X	O-SHALE [-1]

Silt Cover (Check One): X-SILT HEAVY [-2] O-SILT MODERATE [-1] O-SILT NORMAL [0] O-SILT FREE [1]

Extent Of Embeddedness (Check One): X-EXTENSIVE [-2] O-MODERATE [-1] O-LOW [0] O-NONE [1]

TOTAL NUMBER OF SUBSTRATE TYPES: 5 [2] 4 <= 4 [0] O-COAL FINES [-2]
NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)
COMMENTS:

2] INSTREAM COVER

COVER SCORE: [13]

TYPE (Check All That Apply): O-UNDERCUT BANKS [1] X-DEEP POOLS [2] O-OXBOWS [1] X-OVERHANGING VEGETATION [1] X-ROOTWADS [1] O-AQUATIC MACROPHYTES [1] X-SHALLOWS (IN SLOW WATER) [1] O-BOULDERS [1] X-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check ONLY One or check 2 and AVERAGE): O - EXTENSIVE > 75% [11] X - MODERATE 25-75% [7] O - SPARSE 5-25% [3] O - NEARLY ABSENT < 5% [1]

COMMENTS:

3] CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE)

CHANNEL: [7]

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
X - LOW [2]	O - FAIR [3]	X - RECOVERING [3]	X - LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	X - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: Only Station on Rogen with wetland plants

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

RIPARIAN: [X] 7

"River Right Looking Downstream"

RIPARIAN WIDTH (Per Bank) L R	EROSION/RUNOFF - FLOOD PLAIN QUALITY (Most Predominant Per Bank) L R	(Per Bank) L R	BANK EROSION
O-WIDE>50m [4]	X-FOREST, SWAMP [3]	O-URBAN OR INDUSTRIAL[0]	O-NONE OR LITTLE [3]
O-MODERATE 10-50 [3]	O-OPEN PASTURE/ ROWCROP[0]	O-SHRUB OR OLD FIELD[2]	X-MODERATE [2]
O-NARROW 5-10m [2]	O-RESID.,PARK,NEW FIELD [1]	O-CONSERV. TILLAGE [1]	O-HEAVY OR SEVERE[1]
X-VERY NARROW 1-5m [1]	O-FENCED PASTURE [1]	O-MINING/CONSTRUCTION [0]	
O-NONE[0]			

COMMENTS:

POOL/GLIDE AND RIFFLE/RUN QUALITY

POOL: [6]

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check All That Apply)	
O- >1m [6]	O-POOL WIDTH > RIFFLE WIDTH [2]	O-TORRENTIAL[-1]	O-EDDIES[1]
X-0.7-1m [4]	X-POOL WIDTH = RIFFLE WIDTH [1]	O-FAST[1]	O-INTERSTITIAL[-1]
O- 0.4-0.7m [2]	O-POOL WIDTH < RIFFLE W. [0]	X-MODERATE [1]	O-INTERMITTENT[-2]
O- < 0.4m [1]		O-SLOW [1]	
O-<0.2m [Pool = 0]			

O-NO POOL [0]

COMMENTS:

RIFFLE:

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
X-GENERALLY >10 cm,MAX>50 [4]	X-STABLE (e.g.,Cobble, Boulder) [2]	O-EXTENSIVE [-1] O-MODERATE[0]
O - GENERALLY >10 cm,MAX<50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	X-LOW. [1] O-NONE[2]
O - GENERALLY 5-10 cm [1]	O-UNSTABLE (Gravel,Sand) [0]	
O - GENERALLY < 5 cm [Riffle = 0]		

O-NO RIFFLE [0]

COMMENTS:

GRADIENT: [4]

6] Gradient (feet/mile): %POOL: %RIFFLE: %RUN:

Procedure No.	WQPA-SWS-1	Date Issued	9-30-89
Revision No.	6	Date Effective	9-30-89

PC-5
5/12/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 50

Stream: Pigeon Creek RM: ____ Date: ____ River Code: ____

Location: PC-5 Crew: ESB/CWR

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*);

TYPE	POOL	RIFFLE		POOL	RIFFLE	
☐ O-BLDER /SLABS[10]	____	____	☐ X-GRAVEL [7]	X	X	
☐ O-BOULDER [9]	____	____	☐ O-SAND [6]	X	X	
☐ O-COBBLE [8]	____	X	X O-BEDROCK[5]	X	____	X-TILLS [1]
☐ O-HARDPAN [4]	____	____	☐ O-DETRITUS[3]	X	____	O-SANDSTONE [0]
☐ O-MUCK [2]	____	____	☐ O-ARTIFIC.[0]	____	____	X-SHALE [-1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐ 4 [2] X <= 4 [0] O-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

SUBSTRATE QUALITY — Substrate Origin (Check all): O-LIMESTONE [1] O-RIP/RAP [0] O-HARDPAN [0]

SUBSTRATE SCORE: 11

Silt Cover (Check One): O-SILT HEAVY [-2] O-SILT MODERATE [-1] X-SILT NORMAL [0] O-SILT FREE [1]

Extent Of Embeddedness (Check One): O—EXTENSIVE [-2] X—MODERATE [-1] O—LOW [0] O—NONE [1]

2) INSTREAM COVER

TYPE (Check *All* That Apply)

☐ -UNDERCUT BANKS [1]
X -OVERHANGING VEGETATION [1]
X -SHALLOWS (IN SLOW WATER) [1]
X -DEEP POOLS [2]
X -ROOTWADS [1]
☐ -BOULDERS [1]
☐ -OXBOWS [1]
☐ -AQUATIC MACROPHYTES [1]
X -LOGS OR WOODY DEBRIS [1]

COVER SCORE: 9

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
X - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3) CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

CHANNEL: 7

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☐ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
X - LOW [2]	☐ - FAIR [3]	X - RECOVERING [3]	X - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	X - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

"River Right Looking Downstream"

RIPARIAN: 12

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐ ☐ -WIDE> 50m [4]	X X -FOREST, SWAMP [3]	☐ ☐ -URBAN OR INDUSTRIAL [0]	☐ ☐ -NONE OR LITTLE [3]
☐ ☐ -MODERATE 10-50 [3]	☐ ☐ -OPEN PASTURE/ ROWCROP [0]	☐ ☐ -SHRUB OR OLD FIELD [2]	X X -MODERATE [2]
☐ ☐ -NARROW 5-10m [2]	☐ ☐ - RESID., PARK, NEW FIELD [1]	☐ ☐ -CONSERV. TILLAGE [1]	☐ ☐ -HEAVY OR SEVERE [1]
X X -VERY NARROW 1-5m [1]	☐ ☐ -FENCED PASTURE [1]	☐ ☐ -MINING/CONSTRUCTION [0]	
☐ ☐ -NONE [0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY

POOL: 6

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☐ - >1m [6]		☐ -TORRENTIAL [-1]	☐ -EDDIES [1]
X - 0.7-1m [4]	☐ -POOL WIDTH > RIFFLE WIDTH [2]	☐ -FAST [1]	☐ -INTERSTITIAL [-1]
☐ - 0.4-0.7m [2]	X -POOL WIDTH = RIFFLE WIDTH [1]	X -MODERATE [1]	☐ -INTERMITTENT [-2]
☐ - < 0.4m [1]	☐ -POOL WIDTH < RIFFLE W. [0]	☐ -SLOW [1]	
☐ —<0.2m (Pool = 0)			

☐ - NO POOL [0]

COMMENTS: ____

RIFFLE: 3

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm, MAX>50 [4]	X STABLE (e.g., Cobble, Boulder) [2]	☐ -EXTENSIVE [-1] X -MODERATE [0]
☐ - GENERALLY >10 cm, MAX<50 [3]	☐ -MOD. STABLE (e.g., Pea Gravel) [1]	☐ -LOW. [1] ☐ -NONE [2]
X - GENERALLY 5-10 cm [1]	☐ -UNSTABLE (Gravel, Sand) [0]	
☐ - GENERALLY < 5 cm (Riffle = 0)		

☐ - NO RIFFLE [0]

COMMENTS ____

GRADIENT: 2

6) Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

PC-6
5/14/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 30 38

Stream Pigeon Creek RM ____ Date ____ River Code ____
Location PC-6 Crew: EJB/CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); SUBSTRATE SCORE: 5

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]			☐ ☐-GRAVEL [7]		
☐ ☐-BOULDER [9]			☐ ☐-SAND [6]		
☐ ☐-COBBLE [8]			☐ ☐-BEDROCK[5]		
☒ ☐-HARDPAN [4]	X		☐ ☐-DETRITUS[3]	X	
☒ ☐-MUCK [2]	X		☐ ☐-ARTIFIC.[0]	X	

TOTAL NUMBER OF SUBSTRATE TYPES: ☐> 4 [2] ☒— <= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

SUBSTRATE QUALITY: ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1] ☐ - SILT NORMAL [0] ☐ - SILT FREE [1]

Substrate Origin (Check All): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☒-TILLS [1] ☒-HARDPAN [0] ☐-SANDSTONE [0] ☐-SHALE [-1] ☐-COAL FINES [-2]

Silt Cover (Check One): ☐—EXTENSIVE [-2] ☒—MODERATE [-1] ☐—LOW [0] ☐—NONE [1]

Extent Of Embeddedness (Check One): ☐—EXTENSIVE [-2] ☒—MODERATE [-1] ☐—LOW [0] ☐—NONE [1]

COMMENTS ____

2] INSTREAM COVER COVER SCORE: 0

TYPE (Check *All* That Apply): ☐ -UNDERCUT BANKS [1] ☒-DEEP POOLS [2] ☐ -OXBOWS [1] ☐ -OVERHANGING VEGETATION [1] ☒-ROOTWADS [1] ☐ -AQUATIC MACROPHYTES [1] ☒-SHALLOWS (IN SLOW WATER) [1] ☐ -BOULDERS [1] ☒-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): ☐ - EXTENSIVE > 75% [11] ☐ - MODERATE 25-75% [7] ☒- SPARSE 5-25% [3] ☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) CHANNEL: 7

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☐ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ LOW [2]	☐ - FAIR [3]	☒- RECOVERING [3]	☒- LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☒- POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 4

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)		BANK EROSION L R (Per Bank)
☐ ☐ -WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☒ ☒-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐ -MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☐ ☐-MODERATE [2]
☐ ☐ -NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☒ ☒-HEAVY OR SEVERE[1]
☒ ☒ -VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐ -NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY POOL: 8

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☒ >1m [6]			
☐ 0.7-1m [4]	☐ -POOL WIDTH > RIFFLE WIDTH [2]	☐ -TORRENTIAL[-1]	☐ -EDDIES[1]
☐ 0.4-0.7m [2]	☒ -POOL WIDTH = RIFFLE WIDTH [1]	☐ -FAST[1]	☐ -INTERSTITIAL[-1]
☐ < 0.4m [1]	☐ -POOL WIDTH < RIFFLE W. [0]	☐ -MODERATE [1]	☐ -INTERMITTENT[-2]
☐—<0.2m [Pool = 0]		☒ SLOW [1]	

☐ -NO POOL[0]

COMMENTS: ____

RIFFLE: 4

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☒ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☒-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☐-LOW. [1] ☐-NONE[2]
☐ - GENERALLY 5-10 cm [1]	☒UNSTABLE (Gravel,Sand) [0]	
☐ - GENERALLY < 5 cm [Riffle = 0]		

☐-NO RIFFLE[0]

COMMENTS ____

GRADIENT: 2

6] Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

PC-7
5/12/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 2 44

Stream Placer Creek RM ____ Date ____ River Code ____
Location PC-7 Crew: EJB/CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*):

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]			☐ ☐-GRAVEL [7]	X	
☐ ☐-BOULDER [9]			☐ ☐-SAND [6]		
☐ ☐-COBBLE [8]			☐ ☐-BEDROCK[5]		
☐ ☒-HARDPAN [4]	X		☐ ☐-DETRITUS[3]		
☒ ☐-MUCK [2]	X		☐ ☐-ARTIFIC.[0]	X	

SUBSTRATE QUALITY — SUBSTRATE SCORE: 9 5

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1]
☐-SANDSTONE [0] ☒-TILLS [1] ☒-HARDPAN [0] ☐-SILT NORMAL [0] ☐-SILT FREE [1]
☐-SHALE [-1]
☐-COAL FINES [-2]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddedness (Check One): ☐-EXTENSIVE [-2] ☒-MODERATE [-1] ☐-LOW [0] ☐-NONE [1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐> 4 [2] ☒ <= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS ____

2] INSTREAM COVER — COVER SCORE: 8

TYPE (Check *All* That Apply)
☐ -UNDERCUT BANKS [1]
☒ -OVERHANGING VEGETATION [1]
☐ -SHALLOWS (IN SLOW WATER) [1]
☒ -DEEP POOLS [2]
☐ -ROOTWADS [1]
☐ -BOULDERS [1]
☐ -OXBOWS [1]
☐ -AQUATIC MACROPHYTES [1]
☒ -LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)
☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) — CHANNEL: 7

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☐ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ - LOW [2]	☐ - FAIR [3]	☒ - RECOVERING [3]	☒ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☒ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
					☐ - ONE SIDE CHANNEL MODIFICATIONS

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — RIPARIAN: 10

"River Rights Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/FLOODPLAIN QUALITY L R (Most Predominant Per Bank)	EROSION/FLOODPLAIN QUALITY L R (Per Bank)	BANK EROSION
☐ ☐ -WIDE> 50m [4]	☒ ☒-FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐ -MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐ -NARROW 5-10m [2]	☒ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒ -VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐ -NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY — POOL: 8

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☒ - >1m [6]	☐ -POOL WIDTH > RIFFLE WIDTH [2]	☐ -TORRENTIAL[-1]	☐ -EDDIES[1]
☐ - 0.7-1m [4]	☒ -POOL WIDTH = RIFFLE WIDTH [1]	☐ -FAST[1]	☐ -INTERSTITIAL[-1]
☐ - 0.4-0.7m [2]	☐ -POOL WIDTH < RIFFLE W. [0]	☐ -MODERATE [1]	☐ -INTERMITTENT[-2]
☐ - < 0.4m [1]		☒ -SLOW [1]	
☐ -<0.2m (Pool = 0)			

☐ - NO POOL [0]

COMMENTS: ____

RIFFLE/RUN DEPTH — RIFFLE: 4

☒ - GENERALLY > 10 cm, MAX> 50 [4]
☐ - GENERALLY > 10 cm, MAX< 50 [3]
☐ - GENERALLY 5-10 cm [1]
☐ - GENERALLY < 5 cm [Riffle = 0]

RIFFLE/RUN SUBSTRATE
☐-STABLE (e.g.,Cobble, Boulder) [2]
☐-MOD. STABLE (e.g.,Pea Gravel) [1]
☒-UNSTABLE (Gravel,Sand) [0]

RIFFLE/RUN EMBEDDEDNESS
☐-EXTENSIVE [-1] ☒-MODERATE[0]
☐-LOW. [1] ☐-NONE[2]

☐-NO RIFFLE [0]

COMMENTS ____

GRADIENT: 2

6] Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

PC-8
5/3/00.

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: [X] 42 46

Stream PCB Pigeon RM ____ Date 5/3/00 River Code ____
Location ____ Crew: ESO/CWB/ARS

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*); SUBSTRATE SCORE: [X] 24

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE	SUBSTRATE QUALITY
O-BLDER /SLABS[10]			O-GRAVEL [7]	X		Substrate Origin (Check all)
O-BOULDER [9]			O-SAND [6]	X		O-LIMESTONE [1] O-RIP/RAP [0]
O-COBBLE [8]			O-BEDROCK[5]			O-TILLS [1] X-HARDPAN [0]
X O-HARDPAN [4]	X		O-DETRITUS[3]	X		O-SANDSTONE [0]
X O-MUCK [2]	X		O-ARTIFIC.[0]			O-SHALE [-1]

TOTAL NUMBER OF SUBSTRATE TYPES: X 4 [2] O— <= 4 [0] X COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS ____

Silt Cover (Check One): X-SILT HEAVY [-2] O-SILT MODERATE [-1] O - SILT NORMAL [0] O - SILT FREE [1]

Extent Of Embeddedness (Check One): X—EXTENSIVE [-2] O—MODERATE[-1] O—LOW[0] O—NONE[1]

COVER SCORE: 13

2) INSTREAM COVER

TYPE (Check *All* That Apply)

O -UNDERCUT BANKS [1] X-DEEP POOLS [2] O -OXBOWS [1]
X-OVERHANGING VEGETATION [1] X-ROOTWADS [1] O -AQUATIC MACROPHYTES [1]
X-SHALLOWS (IN SLOW WATER) [1] O -BOULDERS [1] X-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)
O - EXTENSIVE > 75% [11]
X - MODERATE 25-75% [7]
O - SPARSE 5-25% [3]
O - NEARLY ABSENT < 5% [1]

COMMENTS: ____

CHANNEL: 7

3) CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
X - LOW [2]	X - FAIR [3]	X - RECOVERING [3]	X LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	O - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

RIPARIAN: 7

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)
"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)		BANK EROSION
O O -WIDE>50m [4]	X X-FOREST, SWAMP [3]	O O-URBAN OR INDUSTRIAL[0]	O O-NONE OR LITTLE [3]
O O -MODERATE 10-50 [3]	X O-OPEN PASTURE/ ROWCROP[0]	O O-SHRUB OR OLD FIELD[2]	O O-MODERATE[2]
O O -NARROW 5-10m [2]	O O- RESID.,PARK,NEW FIELD [1]	O O-CONSERV. TILLAGE [1]	X X-HEAVY OR SEVERE[1]
X X -VERY NARROW 1-5m [1]	O O-FENCED PASTURE [1]	O O-MINING/CONSTRUCTION [0]	
O O -NONE[0]			

COMMENTS: ____

POOL: 9

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
X >1m [6]	X -POOL WIDTH > RIFFLE WIDTH [2]	O -TORRENTIAL[-1]	O -EDDIES[1]
O- 0.7-1m [4]	O -POOL WIDTH = RIFFLE WIDTH [1]	O -FAST[1]	O -INTERSTITIAL[-1]
O- 0.4-0.7m [2]	X -POOL WIDTH < RIFFLE W. [0]	X-MODERATE [1]	O -INTERMITTENT[-2]
O- < 0.4m [1]		O -SLOW [1]	
O—<0.2m (Pool = 0)			

O - NO POOL[0]

COMMENTS: ____

RIFFLE: 0

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
O - GENERALLY >10 cm,MAX>50 [4]	O-STABLE (e.g.,Cobble, Boulder) [2]	O-EXTENSIVE [-1] O-MODERATE[0]
O - GENERALLY >10 cm,MAX<50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	O-LOW. [1] O-NONE[2]
O - GENERALLY 5-10 cm [1]	O-UNSTABLE (Gravel,Sand) [0]	
X GENERALLY < 5 cm (Riffle = 0)		

X NO RIFFLE[0]

COMMENTS ____

GRADIENT: 4

5) Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

PC-9
5/10/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: [X] 41

Stream: Pigeon Creek RM: ____ Date: ____ River Code: ____

Location: PC-9 Crew: EJB / GWB / APB

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; *Check all types present*): SUBSTRATE SCORE: [2] 2

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
O-BLDER /SLABS[10]			O-GRAVEL [7]		
O-BOULDER [9]			O-SAND [6]		
O-COBBLE [8]			O-BEDROCK[5]		
O-HARDPAN [4]			O-DETRITUS[3]	X	
X-MUCK [2]	X		O-ARTIFIC.[0]		

SUBSTRATE QUALITY — Substrate Origin (Check all): O-LIMESTONE [1] O-RIP/RAP [0] X-TILLS [1] X-HARDPAN [0] O-SANDSTONE [0] O-SHALE [-1] O-COAL FINES [-2]

Silt Cover (Check One): O-SILT HEAVY [-2] O-SILT MODERATE [-1] O-SILT NORMAL [0] O-SILT FREE [1]

Extent Of Embeddedness (Check One): O-EXTENSIVE [-2] X-MODERATE [-1] O-LOW [0] O-NONE [1]

TOTAL NUMBER OF SUBSTRATE TYPES: O-> 4 [2] O-<= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

COVER SCORE: [6]

2) INSTREAM COVER

TYPE (Check *All* That Apply): O-UNDERCUT BANKS [1] X-DEEP POOLS [2] O-OXBOWS [1] X-OVERHANGING VEGETATION [1] X-ROOTWADS [1] O-AQUATIC MACROPHYTES [1] O-SHALLOWS (IN SLOW WATER) [1] O-BOULDERS [1] X-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): O-EXTENSIVE > 75% [11] O-MODERATE 25-75% [7] O-SPARSE 5-25% [3] X-NEARLY ABSENT < 5% [1]

COMMENTS: ____

CHANNEL: [7]

3) CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O-HIGH [4]	O-EXCELLENT [7]	O-NONE [6]	O-HIGH [3]	O-SNAGGING	O-IMPOUND.
O-MODERATE [3]	O-GOOD [5]	O-RECOVERED [4]	O-MODERATE [2]	O-RELOCATION	O-ISLANDS
X-LOW [2]	O-FAIR [3]	X-RECOVERING [3]	O-LOW [1]	O-CANOPY REMOVAL	O-LEVEED
O-NONE [1]	X-POOR [1]	O-RECENT OR NO RECOVERY [1]		O-DREDGING	O-BANK SHAPING
					O-ONE SIDE CHANNEL MODIFICATIONS

COMMENTS: ____

RIPARIAN: [10] 12

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

"River Right Looking Downstream"

RIPARIAN WIDTH (L R (Per Bank))	EROSION/RUNOFF - FLOOD PLAIN QUALITY (L R (Most Predominant Per Bank))	(L R (Per Bank))	BANK EROSION
O-WIDE>50m [4]	X-FOREST, SWAMP [3]	O-URBAN OR INDUSTRIAL[0]	O-NONE OR LITTLE [3]
O-MODERATE 10-50 [3]	O-OPEN PASTURE/ ROWCROP[0]	O-SHRUB OR OLD FIELD[2]	X-MODERATE [2]
O-NARROW 5-10m [2]	O-RESID.,PARK,NEW FIELD [1]	O-CONSERV. TILLAGE [1]	O-HEAVY OR SEVERE[1]
X-VERY NARROW 1-5m [1]	O-FENCED PASTURE [1]	O-MINING/CONSTRUCTION [0]	
O-NONE[0]			

COMMENTS: ____

POOL: [8]

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX DEPTH (Check 1): X->1m [6] O-0.7-1m [4] O-0.4-0.7m [2] O-< 0.4m [1] O-<0.2m (Pool = 0)

MORPHOLOGY (Check 1): O-POOL WIDTH > RIFFLE WIDTH [2] X-POOL WIDTH = RIFFLE WIDTH [1] O-POOL WIDTH < RIFFLE W. [0]

POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply): O-TORRENTIAL[-1] O-EDDIES[1] O-FAST[1] O-INTERSTITIAL[-1] O-MODERATE [1] O-INTERMITTENT[-2] X-SLOW [1]

O-NO POOL[0]

COMMENTS: ____

RIFFLE: [4]

RIFFLE/RUN DEPTH: X-GENERALLY >10 cm,MAX>50 [4] O-GENERALLY >10 cm,MAX<50 [3] O-GENERALLY 5-10 cm [1] O-GENERALLY < 5 cm (Riffle = 0)

RIFFLE/RUN SUBSTRATE: O-STABLE (e.g.,Cobble, Boulder) [2] O-MOD. STABLE (e.g.,Pea Gravel) [1] X-UNSTABLE (Gravel,Sand) [0]

RIFFLE/RUN EMBEDDEDNESS: O-EXTENSIVE [-1] X-MODERATE[0] O-LOW. [1] O-NONE[2]

O-NO RIFFLE[0]

COMMENTS: ____

GRADIENT: [2]

6) Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

PC-11
5/10/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 57

Stream: Plum Creek RM: Date: River Code:

Location: PC-11 Clear: E.J.B/CWB/ARS

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; *Check all types present*); SUBSTRATE SCORE: 9

TYPE	POOL	RIFFLE	POOL	RIFFLE	SUBSTRATE QUALITY	Silt Cover (Check One)
O-BLDER /SLABS[10]			O-GRAVEL [7]	X	X Substrate Origin (Check all)	O-SILT HEAVY [-2]
O-BOULDER [9]			O-SAND [6]	X	X O-LIMESTONE [1]	O-RIP/RAP [0]
O-COBBLE [8]			O-BEDROCK[5]		X TILLS [1]	O-HARDPAN [0]
O-HARDPAN [4]			X O-DETRITUS[3]	X	X O-SANDSTONE [0]	
O-MUCK [2]			O-ARTIFIC.[0]		O-SHALE [-1]	

X O-SILT MODERATE [-1]
O - SILT NORMAL [0]
O - SILT FREE [1]

Extent Of Embeddness (Check One)
O—EXTENSIVE [-2] X—MODERATE[-1]
O—LOW[0] O—NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: O> 4 [2] X 3 or 4 [0] O-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS:

2] INSTREAM COVER COVER SCORE: 13

TYPE (Check *All* That Apply)

O -UNDERCUT BANKS [1]
X -OVERHANGING VEGETATION [1]
X -SHALLOWS (IN SLOW WATER) [1]
X -DEEP POOLS [2]
X -ROOTWADS [1]
O -BOULDERS [1]
O -OXBOWS [1]
O -AQUATIC MACROPHYTES [1]
X -LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)
O - EXTENSIVE > 75% [11]
X - MODERATE 25-75% [7]
O - SPARSE 5-25% [3]
O - NEARLY ABSENT < 5% [1]

COMMENTS:

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) CHANNEL: 7

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
X - LOW [2]	O - FAIR [3]	X - RECOVERING [3]	X - LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	X - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS:

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 12

'River Right Looking Downstream'

RIPARIAN WIDTH L R (Per Bank)	EROSION/BUNCES - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
O O -WIDE>50m [4]	X X FOREST, SWAMP [3]	O O-URBAN OR INDUSTRIAL[0]	O O-NONE OR LITTLE [3]
O O -MODERATE 10-50 [3]	O O-OPEN PASTURE/ ROWCROP[0]	O O-SHRUB OR OLD FIELD[2]	X X MODERATE [2]
O O -NARROW 5-10m [2]	O O- RESID.,PARK,NEW FIELD [1]	O O-CONSERV. TILLAGE [1]	O O-HEAVY OR SEVERE[1]
X X -VERY NARROW 1-5m [1]	O O-FENCED PASTURE [1]	O O-MINING/CONSTRUCTION [0]	
O O -NONE[0]			

COMMENTS:

POOL/GLIDE AND RIFFLE/RUN QUALITY POOL: 8

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
X >1m [6]		O -TORRENTIAL[-1]	O -EDDIES[1]
O- 0.7-1m [4]	O -POOL WIDTH > RIFFLE WIDTH [2]	O -FAST[1]	O -INTERSTITIAL[-1]
O- 0.4-0.7m [2]	X -POOL WIDTH = RIFFLE WIDTH [1]	X -MODERATE [1]	O -INTERMITTENT[-2]
O- < 0.4m [1]	O -POOL WIDTH < RIFFLE W. [0]	O -SLOW [1]	
O—<0.2m [Pool = 0]			

O - NO POOL[0]

COMMENTS:

RIFFLE: 4

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
X - GENERALLY >10 cm,MAX>50 [4]	O-STABLE (e.g.,Cobble, Boulder) [2]	O-EXTENSIVE [-1] X-MODERATE[0]
O - GENERALLY >10 cm,MAX<50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	O-LOW. [1] O-NONE[2]
O - GENERALLY 5-10 cm [1]	X UNSTABLE (Gravel,Sand) [0]	
O - GENERALLY < 5 cm (Riffle = 0)		

O-NO RIFFLE[0]

COMMENTS

GRADIENT: 4

6] Gradient (feet/mile): _____ %POOL: _____ %RIFFLE: _____ %RUN: _____

EPA 4520

PC-12 *
5/10/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 50

Stream Pigeon Creek RM ____ Date ____ River Code ____
Location PC-12 Crew: EDB/CWB

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; *Check all types present*):

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE	SUBSTRATE QUALITY
☐ O-BLDER /SLABS[10]			☒ O-GRAVEL [7]	X	X	Substrate Origin (Check all)
☐ O-BOULDER [9]			☐ O-SAND [6]	X	X	☐ O-LIMESTONE [1] ☐ O-RIP/RAP [0]
☐ O-COBBLE [8]			☐ O-BEDROCK[5]			☒ O-TILLS [1] ☒ O-HARDPAN [0]
☒ O-HARDPAN [4]	X	X	☐ O-DETRITUS[3]			☐ O-SANDSTONE [0]
☐ O-MUCK [2]			☐ O-ARTIFIC.[0]			☐ O-SHALE [-1]
						☐ O-COAL FINES [-2]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐ > 4 [2] ☒ <= 4 [0]
NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)
COMMENTS ____

SUBSTRATE SCORE: 12

Silt Cover (Check One): ☐ O-SILT HEAVY [-2] ☐ O-SILT MODERATE [-1] ☐ O-SILT NORMAL [0] ☐ O-SILT FREE [1]
Extent Of Embeddedness (Check One): ☐ O-EXTENSIVE [-2] ☐ O-MODERATE [-1] ☒ O-LOW [0] ☐ O-NONE [1]

2) INSTREAM COVER

TYPE (Check *All* That Apply): ☐ -UNDERCUT BANKS [1] ☒ -DEEP POOLS [2] ☐ -OXBOWS [1] ☒ -OVERHANGING VEGETATION [1] ☐ -ROOTWADS [1] ☐ -AQUATIC MACROPHYTES [1] ☒ -SHALLOWS (IN SLOW WATER) [1] ☐ -BOULDERS [1] ☒ -LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): ☐ - EXTENSIVE > 75% [11] ☐ - MODERATE 25-75% [7] ☒ - SPARSE 5-25% [3] ☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

COVER SCORE: 8

3) CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☐ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ - LOW [2]	☐ - FAIR [3]	☒ - RECOVERING [3]	☒ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☒ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

CHANNEL: 7

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)
"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/BUNCEE - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐ ☐ - WIDE > 50m [4]	☒ ☒ - FOREST, SWAMP [3]	☐ ☐ - URBAN OR INDUSTRIAL [0]	☐ ☐ - NONE OR LITTLE [3]
☐ ☐ - MODERATE 10-50 [3]	☐ ☐ - OPEN PASTURE/ ROWCROP [0]	☐ ☐ - SHRUB OR OLD FIELD [2]	☒ ☒ - MODERATE [2]
☐ ☐ - NARROW 5-10m [2]	☐ ☐ - RESID., PARK, NEW FIELD [1]	☐ ☐ - CONSERV. TILLAGE [1]	☐ ☐ - HEAVY OR SEVERE [1]
☒ ☒ - VERY NARROW 1-5m [1]	☐ ☐ - FENCED PASTURE [1]	☐ ☐ - MINING/CONSTRUCTION [0]	
☐ ☐ - NONE [0]			

COMMENTS: ____

RIPARIAN: 12

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☒ > 1m [6]	☐ - POOL WIDTH > RIFFLE WIDTH [2]	☐ - TORRENTIAL [-1]	☐ - EDDIES [1]
☐ - 0.7-1m [4]	☒ - POOL WIDTH = RIFFLE WIDTH [1]	☐ - FAST [1]	☐ - INTERSTITIAL [-1]
☐ - 0.4-0.7m [2]	☐ - POOL WIDTH < RIFFLE W. [0]	☐ - MODERATE [1]	☐ - INTERMITTENT [-2]
☐ - < 0.4m [1]		☐ - SLOW [1]	
☐ - < 0.2m [Pool = 0]			

☐ - NO POOL [0]

COMMENTS: ____

POOL: 3

RIFFLE/RUN DEPTH
☒ - GENERALLY > 10 cm, MAX > 50 [4]
☐ - GENERALLY > 10 cm, MAX < 50 [3]
☐ - GENERALLY 5-10 cm [1]
☐ - GENERALLY < 5 cm [Riffle = 0]

RIFFLE/RUN SUBSTRATE
☐ - STABLE (e.g., Cobble, Boulder) [2]
☐ - MOD. STABLE (e.g., Pea Gravel) [1]
☒ - UNSTABLE (Gravel, Sand) [0]

RIFFLE/RUN EMBEDDEDNESS
☐ - EXTENSIVE [-1] ☐ - MODERATE [0]
☒ - LOW [1] ☐ - NONE [2]

☐ - NO RIFFLE [0]

COMMENTS ____

RIFFLE: 5

GRADIENT: 4

6) Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

PC-13 X
5/8/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

QHEI SCORE: ~~50~~ 52

Stream: Pigeon Creek RM: ____ Date: ____ River Code: ____

Location: PC-13 Crew: EJB/CWB

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*);

SUBSTRATE SCORE: ~~8~~ 9

TYPE	POOL	RIFFLE		POOL	RIFFLE	SUBSTRATE QUALITY
O-BLDER /SLABS[10]			X O-GRAVEL [7]			
O-BOULDER [9]			O-SAND [6]			
O-COBBLE [8]			O-BEDROCK[5]			
X O-HARDPAN [4]			O-DETRITUS[3]	X		
O-MUCK [2]			O-ARTIFIC.[0]			

Substrate Origin (Check all): O-LIMESTONE [1] O-RIP/RAP [0] X-HARDPAN [0] O-TILLS [1] O-SANDSTONE [0] O-SHALE [-1]

Silt Cover (Check One): O-SILT HEAVY [-2] X SILT MODERATE [-1] O-SILT NORMAL [0] O-SILT FREE [1]

Extent Of Embeddedness (Check One): O-EXTENSIVE [-2] X MODERATE [-1] O-LOW [0] O-NONE [1]

TOTAL NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS:

COVER SCORE: 7

2) INSTREAM COVER

TYPE (Check *All* That Apply): O-UNDERCUT BANKS [1]; X-DEEP POOLS [2]; O-OXBOWS [1]; O-OVERHANGING VEGETATION [1]; O-ROOTWADS [1]; O-AQUATIC MACROPHYTES [1]; X-SHALLOWS (IN SLOW WATER) [1]; O-BOULDERS [1]; X-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): O-EXTENSIVE > 75% [11]; O-MODERATE 25-75% [7]; X-SPARSE 5-25% [3]; O-NEARLY ABSENT < 5% [1]

COMMENTS:

CHANNEL: 10

3) CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	X - MODERATE [2]	O - RELOCATION	O - ISLANDS
X - LOW [2]	X - FAIR [3]	X - RECOVERING [3]	O - LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	O - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS:

RIPARIAN: 14

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

River Right Looking Downstream

RIPARIAN WIDTH (L R (Per Bank))	EROSION/BUNCES - FLOOD PLAIN QUALITY (L R (Most Predominant Per Bank))		BANK EROSION
O - WIDE > 50m [4]	X X FOREST, SWAMP [3]	O - URBAN OR INDUSTRIAL [0]	X X NONE OR LITTLE [3]
O - MODERATE 10-50 [3]	O - OPEN PASTURE/ ROWCROP [0]	O - SHRUB OR OLD FIELD [2]	O - MODERATE [2]
O - NARROW 5-10m [2]	O - RESID., PARK, NEW FIELD [1]	O - CONSERV. TILLAGE [1]	O - HEAVY OR SEVERE [1]
X X - VERY NARROW 1-5m [1]	O - FENCED PASTURE [1]	O - MINING/CONSTRUCTION [0]	
O - NONE [0]			

COMMENTS:

POOL: 9

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
X > 1m [6]	O - POOL WIDTH > RIFFLE WIDTH [2]	O - TORRENTIAL [-1]	X - EDDIES [1]
O - 0.7-1m [4]	X - POOL WIDTH = RIFFLE WIDTH [1]	O - FAST [1]	O - INTERSTITIAL [-1]
O - 0.4-0.7m [2]	O - POOL WIDTH < RIFFLE W. [0]	O - MODERATE [1]	O - INTERMITTENT [-2]
O - < 0.4m [1]		X - SLOW [1]	
O - < 0.2m [Pool = 0]			

O - NO POOL [0]

COMMENTS:

RIFFLE: 1

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
O - GENERALLY > 10 cm, MAX > 50 [4]	O - STABLE (e.g., Cobble, Boulder) [2]	O - EXTENSIVE [-1]
O - GENERALLY > 10 cm, MAX < 50 [3]	O - MOD. STABLE (e.g., Pea Gravel) [1]	X - MODERATE [0]
X - GENERALLY 5-10 cm [1]	X - UNSTABLE (Gravel, Sand) [0]	O - LOW. [1]
O - GENERALLY < 5 cm [Riffle = 0]		O - NONE [2]

O - NO RIFFLE [0]

COMMENTS

GRADIENT: 2

6) Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

PC-14 X
5/2/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish — QHEI SCORE: 45

Stream: Pigeon — RM: ____ Date: 5/2/00 — River Code: ____
Location: PC-14 — Crew: EJB CWS

1] SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Check all types present);

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
O-BLDER /SLABS[10]			O-GRAVEL [7]	X	X
O-BOULDER [9]			O-SAND [6]	X	X
O-COBBLE [8]			O-BEDROCK[5]		
X-HARDPAN [4]	X		O-DETRITUS[3]		
O-MUCK [2]			O-ARTIFIC.[0]		
			O-LIMESTONE [1]		
			O-TILLS [1]		
			O-SHALE [-1]		
			O-SANDSTONE [0]		
			O-COAL FINES [-2]		

SUBSTRATE QUALITY — SUBSTRATE SCORE: 13

Substrate Origin (Check all): O-RIP/RAP [0] X-HARDPAN [0]

Silt Cover (Check One): O-SILT HEAVY [-2] O-SILT MODERATE [-1] X-SILT NORMAL [0] O-SILT FREE [1]

Extent Of Embeddedness (Check One): O-EXTENSIVE [-2] O-MODERATE[-1] X-LOW[0] O-NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: O- > 4 [2] X- <= 4 [0] O-COAL FINES [-2]
NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)
COMMENTS: ____

2] INSTREAM COVER — COVER SCORE: 8

TYPE (Check All That Apply)
O-UNDERCUT BANKS [1]
X-DEEP POOLS [2]
O-OXBOWS [1]
X-OVERHANGING VEGETATION [1]
O-ROOTWADS [1]
O-AQUATIC MACROPHYTES [1]
X-SHALLOWS (IN SLOW WATER) [1]
O-BOULDERS [1]
X-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check ONLY One or check 2 and AVERAGE)
O - EXTENSIVE > 75% [11]
O - MODERATE 25-75% [7]
X - SPARSE 5-25% [3]
O - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE) — CHANNEL: 7

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
X - LOW [2]	O - FAIR [3]	X - RECOVERING [3]	X - LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	X - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — RIPARIAN: 6
"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
O-WIDE > 50m [4]	O-FOREST, SWAMP [3]	O-URBAN OR INDUSTRIAL[0]	O-NONE OR LITTLE [3]
O-MODERATE 10-50 [3]	X-OPEN PASTURE/ ROWCROP[0]	O-SHRUB OR OLD FIELD[2]	X-MODERATE[2]
O-NARROW 5-10m [2]	O-RESID.,PARK,NEW FIELD [1]	O-CONSERV. TILLAGE [1]	O-HEAVY OR SEVERE[1]
X-VERY NARROW 1-5m [1]	O-FENCED PASTURE [1]	O-MINING/CONSTRUCTION [0]	
O-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY — POOL: 5

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check All That Apply)	
O- >1m [5]	X-POOL WIDTH > RIFFLE WIDTH [2]	O-TORRENTIAL[-1]	O-EDDIES[1]
O-0.7-1m [4]	O-POOL WIDTH = RIFFLE WIDTH [1]	O-FAST[1]	O-INTERSTITIAL[-1]
X-0.4-0.7m [2]	O-POOL WIDTH < RIFFLE W. [0]	X-MODERATE [1]	O-INTERMITTENT[-2]
O- < 0.4m [1]		O-SLOW [1]	
O-<0.2m [Pool = 0]			

O-NO POOL[0]

COMMENTS: ____

RIFFLE — RIFFLE: 2

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
O - GENERALLY >10 cm,MAX>50 [4]	O-STABLE (e.g.,Cobble, Boulder) [2]	O-EXTENSIVE [-1] O-MODERATE[0]
O - GENERALLY >10 cm,MAX<50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	X-LOW. [1] O-NONE[2]
X- GENERALLY 5-10 cm [1]	X-UNSTABLE (Gravel,Sand) [0]	
O - GENERALLY < 5 cm [Riffle = 0]		

O-NO RIFFLE[0]

COMMENTS: ____

GRADIENT: 2

6] Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

PC-15
5/2/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

QHEI SCORE: 42

Stream Pigeon RM _____ Date 5/2/00 River Code _____
Location PC15 Crew: EJB/CWB

1) SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Check all types present):

SUBSTRATE SCORE: 13

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]			☐ ☒-GRAVEL [7]		X
☐ ☐-BOULDER [9]			☒ ☐-SAND [6]	X	
☐ ☐-COBBLE [8]			☐ ☐-BEDROCK[5]		
☐ ☐-HARDPAN [4]			☐ ☐-DETRITUS[3]		
☐ ☐-MUCK [2]			☐ ☐-ARTIFIC.[0]		

TOTAL NUMBER OF SUBSTRATE TYPES: ☐> 4 [2] ☒ <= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS _____

SUBSTRATE QUALITY

☐-LIMESTONE [1] ☐-RIP/RAP [0]
☐-TILLS [1] ☐-HARDPAN [0]
☒-SANDSTONE [0]
☐-SHALE [-1]
☐-COAL FINES [-2]

Substrate Origin (Check all)

Silt Cover (Check One)

☐-SILT HEAVY [-2] ☐-SILT MODERATE [-1]
☒-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddedness (Check One)

☐-EXTENSIVE [-2] ☐-MODERATE [-1]
☒-LOW [0] ☐-NONE [1]

2) INSTREAM COVER

COVER SCORE: 6

TYPE (Check All That Apply)

☒-UNDERCUT BANKS [1]
☒-OVERHANGING VEGETATION [1]
☒-SHALLOWS (IN SLOW WATER) [1]
☐-DEEP POOLS [2]
☐-ROOTWADS [1]
☐-BOULDERS [1]
☐-OXBOWS [1]
☐-AQUATIC MACROPHYTES [1]
☐-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check ONLY One or check 2 and AVERAGE)

☐-EXTENSIVE > 75% [11]
☐-MODERATE 25-75% [7]
☒-SPARSE 5-25% [3]
☐-NEARLY ABSENT < 5% [1]

COMMENTS: _____

3) CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE)

CHANNEL: 7

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐-HIGH [4]	☐-EXCELLENT [7]	☐-NONE [6]	☐-HIGH [3]	☐-SNAGGING	☐-IMPOUND.
☐-MODERATE [3]	☐-GOOD [5]	☐-RECOVERED [4]	☐-MODERATE [2]	☐-RELOCATION	☐-ISLANDS
☒-LOW [2]	☐-FAIR [3]	☒-RECOVERING [3]	☒-LOW [1]	☐-CANOPY REMOVAL	☐-LEVEED
☐-NONE [1]	☒-POOR [1]	☐-RECENT OR NO RECOVERY [1]		☐-DREDGING	☐-BANK SHAPING
				☐-ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: _____

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

RIPARIAN: 6

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank) L R (Per Bank)	BANK EROSION
☐ ☐-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☒ ☒-OPEN PASTURE/ ROWCROP[0]	☒ ☒-MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☐ ☐-RESID.,PARK,NEW FIELD [1]	☐ ☐-HEAVY OR SEVERE [1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	
☐ ☐-NONE[0]		

COMMENTS: _____

POOL/GLIDE AND RIFFLE/RUN QUALITY

POOL: 4

MAX. DEPTH (Check 1)

☐-> 1m [6]
☐-0.7-1m [4]
☐-0.4-0.7m [2]
☒-< 0.4m [1]
☐-<0.2m [Pool = 0]

MORPHOLOGY (Check 1)

☒-POOL WIDTH > RIFFLE WIDTH [2]
☐-POOL WIDTH = RIFFLE WIDTH [1]
☐-POOL WIDTH < RIFFLE W. [0]

POOL/RUN/RIFFLE CURRENT VELOCITY (Check All That Apply)

☐-TORRENTIAL[-1]
☐-FAST[1]
☒-MODERATE [1]
☐-SLOW [1]
☐-EDDIES [1]
☐-INTERSTITIAL[-1]
☐-INTERMITTENT[-2]

☐-NO POOL[0]

COMMENTS: _____

RIFFLE: 2

RIFFLE/RUN DEPTH

☐-GENERALLY >10 cm,MAX>50 [4]
☐-GENERALLY >10 cm,MAX<50 [3]
☒-GENERALLY 5-10 cm [1]
☐-GENERALLY < 5 cm [Riffle = 0]

RIFFLE/RUN SUBSTRATE

☐-STABLE (e.g.,Cobble, Boulder) [2]
☐-MOD. STABLE (e.g.,Pea Gravel) [1]
☒-UNSTABLE (Gravel,Sand) [0]

RIFFLE/RUN EMBEDDEDNESS

☐-EXTENSIVE [-1] ☐-MODERATE[0]
☒-LOW. [1] ☐-NONE[2]

☐-NO RIFFLE[0]

COMMENTS _____

GRADIENT: 4

6) Gradient (feet/mile): _____ %POOL: _____ %RIFFLE: _____ %RUN: _____

EPA 4520

PC-16
5/8/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 56

Stream Pigeon Creek RM ____ Date ____ River Code ____
Location PC-16 Crew ESB/CWB/

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; Check *all* types present);

TYPE	POOL	RIFFLE		POOL	RIFFLE	SUBSTRATE QUALITY
☐ O-BLDER /SLABS[10]			☒ O-GRAVEL [7]			Substrate Origin (Check all)
☐ O-BOULDER [9]			☒ O-SAND [6]			☐ O-LIMESTONE [1] ☐ O-RIP/RAP [0] ☐ O-HARDPAN [0]
☐ O-COBBLE [8]			☐ O-BEDROCK[5]			☒ O-TILLS [1]
☐ O-HARDPAN [4]			☐ O-DETRITUS[3]			☐ O-SANDSTONE [0]
☐ O-MUCK [2]			☐ O-ARTIFIC.[0]			☐ O-SHALE [-1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐ > 4 [2] ☒ <= 4 [0] ☐ O-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS ____

SUBSTRATE SCORE: 14

Silt Cover (Check One)
☐ O- SILT HEAVY [-2] ☐ O- SILT MODERATE [-1]
☒ O- SILT NORMAL [0] ☐ O- SILT FREE [1]

Extent Of Embeddness (Check One)
☐ — EXTENSIVE [-2] ☐ — MODERATE [-1]
☒ — LOW [0] ☐ — NONE [1]

COVER SCORE: 8

2] INSTREAM COVER

TYPE (Check *All* That Apply)
☐ - UNDERCUT BANKS [1]
☒ - OVERHANGING VEGETATION [1]
☒ - SHALLOWS (IN SLOW WATER) [1]
☒ - DEEP POOLS [2]
☐ - ROOTWADS [1]
☐ - BOULDERS [1]
☐ - OXBOWS [1]
☐ - AQUATIC MACROPHYTES [1]
☒ - LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)
☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) CHANNEL: 10

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☒ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ - LOW [2]	☒ - FAIR [3]	☒ - RECOVERING [3]	☐ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☐ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 9

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐ ☐ - WIDE > 50m [4]	☐ ☐ - FOREST, SWAMP [3]	☐ ☐ - URBAN OR INDUSTRIAL [0]	☒ ☒ - NONE OR LITTLE [3]
☐ ☐ - MODERATE 10-50 [3]	☒ ☐ - OPEN PASTURE/ ROWCROP [0]	☐ ☐ - SHRUB OR OLD FIELD [2]	☐ ☐ - MODERATE [2]
☐ ☐ - NARROW 5-10m [2]	☐ ☒ - RESID., PARK, NEW FIELD [1]	☐ ☐ - CONSERV. TILLAGE [1]	☐ ☐ - HEAVY OR SEVERE [1]
☒ ☒ - VERY NARROW 1-5m [1]	☐ ☐ - FENCED PASTURE [1]	☐ ☐ - MINING/CONSTRUCTION [0]	
☐ ☐ - NONE [0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY POOL: 6

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☐ - > 1m [6]			
☒ - 0.7-1m [4]	☐ - POOL WIDTH > RIFFLE WIDTH [2]	☐ - TORRENTIAL [-1]	☐ - EDDIES [1]
☐ - 0.4-0.7m [2]	☒ - POOL WIDTH = RIFFLE WIDTH [1]	☐ - FAST [1]	☐ - INTERSTITIAL [-1]
☐ - < 0.4m [1]	☐ - POOL WIDTH < RIFFLE W. [0]	☐ - MODERATE [1]	☐ - INTERMITTENT [-2]
☐ - < 0.2m (Pool = 0)		☒ - SLOW [1]	

☐ - NO POOL [0]

COMMENTS: ____

RIFFLE: 5

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY > 10 cm, MAX > 50 [4]	☐ - STABLE (e.g., Cobble, Boulder) [2]	☐ - EXTENSIVE [-1] ☐ - MODERATE [0]
☒ - GENERALLY > 10 cm, MAX < 50 [3]	☒ - MOD. STABLE (e.g., Pea Gravel) [1]	☒ - LOW [1] ☐ - NONE [2]
☐ - GENERALLY 5-10 cm [1]	☐ - UNSTABLE (Gravel, Sand) [0]	
☐ - GENERALLY < 5 cm [Riffle = 0]		

☐ - NO RIFFLE [0]

COMMENTS ____

GRADIENT: 4

6] Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

LC-1
5/6/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 46.47

Stream Locust Creek RM ____ Date ____ River Code ____

Location LC-1 Crew: ESB/CWB

1) SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Check all types present);

SUBSTRATE SCORE: 9

TYPE	POOL	RIFFLE	POOL	RIFFLE
O-BLDER /SLABS[10]		X-GRAVEL [7]		X
O-BOULDER [9]		O-SAND [6]		
O-COBBLE [8]		O-BEDROCK[5]		
X-HARDPAN [4]	X	O-DETRITUS[3]		
O-MUCK [2]		O-ARTIFIC.[0]		

Substrate Origin (Check All): O-LIMESTONE [1] O-RIP/RAP [0] X-TILLS [1] X-HARDPAN [0] O-SANDSTONE [0] O-SHALE [-1] O-COAL FINES [-2]

SILT SUBSTRATE QUALITY: O-SILT HEAVY [-2] X-SILT MODERATE [-1] O-SILT NORMAL [0] O-SILT FREE [1]

Extent Of Embeddedness (Check One): X-EXTENSIVE [-2] O-MODERATE [-1] O-LOW [0] O-NONE [1]

TOTAL NUMBER OF SUBSTRATE TYPES: O-> 4 [2] X-<= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS ____

2) INSTREAM COVER

COVER SCORE: 8

TYPE (Check All That Apply)

O-UNDERCUT BANKS [1]
O-OVERHANGING VEGETATION [1]
X-SHALLOWS (IN SLOW WATER) [1]
X-DEEP POOLS [2]
X-ROOTWADS [1]
O-BOULDERS [1]
O-OXBOWS [1]
O-AQUATIC MACROPHYTES [1]
X-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check ONLY One or check 2 and AVERAGE)

O-EXTENSIVE > 75% [11]
O-MODERATE 25-75% [7]
X-SPARSE 5-25% [3]
O-NEARLY ABSENT < 5% [1]

COMMENTS: ____

3) CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE)

CHANNEL: 8

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O-HIGH [4]	O-EXCELLENT [7]	O-NONE [6]	O-HIGH [3]	O-SNAGGING	O-IMPOUND.
X-MODERATE [3]	O-GOOD [5]	O-RECOVERED [4]	O-MODERATE [2]	O-RELOCATION	O-ISLANDS
O-LOW [2]	O-FAIR [3]	X-RECOVERING [3]	X-LOW [1]	O-CANOPY REMOVAL	O-LEVEED
O-NONE [1]	X-POOR [1]	O-RECENT OR NO RECOVERY [1]		O-DREDGING	O-BANK SHAPING
				O-ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

RIPARIAN: 12

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Per Bank)	BANK EROSION
O-WIDE>50m [4]	X-FOREST, SWAMP [3]	O-URBAN OR INDUSTRIAL[0]	O-NONE OR LITTLE [3]
O-MODERATE 10-50 [3]	O-OPEN PASTURE/ ROWCROP[0]	O-SHRUB OR OLD FIELD[2]	X-MODERATE[2]
O-NARROW 5-10m [2]	O-RESID.,PARK,NEW FIELD [1]	O-CONSERV. TILLAGE [1]	O-HEAVY OR SEVERE[1]
X-VERY NARROW 1-5m [1]	O-FENCED PASTURE [1]	O-MINING/CONSTRUCTION [0]	
O-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY

POOL: 8

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check All That Apply)	
O->1m [6]	X-POOL WIDTH > RIFFLE WIDTH [2]	O-TORRENTIAL[-1]	X-EDDIES[1]
X-0.7-1m [4]	O-POOL WIDTH = RIFFLE WIDTH [1]	O-FAST[1]	O-INTERSTITIAL[-1]
O-0.4-0.7m [2]	O-POOL WIDTH < RIFFLE W. [0]	O-MODERATE [1]	O-INTERMITTENT[-2]
O-< 0.4m [1]		X-SLOW [1]	
O-<0.2m (Pool = 0)			

O-NO POOL[0]

COMMENTS: ____

RIFFLE: 0

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
O-GENERALLY >10 cm,MAX>50 [4]	O-STABLE (e.g.,Cobble, Boulder) [2]	O-EXTENSIVE [-1]
O-GENERALLY >10 cm,MAX<50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	X-MODERATE[0]
O-GENERALLY 5-10 cm [1]	X-UNSTABLE (Gravel,Sand) [0]	O-LOW. [1]
X-GENERALLY < 5 cm [Riffle = 0]		O-NONE[2]

O-NO RIFFLE[0]

COMMENTS ____

GRADIENT: 2

6) Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

LC-2
5/6/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

QHEI SCORE: 53 53

Stream Locust Creek RM _____ Date _____ River Code _____
Location LC-2 Crew: ESB/CWB

1) SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Check all types present);

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
O-BLDER /SLABS[10]		X	O-GRAVEL [7]		X
O-BOULDER [9]			O-SAND [6]		X
O-COBBLE [8]			O-BEDROCK[5]		
X-HARDPAN [4]	X	X	O-DETRITUS[3]		
O-MUCK [2]	X		O-ARTIFIC.[0]		

SUBSTRATE QUALITY

Substrate Origin (Check all)
X O-LIMESTONE [1] O-RIP/RAP [0] O-HARDPAN [0]
X O-TILLS [1]
O-SANDSTONE [0]
O-SHALE [-1]
O-COAL FINES [-2]

SUBSTRATE SCORE: 17

Silt Cover (Check One)
O-SILT HEAVY [-2] O-SILT MODERATE [-1]
X SILT NORMAL [0] O - SILT FREE [1]

Extent Of Embeddedness (Check One)
O—EXTENSIVE [-2] O—MODERATE[-1]
X—LOW[0] O—NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: X 4 [2] O— <= 4 [0] O-COAL FINES [-2]
NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)
COMMENTS _____

2) INSTREAM COVER

COVER SCORE: 13 13

TYPE (Check All That Apply)
O -UNDERCUT BANKS [1]
X OVERHANGING VEGETATION [1]
X SHALLOWS (IN SLOW WATER) [1]
X DEEP POOLS [2]
O -ROOTWADS [1]
O -BOULDERS [1]
O -OXBOWS [1]
X AQUATIC MACROPHYTES [1]
X LOGS OR WOODY DEBRIS [1]

AMOUNT (Check ONLY One or check 2 and AVERAGE)
O - EXTENSIVE > 75% [11]
X MODERATE 25-75% [7]
O - SPARSE 5-25% [3]
O - NEARLY ABSENT < 5% [1]

COMMENTS: _____

3) CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE)

CHANNEL: 10

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
X MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
O - LOW [2]	X FAIR [3]	X RECOVERING [3]	X LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	O - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: _____

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

RIPARIAN: 6

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	FLOOD PLAIN QUALITY L R (Per Bank)	BANK EROSION
O-WIDE>50m [4]	O-FOREST, SWAMP [3]	O-URBAN OR INDUSTRIAL[0]	O-NONE OR LITTLE [3]
O-MODERATE 10-50 [3]	X OPEN PASTURE/ ROWCROP[0]	O-SHRUB OR OLD FIELD[2]	X MODERATE[2]
O-NARROW 5-10m [2]	O- RESID.,PARK,NEW FIELD [1]	O-CONSERV. TILLAGE [1]	O-HEAVY OR SEVERE[1]
X VERY NARROW 1-5m [1]	O-FENCED PASTURE [1]	O-MINING/CONSTRUCTION [0]	
O-NONE[0]			

COMMENTS: _____

POOL/GLIDE AND RIFFLE/RUN QUALITY

POOL: 4

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check All That Apply)	
O- >1m [5]	X POOL WIDTH > RIFFLE WIDTH [2]	O-TORRENTIAL[-1]	O-EDDIES[1]
O- 0.7-1m [4]	O -POOL WIDTH = RIFFLE WIDTH [1]	O-FAST[1]	O-INTERSTITIAL[-1]
X- 0.4-0.7m [2]	O-POOL WIDTH < RIFFLE W. [0]	O-MODERATE [1]	O-INTERMITTENT[-2]
X- < 0.4m [1]		X SLOW [1]	
O—<0.2m (Pool = 0)			

O-NO POOL[0]

COMMENTS: _____

RIFFLE: 2

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS	
O - GENERALLY >10 cm, MAX>50 [4]	O-STABLE (e.g.,Cobble, Boulder) [2]	O-EXTENSIVE [-1]	O-MODERATE[0]
O - GENERALLY >10 cm, MAX<50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	X LOW. [1]	O-NONE[2]
X GENERALLY 5-10 cm [1]	X UNSTABLE (Gravel,Sand) [0]		
O - GENERALLY < 5 cm (Riffle = 0)			

O-NO RIFFLE[0]

COMMENTS _____

GRADIENT: 4

6) Gradient (feet/mile): _____ %POOL: _____ %RIFFLE: _____ %RUN: _____

EPA 4520

LP-1
5/6/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: ~~42~~ 43

Stream Little Pigeon RM ____ Date ____ River Code ____

Location LP-1 Crew EJB/CWB

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*);

TYPE	POOL	RIFFLE		POOL	RIFFLE
☐ ☐-BLDER /SLABS[10]			☐ ☐-GRAVEL [7]		
☐ ☐-BOULDER [9]			☐ ☐-SAND [6]		
☐ ☐-COBBLE [8]			☐ ☐-BEDROCK[5]		
☐ ☒-HARDPAN [4]	X		☐ ☐-DETRITUS[3]		
☐ ☐-MUCK [2]			☒ ☐-ARTIFIC.[0]	X	X

TOTAL NUMBER OF SUBSTRATE TYPES: ☐ > 4 [2] ☒ <= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS ____

SUBSTRATE QUALITY — SUBSTRATE SCORE: 2

Substrate Origin (Check All)
☐ ☐-LIMESTONE [1] ☐-RIP/RAP [0]
☐ ☒-HARDPAN [0] ☐ - SILT NORMAL [0]

Silt Cover (Check One)
☐ - SILT HEAVY [-2] ☒ SILT MODERATE [-1]
☐ - SILT FREE [1]

Extent Of Embeddedness (Check One)
☐—EXTENSIVE [-2] ☒—MODERATE [-1]
☐—LOW [0] ☐—NONE [1]

2) INSTREAM COVER — COVER SCORE: 8

TYPE (Check *All* That Apply)
☐ -UNDERCUT BANKS [1]
☐ -OVERHANGING VEGETATION [1]
☒ SHALLOWS (IN SLOW WATER) [1]
☒ -DEEP POOLS [2]
☒ -ROOTWADS [1]
☐ -BOULDERS [1]
☐ -OXBOWS [1]
☐ -AQUATIC MACROPHYTES [1]
☒ -LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)
☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3) CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) — CHANNEL: 9

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☒ MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☐ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☐ - LOW [2]	☐ - FAIR [3]	☒ RECOVERING [3]	☒ LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☒ POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — RIPARIAN: 12

"River Right Looking Downstream"

RIPARIAN WIDTH	EROSION/RUNOFF - FLOOD PLAIN QUALITY	BANK EROSION
L R (Per Bank)	L R (Most Predominant Per Bank)	L R (Per Bank)
☐ ☐-WIDE > 50m [4]	☒ ☒ FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL [0] ☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP [0]	☐ ☐-SHRUB OR OLD FIELD [2] ☒ ☒ MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1] ☐ ☐-HEAVY OR SEVERE [1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]
☐ ☐-NONE [0]		

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY — POOL: ~~7~~ 8

MAX. DEPTH (Check 1)
☒ >1m [6]
☐ 0.7-1m [4]
☐ 0.4-0.7m [2]
☐ < 0.4m [1]
☐—<0.2m [Pool = 0]

MORPHOLOGY (Check 1)
☐ -POOL WIDTH > RIFFLE WIDTH [2]
☒ -POOL WIDTH = RIFFLE WIDTH [1]
☐ -POOL WIDTH < RIFFLE W. [0]

POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)
☐ -TORRENTIAL [-1] ☐ -EDDIES [1]
☐ -FAST [1] ☐ -INTERSTITIAL [-1]
☐ -MODERATE [1] ☐ -INTERMITTENT [-2]
☒ SLOW [1]

☐ NO POOL [0]

COMMENTS: ____

RIFFLE — RIFFLE: 1

RIFFLE/RUN DEPTH
☐ - GENERALLY > 10 cm, MAX > 50 [4]
☐ - GENERALLY > 10 cm, MAX < 50 [3]
☒ GENERALLY 5-10 cm [1]
☐ - GENERALLY < 5 cm [Riffle = 0]

RIFFLE/RUN SUBSTRATE
☐ - STABLE (e.g., Cobble, Boulder) [2]
☐ - MOD. STABLE (e.g., Pea Gravel) [1]
☒ UNSTABLE (Gravel, Sand) [0]

RIFFLE/RUN EMBEDDEDNESS
☐ - EXTENSIVE [-1] ☒ MODERATE [0]
☐ - LOW [1] ☐ - NONE [2]

☐ - NO RIFFLE [0]

COMMENTS ____

GRADIENT: 4

6) Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

LP-2
5/6/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 49

Stream Little Pigeon RM ____ Date ____ River Code ____
Location LP-2 Crew: KB/CWB

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; *Check all types present*); SUBSTRATE SCORE: 11

TYPE	POOL	RIFFLE	POOL	RIFFLE	SUBSTRATE QUALITY
O-BLDER /SLABS[10]		O-GRAVEL [7]	X	X	Substrate Origin (Check all)
O-BOULDER [9]		O-SAND [6]			O-LIMESTONE [1] O-RIP/RAP [0]
O-COBBLE [8]		O-BEDROCK[5]			O-TILLS [1]
X O-HARDPAN [4]	X	O-DETRITUS[3]			O-SANDSTONE [0]
O-MUCK [2]		O-ARTIFIC.[0]		X	O-SHALE [-1]

TOTAL NUMBER OF SUBSTRATE TYPES: O> 4 [2] X <= 4 [0] O-COAL FINES [-2]
NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

Silt Cover (Check One): O-SILT HEAVY [-2] O-SILT MODERATE [-1] X SILT NORMAL [0] O - SILT FREE [1]

Extent Of Embeddness (Check One): O—EXTENSIVE [-2] O—MODERATE[-1] X LOW[0] O—NONE[1]

COMMENTS ____

2) INSTREAM COVER COVER SCORE: 9

TYPE (Check *All* That Apply)
O -UNDERCUT BANKS [1]
X -DEEP POOLS [2]
O -OXBOWS [1]
X OVERHANGING VEGETATION [1]
X -ROOTWADS [1]
O -AQUATIC MACROPHYTES [1]
X -SHALLOWS (IN SLOW WATER) [1]
O -BOULDERS [1]
X -LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)
O - EXTENSIVE > 75% [11]
O - MODERATE 25-75% [7]
X - SPARSE 5-25% [3]
O - NEARLY ABSENT < 5%[1]

COMMENTS: ____

3) CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) CHANNEL: 8

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
X - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
O - LOW [2]	O - FAIR [3]	X RECOVERING [3]	X LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	X - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 12

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
O -WIDE> 50m [4]	X X FOREST, SWAMP [3]	O O-URBAN OR INDUSTRIAL[0]	O O-NONE OR LITTLE [3]
O -MODERATE 10-50 [3]	O O-OPEN PASTURE/ ROWCROP[0]	O O-SHRUB OR OLD FIELD[2]	X X MODERATE[2]
O -NARROW 5-10m [2]	O O- RESID.,PARK,NEW FIELD [1]	O O-CONSERV. TILLAGE [1]	O O-HEAVY OR SEVERE[1]
X X -VERY NARROW 1-5m [1]	O O-FENCED PASTURE [1]	O O-MINING/CONSTRUCTION [0]	
O -NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY POOL: 5

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
O- >1m [6]	X POOL WIDTH > RIFFLE WIDTH [2]	O -TORRENTIAL[-1]	O -EDDIES[1]
O- 0.7-1m [4]	O -POOL WIDTH = RIFFLE WIDTH [1]	O -FAST[1]	O -INTERSTITIAL[-1]
X 0.4-0.7m [2]	O -POOL WIDTH < RIFFLE W. [0]	O -MODERATE [1]	O -INTERMITTENT[-2]
O - < 0.4m [1]		X SLOW [1]	
O—<0.2m [Pool = 0]			

O- NO POOL[0]

COMMENTS: ____

RIFFLE: 2

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
O - GENERALLY >10 cm,MAX> 50 [4]	O-STABLE (e.g.,Cobble, Boulder) [2]	O-EXTENSIVE [-1] O-MODERATE[0]
O - GENERALLY >10 cm,MAX<50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	X LOW. [1] O-NONE[2]
X GENERALLY 5-10 cm [1]	X UNSTABLE (Gravel,Sand) [0]	
O - GENERALLY < 5 cm (Riffle = 0)		

O-NO RIFFLE[0]

COMMENTS ____

GRADIENT: ~~1~~ 2

6) Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

BC-1
5/3/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 41

Stream Bluegrass Creek RM ____ Date ____ River Code ____
Location BC-1 Crew: EJB, CWB, ARS

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; *Check all types present*);

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
O-BLDER /SLABS[10]			X-GRAVEL [7]		X
O-BOULDER [9]			X-SAND [6]		X
O-COBBLE [8]			O-BEDROCK[5]		
O-HARDPAN [4]			X-DETRITUS[3]	X	
O-MUCK [2]	X		O-ARTIFIC.[0]		

SUBSTRATE QUALITY

Substrate Origin (Check all)
X-LIMESTONE [1] O-RIP/RAP [0] O-HARDPAN [0]
O-TILLS [1]
O-SANDSTONE [0]
O-SHALE [-1]
X-COAL FINES [-2]

SUBSTRATE SCORE: 9

Silt Cover (Check One)
O-SILT HEAVY [-2] X-SILT MODERATE [-1]
O-SILT NORMAL [0] O-SILT FREE [1]

Extent Of Embeddness (Check One)
O-EXTENSIVE [-2] X-MODERATE [-1]
O-LOW [0] O-NONE [1]

TOTAL NUMBER OF SUBSTRATE TYPES: X-> 4 [2] X-<= 4 [0]
NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)
COMMENTS ____

2) INSTREAM COVER

TYPE (Check *All* That Apply)
O-UNDERCUT BANKS [1]
O-OVERHANGING VEGETATION [1]
X-SHALLOWS (IN SLOW WATER) [1]
O-DEEP POOLS [2]
O-ROOTWADS [1]
O-BOULDERS [1]
O-OXBOWS [1]
O-AQUATIC MACROPHYTES [1]
X-LOGS OR WOODY DEBRIS [1]

COVER SCORE: 5

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)
O - EXTENSIVE > 75% [11]
O - MODERATE 25-75% [7]
X - SPARSE 5-25% [3]
O - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3) CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

CHANNEL: 7 7

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
X - LOW [2]	O - FAIR [3]	X - RECOVERING [3]	X - LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	X - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)
"River Right Looking Downstream"

RIPARIAN: 12

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	FLOOD PLAIN QUALITY L R (Per Bank)	BANK EROSION
O-WIDE > 50m [4]	X-FOREST, SWAMP [3]	O-URBAN OR INDUSTRIAL [0]	O-NONE OR LITTLE [3]
O-MODERATE 10-50 [3]	O-OPEN PASTURE/ ROWCROP [0]	O-SHRUB OR OLD FIELD [2]	X-MODERATE [2]
O-NARROW 5-10m [2]	O-RESID., PARK, NEW FIELD [1]	O-CONSERV. TILLAGE [1]	O-HEAVY OR SEVERE [1]
X-VERY NARROW 1-5m [1]	O-FENCED PASTURE [1]	O-MINING/CONSTRUCTION [0]	
O-NONE [0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY

POOL: 4

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
O- > 1m [6]	X-POOL WIDTH > RIFFLE WIDTH [2]	O-TORRENTIAL [-1]	O-EDDIES [1]
O- 0.7-1m [4]	O-POOL WIDTH = RIFFLE WIDTH [1]	O-FAST [1]	O-INTERSTITIAL [-1]
O- 0.4-0.7m [2]	O-POOL WIDTH < RIFFLE W. [0]	X-MODERATE [1]	O-INTERMITTENT [-2]
X- < 0.4m [1]		O-SLOW [1]	
O- <0.2m [Pool = 0]			

O-NO POOL [0]

COMMENTS: ____

RIFFLE: 0

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
O - GENERALLY > 10 cm, MAX > 50 [4]	O-STABLE (e.g., Cobble, Boulder) [2]	O-EXTENSIVE [-1] X-MODERATE [0]
O - GENERALLY > 10 cm, MAX < 50 [3]	O-MOD. STABLE (e.g., Pea Gravel) [1]	O-LOW. [1] O-NONE [2]
O - GENERALLY 5-10 cm [1]	X-UNSTABLE (Gravel, Sand) [0]	
X - GENERALLY < 5 cm [Riffle = 0]		

O-NO RIFFLE [0]

COMMENTS ____

GRADIENT: 4

6) Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

BC-2
5/3/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 22 31

Stream Bluegrass Creek RM ____ Date ____ River Code ____
Location BC-2 Crew EPB, CWR, ARS

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; Check *all* types present):

SUBSTRATE SCORE: 7

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
☐ O-BLDER/SLABS[10]			☐ O-GRAVEL [7]		
☐ O-BOULDER [9]			☐ O-SAND [6]		
☐ O-COBBLE [8]			☐ O-BEDROCK[5]		
☐ O-HARDPAN [4]			☐ O-DETRITUS[3]	X	
X MUCK [2]	X		☐ O-ARTIFIC.[0]		
☐ O-SILTS [1]			☐ O-SANDSTONE [0]		
☐ O-HARDPAN [0]			☐ O-SHALE [-1]		
☐ O-LIMESTONE [1]			☐ O-COAL FINES [-2]		
☐ O-RIP/RAP [0]					

TOTAL NUMBER OF SUBSTRATE TYPES: ☐ > 4 [2] X <= 4 [0] ☐ O-COAL FINES [-2]
NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)
COMMENTS ____

Substrate Origin (Check *all*): X SILT HEAVY [-2] ☐ O-SILT MODERATE [-1] ☐ O - SILT NORMAL [0] ☐ O - SILT FREE [1]

Extent Of Embeddedness (Check One): ☐ —EXTENSIVE [-2] X MODERATE [-1] X LOW [0] ☐ —NONE [1]

COVER SCORE: 6

2] INSTREAM COVER

TYPE (Check *All* That Apply): ☐ -UNDERCUT BANKS [1] ☐ -OVERHANGING VEGETATION [1] ☐ -SHALLOWS (IN SLOW WATER) [1] ☐ -DEEP POOLS [2] ☐ -ROOTWADS [1] ☐ -BOULDERS [1] ☐ -OXBOWS [1] ☐ -AQUATIC MACROPHYTES [1] ☐ -LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One of check 2 and *AVERAGE*): ☐ - EXTENSIVE > 75% [11] ☐ - MODERATE 25-75% [7] X - SPARSE 5-25% [3] ☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

CHANNEL: 7

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☐ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
X LOW [2]	☐ - FAIR [3]	X RECOVERING [3]	X LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	X POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

RIPARIAN: 6

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)
"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐ ☐ -WIDE > 50m [4]	☐ ☐ -FOREST, SWAMP [3]	☐ ☐ -URBAN OR INDUSTRIAL [0]	☐ ☐ -NONE OR LITTLE [3]
☐ ☐ -MODERATE 10-50 [3]	X X -OPEN PASTURE/ ROWCROP [0]	☐ ☐ -SHRUB OR OLD FIELD [2]	X X -MODERATE [2]
☐ ☐ -NARROW 5-10m [2]	☐ ☐ - RESID., PARK, NEW FIELD [1]	☐ ☐ -CONSERV. TILLAGE [1]	☐ ☐ -HEAVY OR SEVERE [1]
X X -VERY NARROW 1-5m [1]	☐ ☐ -FENCED PASTURE [1]	☐ ☐ -MINING/CONSTRUCTION [0]	
☐ ☐ -NONE [0]			

COMMENTS: ____

POOL: 2 X3

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
☐ - > 1m [6]	☐ -POOL WIDTH > RIFFLE WIDTH [2]	☐ -TORRENTIAL [-1]	☐ -EDDIES [1]
☐ - 0.7-1m [4]	X POOL WIDTH = RIFFLE WIDTH [1]	☐ -FAST [1]	☐ -INTERSTITIAL [-1]
X - 0.4-0.7m [2]	☐ -POOL WIDTH < RIFFLE W. [0]	X X -MODERATE [1]	☐ -INTERMITTENT [-2]
X - < 0.4m [1]		☐ -SLOW [1]	
☐ — <0.2m [Pool = 0]			

☐ - NO POOL [0]

COMMENTS: ____

RIFFLE: 0

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY > 10 cm, MAX > 50 [4]	☐ - STABLE (e.g., Cobble, Boulder) [2]	X X -EXTENSIVE [-1] ☐ - MODERATE [0]
☐ - GENERALLY > 10 cm, MAX < 50 [3]	☐ - MOD. STABLE (e.g., Pea Gravel) [1]	☐ - LOW. [1] ☐ - NONE [2]
X X - GENERALLY 5-10 cm [1]	X X - UNSTABLE (Gravel, Sand) [0]	
☐ - GENERALLY < 5 cm [Riffle = 0]		

☐ - NO RIFFLE [0]

COMMENTS ____

GRADIENT: 2

6] Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

BC-3 X
5/4/00
Duplicate WQ Sample

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 30

Stream Big Grass Creek RM ____ Date ____ River Code ____

Location BC-3 → New Harmony to Warren County line Crew: EJB / CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; *Check all types present*):

TYPE	POOL	RIFFLE	POOL	RIFFLE	SUBSTRATE QUALITY
O-BLDER /SLABS[10]		(R)	O-GRAVEL [7]	X	X
O-BOULDER [9]			X O-SAND [6]	X	X
O-COBBLE [8]			O-BEDROCK[5]		TILLS [1]
O-HARDPAN [4]			O-DETRITUS[3]		O-SANDSTONE [0]
O-MUCK [2]	X		O-ARTIFIC.[0]		O-SHALE [-1]

Substrate Origin (Check all): O-LIMESTONE [1] O-RIP/RAP [0] O-HARDPAN [0]

SUBSTRATE SCORE: 10

Silt Cover (Check One): X SILT HEAVY [-2] O-SILT MODERATE [-1] O - SILT NORMAL [0] O - SILT FREE [1]

Extent Of Embeddedness (Check One): X EXTENSIVE [-2] O—MODERATE[-1] O—LOW[0] O—NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: O> 4 [2] X <= 4 [0] O-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS ____

2] INSTREAM COVER

TYPE (Check *All* That Apply)

O -UNDERCUT BANKS [1] X -DEEP POOLS [2] O -OXBOWS [1]
X -OVERHANGING VEGETATION [1] O -ROOTWADS [1] O -AQUATIC MACROPHYTES [1]
O -SHALLOWS (IN SLOW WATER) [1] O -BOULDERS [1] O -LOGS OR WOODY DEBRIS [1]

COVER SCORE: 6

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

O - EXTENSIVE > 75% [11]
O - MODERATE 25-75% [7]
X SPARSE 5-25% [3]
O - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*)

CHANNEL: 8

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	X - MODERATE [2]	O - RELOCATION	O - ISLANDS
X - LOW [2]	O - FAIR [3]	X - RECOVERING [3]	O - LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	X - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 6

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
O -WIDE> 50m [4]	O-FOREST, SWAMP [3]	O-URBAN OR INDUSTRIAL[0]	O O-NONE OR LITTLE [3]
O -MODERATE 10-50 [3]	X X OPEN PASTURE/ ROW CROP[0]	O-SHRUB OR OLD FIELD[2]	X X MODERATE[2]
O -NARROW 5-10m [2]	O O- RESID.,PARK,NEW FIELD [1]	O-CONSERV. TILLAGE [1]	O O-HEAVY OR SEVERE[1]
X X -VERY NARROW 1-5m [1]	O O-FENCED PASTURE [1]	O-MINING/CONSTRUCTION [0]	
O O -NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY

POOL: 4

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)		
O- >1m [5]		O -TORRENTIAL[-1]	O -EDDIES [1]	
O- 0.7-1m [4]	O -POOL WIDTH > RIFFLE WIDTH [2]	O -FAST[1]	O -INTERSTITIAL[-1]	O- NO POOL[0]
X 0.4-0.7m [2]	X -POOL WIDTH = RIFFLE WIDTH [1]	O -MODERATE [1]	O -INTERMITTENT[-2]	
O- < 0.4m [1]	O -POOL WIDTH < RIFFLE W. [0]	X -SLOW [1]		
O—<0.2m (Pool = 0)				

COMMENTS: ____

RIFFLE: 0

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS	
O - GENERALLY >10 cm, MAX> 50 [4]	O-STABLE (e.g.,Cobble, Boulder) [2]	X EXTENSIVE [-1]	O-MODERATE[0]
O - GENERALLY >10 cm, MAX < 50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	O-LOW. [1]	O-NONE[2]
X GENERALLY 5-10 cm [1]	X UNSTABLE (Gravel,Sand) [0]		O-NO RIFFLE[0]
O - GENERALLY < 5 cm (Riffle = 0)			

COMMENTS ____

GRADIENT: 4

6] Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

WD 1 X
5/4/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 38

Stream Weinsheimer Ditch RM ____ Date 5/4/00 River Code ____
Location WD - Crew EJB/CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*);

TYPE	POOL	RIFFLE		POOL	RIFFLE
O-BLDER /SLABS[10]			O-GRAVEL [7]		
O-BOULDER [9]			O-SAND [6]		
O-COBBLE [8]			O-BEDROCK[5]		
O-HARDPAN [4]			X O-DETRITUS[3]	X	
X O-MUCK [2]	X		O-ARTIFIC.[0]		

TOTAL NUMBER OF SUBSTRATE TYPES: O > 4 [2] X <= 4 [0] O-COAL FINES [-2]
NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)
COMMENTS ____

SUBSTRATE QUALITY — SUBSTRATE SCORE: 2

Substrate Origin (Check all): O-LIMESTONE [1] O-RIP/RAP [0] X TILLS [1] O-HARDPAN [0] O-SANDSTONE [0] O-SHALE [-1]

Silt Cover (Check One): X SILT HEAVY [-2] O-SILT MODERATE [-1] O - SILT NORMAL [0] O - SILT FREE [1]

Extent Of Embeddness (Check One): X EXTENSIVE [-2] O MODERATE [-1] O LOW [0] O NONE [1]

2] INSTREAM COVER — COVER SCORE: 6

TYPE (Check *All* That Apply): O -UNDERCUT BANKS [1] O -OVERHANGING VEGETATION [1] O -SHALLOWS (IN SLOW WATER) [1] X -DEEP POOLS [2] O -ROOTWADS [1] O -BOULDERS [1] O -OXBOWS [1] O -AQUATIC MACROPHYTES [1] X -LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): O - EXTENSIVE > 75% [11] O - MODERATE 25-75% [7] X - SPARSE 5-25% [3] O - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) — CHANNEL: 7

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
X - LOW [2]	O - FAIR [3]	X - RECOVERING [3]	X - LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	X - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — RIPARIAN: 11

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
O O-WIDE > 50m [4]	X FOREST, SWAMP [3]	O O-URBAN OR INDUSTRIAL[0]	O O-NONE OR LITTLE [3]
O O-MODERATE 10-50 [3]	O O-OPEN PASTURE/ ROWCROP[0]	O O-SHRUB OR OLD FIELD[2]	O X O-MODERATE[2]
O O-NARROW 5-10m [2]	O O- RESID.,PARK,NEW FIELD [1]	O O-CONSERV. TILLAGE [1]	X O-HEAVY OR SEVERE[1]
X O-VERY NARROW 1-5m [1]	O O-FENCED PASTURE [1]	O O-MINING/CONSTRUCTION [0]	
O O-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY — POOL: 8

MAX. DEPTH (Check 1): X > 1m [5] O- 0.7-1m [4] O- 0.4-0.7m [2] O- < 0.4m [1] O—<0.2m [Pool = 0]

MORPHOLOGY (Check 1): O-POOL WIDTH > RIFFLE WIDTH [2] X-POOL WIDTH = RIFFLE WIDTH [1] O-POOL WIDTH < RIFFLE W. [0]

POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply): O-TORRENTIAL[-1] O-EDDIES[1] O-FAST[1] O-INTERSTITIAL[-1] O-MODERATE [1] O-INTERMITTENT[-2] X-SLOW [1]

O- NO POOL[0]

COMMENTS: ____

RIFFLE — RIFFLE/RUN

RIFFLE/RUN DEPTH: O - GENERALLY >10 cm, MAX > 50 [4] X - GENERALLY >10 cm, MAX < 50 [3] O - GENERALLY 5-10 cm [1] O - GENERALLY < 5 cm [Riffle = 0]

RIFFLE/RUN SUBSTRATE: O-STABLE (e.g.,Cobble, Boulder) [2] O-MOD. STABLE (e.g.,Pea Gravel) [1] X UNSTABLE (Gravel,Sand) [0]

RIFFLE/RUN EMBEDDEDNESS: X EXTENSIVE [-1] O-MODERATE[0] O-LOW. [1] O-NONE[2]

X NO RIFFLE[0]

COMMENTS ____

GRADIENT: 2

6] Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

SD-1
5-4-00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 39

Stream Stollberg Ditch RM ____ Date ____ River Code ____

Location SD-1 Crew: ESB/CWB

1) SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Check all types present): SUBSTRATE SCORE: 5

TYPE	POOL	RIFFLE		POOL	RIFFLE	SUBSTRATE QUALITY
O-BLDER /SLABS[10]			O-GRAVEL [7]		X	Substrate Origin (Check all)
O-BOULDER [9]			O-SAND [6]		X	O-LIMESTONE (1) O-RIP/RAP [0]
O-COBBLE [8]			O-BEDROCK[5]		X	TILLS [1] O-HARDPAN [0]
O-HARDPAN [4]			O-DETRITUS[3]	X		O-SANDSTONE [0]
X O-MUCK [2]	X	X	O-ARTIFIC.[0]			O-SHALE [-1]

TOTAL NUMBER OF SUBSTRATE TYPES: O> 4 [2] X <= 4 [0] O-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

Silt Cover (Check One): X SILT HEAVY [-2] O-SILT MODERATE [-1] O-SILT NORMAL [0] O - SILT FREE [1]

Extent Of Embeddedness (Check One): X EXTENSIVE [-2] O—MODERATE[-1] O—LOW[0] O—NONE[1]

COMMENTS

COVER SCORE: 16

2) INSTREAM COVER

TYPE (Check All That Apply)

O -UNDERCUT BANKS [1]
X -OVERHANGING VEGETATION [1]
X SHALLOWS (IN SLOW WATER) [1]
O -DEEP POOLS [2]
O -ROOTWADS [1]
O -BOULDERS [1]
O -OXBOWS [1]
O -AQUATIC MACROPHYTES [1]
X -LOGS OR WOODY DEBRIS [1]

AMOUNT (Check ONLY One or check 2 and AVERAGE)

O - EXTENSIVE > 75% [11]
O - MODERATE 25-75% [7]
X - SPARSE 5-25% [3]
O - NEARLY ABSENT < 5%[1]

COMMENTS:

3) CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE) CHANNEL: 7

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
X - LOW [2]	O - FAIR [3]	X RECOVERING [3]	X - LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	X POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
					O - ONE SIDE CHANNEL MODIFICATIONS

COMMENTS:

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 12

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/BUNCER - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
O -WIDE> 50m [4]	X FOREST, SWAMP [3]	O-URBAN OR INDUSTRIAL[0]	O -NONE OR LITTLE [3]
O -MODERATE 10-50 [3]	O-OPEN PASTURE/ ROWCROP[0]	O-SHRUB OR OLD FIELD[2]	X MODERATE [2]
O -NARROW 5-10m [2]	O- RESID.,PARK,NEW FIELD [1]	O-CONSERV. TILLAGE [1]	O -HEAVY OR SEVERE[1]
X -VERY NARROW 1-5m [1]	O-FENCED PASTURE [1]	O-MINING/CONSTRUCTION [0]	
O -NONE[0]			

COMMENTS:

POOL: 5

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	DIST./RUN/GLIDE CURRENT VELOCITY (Check All That Apply)	
O- > 1m [6]		O-TORRENTIAL[-1]	O-EDDIES [1]
O- 0.7-1m [4]	X POOL WIDTH > RIFFLE WIDTH [2]	O-FAST[1]	O-INTERSTITIAL[-1]
X 0.4-0.7m [2]	O -POOL WIDTH = RIFFLE WIDTH [1]	O-MODERATE [1]	O-INTERMITTENT[-2]
O- < 0.4m [1]	O-POOL WIDTH < RIFFLE W. [0]	X SLOW [1]	
O—<0.2m (Pool = 0)			

O- NO POOL[0]

COMMENTS:

RIFFLE: 0

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
O - GENERALLY > 10 cm,MAX> 50 [4]	O-STABLE (e.g.,Cobble, Boulder) [2]	X EXTENSIVE [-1] O-MODERATE[0]
O - GENERALLY > 10 cm,MAX< 50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	O-LOW. [1] O-NONE[2]
O - GENERALLY 5-10 cm [1]	X UNSTABLE (Gravel,Sand) [0]	
X - GENERALLY < 5 cm (Riffle = 0)		

O-NO RIFFLE[0]

COMMENTS

GRADIENT: 4

6) Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4500

UN-1
5/4/00

Procedure No.	WQPA-SWS-3	Date Issued	9-30-89
Revision No.	6	Date Effective	9-30-89

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 30

Stream Unidentified Tributary RM ____ Date 5/4/00 River Code ____

Location UN-1 - Trib to Squaw Creek near Chandler Crew: ESB/CWR

1) SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Check all types present); SUBSTRATE SCORE: 2

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
O-BLDER/SLABS[10]			O-GRAVEL [7]		
O-BOULDER [9]			O-SAND [6]		
O-COBBLE [8]			O-BEDROCK[5]		
O-HARDPAN [4]			O-DETRITUS[3]	X	
X-MUCK [2]		X	O-ARTIFIC.[0]		

TOTAL NUMBER OF SUBSTRATE TYPES: O> 4 [2] X <= 4 [0] O-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS ____

Substrate Origin (Check all): O-LIMESTONE [1] O-RIP/RAP [0] X-TILLS [1] O-HARDPAN [0] O-SANDSTONE [0] O-SHALE [-1]

Silt Cover (Check One): X-SILT HEAVY [-2] O-SILT MODERATE [-1] O - SILT NORMAL [0] O - SILT FREE [1]

Extent Of Embeddedness (Check One): O—EXTENSIVE [-2] X—MODERATE [-1] O—LOW [0] O—NONE [1]

2] INSTREAM COVER COVER SCORE: 6

TYPE (Check All That Apply): O -UNDERCUT BANKS [1] X-OVERHANGING VEGETATION [1] O -SHALLOWS (IN SLOW WATER) [1] O -DEEP POOLS [2] O -ROOTWADS [1] O -BOULDERS [1] O -OXBOWS [1] X-AQUATIC MACROPHYTES [1] X-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check ONLY One or check 2 and AVERAGE): O - EXTENSIVE > 75% [11] O - MODERATE 25-75% [7] X - SPARSE 5-25% [3] O - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE) CHANNEL: 7

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
X - LOW [2]	O - FAIR [3]	X - RECOVERING [3]	X - LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	X - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 9

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
O O-WIDE>50m [4]	X O-FOREST, SWAMP [3]	O O-URBAN OR INDUSTRIAL[0]	O O-NONE OR LITTLE [3]
O O-MODERATE 10-50 [3]	X O-OPEN PASTURE/ ROWCROP[0]	O O-SHRUB OR OLD FIELD[2]	X O-MODERATE[2]
O O-NARROW 5-10m [2]	O O- RESID.,PARK,NEW FIELD [1]	O O-CONSERV. TILLAGE [1]	O O-HEAVY OR SEVERE[1]
X O-VERY NARROW 1-5m [1]	O O-FENCED PASTURE [1]	O O-MINING/CONSTRUCTION [0]	
O O-NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY POOL: 3

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check All That Apply)		
O- >1m [6]	O-POOL WIDTH > RIFFLE WIDTH [2]	O-TORRENTIAL[-1]	O-EDDIES[1]	O- NO POOL[0]
O- 0.7-1m [4]	X-POOL WIDTH = RIFFLE WIDTH [1]	O-FAST[1]	O-INTERSTITIAL[-1]	
O- 0.4-0.7m [2]	O-POOL WIDTH < RIFFLE W. [0]	O-MODERATE [1]	O-INTERMITTENT[-2]	
X- <0.4m [1]		X-SLOW [1]		
O—<0.2m (Pool = 0)				

COMMENTS: ____

RIFFLE: X 1

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS	
O - GENERALLY >10 cm,MAX>50 [4]	O-STABLE (e.g.,Cobble, Boulder) [2]	O-EXTENSIVE [-1]	X-MODERATE[0]
O - GENERALLY >10 cm,MAX<50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	O-LOW. [1]	O-NONE[2]
X- GENERALLY 5-10 cm [1]	X-UNSTABLE (Gravel,Sand) [0]		O-NO RIFFLE[0]
O - GENERALLY < 5 cm (Riffle = 0)			

COMMENTS ____

GRADIENT: 2

6] Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

SC-1
5/10/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 60

Stream Squaw Creek RM ____ Date ____ River Code ____
Location SC-1 Crew: ESP/KWB/APS

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; Check *all types present*); SUBSTRATE SCORE: 14

TYPE	POOL	RIFFLE		POOL	RIFFLE	
O-BLDER /SLABS[10]			X O-GRAVEL [7]		X	
O-BOULDER [9]			X O-SAND [6]		X	
O-COBBLE [8]			O-BEDROCK[5]			
O-HARDPAN [4]			X O-TILLS [1]			
O-MUCK [2]			O-ARTIFIC.[0]			

SUBSTRATE QUALITY

Substrate Origin (Check all): O-LIMESTONE [1] O-RIP/RAP [0] O-HARDPAN [0]

Silt Cover (Check One): O-SILT HEAVY [-2] O-SILT MODERATE [-1] X-SILT NORMAL [0] O-SILT FREE [1]

Extent Of Embeddness (Check One): O-EXTENSIVE [-2] O-MODERATE [-1] X-LOW [0] O-NONE [1]

O-SANDSTONE [0]
O-SHALE [-1]
O-COAL FINES [-2]

TOTAL NUMBER OF SUBSTRATE TYPES: O- > 4 [2] X- <= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS

2] INSTREAM COVER COVER SCORE: 9

TYPE (Check *All* That Apply)

O-UNDERCUT BANKS [1]
X-OVERHANGING VEGETATION [1]
X-SHALLOWS (IN SLOW WATER) [1]
X-DEEP POOLS [2]
X-ROOTWADS [1]
O-BOULDERS [1]
O-OXBOWS [1]
O-AQUATIC MACROPHYTES [1]
X-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

O - EXTENSIVE > 75% [11]
O - MODERATE 25-75% [7]
X - SPARSE 5-25% [3]
O - NEARLY ABSENT < 5% [1]

COMMENTS:

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) CHANNEL: 8

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
X - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
O - LOW [2]	O - FAIR [3]	X - RECOVERING [3]	X - LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	X - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS:

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 12

"River Right Looking Downstream"

RIPARIAN WIDTH (L R (Per Bank))	EROSION/RUNOFF - FLOOD PLAIN QUALITY (L R (Most Predominant Per Bank))	FLOOD PLAIN QUALITY (L R (Per Bank))	BANK EROSION
O O-WIDE>50m [4]	X X-FOREST, SWAMP [3]	O O-URBAN OR INDUSTRIAL[0]	O O-NONE OR LITTLE [3]
O O-MODERATE 10-50 [3]	O O-OPEN PASTURE/ ROWCROP[0]	O O-SHRUB OR OLD FIELD[2]	X X-MODERATE [2]
O O-NARROW 5-10m [2]	O O- RESID.,PARK,NEW FIELD [1]	O O-CONSERV. TILLAGE [1]	O O-HEAVY OR SEVERE[1]
X X-VERY NARROW 1-5m [1]	O O-FENCED PASTURE [1]	O O-MINING/CONSTRUCTION [0]	
O O-NONE[0]			

COMMENTS:

POOL/GLIDE AND RIFFLE/RUN QUALITY POOL: 8

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
X >1m [6]			
O 0.7-1m [4]	O-POOL WIDTH > RIFFLE WIDTH [2]	O-TORRENTIAL[-1]	O-EDDIES[1]
O 0.4-0.7m [2]	X POOL WIDTH = RIFFLE WIDTH [1]	O-FAST[1]	O-INTERSTITIAL[-1]
O < 0.4m [1]	O-POOL WIDTH < RIFFLE W. [0]	O-MODERATE [1]	O-INTERMITTENT[-2]
O <0.2m (Pool = 0)		X SLOW [1]	

O-NO POOL[0]

COMMENTS:

RIFFLE/RUN RIFFLE: 5

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
X GENERALLY >10 cm,MAX>50 [4]	O-STABLE (e.g.,Cobble, Boulder) [2]	O-EXTENSIVE [-1]
O - GENERALLY >10 cm,MAX<50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	X LOW. [1]
O - GENERALLY 5-10 cm [1]	X UNSTABLE (Gravel,Sand) [0]	O-MODERATE[0]
O - GENERALLY < 5 cm [Riffle = 0]		O-NONE[2]

O-NO RIFFLE[0]

COMMENTS

GRADIENT: 4

6] Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

BG-1
5/7/00

Procedure No.	WQPA-SWS-3	Date Issued	9-30-89
Revision No.	6	Date Effective	9-30-89

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 52

Stream Big Creek RM ____ Date ____ River Code ____

Location BG-1 Crew: ESB/CWB

1] SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Check all types present);

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
O-BLDER /SLABS[10]		X	O-GRAVEL [7]	X	X
O-BOULDER [9]			O-SAND [6]	X	X
O-COBBLE [8]			O-BEDROCK[5]		
X-HARDPAN [4]	X	X	O-DETRITUS[3]	X	
O-MUCK [2]			O-ARTIFIC.[0]		
			O-SHALE [-1]		

TOTAL NUMBER OF SUBSTRATE TYPES: X > 4 [2] O— <= 4 [0] X-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS

SUBSTRATE SCORE: 12

Substrate Origin (Check all): O-LIMESTONE [1] O-RIP/RAP [0] X-HARDPAN [0] X-TILLS [1]

Silt Cover (Check One): O-SILT HEAVY [-2] O-SILT MODERATE [-1] X SILT NORMAL [0] O - SILT FREE [1]

Extent Of Embeddness (Check One): O—EXTENSIVE [-2] O—MODERATE [-1] X—LOW [0] O—NONE [1]

2] INSTREAM COVER

TYPE (Check All That Apply)

O -UNDERCUT BANKS [1] X-DEEP POOLS [2] O -OXBOWS [1]
O -OVERHANGING VEGETATION [1] O -ROOTWADS [1] X-AQUATIC MACROPHYTES [1]
X -SHALLOWS (IN SLOW WATER) [1] O -BOULDERS [1] X-LOGS OR WOODY DEBRIS [1]

COVER SCORE: 17

AMOUNT (Check ONLY One or check 2 and AVERAGE)

O - EXTENSIVE > 75% [11]
X- MODERATE 25-75% [7]
O - SPARSE 5-25% [3]
O - NEARLY ABSENT < 5% [1]

COMMENTS:

3] CHANNEL MORPHOLOGY; (Check ONLY One PER Category OR check 2 and AVERAGE)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
X- MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
O - LOW [2]	O - FAIR [3]	X- RECOVERING [3]	X- LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	X- POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

CHANNEL: 6

COMMENTS:

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	FLOOD PLAIN QUALITY L R (Per Bank)	BANK EROSION
O -WIDE>50m [4]	O-FOREST, SWAMP [3]	O-URBAN OR INDUSTRIAL[0]	O -NONE OR LITTLE [3]
O -MODERATE 10-50 [3]	X-OPEN PASTURE/ ROWCROP[3]	O-SHRUB OR OLD FIELD[2]	X-MODERATE [2]
O -NARROW 5-10m [2]	O- RESID.,PARK,NEW FIELD [1]	O-CONSERV. TILLAGE [1]	X-HEAVY OR SEVERE[1]
X-VERY NARROW 1-5m [1]	O-FENCED PASTURE [1]	O-MINING/CONSTRUCTION [0]	
O -NONE[0]			

RIPARIAN: 5

COMMENTS:

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check All That Apply)	
O - >1m [6]		O -TORRENTIAL[-1]	O -EDDIES[1]
X-0.7-1m [4]	X-POOL WIDTH > RIFFLE WIDTH [2]	O -FAST[1]	O -INTERSTITIAL[-1]
O- 0.4-0.7m [2]	O -POOL WIDTH = RIFFLE WIDTH [1]	O -MODERATE [1]	O -INTERMITTENT[-2]
O- < 0.4m [1]	O -POOL WIDTH < RIFFLE W. [0]	X-SLOW [1]	
O—<0.2m (Pool = 0)			

O-NO POOL[0]

POOL: 7

COMMENTS:

RIFFLE/RUN DEPTH

O - GENERALLY >10 cm,MAX>50 [4]
X- GENERALLY >10 cm,MAX<50 [3]
O - GENERALLY 5-10 cm [1]
O - GENERALLY < 5 cm (Riffle = 0)

RIFFLE/RUN SUBSTRATE

O-STABLE (e.g.,Cobble, Boulder) [2]
O-MOD. STABLE (e.g.,Pea Gravel) [1]
X-UNSTABLE (Gravel,Sand) [0]

RIFFLE/RUN EMBEDDEDNESS

O-EXTENSIVE [-1] O-MODERATE[0]
X-LOW. [1] O-NONE[2]

O-NO RIFFLE[0]

RIFFLE: 4

COMMENTS

GRADIENT: 4

6] Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

5/7/00
BG-2

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

QHEI SCORE: [ ]

Stream: Big Creek RM: _____ Date: _____ River Code: _____

Location: BG-2 Crew: ESB / CWB

1) SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Check all types present);

SUBSTRATE SCORE: [12]

TYPE	POOL	RIFFLE		POOL	RIFFLE
O-BLDER /SLABS[10]			O-GRAVEL [7]	X	X
O-BOULDER [9]			O-SAND [6]	X	X
O-COBBLE [8]	X	X	O-BEDROCK[5]		
O-HARDPAN [4]	X	X	O-DETRITUS[3]	X	
O-MUCK [2]			O-ARTIFIC.[0]		

SUBSTRATE QUALITY (Check all)
O-LIMESTONE [1] O-RIP/RAP [0]
O-TILLS [1] O-HARDPAN [0]
O-SANDSTONE [0]
O-SHALE [-1]
O-COAL FINES [-2]

Substrate Origin (Check all)

Silt Cover (Check One)
O-SILT HEAVY [-2] O-SILT MODERATE [-1]
O-SILT NORMAL [0] O-SILT FREE [1]

Extent Of Embeddedness (Check One)
O-EXTENSIVE [-2] O-MODERATE [-1]
O-LOW [0] O-NONE [1]

TOTAL NUMBER OF SUBSTRATE TYPES: X > 4 [2] O-<= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: _____

COVER SCORE: [9]

2) INSTREAM COVER

TYPE (Check All That Apply)
O-UNDERCUT BANKS [1]
X-OVERHANGING VEGETATION [1]
X-SHALLOWS (IN SLOW WATER) [1]
X-DEEP POOLS [2]
X-ROOTWADS [1]
O-BOULDERS [1]
O-OXBOWS [1]
O-AQUATIC MACROPHYTES [1]
X-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check ONLY One or check 2 and AVERAGE)
O - EXTENSIVE > 75% [11]
O - MODERATE 25-75% [7]
X - SPARSE 5-25% [3]
O - NEARLY ABSENT < 5% [1]

COMMENTS: _____

CHANNEL: [11]

3) CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
X-MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	X-MODERATE [2]	O - RELOCATION	O - ISLANDS
O - LOW [2]	X-FAIR [3]	X-RECOVERING [3]	O - LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	O - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: _____

RIPARIAN: [1]

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

River Right Looking Downstream

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
O-WIDE > 50m [4]	X-FOREST, SWAMP [3]	O-URBAN OR INDUSTRIAL [0]	O-NONE OR LITTLE [3]
O-MODERATE 10-50 [3]	O-OPEN PASTURE/ ROWCROP [0]	O-SHRUB OR OLD FIELD [2]	X-MODERATE [2]
O-NARROW 5-10m [2]	O-RESID., PARK, NEW FIELD [1]	O-CONSERV. TILLAGE [1]	O-HEAVY OR SEVERE [1]
X-VERY NARROW 1-5m [1]	O-FENCED PASTURE [1]	O-MINING/CONSTRUCTION [0]	
O-NONE [0]			

COMMENTS: _____

POOL: [ ]

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check All That Apply)	
X->1m [6]	O-POOL WIDTH > RIFFLE WIDTH [2]	O-TORRENTIAL [-1]	O-EDDIES [1]
O-0.7-1m [4]	X-POOL WIDTH = RIFFLE WIDTH [1]	O-FAST [1]	O-INTERSTITIAL [-1]
O-0.4-0.7m [2]	O-POOL WIDTH < RIFFLE W. [0]	O-MODERATE [1]	O-INTERMITTENT [-2]
O-< 0.4m [1]		X-SLOW [1]	
O-<0.2m (Pool = 0)			

O-NO POOL [0]

COMMENTS: _____

RIFFLE: [1]

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
O - GENERALLY >10 cm, MAX > 50 [4]	O-STABLE (e.g., Cobble, Boulder) [2]	O-EXTENSIVE [-1] O-MODERATE [0]
X-GENERALLY >10 cm, MAX < 50 [3]	O-MOD. STABLE (e.g., Pea Gravel) [1]	X-LOW. [1] O-NONE [2]
O - GENERALLY 5-10 cm [1]	X-UNSTABLE (Gravel, Sand) [0]	
O - GENERALLY < 5 cm (Riffle = 0)		

O-NO RIFFLE [0]

COMMENTS: _____

GRADIENT: [1]

6) Gradient (feet/mile): _____ %POOL: _____ %RIFFLE: _____ %RUN: _____

EPA 4520

SF-1
5/9/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 49

Stream SMITH FORK RM ____ Date ____ River Code ____
Location SF-1 Crew: EB/KWB/ARK

1) SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Check all types present); SUBSTRATE SCORE: 12

TYPE	POOL	RIFFLE		POOL	RIFFLE	SUBSTRATE QUALITY
☐ ☐-BLDER /SLABS[10]			☒ ☐-GRAVEL [7]	X	X	Substrate Origin (Check all)
☐ ☐-BOULDER [9]			☐ ☒-SAND [6]	X	X	☐-LIMESTONE [1] ☐-RIP/RAP [0]
☐ ☐-COBBLE [8]			☐ ☐-BEDROCK[5]			☒-TILLS [1] ☐-HARDPAN [0]
☐ ☐-HARDPAN [4]	X		☐ ☐-DETRITUS[3]			☐-SANDSTONE [0]
☐ ☐-MUCK [2]			☐ ☐-ARTIFIC.[0]			☐-SHALE [-1]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☒-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddedness (Check One): ☐-EXTENSIVE [-2] ☐-MODERATE[-1] ☒-LOW[0] ☐-NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐> 4 [2] ☒ 4 [0] ☒ <= 4 [0] ☒ COAL FINES [-2]
NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)
COMMENTS ____

2) INSTREAM COVER COVER SCORE: 7

TYPE (Check All That Apply)
☐ -UNDERCUT BANKS [1]
☐ -OVERHANGING VEGETATION [1]
☒ -SHALLOWS (IN SLOW WATER) [1]
☒ -DEEP POOLS [2]
☐ -ROOTWADS [1]
☐ -BOULDERS [1]
☐ -OXBOWS [1]
☐ -AQUATIC MACROPHYTES [1]
☒ -LOGS OR WOODY DEBRIS (1)

AMOUNT (Check ONLY One or check 2 and AVERAGE)
☐ - EXTENSIVE > 75% [11]
☐ - MODERATE 25-75% [7]
☒ - SPARSE 5-25% [3]
☐ - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3) CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE) CHANNEL: 7

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☐ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ - LOW [2]	☐ - FAIR [3]	☒ - RECOVERING [3]	☒ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☒ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 12
"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
☐ ☐ -WIDE > 50m [4]	☒ ☒ -FOREST, SWAMP [3]	☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐ -MODERATE 10-50 [3]	☐ ☐-OPEN PASTURE/ ROWCROP[0]	☐ ☐-SHRUB OR OLD FIELD[2]	☒ ☒-MODERATE [2]
☐ ☐ -NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1]	☐ ☐-CONSERV. TILLAGE [1]	☐ ☐-HEAVY OR SEVERE[1]
☒ ☒ -VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1]	☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐ -NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY POOL: 5

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check All That Apply)	
☐ - >1m [6]	☒ -POOL WIDTH > RIFFLE WIDTH [2]	☐ -TORRENTIAL[-1]	☐ -EDDIES[1]
☐ - 0.7-1m [4]	☐ -POOL WIDTH = RIFFLE WIDTH [1]	☐ -FAST[1]	☐ -INTERSTITIAL[-1]
☒ - 0.4-0.7m [2]	☐ -POOL WIDTH < RIFFLE W. [0]	☐ -MODERATE [1]	☐ -INTERMITTENT[-2]
☐ - < 0.4m [1]		☒ -SLOW [1]	
☐ - <0.2m [Pool = 0]			

☐ - NO POOL[0]

COMMENTS: ____

RIFFLE: 2

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐-STABLE (e.g.,Cobble, Boulder) [2]	☐-EXTENSIVE [-1] ☐-MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐-MOD. STABLE (e.g.,Pea Gravel) [1]	☒-LOW. [1] ☐-NONE[2]
☒ - GENERALLY 5-10 cm [1]	☒-UNSTABLE (Gravel,Sand) [0]	
☐ - GENERALLY < 5 cm [Riffle = 0]		

☐-NO RIFFLE[0]

COMMENTS ____

GRADIENT: 4

6) Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

SF-2
5/7/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 44 44

Stream Smith Fork RM ____ Date ____ River Code ____
Location SF-2 Crew: EJB/CWB

1) SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Check all types present):

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
☐ O-BLDER /SLABS[10]		X	☐ O-GRAVEL [7]	✓	X
☐ O-BOULDER [9]			☐ O-SAND [6]	X	X
☐ O-COBBLE [8]			☐ O-BEDROCK[5]		
☐ X HARDPAN [4]	X	X	☐ O-DETRITUS[3]		
☐ O-MUCK [2]			☐ O-ARTIFIC.[0]		

SUBSTRATE QUALITY — Substrate Origin (Check all): ☐ O-LIMESTONE [1] ☐ O-RIP/RAP [0] ☐ X HARDPAN [0] ☐ O-SANDSTONE [0] ☐ O-SHALE [-1]

SUBSTRATE SCORE: 1

Silt Cover (Check One): ☐ O-SILT HEAVY [-2] ☐ O-SILT MODERATE [-1] ☐ X SILT NORMAL [0] ☐ O - SILT FREE [1]

Extent Of Embeddedness (Check One): ☐ EXTENSIVE [-2] ☐ MODERATE [-1] ☐ X LOW [0] ☐ NONE [1]

TOTAL NUMBER OF SUBSTRATE TYPES: ☐ > 4 [2] ☐ X <= 4 [0] ☐ O-COAL FINES [-2]
NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)
COMMENTS ____

COVER SCORE: 8

2) INSTREAM COVER

TYPE (Check All That Apply): ☐ O-UNDERCUT BANKS [1] ☐ X DEEP POOLS [2] ☐ O-OXBOWS [1] ☐ X OVERHANGING VEGETATION [1] ☐ O-ROOTWADS [1] ☐ O-AQUATIC MACROPHYTES [1] ☐ X SHALLOWS (IN SLOW WATER) [1] ☐ O-BOULDERS [1] ☐ X LOGS OR WOODY DEBRIS [1]

AMOUNT (Check ONLY One or check 2 and AVERAGE): ☐ O - EXTENSIVE > 75% [11] ☐ O - MODERATE 25-75% [7] ☐ X - SPARSE 5-25% [3] ☐ O - NEARLY ABSENT < 5% [1]

COMMENTS: ____

CHANNEL: 9

3) CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ O - HIGH [4]	☐ O - EXCELLENT [7]	☐ O - NONE [6]	☐ O - HIGH [3]	☐ O - SNAGGING	☐ O - IMPOUND.
☐ O - MODERATE [3]	☐ O - GOOD [5]	☐ O - RECOVERED [4]	☐ O - MODERATE [2]	☐ O - RELOCATION	☐ O - ISLANDS
☐ X - LOW [2]	☐ X - FAIR [3]	☐ X - RECOVERING [3]	☐ X - LOW [1]	☐ O - CANOPY REMOVAL	☐ O - LEVEED
☐ O - NONE [1]	☐ O - POOR [1]	☐ O - RECENT OR NO RECOVERY [1]		☐ O - DREDGING	☐ O - BANK SHAPING
				☐ O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

RIPARIAN: 6

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)
"River Right Looking Downstream"

RIPARIAN WIDTH (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY (Most Predominant Per Bank)		BANK EROSION
L R	L R	L R	
☐ ☐ O-WIDE > 50m [4]	☐ ☐ O-FOREST, SWAMP [3]	☐ ☐ O-URBAN OR INDUSTRIAL [0]	☐ ☐ O-NONE OR LITTLE [3]
☐ ☐ O-MODERATE 10-50 [3]	X X OPEN PASTURE/ ROWCROP [0]	☐ ☐ O-SHRUB OR OLD FIELD [2]	X X MODERATE [2]
☐ ☐ O-NARROW 5-10m [2]	☐ ☐ O- RESID., PARK, NEW FIELD [1]	☐ ☐ O-CONSERV. TILLAGE [1]	☐ ☐ O-HEAVY OR SEVERE [1]
X X O-VERY NARROW 1-5m [1]	☐ ☐ O-FENCED PASTURE [1]	☐ ☐ O-MINING/CONSTRUCTION [0]	
☐ ☐ O-NONE [0]			

COMMENTS: ____

POOL: 4

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check All That Apply)	
☐ O- > 1m [5]			
☐ O- 0.7-1m [4]	X POOL WIDTH > RIFFLE WIDTH [2]	☐ O-TORRENTIAL [-1]	☐ O-EDDIES [1]
☐ O- 0.4-0.7m [2]	☐ O -POOL WIDTH = RIFFLE WIDTH [1]	☐ O-FAST [1]	☐ O-INTERSTITIAL [-1]
X < 0.4m [1]	☐ O-POOL WIDTH < RIFFLE W. [0]	☐ O-MODERATE [1]	☐ O-INTERMITTENT [-2]
☐ <0.2m (Pool = 0)		X SLOW [1]	

☐ O-NO POOL [0]

COMMENTS: ____

RIFFLE: 2

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ O - GENERALLY > 10 cm, MAX > 50 [4]	☐ O-STABLE (e.g., Cobble, Boulder) [2]	☐ O-EXTENSIVE [-1] ☐ O-MODERATE [0]
☐ O - GENERALLY > 10 cm, MAX < 50 [3]	☐ O-MOD. STABLE (e.g., Pea Gravel) [1]	X LOW. [1] ☐ O-NONE [2]
X O - GENERALLY 5-10 cm [1]	X UNSTABLE (Gravel, Sand) [0]	
☐ O - GENERALLY < 5 cm (Riffle = 0)		

☐ O-NO RIFFLE [0]

COMMENTS ____

GRADIENT: 4

6) Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

SF-3
5/7/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

QHEI SCORE: 49

Stream: Santa Fork RM: Date: River Code:
Location: SF-3 Crew: EJB/CWB

1) SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Check all types present);

SUBSTRATE SCORE: 12

TYPE	POOL	RIFFLE		POOL	RIFFLE
☐ O-BLDER /SLABS[10]		X	O-GRAVEL [7]	X	X
☐ O-BOULDER [9]			O-SAND [6]	X	X
☐ O-COBBLE [8]		X	O-BEDROCK[5]		
☐ O-HARDPAN [4]			O-DETRITUS[3]		
☐ O-MUCK [2]			O-ARTIFIC.[0]		

SUBSTRATE QUALITY: O-LIMESTONE [1] O-RIP/RAP [0] O-SILT HEAVY [-2] O-SILT MODERATE [-1] O-HARDPAN [0] O-SILT NORMAL [0] O - SILT FREE [1]

Substrate Origin (Check all): O-GILLS [1] O-SANDSTONE [0] O-SHALE [-1]

Silt Cover (Check One): O—EXTENSIVE [-2] O—MODERATE[-1] O—LOW[0] O—NONE[1]

Extent Of Embeddness (Check One)

TOTAL NUMBER OF SUBSTRATE TYPES: O> 4 [2] O<= 4 [0] O-COAL FINES [-2]
NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)
COMMENTS

COVER SCORE: 5

2) INSTREAM COVER

TYPE (Check All That Apply)
- O -UNDERCUT BANKS [1]
- O-OVERHANGING VEGETATION [1]
- O-SHALLOWS (IN SLOW WATER) [1]
- O-DEEP POOLS [2]
- O -ROOTWADS [1]
- O -BOULDERS [1]
- O -OXBOWS [1]
- O -AQUATIC MACROPHYTES [1]
- O-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check ONLY One or check 2 and AVERAGE)
- O - EXTENSIVE > 75% [11]
- O - MODERATE 25-75% [7]
- O - SPARSE 5-25% [3]
- O - NEARLY ABSENT < 5% [1]

COMMENTS:

CHANNEL: 10

3] CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O-MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
O - LOW [2]	O-FAIR [3]	O-RECOVERING [3]	O - LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	O - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS:

RIPARIAN: 9

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)
River Right Looking Downstream

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
O O'-WIDE>50m [4]	O-FOREST, SWAMP [3]	O O-URBAN OR INDUSTRIAL[0]	O O-NONE OR LITTLE [3]
O O'-MODERATE 10-50 [3]	O-OPEN PASTURE/ ROWCROP[0]	O O-SHRUB OR OLD FIELD[2]	O-MODERATE [2]
O O'-NARROW 5-10m [2]	O O- RESID.,PARK,NEW FIELD [1]	O O-CONSERV. TILLAGE [1]	O O-HEAVY OR SEVERE[1]
O-VERY NARROW 1-5m [1]	O O-FENCED PASTURE [1]	O O-MINING/CONSTRUCTION [0]	
O O'-NONE[0]			

COMMENTS:

POOL: 4

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/GLIDE CURRENT VELOCITY (Check All That Apply)		
O- >1m [6]		O'-TORRENTIAL[-1]	O'-EDDIES[1]	
O- 0.7-1m [4]	O'-POOL WIDTH > RIFFLE WIDTH [2]	O'-FAST[1]	O'-INTERSTITIAL[-1]	O- NO POOL[0]
O-0.4-0.7m [2]	O-POOL WIDTH = RIFFLE WIDTH [1]	O'-MODERATE [1]	O'-INTERMITTENT[-2]	
O- < 0.4m [1]	O'-POOL WIDTH < RIFFLE W. [0]	O-SLOW [1]		
O—<0.2m (Pool = 0)				

COMMENTS:

RIFFLE: 7

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS	
O - GENERALLY >10 cm,MAX>50 [4]	O-STABLE (e.g.,Cobble, Boulder) [2]	O-EXTENSIVE [-1]	O-MODERATE[0]
O - GENERALLY >10 cm,MAX<50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	O-LOW. [1]	O-NONE[2]
O-GENERALLY 5-10 cm [1]	O-UNSTABLE (Gravel,Sand) [0]		O-NO RIFFLE[0]
O - GENERALLY < 5 cm (Riffle = 0)			

COMMENTS

GRADIENT: 4

6] Gradient (feet/mile): _____ %POOL: _____ %RIFFLE: _____ %RUN: _____

WF-1
5/5/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 34

Stream: West fork of Pigeon RM: ____ Date: ____ River Code: ____

Location: WF-1 Crew: EJB / CHJT

1) SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Check all types present):

TYPE	POOL	RIFFLE	TYPE	POOL	RIFFLE
O-BLDER /SLABS[10]		O X	GRAVEL [7]	X	X
O-BOULDER [9]			O-SAND [6]	X	X
O-COBBLE [8]			O-BEDROCK[5]		
O-HARDPAN [4]			O-DETRITUS[3]	X	
O-MUCK [2]			O-ARTIFIC.[0]		

SUBSTRATE QUALITY — Substrate Origin (Check all): O-LIMESTONE [1] O-RIP/RAP [0] O-TILLS [1] O-HARDPAN [0] O-SANDSTONE [0] O-SHALE [-1]

Silt Cover (Check One): X SILT HEAVY [-2] O-SILT MODERATE [-1] O - SILT NORMAL [0] O - SILT FREE [1]

Extent Of Embeddedness (Check One): X EXTENSIVE [-2] O—MODERATE[-1] O—LOW[0] O—NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: O> 4 [2] X <= 4 [0] O-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

SUBSTRATE SCORE: 10

2) INSTREAM COVER — TYPE (Check All That Apply): O -UNDERCUT BANKS [1]; X OVERHANGING VEGETATION [1]; X SHALLOWS (IN SLOW WATER) [1]; X DEEP POOLS [2]; O -ROOTWADS [1]; O -BOULDERS [1]; O -OXBOWS [1]; O -AQUATIC MACROPHYTES [1]; X LOGS OR WOODY DEBRIS [1]

AMOUNT (Check ONLY One or check 2 and AVERAGE): O - EXTENSIVE > 75% [11]; O - MODERATE 25-75% [7]; X SPARSE 5-25% [3]; O - NEARLY ABSENT < 5% [1]

COMMENTS: ____

COVER SCORE: 8 8

3) CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING; O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION; O - ISLANDS
X LOW [2]	O - FAIR [3]	X RECOVERING [3]	X LOW [1]	O - CANOPY REMOVAL; O - LEVEED
O - NONE [1]	X POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING; O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS

COMMENTS: ____

CHANNEL: 7 7

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank)

"River Right Looking Downstream"

RIPARIAN WIDTH (Per Bank) L R	EROSION/RUNOFF - FLOOD PLAIN QUALITY (Most Predominant Per Bank) L R	(Per Bank) L R	BANK EROSION
O O-WIDE>50m [4]	O O-FOREST, SWAMP [3]	O O-URBAN OR INDUSTRIAL[0]	O O-NONE OR LITTLE [3]
O O-MODERATE 10-50 [3]	X OPEN PASTURE/ ROWCROP[0]	O O-SHRUB OR OLD FIELD[2]	X MODERATE[2]
O O-NARROW 5-10m [2]	O O- RESID.,PARK,NEW FIELD [1]	O O-CONSERV. TILLAGE [1]	O O-HEAVY OR SEVERE[1]
X VERY NARROW 1-5m [1]	O O-FENCED PASTURE [1]	O O-MINING/CONSTRUCTION [0]	
O O-NONE[0]			

COMMENTS: ____

RIPARIAN: 6

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check All That Apply)	
O > 1m [6]	O-POOL WIDTH > RIFFLE WIDTH [2]	O-TORRENTIAL[-1]	O-EDDIES[1]
O 0.7-1m [4]	X POOL WIDTH = RIFFLE WIDTH [1]	O-FAST[1]	O-INTERSTITIAL[-1]
X 0.4-0.7m [2]	O-POOL WIDTH < RIFFLE W. [0]	X MODERATE [1]	O-INTERMITTENT[-2]
O < 0.4m [1]		O-SLOW [1]	
O—<0.2m [Pool = 0]			

O-NO POOL[0]

COMMENTS: ____

POOL: 4 4

RIFFLE/RUN DEPTH: O - GENERALLY >10 cm,MAX>50 [4]; O - GENERALLY >10 cm,MAX<50 [3]; X GENERALLY 5-10 cm [1]; O - GENERALLY < 5 cm [Riffle = 0]

RIFFLE/RUN SUBSTRATE: O-STABLE (e.g.,Cobble, Boulder) [2]; O-MOD. STABLE (e.g.,Pea Gravel) [1]; X UNSTABLE (Gravel,Sand) [0]

RIFFLE/RUN EMBEDDEDNESS: O-EXTENSIVE [-1]; X MODERATE[0]; O-LOW. [1]; O-NONE[2]

O-NO RIFFLE[0]

COMMENTS: ____

RIFFLE: 1

GRADIENT: 2

6) Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

WF-2
5/5/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 39 39

Stream: West Fork of Pigeon RM: ____ Date: ____ River Code: ____

Location: WF-2 Crew: EJB/CWB

1] SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Check all types present):

TYPE	POOL	RIFFLE	POOL	RIFFLE	SUBSTRATE QUALITY
☐ ☐-BLDER /SLABS[10]			☐ ☒-GRAVEL [7]		☒
☐ ☐-BOULDER [9]			☐ ☐-SAND [6]		
☐ ☐-COBBLE [8]			☐ ☐-BEDROCK[5]		
☒ ☐-HARDPAN [4]	☒	☒	☐ ☐-DETRITUS[3]	☒	
☐ ☐-MUCK [2]	☒		☐ ☐-ARTIFIC.[0]		

Substrate Origin (Check all): ☐-LIMESTONE [1] ☐-RIP/RAP [0] ☒-HARDPAN [0] ☐-TILLS [1] ☐-SANDSTONE [0] ☐-SHALE [-1] ☐-COAL FINES [-2]

Silt Cover (Check One): ☐-SILT HEAVY [-2] ☒-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Extent Of Embeddedness (Check One): ☐-EXTENSIVE [-2] ☐-MODERATE[-1] ☒-LOW[0] ☐-NONE[1]

SUBSTRATE SCORE: 10

TOTAL NUMBER OF SUBSTRATE TYPES: ☐> 4 [2] ☒<= 4 [0]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

2] INSTREAM COVER — COVER SCORE: 7

TYPE (Check All That Apply): ☐-UNDERCUT BANKS [1] ☒-OVERHANGING VEGETATION [1] ☒-SHALLOWS (IN SLOW WATER) [1] ☒-DEEP POOLS [2] ☐-ROOTWADS [1] ☐-BOULDERS [1] ☐-OXBOWS [1] ☐-AQUATIC MACROPHYTES [1] ☐-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check ONLY One or check 2 and AVERAGE): ☐-EXTENSIVE > 75% [11] ☐-MODERATE 25-75% [7] ☒-SPARSE 5-25% [3] ☐-NEARLY ABSENT < 5%[1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE) — CHANNEL: 7

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
☐ - HIGH [4]	☐ - EXCELLENT [7]	☐ - NONE [6]	☐ - HIGH [3]	☐ - SNAGGING	☐ - IMPOUND.
☐ - MODERATE [3]	☐ - GOOD [5]	☐ - RECOVERED [4]	☐ - MODERATE [2]	☐ - RELOCATION	☐ - ISLANDS
☒ - LOW [2]	☐ - FAIR [3]	☒ - RECOVERING [3]	☒ - LOW [1]	☐ - CANOPY REMOVAL	☐ - LEVEED
☐ - NONE [1]	☒ - POOR [1]	☐ - RECENT OR NO RECOVERY [1]		☐ - DREDGING	☐ - BANK SHAPING
				☐ - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — RIPARIAN: 5

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank) L R (Per Bank)	BANK EROSION
☐ ☐-WIDE>50m [4]	☐ ☐-FOREST, SWAMP [3] ☐ ☐-URBAN OR INDUSTRIAL[0]	☐ ☐-NONE OR LITTLE [3]
☐ ☐-MODERATE 10-50 [3]	☒ ☒-OPEN PASTURE/ ROW CROP[0] ☐ ☐-SHRUB OR OLD FIELD[2]	☐ ☒-MODERATE [2]
☐ ☐-NARROW 5-10m [2]	☐ ☐- RESID.,PARK,NEW FIELD [1] ☐ ☐-CONSERV. TILLAGE [1]	☒ ☐-HEAVY OR SEVERE[1]
☒ ☒-VERY NARROW 1-5m [1]	☐ ☐-FENCED PASTURE [1] ☐ ☐-MINING/CONSTRUCTION [0]	
☐ ☐-NONE[0]		

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY — POOL: 6

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check All That Apply)	
☐ > 1m [6]	☒ - POOL WIDTH > RIFFLE WIDTH [2]	☐ - TORRENTIAL[-1]	☒ - EDDIES[1]
☐ 0.7-1m [4]	☐ - POOL WIDTH = RIFFLE WIDTH [1]	☐ - FAST[1]	☐ - INTERSTITIAL[-1]
☒ 0.4-0.7m [2]	☐ - POOL WIDTH < RIFFLE W. [0]	☒ - MODERATE [1]	☐ - INTERMITTENT[-2]
☐ < 0.4m [1]		☐ - SLOW [1]	
☐ <0.2m (Pool = 0)			

☐ - NO POOL[0]

COMMENTS: ____

RIFFLE/RUN — RIFFLE: 7

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
☐ - GENERALLY >10 cm,MAX>50 [4]	☐ - STABLE (e.g.,Cobble, Boulder) [2]	☐ - EXTENSIVE [-1] ☐ - MODERATE[0]
☐ - GENERALLY >10 cm,MAX<50 [3]	☐ - MOD. STABLE (e.g.,Pea Gravel) [1]	☒ - LOW. [1] ☐ - NONE[2]
☒ - GENERALLY 5-10 cm [1]	☒ - UNSTABLE (Gravel,Sand) [0]	
☐ - GENERALLY < 5 cm (Riffle = 0)		

☐ - NO RIFFLE[0]

COMMENTS: ____

GRADIENT: 2

6] Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

WF-3
5/5/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish

QHEI SCORE: 43

Stream: West Fork of Pigeon RM: ____ Date: ____ River Code: ____

Location: WF-3 Crew: EJB/CWB

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*);

TYPE	POOL	RIFFLE		POOL	RIFFLE	Substrate Origin (Check All)
☐ O-BLDER /SLABS[10]			☒ O-GRAVEL [7]	X	X	
☐ O-BOULDER [9]			☐ O-SAND [6]	X	X	O-LIMESTONE [1] O-RIP/RAP [0]
☐ O-COBBLE [8]			☐ O-BEDROCK[5]			O-TILLS [1] ☒ HARDPAN [0]
☒ HARDPAN [4]	X		☐ O-DETRITUS[3]	X		O-SANDSTONE [0]
☐ O-MUCK [2]	X		☐ O-ARTIFIC.[0]			O-SHALE [-1]

SUBSTRATE QUALITY — SUBSTRATE SCORE: 11

Silt Cover (Check One): O-SILT HEAVY [-2] ☒ SILT MODERATE [-1] O - SILT NORMAL [0] O - SILT FREE [1]

Extent Of Embeddedness (Check One): O—EXTENSIVE [-2] ☒ MODERATE[-1] O—LOW[0] O—NONE[1]

TOTAL NOUMBER OF SUBSTRATE TYPES: ☒ > 4 [2] O— <= 4 [0] O-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

COMMENTS: ____

2] INSTREAM COVER — COVER SCORE: 8

TYPE (Check *All* That Apply)

O -UNDERCUT BANKS [1] ☒ DEEP POOLS [2] O -OXBOWS [1]
☒ OVERHANGING VEGETATION [1] O -ROOTWADS [1] O -AQUATIC MACROPHYTES [1]
☒ SHALLOWS (IN SLOW WATER) [1] O -BOULDERS [1] ☒ LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

O - EXTENSIVE > 75% [11]
O - MODERATE 25-75% [7]
☒ SPARSE 5-25% [3]
O - NEARLY ABSENT < 5%[1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) — CHANNEL: 9

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
☒ LOW [2]	☒ FAIR [3]	☒ RECOVERING [3]	☒ LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	O - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) — RIPARIAN: 4

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/BUNDEE - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
O O -WIDE>50m [4]	O O-FOREST, SWAMP [3]	O O-URBAN OR INDUSTRIAL[0]	O O-NONE OR LITTLE [3]
O O -MODERATE 10-50 [3]	☒ O-OPEN PASTURE/ ROWCROP[0]	O O-SHRUB OR OLD FIELD[2]	O ☒ MODERATE [2]
O O -NARROW 5-10m [2]	O O- RESID.,PARK,NEW FIELD [1]	O O-CONSERV. TILLAGE [1]	O O-HEAVY OR SEVERE[1]
☒ O -VERY NARROW 1-5m [1]	O O-FENCED PASTURE [1]	O O-MINING/CONSTRUCTION [0]	
O O -NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY — POOL: 6

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/RIFFLE CURRENT VELOCITY (Check *All* That Apply)		
O- >1m [6]		O -TORRENTIAL[-1]	☒ -EDDIES[1]	
O- 0.7-1m [4]	☒ -POOL WIDTH > RIFFLE WIDTH [2]	O -FAST[1]	O -INTERSTITIAL[-1]	O- NO POOL[0]
☒ 0.4-0.7m [2]	O -POOL WIDTH = RIFFLE WIDTH [1]	O -MODERATE [1]	O -INTERMITTENT[-2]	
O- < 0.4m [1]	O -POOL WIDTH < RIFFLE W. [0]	☒ -SLOW [1]		
O—<0.2m [Pool = 0]				

COMMENTS: ____

RIFFLE — RIFFLE: 1

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
O - GENERALLY >10 cm,MAX>50 [4]	O-STABLE (e.g.,Cobble, Boulder) [2]	O-EXTENSIVE [-1] ☒ MODERATE[0]
O - GENERALLY >10 cm,MAX<50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	O-LOW. [1] O-NONE[2]
☒ GENERALLY 5-10 cm [1]	☒ UNSTABLE (Gravel,Sand) [0]	O-NO RIFFLE[0]
O - GENERALLY < 5 cm [Riffle = 0]		

COMMENTS: ____

GRADIENT: 4

6] Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

HC-1
5/5/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: 40

Stream Hurricane Creek RM ____ Date ____ River Code ____
Location HC1 Crew: EJB/CWB

1] SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES*; Check *all types present*); SUBSTRATE SCORE: 11

TYPE	POOL	RIFFLE		POOL	RIFFLE	
O-BLDER /SLABS[10]			O-GRAVEL [7]		X	X
O-BOULDER [9]			O-SAND [6]			X
O-COBBLE [8]			O-BEDROCK[5]			
X-HARDPAN [4]		X	O-DETRITUS[3]		X	
O-MUCK [2]		X	X	O-ARTIFIC.[0]		

Substrate Origin (Check all): O-LIMESTONE [1] O-RIP/RAP [0] X-HARDPAN [0] O-SANDSTONE [0] O-SHALE [-1] O-COAL FINES [-2]

SIL Cover (Check One): O-SILT HEAVY [-2] X-SILT MODERATE [-1] O - SILT NORMAL [0] O - SILT FREE [1]

Extent Of Embeddness (Check One): O—EXTENSIVE [-2] X-MODERATE[-1] O—LOW[0] O—NONE[1]

TOTAL NUMBER OF SUBSTRATE TYPES: X > 4 [2] O— <= 4 [0]
NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)
COMMENTS ____

2] INSTREAM COVER COVER SCORE: 8

TYPE (Check *All* That Apply): O -UNDERCUT BANKS [1] X-DEEP POOLS [2] O -OXBOWS [1] X-OVERHANGING VEGETATION [1] O -ROOTWADS [1] O -AQUATIC MACROPHYTES [1] X-SHALLOWS (IN SLOW WATER) [1] O -BOULDERS [1] X-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*): O - EXTENSIVE > 75% [11] O - MODERATE 25-75% [7] X - SPARSE 5-25% [3] O - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3] CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) CHANNEL: 7

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
X - LOW [2]	O - FAIR [3]	X - RECOVERING [3]	X - LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	X - POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4] RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 6
"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Most Predominant Per Bank)	L R (Per Bank)	BANK EROSION
O -WIDE> 50m [4]	O-FOREST, SWAMP [3]	O-URBAN OR INDUSTRIAL[0]	O -NONE OR LITTLE [3]
O -MODERATE 10-50 [3]	X-OPEN PASTURE/ ROWCROP[0]	O-SHRUB OR OLD FIELD[2]	X-MODERATE[2]
O -NARROW 5-10m [2]	O- RESID.,PARK,NEW FIELD [1]	O-CONSERV. TILLAGE [1]	O -HEAVY OR SEVERE[1]
X-VERY NARROW 1-5m [1]	O-FENCED PASTURE [1]	O-MINING/CONSTRUCTION [0]	
O -NONE[0]			

COMMENTS: ____

POOL/GLIDE AND RIFFLE/RUN QUALITY POOL: 4

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/GLIDE/RIFFLE CURRENT VELOCITY (Check *All* That Apply)	
O- >1m [6]	X-POOL WIDTH > RIFFLE WIDTH [2]	O -TORRENTIAL[-1]	O -EDDIES[1]
O- 0.7-1m [4]	O -POOL WIDTH = RIFFLE WIDTH [1]	O -FAST[1]	O -INTERSTITIAL[-1]
O- 0.4-0.7m [2]	O -POOL WIDTH < RIFFLE W. [0]	O -MODERATE [1]	O -INTERMITTENT[-2]
X- < 0.4m [1]		X-SLOW [1]	
O—<0.2m [Pool = 0]			

O-NO POOL[0]

COMMENTS: ____

RIFFLE: 0

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
O - GENERALLY >10 cm,MAX>50 [4]	O-STABLE (e.g.,Cobble, Boulder) [2]	O-EXTENSIVE [-1] X-MODERATE[0]
O - GENERALLY >10 cm,MAX<50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	O-LOW. [1] O-NONE[2]
O - GENERALLY 5-10 cm [1]	X-UNSTABLE (Gravel,Sand) [0]	
X- GENERALLY < 5 cm [Riffle = 0]		

O-NO RIFFLE[0]

COMMENTS ____

GRADIENT: 4

6] Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

SA-1
5/2/00

Figure V-4-5. Front side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record information for the calculation of the Qualitative Habitat Evaluation Index (QHEI).

Ohio EPA Site Description Sheet - Fish QHEI SCORE: ~~XX~~ 41

Stream Sand Creek RM ____ Date 5/2/00 River Code ____

Location SA1 Crew: EJB CWB

1) SUBSTRATE (Check *ONLY* Two Substrate *TYPE BOXES; Check all types present*):

SUBSTRATE SCORE: ~~XX~~ 11

TYPE	POOL	RIFFLE		POOL	RIFFLE	SUBSTRATE QUALITY
O-BLDER /SLABS[10]	____	____	O-GRAVEL [7]	X	X	Substrate Origin (Check all)
O-BOULDER [9]	____	____	O-SAND [6]	X	X	O-LIMESTONE [1]
O-COBBLE [8]	____	____	O-BEDROCK[5]	____	____	O-TILLS [1]
O-HARDPAN [4]	X	____	O-DETRITUS[3]	____	____	O-SANDSTONE [0]
O-MUCK [2]	____	____	O-ARTIFIC.[0]	____	____	O-SHALE [-1]

TOTAL NUMBER OF SUBSTRATE TYPES: O> 4 [2] X <= 4 [0] O-COAL FINES [-2]

NOTE: (Ignore sludge that originates from point-sources; score is based on natural substrates)

Silt Cover (Check One): O-SILT HEAVY [-2] X-SILT MODERATE [-1] O - SILT NORMAL [0] O - SILT FREE [1]

Extent Of Embeddedness (Check One): O—EXTENSIVE [-2] X-MODERATE[-1] O—LOW[0] O—NONE[1]

COMMENTS ____

COVER SCORE: 4

2) INSTREAM COVER

TYPE (Check *All* That Apply)

O -UNDERCUT BANKS [1]
X-OVERHANGING VEGETATION [1]
X-SHALLOWS (IN SLOW WATER) [1]
X-DEEP POOLS [2]
O -ROOTWADS [1]
O -BOULDERS [1]
O -OXBOWS [1]
X-AQUATIC MACROPHYTES [1]
X-LOGS OR WOODY DEBRIS [1]

AMOUNT (Check *ONLY* One or check 2 and *AVERAGE*)

O - EXTENSIVE > 75% [11]
O - MODERATE 25-75% [7]
X - SPARSE 5-25% [3]
O - NEARLY ABSENT < 5% [1]

COMMENTS: ____

3) CHANNEL MORPHOLOGY: (Check *ONLY* One PER Category OR check 2 and *AVERAGE*) CHANNEL: 7

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	
O - HIGH [4]	O - EXCELLENT [7]	O - NONE [6]	O - HIGH [3]	O - SNAGGING	O - IMPOUND.
O - MODERATE [3]	O - GOOD [5]	O - RECOVERED [4]	O - MODERATE [2]	O - RELOCATION	O - ISLANDS
X-LOW [2]	O - FAIR [3]	X-RECOVERING [3]	X-LOW [1]	O - CANOPY REMOVAL	O - LEVEED
O - NONE [1]	X-POOR [1]	O - RECENT OR NO RECOVERY [1]		O - DREDGING	O - BANK SHAPING
				O - ONE SIDE CHANNEL MODIFICATIONS	

COMMENTS: ____

4) RIPARIAN ZONE AND BANK EROSION - (check ONE box per bank or check 2 and AVERAGE per bank) RIPARIAN: 6

"River Right Looking Downstream"

RIPARIAN WIDTH L R (Per Bank)	EROSION/RUNOFF - FLOOD PLAIN QUALITY L R (Per Bank)		BANK EROSION
O -WIDE>50m [4]	O-FOREST, SWAMP [3]	O-URBAN OR INDUSTRIAL[0]	O-NONE OR LITTLE [3]
O -MODERATE 10-50 [3]	X-OPEN PASTURE/ ROWCROP[0]	O-SHRUB OR OLD FIELD[2]	X-MODERATE [2]
O -NARROW 5-10m [2]	O- RESID., PARK, NEW FIELD [1]	O-CONSERV. TILLAGE [1]	O -HEAVY OR SEVERE[1]
X-VERY NARROW 1-5m [1]	O-FENCED PASTURE [1]	O-MINING/CONSTRUCTION [0]	
O -NONE[0]			

COMMENTS: ____

POOL: 5

POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX DEPTH (Check 1)	MORPHOLOGY (Check 1)	POOL/RUN/GLIDE CURRENT VELOCITY (Check *All* That Apply)	
O- >1m [6]		O-TORRENTIAL[-1]	O-EDDIES[1]
O- 0.7-1m [4]	X-POOL WIDTH > RIFFLE WIDTH [2]	O-FAST[1]	O-INTERSTITIAL[-1]
X-0.4-0.7m [2]	O -POOL WIDTH = RIFFLE WIDTH [1]	O-MODERATE [1]	O-INTERMITTENT[-2]
O- < 0.4m [1]	O-POOL WIDTH < RIFFLE W. [0]	X-SLOW [1]	
O—<0.2m [Pool = 0]			

O-NO POOL[0]

COMMENTS: ____

RIFFLE: 1

RIFFLE/RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
O - GENERALLY >10 cm, MAX>50 [4]	O-STABLE (e.g.,Cobble, Boulder) [2]	O-EXTENSIVE [-1] X-MODERATE[0]
O - GENERALLY >10 cm, MAX<50 [3]	O-MOD. STABLE (e.g.,Pea Gravel) [1]	O-LOW. [1] O-NONE[2]
X-GENERALLY 5-10 cm [1]	X-UNSTABLE (Gravel,Sand) [0]	
O - GENERALLY < 5 cm [Riffle = 0]		

O-NO RIFFLE[0]

COMMENTS ____

GRADIENT: 2

6) Gradient (feet/mile): ____ %POOL: ____ %RIFFLE: ____ %RUN: ____

EPA 4520

PC-1 X
5/12/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta ~~|||~~ 3 3	Amphipoda - ||| 3	Isopoda - ~~||||~~ ~~||||~~ 6 16
Annelid - || 2 2		Water beatman - ~~||||~~ ~~||||~~ | 11
	Anisoptera	Daphnia - ~~||||~~ |||| 9
Gastropoda LHS - ~~||||~~ |||| 9 9		Coleoptera Dytiscid - ~~||||~~ ~~||||~~ ||| 14 14
	Zygoptera	
Bivalvia		Diptera Sir. Chrd - ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ 26
Crayfish - ~~||||~~ |||| 9 9	Plecoptera	Bld Red - ~~||||~~ 6 6
Ephemeroptera Canid - ~~||||~~ ~~||||~~ || 11 11		
Neotype - Baetid 1	Trichoptera	
Other		

RIFFLE SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 5	Total Org. in Sample 50

Observations

water temp = 22.0°C
DO = 17 mg/L
%DO = 206%
pH = 7.82
Cond = 1,192 µmhos

PC-2 X
5/12/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	(0)	1	2	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	(0)	1	2	3	4	Macroinvertebrates	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4	Fish	0	(1)	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta – (1) ✓		Isopoda – (1) ✓
Gastropoda Phs – (5) ✓	Anisoptera	
Lhs – (10) (20)		Coleoptera – (2) ✓
Limpet (5) ✓	Zygoptera	
Bivalvia		Diptera
	Plecoptera	Brown Ch... (20) (70)
Ephemeroptera		Blood (10)
	Trichoptera	
Other		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers (0)	Filtering Collectors (5)

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders	Total Org. in Sample

Observations

Water temp = 22.5
DO = 18.90
%DO = 230
Cond = 1,724
pH = 7.90

PC-3 X
5/8/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

		List Families Present/Indicate Abundance
Oligochaeta – 17		
Anelid – 1 (1)		
	Anisoptera	
Gastropoda LHS – 19		Coleoptera Elmidae – 11
Limpet – 111 (3)		Drupidae – 111 (3)
	Zygoptera Calistrygoda (2)	
Bivalvia		Diptera Brn Chrd – 53
Crayfish – 111 (3)	Plecoptera	Bloodred – 1111 (4)
Ephemeroptera		
	Trichoptera	
Other		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 0	Total Org. in Sample 50

Observations

water temp = 21.3
DO = 14.8
%DO = 172
Cond = 1,303
pH = 7.74

PC-4 X
5/14/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	(2)	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	(0)	1	2	3	4

0 = Absent/Not Observed   1 = Rare   2 = Common   3 = Abundant   4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta - ⅡⅡ (7) ✓

Anelid - | (1) ✓

Planaria - ⅡⅡ (5) ✓

Isopoda - ⅡⅡ ⅡⅡ |||| (14) ✓

Gastropoda

Anisoptera

Coleoptera

Zygoptera Coenagrionidae - | (1)

Bivalvia - ⅡⅡ || (7) ✓

Diptera Chironomidae - ⅡⅡ ⅡⅡ ⅡⅡ ... (80) (86)

Plecoptera

Ephemeroptera

Ceratopogonidae - |||| (4) ✓

Tipulidae - || (2) ✓

Trichoptera

Other

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers

Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 8

Total Org. in Sample 50

Observations

water temp = 21.4 °C
DO = 15.0 mg/L
% DO = 180%
Cond = 1,643 µmhos
pH 7.97

X

PC-5
5/12/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta – /// 3 ✓	Planaria – 1 1 ✓	Isopoda – 54 ✓
	Anisoptera	
Gastropoda LHS – 1 1 ✓		Coleoptera Dryopidae – 1 1 ✓
Limpet – 11 2 2		Dytiscid – 1 1 ✓
	Zygoptera Calipecterid – 1 1 ✓	
Bivalvia – 1 1 ✓		Diptera Brn Chrnd – 52 52
Crayfish – //// 4 ✓	Plecoptera	Bld Red – /// 3 2
Ephemeroptera		Simulidae – 18
Cor – 1 1 ✓	Trichoptera Hydropschid – /// 4	
Other		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 3	Total Org. in Sample 50

Observations

water temp = 22.8 °C
DO = 17.3 mg/L
%DO = 213%
pH = 7.88
Cond = 1,667 µmhos

PC-6 X
5/14/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	(0)	1	2	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	(1)	2	3	4

0 = Absent/Not Observed   1 = Rare   2 = Common   3 = Abundant   4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta

Gastropoda LHS - || (2) ✓

Bivalvia - | (1) ✓

Crayfish - |||| |||| (9) ✓

Ephemeroptera

Anisoptera

Zygoptera coliecetrdea - || (2) ✓

Plecoptera

Trichoptera

Waterboatmen (Corixidae) - |||| |||| |||| |||| ||| (23)

Isopoda - | (1) ✓

Coleoptera Dytiscid - |||| |||| (9) ✓

Diptera Brn Chrd - |||| |||| |||| |||| |||| |||| |||| |||| |||| |||| |||| |||| ||| (63) ✓

Bld red - || (2) ✓

Ceratopogonidae - |||| |||| || (12)

Other

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers

Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders |

Total Org. in Sample 50

Observations

water temp = 20.6 °C
DO = 14.3 mg/L
%DO = 168%
Cond = 1,663 µmhos
pH - 7.89

PC-7 X
5/12/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta - 卌 II (7) ✓	Planeria - II (2) ✓	Isopod - 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 (57)
	Annelid - III (7) ✓	Waterstrdr - II (2) ✓
	✓ Anisoptera	Waterboatmen - I (1) ✓
Gastropoda LHS - 卌 卌 II (11)	Longleg - I (1)	Coleoptera Dytiscid - I (1) ✓
	Zygoptera Calipetalea - 卌 (5) ✓	
Bivalvia - 卌 卌 II (12) ✓		Diptera Brn Chrd - 卌 卌 卌 卌 卌 (23)
Crayfish - 卌 I (6) ✓	Plecoptera	Bldred - I (1) ✓
Ephemeroptera Cand - III (3) ✓		
	Trichoptera	
Other		

RIFFLE SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers 30	Filtering Collectors 60

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders	Total Org. in Sample
Observations	

Water temp = 22.3°C
DO = 17.2 mg/L
% DO = 209%
Cond = 1,227 µmhos
pH = 7.89

PC-8
5/3/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	(0)	1	2	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	(1)	2	3	4
Fish	(0)	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta – (5) ✓	Isopod – (12) ✓	Planaria – (2) Tricladida
Annelid – (2) ✓		
	Anisoptera	
Gastropoda		Coleoptera
lbs – (18) ✓		riffle – Elmidae (3) ✓
Ancylidae (1) Limpet – 1 (1) ✓	Zygoptera	longtoed – Dryopidae (2) ✓
Bivalvia – (3) ✓	Calop – (20) ✓	Diptera
	Plecoptera	Blood red – (12) ✓
		Brown – (15) ✓
Ephemeroptera		Simulada – (6) ✓
Caenidae – (10)	Trichoptera	Crayfish – 1 ✓ (1)
	Hydro – 1 (1) ✓	NoSee'em – 1 Ceratopog (1)
Other		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers 5 | Filtering Collectors 55

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders | Total Org. in Sample

Observations

Pictures 21 – upstream
20 – downstream

air temp = 22.5
water temp = 20.5
DO = 8.5 mg/L
% DO = 100%
pH = 7.8
Cond = 1,793

PC-9X
5/10/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	(0)	1	2	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	(0)	1	2	3	4	Macroinvertebrates	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4	Fish	0	(1)	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

			List Families Present/Indicate Abundance
Oligochaeta – II (2) ✓			Water boatman – ~~IIII~~ IIII (10) (9)
Planaria – I (1) ✓			Water strider – II (2) ✓
		Anisoptera	
Gastropoda RHS – I (1) ✓			Coleoptera Dryopidae – ~~IIII~~ I (5) ✓
			Dytiscid – III (3) ✓
		Zygoptera Calipteryd – ~~IIII~~ (5)	
Bivalvia			Diptera Brn Chird – ~~IIII IIII IIII~~ ~~IIII IIII IIII~~ ~~IIII IIII~~
		Plecoptera	
Ephemeroptera			Bld red – ~~IIII IIII IIII IIII~~ ~~IIII IIII IIII~~ ~~IIII IIII~~ II
Caenidae – ~~IIII~~ III (18) ✓		Trichoptera	
Other			

(83)

(67)

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders	Total Org. in Sample 50
Observations	

water temp = 23.5°C
DO = 20.14 mg/L
%DO = 254%
pH = 8.01
Cond = 1,765 µmhos

PC-11 X
5/10/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	(0)	1	2	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	(1)	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta		Water strider-1 (1) ✓
Gastropoda LHS-1 (1) ✓	Anisoptera	
Bivalvia ~~HHT~~ (5) ✓	Zygoptera	Coleoptera Dytiscid - HHT (5) ✓
		Dryopidae - 1 (1) ✓
		Elmidae - 1 (1) ✓
Ephemeroptera Caen'd - 1111 (4) ✓	Plecoptera	Diptera Brn Chrnd - HHT HHT ... (106)
Baetid - 1111 (4)		Simulid - 1 (1) ✓
	Trichoptera Leptoceridae (1)	Blood red - HHT 1111 (10) ✓
	Hydropsychid - 1111 (4)	Tipulidae - 1 (1)
Other		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors 50

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders	Total Org. in Sample

Observations

water temp = 20.2
DO = 20.15
%DO = 234.9%
Cond = 1673 µmhos
pH = 8.12

PC-12
5/10/00
X

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	(0)	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST — List Families Present/Indicate Abundance

Oligochaeta

Anisoptera

Gastropoda

Coleoptera Dryopidae - II (2) ✓
Elmidae - HHH II (7) ✓
Hairy - I (1) ✓

Zygoptera

Bivalvia - II (2) ✓

Diptera Brn Chird - HHH HHH HHH HHH HHH HHH HHH HHH HHH HHH HHH HHH III (68)
Simulidae - HHH HHH HHH (15) ✓
Bld red - I (1) ✓
Ceratopogonidae - I (1) ✓

Plecoptera

Ephemeroptera Caenidae - IIII (4) ✓
Baetidae - HHH HHH III (13) ✓

Trichoptera Hydropsychid - HHH HHH HHH HHH HHH IIII (29)

Other

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers

Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 0

Total Org. in Sample 50

Observations

water quality = 22.1°C
DO = 18.7 mg/L
%DO = 222%
pH = 8.17
Cond = 1,149 µmhos

Workup in Lab

PC-13 X
5/8/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta III (3) ✓		Amphipoda-I (1)
annelida-IIII (4) ✓		Asellidae-III (3) Isopoda
Turbellaria-IIII III (8) ✓	Anisoptera	
Gastropoda physidae-II (2) ✓		Coleoptera
		Dryopidae-IIII IIII II (13) ✓
	Zygoptera ~~coleopterygidae~~	Haliplidae-II (2) ✓
Bivalvia	Coeg-IIII IIII IIII IIII IIII IIII IIII I	Diptera
	Plecoptera (36) ✓	culicidae-I (1)
Ephemeroptera		Brown Chironomidae-IIII IIII IIII IIII (20)
Caenidae-IIII IIII IIII IIII IIII IIII I (36)	Trichoptera	Blood red Chironomidae-IIII (5)
		Ceratopogonidae I (1)
Other		

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 2	Total Org. in Sample 50
Observations	

water temp = 236
pH = 8.11
Cond = 1,640
DO = 18.7
% DO = 233

PC-14 X
5/2/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	(0)	1	2	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

Misquitoe Fish and Sunfish

MACROBENTHOS QUALITATIVE SAMPLE LIST — List Families Present/Indicate Abundance

Oligochaeta

Isopoda - (26) ✓

Anisoptera

Gastropoda - LHS - |||| (4)

Coleoptera

Zygoptera

Bivalvia - (24) ✓

Crayfish - || ✓

Diptera Simuliidae - (28) ✓

Plecoptera

Blood red - ||| (3) ✓

Ephemeroptera Baetid - (38)

Other Chir - (37)

Trichoptera

Ceratopogonidae - (5) ✓

Other

RIFFLE SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 18 | Total Org. in Sample 50

Observations

Water Temp = 25.3°C
pH = 8.46
Cond = 542
DO = 12.6
DO% = 153%

X

PC15
5/2/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	(0)	1	2	3	4		Slimes	(0)	1	2	3	4
Filamentous Algae	0	1	(2)	3	4		Macroinvertebrates	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4		Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance (31) ✓

Oligochaeta

Isopods - HH HH HH HH HH HH I

Libellulidae (1)

Amphipod - HH (5) ✓

Crayfish - 1 (1) ✓

Anisoptera Cordulidae (1)

Annelid - 1 (1)

Gastropoda — LHS - 1 (1)

long leg - 1

Coleoptera

RHS - 1

Short leg - 1

Lymnaeidae (1) ✓

Zygoptera coena - HH HH HH HH HH III (23) ✓

Bivalvia HH HH HH HH HH I (26)

~~Skter~~ Salip - HH I (6)

Diptera Blood red - HH II (7) ✓

Plecoptera

Brown Chir - HH HH HH HH HH HH HH HH II (42) ✓

Ephemeroptera

Trichoptera Hydropsychid - 1 (1) ✓

Other

RIFFLE SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 15 | Total Org. in Sample 55

Observations several misquitofish (gambuzia)

clear sunny
water temp = 24.5
pH = 8.01
DO = 10.3 mg/L
% DO = 124
SCond = 6,309

Work U8 in Lab

PC-16 X
5/8/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

		List Families Present/Indicate Abundance
Oligochaeta -1 (1)	Amphipoda ~~IIII IIII~~ (11)	
	Isopoda - ~~IIII IIII~~ II (12)	
(26)	Anisoptera	
Gastropoda ~~IIII IIII IIII IIII IIII~~	Gomphidae (Gomphurus) -1 Aeshnidae (1)	Coleoptera ~~[illegible]~~
RHS-1 (1)	Libellulidae-II (2)	Haliplidae-~~IIII~~ (5)
	Zygoptera Calopterygidae -1 (1)	Dytiscidae-~~IIII~~ (5)
Bivalvia II (2)	Corixidae - ~~IIII IIII IIII~~ (16)	Diptera
	Plecoptera	Blood red - ~~IIII IIII~~ III (13)
Ephemeroptera		Brown - ~~IIII IIII IIII IIII IIII IIII IIII~~ I (36) ~~IIII IIII IIII IIII IIII IIII IIII IIII~~
Caenidae -1 (1)	Trichoptera	~~Simuliidae -1~~
Other		Ceratopogonidae - 1 (1)

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders	Total Org. in Sample (0)
Observations	

Water temp = 23.2°C
DO = 21.1 mg/l
% DO = 252
Cond = 675 µmho
pH = 8.05

LC-1
5/6/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	(1)	2	3	4
Fish	(0)	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta — HHT I (6) ✓

Hemiptera - Boatman - I (1) ✓

Anisoptera

Gastropoda

Coleoptera

Zygoptera

Bivalvia — I (1) ✓

Diptera Bra Chrnd — HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT I (96)

Plecoptera

Simulidae - IIII (4) ✓

Bloodred - HHT I (6) ✓

Ephemeroptera

Trichoptera

Other

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 0 | Total Org. in Sample 50

Observations

water temp = 20.7 °C
DO = 14.36 mg/L
% DO = 160%
Cond = 418 µmhos
pH = 7.75

X

LC-2
5/6/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

	0	1	2	3	4
Periphyton	0	(1)	2	3	4
Filamentous Algae	0	(1)	2	3	4
Macrophytes	0	(1)	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	2	(3)	4
Fish	0	(1)	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta —| (1) ✓

Isopoda — 𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸𝍸 ||| (53)

Amphipoda — 𝍸𝍸𝍸𝍸 | ... (21)

Anisoptera

Gastropoda LHS — 𝍸𝍸𝍸|| (17)

Ramshorn — | (1) ✓

Coleoptera Dytiscid — 𝍸|||| (9) ✓

Zygoptera Calopterididae — ||| (3)

Bivalvia

Crayfish — 𝍸|||| (9) ✓

Diptera Bloodred — 𝍸||| (8) ✓

Plecoptera

Brn Chrnd — 𝍸𝍸𝍸𝍸𝍸|| (27)

Ephemeroptera ~~Heptageniid~~ — 𝍸| (6)

Canidae — 𝍸|| (7) ✓

Trichoptera

Other

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 47 | Total Org. in Sample 74

Observations

water temp = 23°C
DO = 18.5 mg/L
% DO = 219%
Cond = 316 μmhos
pH = 7.92

LP-1 X
5/6/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	(2)	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	0	1	(2)	3	4	Macroinvertebrates	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4	Fish	(0)	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST — List Families Present/Indicate Abundance (34)

Oligochaeta - 卌 卌 卌 II (17)		Isopoda - 卌 卌 卌 卌 卌 卌 IIII
		Amphipod - 卌 I (6)
	Anisoptera	
Gastropoda - II physa (2)		Coleoptera
	Zygoptera calipet - II (2)	
Bivalvia	Coenagrend - I (1)	Diptera Brn Chrnd - 卌 卌 卌 I (16)
	Plecoptera	Bldred - II (2)
Ephemeroptera Baetid - 卌 卌 卌 卌 卌 卌 卌 II (37)		
	Trichoptera	
Other		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 5 | Total Org. in Sample 50

Observations

water temp = 21°C
DO = 11.7 mg/L
% DO = 130%
pH = 7.67
Cond = 346 µmhos

LP-2X
5/6/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	(2)	3	4
Filamentous Algae	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	(1)	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST — List Families Present/Indicate Abundance

Oligochaeta – I (1)

Isopoda – tally marks (52)

Amphipod – tally marks (34)

Anisoptera

Gastropoda LHS – II (2)

Coleoptera

Zygoptera

Bivalvia

Diptera Bld red – HHT I (6)

crayfish – HHT I (6)

Plecoptera

BrnChir – tally marks (24)

Simulidae – II (2)

Ephemeroptera heptagen – I (1)

Ceratopogonidae – I (1)

Canidae – HHT HHT III (13)

Trichoptera

Other

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 50 | Total Org. in Sample 82

Observations

Water temp = 21.5°C
DO = 15.5 mg/L
%DO = 178%
pH = 7.92
Cond = 369 μmhos

X

BC-1
5/3/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	(0)	1	2	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	(1)	2	3	4
Fish	0	(1)	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta - 1 (2)		Isopoda - 1 (1)
	Anisoptera	
Gastropoda LHS - 卌 卌 | (11)		Coleoptera Riffle - 1 (1)
	Zygoptera Coenagronidae - 1 | | | (4)	
Bivalvia - 1 (1)		Diptera Blood red - 卌 卌 | | | (14)
	Plecoptera	Brown Chir - 卌 卌 卌 卌 卌 卌 卌 卌 卌 | | | (58)
		Simulidae - 卌 | 6
Ephemeroptera Canidae - 卌 | | (7)		Hairy larva - 1 (1)
	Trichoptera hydropsychid - 1 (1)	Cerato pogonidae - | | | (3)
Other		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 1	Total Org. in Sample 50

Observations

Water temp = 21.7 °C
pH = 8.0
DO% = 164%
DO = 13.8
Cond = 1,488 µmhos

X

BC-2
5/3/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	1	(2)	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta

Isopod - 𝍸 II (7)

Anisoptera

Gastropoda LHS - (66)

Coleoptera

Zygoptera calopterygidae - 𝍸 IIII (9)

Bivalvia

Diptera Blood red - III (3)

other chiro. (65)

Plecoptera

Ceratopogonidae - (16)

Ephemeroptera

Hairy Diptera - IIII (4)

Trichoptera

Simulidae - II (2)

Other

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 3 | Total Org. in Sample 50

Observations

water temp = 23.2°C
pH = 8.5
DO% = 170%
DO = 15.8 mg/L
Cond = 1,871 mmhos

BC-3
5/4/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	0	(0)	2	3	4	Macroinvertebrates	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4	Fish	0	(1)	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

		List Families Present/Indicate Abundance
Oligochaeta		Isopoda - ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ IIIII (34)
	Acrididae (3)	Amphipoda - II (2)
	Anisoptera Stout - III	Daphnia - ~~IIII~~ III (8)
Gastropoda LHS - ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ IIII (31)		Coleoptera dytiscidae - IIII (4)
	Zygoptera	
Bivalvia — (0)		Diptera Brx Chironomid - ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ I (26)
Crayfish - ~~IIII~~ ~~IIII~~ ~~IIII~~ I (16)	Plecoptera	Ceratopogonidae - ~~IIII~~ (5)
		Bbedred - III (3)
Ephemeroptera Heptagenidae - III (3)		Hairy - I (1)
canidae - ~~IIII~~ I (6)	Trichoptera	
Other		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders | 7 | Total Org. in Sample 50

Observations

Water temp = 24 °C
DO = 14.2
% DO = 170%
pH = 7.71
Cond = 548 µmhos

WD-1 X
5/4/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	(0)	1	2	3	4
Filamentous Algae	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	(1)	2	3	4
Fish	0	(1)	2	3	4

0 = Absent/Not Observed   1 = Rare   2 = Common   3 = Abundant   4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta HHT HHT I (11) ✓	Isopoda - HHT HHT III (13) ✓	Decapod - 1 (1) ✓
		Culicidae (mosq) - 1 (1) ✓
	Anisoptera ~~Aeshnidae~~ (1)	
Gastropoda	~~short - 1~~ ~~[illegible]~~ /	Coleoptera
rhs - II (2) ✓		Dytiscid - 1 (1) ✓
lhs - HHT II (7) ✓	Zygoptera	Simuliidae - 1 (1) ✓
Bivalvia		Diptera
	Plecoptera	~~Chironomid~~ HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT III (58) ✓
Ephemeroptera		red Chir - 1 (1) ✓
Canadai - III (3) ✓	Trichoptera	Hairy - 1 (1) ✓
Daphnia - HHT HHT HHT II (17)		Asphod - 1 (1) ✓
Other		Ceratopog - II (2) ✓

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors 50

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders	Total Org. in Sample

Observations

water temp = 20°C
DO = 13.4 mg/L
% DO = 146%
Cond = 334 µmhos
pH = 7.60

SD-1
5-4-00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	2	(3)	4
Fish	(0)	1	2	3	4

0 = Absent/Not Observed   1 = Rare   2 = Common   3 = Abundant   4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta – HHT (5) ✓

Amphipoda – III (3) ✓

Anisoptera

Gastropoda LHS – II (2) ✓

Coleoptera

Zygoptera

Bivalvia

Diptera Bloodred – HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT (105)

Plecoptera

Other Chir – IIII (4)

Ephemeroptera

Trichoptera

Other

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders | Total Org. in Sample 50

Observations

water temp = 17.5°C
DO = 11.5
% DO = 122%
Cond = 860 µmhos
pH = 7.37

UN-1 X
5/4/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	(2)	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	0	1	(2)	3	4	Macroinvertebrates	0	1	2	(3)	4
Macrophytes	0	1	(2)	3	4	Fish	(0)	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST — List Families Present/Indicate Abundance

Oligochaeta – II (2) ✓		Isopoda – 77 ✓
	Anisoptera	
Gastropoda LHS-I (1) ✓		Coleoptera Dryopidae – II (2)
RHS-II (2) ✓		Whirligig – I (1) Gyrinidae (1)
	Zygoptera	
Bivalvia		Diptera Simulid – 46
Crayfish – IIII (4)	Plecoptera	Brown Chir – II (2) ✓
		Bloodred – II (2) ✓
Ephemeroptera		
	Trichoptera	
Other		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 50 | Total Org. in Sample 68

Observations

Water temp = 18.5°C
DO = 14.0 mg/L
DO% = 152%
pH = 7.58
Cond = 1,070 µmhos

5/10/00
SC-1

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta / 0 1	Isopoda (52)	Dreaded II 7
		Planariat 1
	Anisoptera	
Gastropoda	Coen - II 2	Coleoptera
	Calip - (12)	Hairy-I 1
	Zygoptera	
Bivalvia / 1		Diptera
	Plecoptera	Red - III 3
	/ Perlidae	Brown (22)
Ephemeroptera	~~Pteronarcyidae~~ 1	+
Canadae 10 10	Trichoptera	
Other		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 26	Total Org. in Sample 50
Observations	

water temp = 17.9°C
DO = 23 mg/L
%DO = 286%
Cond = 3,295 µmhos
pH = 8.08

BG-1
5/7/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4	Slimes	0	1	2	3	4
Filamentous Algae	0	1	2	3	4	Macroinvertebrates	0	1	2	3	4
Macrophytes	0	1	2	3	4	Fish	0	1	2	3	4

→ nice beds of broad leaf plants

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta		Isopod - 卌 | (6) ✓
	Corduliidae (3)	
	Anisoptera long leg - |||	
Gastropoda	Stout - ||| Aeshnidae - (3)	Coleoptera Dytiscid - 卌 卌 || (11) ✓
	Big - || Gomphidae (2)	dryopid - 卌 卌 卌 卌 || (22)
	Zygoptera calipectid - 卌 卌 ||| (13) ✓	
Bivalvia - 卌 卌 卌 | (16) ✓		Diptera Brn Chird - 卌 卌 卌 卌 卌 || (27) ✓
crayfish - |||| (4)	Plecoptera	Culcipid - | (1) ✓
Ephemeroptera		
Canidae - 卌 卌 卌 卌 卌 卌 卌 |||| (44) ✓	Trichoptera	
Other		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 3 | Total Org. in Sample 50

Observations

water temp = 22.2°C
Cond = 2,304 µmhos
DO = 18.7 mg/L
%DO = 232%
pH = 8.10

BG-2
5/7/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4	Slimes	0	1	2	3	4
Filamentous Algae	0	1	2	3	4	Macroinvertebrates	0	1	2	3	4
Macrophytes	0	1	2	3	4	Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta – II (2)		Annelid-I (1)
	(1) Corduliidae	Isopod-II (2)
	Anisoptera long leg-I	Daphnia – III (3)
Gastropoda LHS – III (3)		Coleoptera Dytiscid – 卌 IIII (9)
	(4)	Dryopidae – 卌 卌 II (12)
	Zygoptera calipteridae – IIII	
Bivalvia – 卌 卌 卌 卌	Coenagronidae – III (3)	Diptera Bra Chirnd – 卌 卌 卌 卌 卌 III (28)
卌 卌 卌 卌 卌 III (18)	Plecoptera	Simuild-I (1)
		Bloodred – II (2)
Ephemeroptera		
Canidae – 卌 I (6)	Trichoptera Hydro-I (1)	
Other		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 2 | Total Org. in Sample 50

Observations

water temp = 22.2
DO - 18.7 mg/L
%DO = 234%
Cond = 2,450 µmhos
pH - 7.99

SF-7 X
5/9/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4
Filamentous Algae	0	1	2	3	4
Macrophytes	0	1	2	3	4
Slimes	0	1	2	3	4
Macroinvertebrates	0	1	2	3	4
Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

		List Families Present/Indicate Abundance
Oligochaeta — 1 (1) ✓		Isopoda - 6 ✓
	Anisoptera	
Gastropoda LHS - 11 (2) ✓		Coleoptera [illegible] 1 ✓
		Elmidae - 3 ✓
	Zygoptera [illegible] 3	Dytiscidae - 1 ✓
Bivalvia - 42 ✓		Diptera Simuliidae - 26 ✓
	Plecoptera	Ceratopogonidae - 2 ✓
Ephemeroptera Baetis - 1 (1) ✓		[illegible] - 17 ✓
Caenidae - 16 ✓	Trichoptera hydropsychidae - 11 ✓	[illegible] 3 ✓
Other		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers	Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 32	Total Org. in Sample [illegible]

Observations

water temp = 22.4°C
DO = 17.0 mg/L
%DO = 219%
pH = 8.04
Cond = 1,672 µmhos

SF-2
5/7/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	0	1	(2)	3	4	Macroinvertebrates	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4	Fish	0	1	2	(3)	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

Shad
Bass
Large Carp
Sunfish
Gambusia/Chubs

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta		Isopoda - 卌卌卌 (14)
	Aeshnidae (1)	
	Anisoptera Stout - 1	
Gastropoda		Coleoptera dytiscid - 1 (1)
	Zygoptera calipceterid - 1 (4)	
Bivalvia		Diptera Simulidae - 卌卌卌卌卌卌卌卌 (36)
	Plecoptera	Bin Chird - 卌卌卌卌卌卌卌卌 (41)
		Blood red - 1
Ephemeroptera		Ceratopognidae - 1 (3)
Canidae - 卌卌卌 (16)	Trichoptera Hydropsychid - 1 (1)	

Other

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 3 | Total Org. in Sample 50

Observations

water temp = 22.3°C
Cond = 1,693 µmhos
DO = 24.0 mg/L
%DO = 305%
pH = 8.46

SF-3 X
5/7/00
2nd Duplicate

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	(2)	3	4
Filamentous Algae	0	1	2	(3)	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	(2)	3	4
Fish	0	1	2	(3)	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta - 卌 卌 卌 卌 卌 卌 卌 || 37 ✓		Isopod - 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 ||| (13) ✓
	Anisoptera	
Gastropoda LHS - 1 (1) ✓		Coleoptera Hairy - 1 (1) ✓
	Zygoptera coenagronidae - || (2)	
Bivalvia		Diptera Brn Chrn - 卌 卌 卌 || (17) ✓
	Plecoptera	Ceratopoganidae - 1 (1) ✓
Ephemeroptera canids - 卌 卌 卌 (15)		Blood red - 1 (1) ✓
	Trichoptera	
Other		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 22 | Total Org. in Sample 72

Observations

Water temp = 22.5
DO = 19 mg/L
% DO = 232%
Cond = 1,703 µmhos
pH = 8.34

WF-1 X
5/5/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4
Filamentous Algae	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4
Slimes	(0)	1	2	3	4
Macroinvertebrates	0	1	2	(3)	4
Fish	0	(1)	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta	Amphipoda - 11 (2)	Planeria - 11 (2)
		Isopoda - 1 (1)
	Anisoptera	Annelid - 1 (1)
Gastropoda LHS - 1 (1)		Coleoptera Hairy - 1 (1)
	Zygoptera Calipterid - 1111 (4)	
Bivalvia - HHT HHT 11 (12)	Coenagronidae - 1 (1)	Diptera Simulidae - HHT HHT HHT HHT 1 (21)
	Plecoptera	Bloodred - HHT HHT 111 (13)
		Bro Chir - HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT 1111 (69)
Ephemeroptera		Ceratopogonidae - 111 (3)
Caenidae - 1 (1)	Trichoptera	
Other		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders | Total Org. in Sample 50

Observations

water temp: 20.5 °C
DO = 15.0 mg/L
%DO: 172%
Cond. 572 μmhos
pH: 7.68

WF-2
5/5/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	1	2	3	4	Slimes	0	1	2	3	4
Filamentous Algae	0	1	2	3	4	Macroinvertebrates	0	1	2	3	4
Macrophytes	0	1	2	3	4	Fish	0	1	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta - 𝍸 𝍸 |||| (14)		Amphipod - 1 (1)
		Planarian - 1 (2)
	Anisoptera	
Gastropoda LHS - 𝍸 𝍸 𝍸 𝍸 |||| (24)		Coleoptera Hairy - 1 (1)
RHS - 1 (1)		
	Zygoptera coenegronidae - 1 (1)	
Bivalvia - 𝍸 𝍸 ||| (13)	calipteridae - |||| (4)	Diptera Bloodred - 1 (3)
Crayfish - 1 (1)	Plecoptera	Brn Chirnd - 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 |||| (40)
		Simulidae - 𝍸 𝍸 |||| (14)
Ephemeroptera		
	Trichoptera Hydropsychid - 1 (2)	
Other		

RIFFLE SAMPLE
FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 1 | Total Org. in Sample 50

Observations

Water temp = 24°C
DO = 15.6 mg/L
%DO = 188%
pH = 7.89
Cond = 636 µmhos

WF-3
5/5/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	0	1	(2)	3	4	Macroinvertebrates	0	1	2	(3)	4
Macrophytes	(0)	1	2	3	4	Fish	0	1	2	(3)	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST — List Families Present/Indicate Abundance

Oligochaeta — HHT HHT HHT IIII (19)

Anisoptera — Aeshnidae (3) Stout - III

Gastropoda — LHS - HHT HHT IIII (14)

Zygoptera — Calipcterd - I (1)

Bivalvia

Crayfish - I (1)

Plecoptera

Ephemeroptera

Trichoptera

Isopoda - HHT HHT HHT II (17)

Amphipod - HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT HHT III (63)

Coleoptera — Dytiscidae - I (1)

Elmidae - I (1)

Diptera — Bloodrod - HHT I (6)

Brachiand - HHT HHT HHT HHT HHT HHT HHT III (4?)

Simulidae - II (2)

Other

RIFFLE SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 5 | Total Org. in Sample 50

Observations

water temp = 24°C
DO = 19 mg/L
DO% = 230%
Cond = 638 µmhos
pH = 8.3

HC-1
5-5-00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	0	(1)	2	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	0	1	(2)	3	4	Macroinvertebrates	0	1	2	(3)	4
Macrophytes	(0)	1	2	3	4	Fish	0	(1)	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

Same silty material as SD-1, which also was dominated by Blood-red Chironomids

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta — 卌 (5)

Amphipoda – ||| (3)

Anisoptera: Aeshnidae (5); Stout – 卌 ||| ; Corduliidae – 卌 (5)

Gastropoda LHS – 卌 卌 (10)

Coleoptera

Zygoptera calipteridae – || (2)

Bivalvia

Crayfish – | (1)

Diptera Blood red – 卌 卌 卌 ... (90)

Brown Chir – | (1)

Culicidae – | (1)

Plecoptera

Ephemeroptera

Trichoptera

Other

RIFFLE SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders Total Org. in Sample

Observations

Water temp = 25°C
DO = 17.3 mg/L
DO% = 212%
pH = 8.02
Cond = 633 µmhos

X

SA-1
5/2/00

Rapid Bioassessment Protocol II

Biosurvey Field Data Sheet

RELATIVE ABUNDANCE OF AQUATIC BIOTA

Periphyton	(0)	1	2	3	4		Slimes	(0)	1	2	3	4
Filamentous Algae	0	1	(2)	3	4		Macroinvertebrates	0	1	(2)	3	4
Macrophytes	0	(1)	2	3	4		Fish	0	(1)	2	3	4

0 = Absent/Not Observed 1 = Rare 2 = Common 3 = Abundant 4 = Dominant

MACROBENTHOS QUALITATIVE SAMPLE LIST

List Families Present/Indicate Abundance

Oligochaeta

Isopoda - 𝍸 𝍸 𝍸 I (16)

Amphipoda - 𝍸 𝍸 𝍸 𝍸 III (23)

Anisoptera

Gastropoda LHS - 𝍸 𝍸 II (12)

Coleoptera

Zygoptera calop - I (1)

Bivalvia - I (1)

Diptera Bloodred - 𝍸 𝍸 𝍸 III (19)

Crayfish - II (2)

Plecoptera

Brown Chir ~~𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 III~~

Ephemeroptera Hept - I (1)

Simulidae - 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 I (36)

Trichoptera

Other

RIFFLE SAMPLE

FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Scrapers | Filtering Collectors

CPOM SAMPLE FUNCTIONAL FEEDING GROUPS (Indicate No. of Individuals Representing Group)

Shredders 8 | Total Org. in Sample 58

Observations Gyrinidae - Whirligig
Coleoptera - Water strider

Water temp 27.1 °C
Cond = 507
DO = 13.2
%DO = 193%
pH = 8.56

PC-1
5/12/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not:

Additional Comments/Pollution Impacts:

	GEAR	DISTANC	WATER CLARITY	WATER STAGE	SUBJECTIVE RATING (1-10)	AESTHETIC RATING (1-10)
FIRST PASS						
SECOND PASS						
THIRD PASS						

CANOPY (%OPEN) 90 GRADIENT: X LOW O-MODERATE O-HIGH PHOTOS: 4-US / 3-DS cam 3

STREAM MEASUREMENTS: AVERAGE WIDTH: 70' AVERAGE DEPTH: 5+' MAX. DEPTH 5+'

LENGTH	WIDTH	DEPTHS ▷									POOL:GLD:RIF:RUN
300	70	4'	6'	5'							POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

No Velocity readings, too deep.

PC-2
5/12/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Camera 3

Is Reach Representative of Stream? (Y/N) ✓ If No: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 40% GRADIENT: Ô-LOW Ô-MODERATE Ô-HIGH PHOTOS: 2 upstream + 3 down

STREAM MEASUREMENTS: AVERAGE WIDTH: _____ AVERAGE DEPTH: _____ MAX. DEPTH _____

LENGTH	WIDTH	DEPTHS ▷									POOL:GLD:RIF:RUN

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Too Deep.

PC-3
5/8/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If No: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 35 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: SU+4D

STREAM MEASUREMENTS: AVERAGE WIDTH: 40' AVERAGE DEPTH: _____ MAX. DEPTH 4'

LENGTH	WIDTH	DEPTHS ▷									POOL:GLD:RIF:RUN

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

i st from LB Dep Velocity

To deep and precarious

PC-4
5/14/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not:

Additional Comments/Pollution Impacts:

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) AESTHETIC RATING (1-10)

CANOPY (%OPEN) 60 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 13-US/13-DS

STREAM MEASUREMENTS: AVERAGE WIDTH: 65 AVERAGE DEPTH: MAX. DEPTH 3'

LENGTH	WIDTH	DEPTHS D									POOL:GLD:RIF:RUN
300	65	2'	3'	2.5'							POOL
300	65	1'	1.5'	1'							RIF

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist from LB (ft)	Dep (ft)	Velocity (ft/sec)
5	0.7	.05
10	0.7	1.77
15	0.7	3.16
20	0.8	2.86
25	1.0	2.47
30	1.3	2.11
35	1.5	2.27
40	1.8	1.66
45	2.1	1.76
50	1.6	1.94
55	1.1	2.02
60	0.6	0.54
62.5	RWE	

PC-5
5/12/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Camera 4

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 25 GRADIENT: ☒ LOW ☐ MODERATE ☐ HIGH PHOTOS: 27-US/26-DS

STREAM MEASUREMENTS: AVERAGE WIDTH: 80 AVERAGE DEPTH: 1.5' MAX. DEPTH 3'

LENGTH	WIDTH	DEPTHS ▷									POOL:GLD:RIF:RUN
300	80	8"	14"	6"							POOL
25	70	4"	3"	6"							RIF

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Distance LB (ft)	Depth (ft)	Velocity (ft/sec)
5.0	.4	0.69
10.0	.6	1.06
15.0	.5	1.18
20.0	1.0	1.06
25.0	1.0	1.24
30.0	0.8	1.04
35.0	0.7	1.18
40.0	0.7	0.89
45.0	0.6	0.89
50.0	0.5	1.11
55.0	0.5	1.16
60.0	0.5	0.97
65.0	0.5	0.74
70.0	0.6	1.11
75.0	0.3	0.74
78.0	RWE	

PC-6
5/14/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 20 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 15-US/14-DS

STREAM MEASUREMENTS: AVERAGE WIDTH: 75' AVERAGE DEPTH: 3' MAX. DEPTH 5+'

LENGTH	WIDTH	DEPTHS ▷										POOL:GLD:RIF:RUN
300	75	3'	5'	65'								POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Too deep for Velocity readings

PC-7
5/12/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not:

Additional Comments/Pollution Impacts:

	GEAR	DISTANC	WATER CLARITY	WATER STAGE	SUBJECTIVE RATING (1-10)	AESTHETIC RATING (1-10)
FIRST PASS						
SECOND PASS						
THIRD PASS						

CANOPY (%OPEN) 10 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 25-US/24-DS

STREAM MEASUREMENTS: AVERAGE WIDTH: 25' AVERAGE DEPTH: 3' MAX. DEPTH 5'

LENGTH	WIDTH	DEPTHS D									POOL:GLD:RIF:RUN
300	75	2'	4'	3'							POOL

CROSS-SECTIONS OF STREAM

ist (ft) from LB Dep (ft) Velocity (ft/sec)

Too Deep, No Velocity readings taken

DRAWING OF STREAM

RC-8
5/3/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

-Greater than 4'.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) _____ GRADIENT: Ô-LOW Ô-MODERATE Ô-HIGH PHOTOS: 4 211 200

STREAM MEASUREMENTS: AVERAGE WIDTH: _____ AVERAGE DEPTH: _____ MAX. DEPTH _____

LENGTH	WIDTH	DEPTHS ▷									POOL-GLD-RIF-RUN

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

PC-9
5/10/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 85 GRADIENT: X LOW O-MODERATE O-HIGH PHOTOS: _____

STREAM MEASUREMENTS: AVERAGE WIDTH: 60 AVERAGE DEPTH: 3' MAX. DEPTH 5+ feet

LENGTH	WIDTH	DEPTHS ▷									POOL:GLD:RIF:RUN
300	60	3'	5'	3'							POOL

CROSS-SECTIONS OF STREAM

Dist from LB (ft)	Dep (ft)	Velocity (ft/sec)

Too Deep for flow measurements

DRAWING OF STREAM

PC-11
5/10/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 10 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 19-US / 18-DS

STREAM MEASUREMENTS: AVERAGE WIDTH: 35' AVERAGE DEPTH: 1.5' MAX DEPTH 3'

LENGTH	WIDTH	DEPTHS D									POOL:GLD:RIF:RUN
300	30	1.5'	2.5'	1.0'							Pool

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

(ft) Dist fm LB	Dep (ft)	(ft/sec) Velocity
2.0	1.0	1.09
4.0	1.3	0.88
6.0	1.1	1.37
8.0	1.1	1.67
10.0	1.4	1.22
12.0	1.6	1.55
14.0	2.0	1.48
16.0	2.0	1.88
18.0	2.0	1.88
20.0	2.0	1.65
22.0	1.9	1.70
24.0	2.2	1.68
26.0	1.8	1.51
28.0	1.2	1.20
30.0	1.3	0.75
32.0	1.3	0.09
34.0	0.5	-0.05
35.0	RWE	

PC-12
5/10/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE	SUBJECTIVE RATING (1-10)	AESTHETIC RATING (1-10)
FIRST PASS						
SECOND PASS						
THIRD PASS						

CANOPY (%OPEN) 65 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 16-US/15-DS

STREAM MEASUREMENTS: AVERAGE WIDTH: 35' AVERAGE DEPTH: 12" MAX. DEPTH 24"

LENGTH	WIDTH	DEPTHS D									POOL:GLD:RIF:RUN
300		6"	10"	6"							RUN
300		10"	22"	18"							POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

ft (ft) LB	Dep (ft)	Velocity
2	0.4	1.76
4	0.5	2.10
6	0.5	1.98
8	0.6	1.66
10	0.8	1.94
12	0.9	1.78
14	0.7	1.84
16	0.8	1.86
18	0.6	1.98
20	0.7	1.74
22	0.7	1.79
24	0.5	1.68
26	0.6	2.00
28	0.9	2.44
30	1.1	2.01
32	1.0	2.37
34	0.8	2.56
36	0.7	2.30
38	0.8	2.00
40	0.5	1.29
42	0.3	0.60
44	RWE	

Procedure No.	WQPA-SWS-3	Date Issued	9-30-89
Revision No.	6	Date Effective	9-30-89

PC-13
5/8/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 65 GRADIENT: O-LOW O-MODERATE O-HIGH PHOTOS: Camera 2 → 1U5 / Camera 3 – 27D5

STREAM MEASUREMENTS: AVERAGE WIDTH: 40 AVERAGE DEPTH: 2' MAX. DEPTH 3'

LENGTH	WIDTH	DEPTHS ▷									POOL:GLD:RIF:RUN
300	40	1.5'	3'	2'							POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist (ft) from LB	Depth (ft)	Velocity (ft/sec)
2.0	.8	.05
4.0	1.1	.05
6.0	1.1	.24
8.0	1.5	.38
10.0	1.6	.49
12.0	1.4	.50
14.0	1.4	.61
16.0	1.5	.55
18.0	1.7	.66
20.0	1.7	.66
22.0	1.5	.71
24.0	1.7	.62
26.0	2.1	.58
28.0	1.9	.62
30.0	1.8	.59
32.0	2.2	.45
34.0	1.8	.42
36.0	1.8	.51
38.0	1.4	.50
40.0	1.4	.27
42.0	RWE	

PC-14
5/2/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) _____ GRADIENT: Ô-LOW Ô-MODERATE Ô-HIGH PHOTOS: US-23 DS-22 Cam 1

STREAM MEASUREMENTS: AVERAGE WIDTH: 10' AVERAGE DEPTH: 8" MAX. DEPTH 18"

LENGTH	WIDTH	DEPTHS D									POOL:GLD:RIF:RUN
300	10'	8"	14"	7"							Pool
20	8'	6"	8"	4"							Run
20	6'	2"	4"	4"							Rif

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist from L Bank	Depth	Vel
0.5 up	0.3'	0.03
1.0	0.6'	0.60
1.5	0.8'	0.75
2.0	1.0'	0.52
2.5	0.9'	0.75
3.0	1.0'	0.70
3.5	1.0'	0.86
4.0	1.0'	0.93
4.5	1.0'	0.94
5.0	0.9'	0.81
5.5	0.8'	0.81
6.0	0.9'	0.78
6.5	0.8'	0.84
7.0	0.8'	0.86
7.5	0.6'	0.48
8.0	0.6'	0.22
8.5	0.4'	0.08
9.0 DWE		

PC-15
5/2/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Commerce/Pollution Impacts: _____

Field tiles on Both banks with discharge to stream

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 90 GRADIENT: X LOW O-MODERATE O-HIGH PHOTOS: US-27, DS-26 Camera 1

STREAM MEASUREMENTS: AVERAGE WIDTH: 7' AVERAGE DEPTH: 6" MAX. DEPTH 18"

LENGTH	WIDTH	DEPTHS D									POOL-GLD-RIF-RUN
45'	5'	4"	5"	3"							RUN
65'	10'	12"	8"	6"							Pool
40'	7'	4"	6"	3"							RUN
170'	10'	12"	8"	8"							Pool
25'	4'	8"	8"	4"							RUN

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist from LB	Depth (ft)	Vel ft/sec
0.3	.2	-0.36
0.7	.3	-0.33
1.0	.5	-0.13
1.3	.5	0.14
1.7	.6	0.68
2.0	.6	1.23
2.3	.7	1.84
2.7	.8	2.10
3.0	.8	2.18
3.3	.8	2.03
3.7	.8	1.99
4.0		1.74

	Depth ft	Vel ft/sec
4.3	.8	1.2
4.7	.7	0.64
5.0	.4	0.20

5.3 - RWE

PC-16
5/8/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 90% GRADIENT: O-LOW O-MODERATE O-HIGH PHOTOS: 3U+2D

STREAM MEASUREMENTS: AVERAGE WIDTH: 10' AVERAGE DEPTH: 8" MAX. DEPTH 1½'

LENGTH	WIDTH	DEPTHS ▷								POOL:GLD:RIF:RUN

CROSS-SECTIONS OF STREAM

Dist. (ft) from LB	Dep (ft)	Velocity (ft/sec)
LW	0.5	0.01
.5	0.8	-0.05
1.0	1.0	0.00
1.5	1.1	0.00
2.0	1.1	0.02
2.5	1.3	0.01
3.0	1.3	0.05
3.5	1.3	0.06
4.0	1.3	0.05
4.5	1.3	0.06
5.0	1.4	0.05
5.5	1.4	0.05
6.0	1.4	0.04
6.5	1.3	0.03
7.0	1.3	0.02
7.5	1.3	0.04
8.0	1.4	0.03
8.5	1.3	0.03
[illegible]	[illegible]	0.01
9.5	1.3	-0.06
10.0	1.2	0.00
10.5	1.0	0.00
11.0	0.9	0.06
11.5	0.8	-.03
Edge of Bank		

DRAWING OF STREAM

LC-1
5/6/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) ____ If No: ____

Additional Comments/Pollution Impacts: ____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 25% GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 21-US 20-DS Cam 2

STREAM MEASUREMENTS: AVERAGE WIDTH: 25 AVERAGE DEPTH: 12" MAX. DEPTH 3'

LENGTH	WIDTH	DEPTHS ▷									POOL:GLD:RIF:RUN
300	25	10"	30"	16"							POOL
10	4'	2"	3"	2"							RIF

CROSS-SECTIONS OF STREAM

☐ ☐ ☐

(A) Dist from LB	Dep (A)	Velocity (A)
.5	.1	—
1.0	.1	—
1.5	.3	-.02
2.0	.3	0.0
2.5	.3	-.03
3.0	.4	-.04
3.5	.5	-.03
4.0	.5	-.02
4.5	.6	-.02
5.0	.6	-.04
5.5	.6	-.03
6.0	.6	-.02
6.5	.8	0.0
7.0	.9	+0.03
7.5	1.0	+0.08
8.0	1.1	0.09
8.5	1.2	0.12
9.0	1.3	0.30
9.5	1.3	0.43
10.0	1.3	0.43
10.5	1.3	0.52

DRAWING OF STREAM

Dist from LB	Dep	Vel
11.0	1.2	0.51
11.5	0.7	0.46
12.0	0.4	0.63
12.5	0.3	0.36
13.0	0.2	0.23
13.5	0.1	—
14.0	RWE	

LC-2
5/6/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: Mallard Duck w/ Ducklings

Additional Comments/Pollution Impacts:

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) AESTHETIC RATING (1-10)

CANOPY (%OPEN) 65 GRADIENT: ☒ LOW ○ MODERATE ○ HIGH PHOTOS: 19-US 18-DS

STREAM MEASUREMENTS: AVERAGE WIDTH: 17' AVERAGE DEPTH: 6" MAX. DEPTH 12"

LENGTH	WIDTH	DEPTHS ▷										POOL:GLD:RIF:RUN
80	17	8"	10"	12"								POOL
20	10	3"	4"	2"								RUN
200	16	6"	8"	10"								POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist (ft) from LB	Dep (ft)	Velocity (ft/sec)
.5	.3	-.03
1.0	.7	+.03
1.5	.8	.04
2.0	.9	.07
2.5	1.0	.07
3.0	1.0	.08
3.5	.9	.06
4.0	.9	.06
4.5	.8	.09
5.0	.8	.10
5.5	.7	.10
6.0	.7	.11
6.5	.7	.10
7.0	.6	.11
7.5	.6	.09
8.0	.5	.09
8.5	.3	.09
9.0	.3	.04
9.5	.3	.01
10.0	.2	-.02
10.5	.1	—
11.0	.1	
	RIVE	

LP-1.
5-6-00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not:

Additional Comments/Pollution Impacts: 2 kids throw rocks at us

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) AESTHETIC RATING (1-10)

CANOPY (%OPEN) 10 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 15-US / 14-DS

STREAM MEASUREMENTS: AVERAGE WIDTH: 30 AVERAGE DEPTH: 12" MAX. DEPTH 4'

LENGTH	WIDTH	DEPTHS ▷									POOL-GLD-RIF-RUN
300	25	16"	36"	20"							POOL
50	25	5"	4"	12"							RUN

CROSS-SECTIONS OF STREAM

Dist from LB (ft) Dep (ft) Velocity (ft/sec)

DRAWING OF STREAM

Too Deep, also has concrete tripping hazards

LP-2
5/6/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: 2 musk rats

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 10 GRADIENT: ☒ LOW ☐ MODERATE ☐ HIGH PHOTOS: 17-43 16-DS

STREAM MEASUREMENTS: AVERAGE WIDTH: 20' AVERAGE DEPTH: 10" MAX. DEPTH 30"

LENGTH	WIDTH	DEPTHS									POOL:GLD:RIF:RUN
300	25'	12"	26"	14"							POOL
50	10'	4"	6"	3"							RUN

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Ft (A) LB	Dep (A)	Vel (Ft/sec)
1.0	.5	-.00
2.0	.5	-.02
3.0	.5	-.04
4.0	1.1	0.0
5.0	1.2	-.02
6.0	1.2	+.04
7.0	1.3	.03
8.0	1.3	.06
9.0	1.4	.03
10.0	1.4	.06
11.0	1.5	.08
12.0	1.5	.08
13.0	1.6	.09
14.0	1.6	.08
15.0	1.6	.07
16.0	1.6	.05
17.0	1.6	.03
18.0	1.4	.03
19.0	1.3	.03
20.0	0.4	.01
21.0	0.6	0.0
22.0	0.4	-0.04
23.0	RWE	

BC-1
5/3/0

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If No:

Additional Comments/Pollution Impacts:

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10)

AESTHETIC RATING (1-10)

CANOPY (%OPEN) 5 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: US-19 DS-18

STREAM MEASUREMENTS: AVERAGE WIDTH: 12' AVERAGE DEPTH: 5" MAX. DEPTH 12"

LENGTH	WIDTH	DEPTHS								POOL:GLD:RIF:RUN
120	5	20								Pool
150	10	15								Run
10	8	10								Riff
50	13	15								Run

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist from LB	Dep (ft)	Vel (ft/sec)
1.0	0.4	0.40
2.0	1.0	0.38
3.0	1.3	0.41
4.0	1.3	0.52
5.0	1.0	0.50
6.0	1.0	0.43
7.0	0.9	0.47
8.0	0.8	0.48
9.0	0.7	0.40
10.0	0.5	0.36
11.0	0.4	0.25
12.0	0.3	0.16
13.0	<.2	—
14.0	<.2	—
15.0	RWE	

BC-2
5/3/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not:

Additional Comments/Pollution Impacts:

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10)

AESTHETIC RATING (1-10)

CANOPY (%OPEN) 85 GRADIENT: ☒-LOW ☐-MODERATE ☐-HIGH PHOTOS: US-15 DS-16 Can (1)

STREAM MEASUREMENTS: AVERAGE WIDTH: 7' AVERAGE DEPTH: 8" MAX. DEPTH 12"

LENGTH	WIDTH	DEPTHS ▷									POOL:GLD:RIF:RUN
75'	4'	4"	6"	3"							RUN
225'	8'	6"	10"	7"							POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist from LB	Depth (ft)	Vel ft/sec
.5	0.1	—
1.0	0.4	0.24
1.5	0.6	0.44
2.0	0.7	0.47
2.5	0.9	0.34
3.0	0.9	0.51
3.5	1.1	0.52
4.0	1.3	0.36
4.5	1.2	0.44
5.0	1.1	0.50
5.5	1.1	0.40
6.0	1.1	0.37
6.5	0.8	0.40
7.0	0.9	0.28
7.5	0.8	0.20
8.0	0.6	0.22
8.5	0.3	0.06
9.0	RWE	

BC-3
5/4/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) _____ GRADIENT: Ô-LOW Ô-MODERATE Ô-HIGH PHOTOS: _____

STREAM MEASUREMENTS: AVERAGE WIDTH: 20' AVERAGE DEPTH: 10" MAX. DEPTH 2.5'

LENGTH	WIDTH	DEPTHS ▷									POOL-GLD-RIF-RUN
300	20'	8"	18"	10"							POOL
50	20'	4"	6"	5"							RUN

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist from LB(ft)	Dep(ft)	Vel(ft/sec)
1.0	1.5	0.02
2.0	1.7	0.15
3.0	1.6	0.13
4.0	1.5	0.12
5.0	1.5	0.14
6.0	1.5	0.17
7.0	1.3	0.16
8.0	1.2	0.14
9.0	1.2	0.17
10.0	1.1	0.17
11.0	1.1	0.13
12.0	1.1	0.14
13.0	1.1	0.12
14.0	1.0	0.14
15.0	1.0	0.13
16.0	1.0	0.14
17.0	1.0	0.13
18.0	1.0	0.11
19.0	1.1	0.14
20.0	1.0	0.03
21.0	0.8	-0.01
22.0	0.1	—
23.0	RWE	

WD-1
5/4/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: Picture 10 & 11 = crayfish
Additional Comments/Pollution Impacts: Picture 9 = snake

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) AESTHETIC RATING (1-10)

CANOPY (%OPEN) 10% GRADIENT: LOW O-MODERATE O-HIGH PHOTOS: US-8 DS-> Cam 1

STREAM MEASUREMENTS: AVERAGE WIDTH: 18' AVERAGE DEPTH: 2' MAX. DEPTH 4'

LENGTH	WIDTH	DEPTHS D									POOL:GLD:RIF:RUN
300	18	2'	3'	1.5'							Pool

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist from LB (ft)	Dep (ft)	Velocity (ft/sec)
1.0	0.7	0.14
2.0	1.1	0.23
3.0	1.3	0.28
4.0	1.6	0.24
5.0	2.0	0.27
6.0	2.0	0.23
7.0	2.8	0.26
8.0	3.2	0.27
9.0	3.3	0.28
10.0	3.3	0.27
11.0	3.3	0.28
12.0	3.0	0.17
13.0	2.8	0.26
14.0	2.7	0.25
15.0	2.3	0.27
16.0	2.0	0.17
17.0	1.9	0.12
18.0	1.4	0.11
19.0	0.8	0.03
20.0	RWE	

SD-1
5-4-00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If No:

Additional Comments/Pollution Impacts: Down stream of Industrial Discharge
Bad Smell
A lot of floculate like silt

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 5 GRADIENT: ☒ LOW ☐ MODERATE ☐ HIGH PHOTOS: 13-45/12-DS Cam ①

STREAM MEASUREMENTS: AVERAGE WIDTH: 15' AVERAGE DEPTH: 8" MAX. DEPTH 18"

LENGTH	WIDTH	DEPTHS ▷										POOL:GLD:RIF:RUN
300	15'	8"	14	10"								Pool
20	10'	3"	4	2"								RIF

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist (ft) from LB	Dep (ft)	Vel (ft/sec)
1.0	1.2	0.14
2.0	1.3	0.18
3.0	1.2	0.22
4.0	1.3	0.19
5.0	1.2	0.60
6.0	1.0	0.20
7.0	0.8	0.18
8.0	0.7	0.11
9.0	0.6	0.08
10.0	0.9	0.06
11.0	1.0	0.02
12.0	0.9	0.04
13.0	0.7	0.06
14.0	0.4	0.03
15.0	RWE	

UN-1
5/4/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

Raining

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) AESTHETIC RATING (1-10)

CANOPY (%OPEN) 40 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 15-U 14-D

STREAM MEASUREMENTS: AVERAGE WIDTH: 6' AVERAGE DEPTH: 5" MAX. DEPTH 10"

LENGTH	WIDTH	DEPTHS									POOL:GLD:RIF:RUN
30	7'	[illegible]	[illegible]	5"							POOL
60	6'	[illegible]	5'	4"							RUN
200	8'	[illegible]	[illegible]	4							POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist. ∠ Bank	Depth	Vel (ft/sec)
.5	.1	—
1.0	.1	—
1.5	.1	—
2.0	.2	0.52
2.5	.2	0.66
3.0	.2	0.83
3.5	.2	1.15
4.0	.2	1.05
4.5	.2	1.33
5.0	.2	1.30
5.5	.2	1.09
6.0	.2	0.90
6.5	.2	0.84
7.0	.1	—
7.5	.1	—
8.0	RWL	

SC-1
5/10/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If No: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 8% GRADIENT: O-LOW X-MODERATE O-HIGH PHOTOS: 20-45/19-DS

STREAM MEASUREMENTS: AVERAGE WIDTH: 25' AVERAGE DEPTH: 12" MAX. DEPTH 3'

LENGTH	WIDTH	DEPTHS ▷									POOL:GLD:RIF:RUN
300	25	10"	24"	18"							POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist (ft) fm LB	Depth (ft)	Velocity (ft/sec)
1.0	.4	.04
2.0	.4	.16
3.0	.6	.17
4.0	.6	.17
5.0	.7	.21
6.0	.8	.22
7.0	.8	.26
8.0	.8	.27
9.0	.8	.29
10.0	.9	.27
11.0	1.0	.28
12.0	1.0	.27
13.0	1.1	.26
14.0	1.3	.22
15.0	1.6	.25
16.0	1.7	.23
17.0	1.8	.25
18.0	1.9	.23
19.0	1.8	.21
20.0	1.3	.08
21.0	1.1	-.02
22.0	RWE	

Procedure No.	WQPA-SWS-3	Date Issued	9-30-89
Revision No.	6	Date Effective	9-30-89

BG 1
5/7/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 75 GRADIENT: ☒ LOW ○ MODERATE ○ HIGH PHOTOS: US-7/DS-6

STREAM MEASUREMENTS: AVERAGE WIDTH: 20 AVERAGE DEPTH: 10" MAX. DEPTH 30"

LENGTH	WIDTH	DEPTHS ▷									POOL:GLD:RIF:RUN
300	25	10"	24"	8"							POOL
50	15	4"	6"	6"							RUN

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist FmLB	Dep (ft)	Velocity (ft/sec)
1.0	.5	0.16
2.0	.7	0.42
3.0	.8	1.01
4.0	.8	1.38
[illegible]	.9	1.43
[illegible]	1.0	1.00
7.0	1.2	0.86
8.0	1.5	0.34
9.0	1.6	0.56
10.0	1.4	0.70
11.0	1.2	0.62
12.0	1.1	0.66
13.0	1.0	1.01
14.0	0.8	1.01
15.0	0.6	1.04
16.0	0.5	1.24
17.0	0.4	0.62
18.0	0.1	—
19.0	RWE	

Procedure No.	WQPA-SWS-3	Date Issued	9-30-89
Revision No.	6	Date Effective	9-30-89

BG-2
5/5/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N)____ If Not: ____

Additional Comments/Pollution Impacts: ____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 5 GRADIENT: ☒-LOW ○-MODERATE ○-HIGH PHOTOS: 9-US/8-DS

STREAM MEASUREMENTS: AVERAGE WIDTH: 25 AVERAGE DEPTH: 10" MAX. DEPTH 48"

LENGTH	WIDTH	DEPTHS ▷									POOL:GLD:RIF:RUN
300	25	10	25	48							POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Depth	Dep	Vel
19.0	1.8	[illegible]
20.0	1.9	.34
21.0	1.8	.40
22.0	1.7	.44
23.0	1.4	.34
24.0	1.0	.37
25.0	.8	.25
26.0	RULE	

SF-1
5/9/00

Procedure No.	WQPA-SWS-3	Date Issued	9-30-89
Revision No.	6	Date Effective	9-30-89

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) 10 GRADIENT: X LOW O MODERATE O HIGH PHOTOS: 26-45 25-DS

STREAM MEASUREMENTS: AVERAGE WIDTH: 20 AVERAGE DEPTH: 1' MAX. DEPTH 18"

LENGTH	WIDTH	DEPTHS									POOL:GLD:RIF:RUN
500	30	10"	16"	8"							POOL
100	25	4"	6"	4"							RUN
20	20	2"	3"	2"							RIF

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

(ft) from LB	Dep (ft)	Velocit. (ft/sec)
1.0	.1	=
2.0	.1	
3.0	.2	.02
4.0	.3	.22
5.0	.3	.39
6.0	.4	.55
7.0	.4	.59
8.0	.4	.60
9.0	.5	.60
10.0	.5	.54
11.0	.6	.68
12.0	.6	.70
13.0	.6	.70
14.0	.6	[illegible]
15.0	.6	[illegible]
16.0	.5	.69
17.0	.5	.59
18.0	.6	.60
19.0	.6	.60
20.0	.5	.56
21.0	.3	.41

SF-2
5/7/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N)_____ If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) _____ GRADIENT: O-LOW O-MODERATE O-HIGH PHOTOS: 13-US/12-DS Cam 2

STREAM MEASUREMENTS: AVERAGE WIDTH: _____ AVERAGE DEPTH: _____ MAX. DEPTH _____

LENGTH	WIDTH	DEPTHS ▷									POOL:GLD:RIF:RUN

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist fm LB (ft)	Dep (ft)	Velocity (ft/sec)
1.0	0.8	.24
2.0	1.2	.29
3.0	1.2	.29
4.0	1.0	.36
5.0	1.0	.46
6.0	0.9	.40
7.0	0.9	.53
8.0	0.9	.48
9.0	0.9	.53
10.0	0.9	.57
11.0	0.8	.50
12.0	0.8	.48
13.0	0.7	.40
14.0	0.7	.33
15.0	0.5	.31
16.0	0.5	.36
17.0	0.4	+ .31
18.0	0.2	-.05
19.0	RWE	

SF-3
5/7/00
2nd Duplicate for water Samples

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) _____ If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) _____ GRADIENT: Ô-LOW Ô-MODERATE Ô-HIGH

PHOTOS: 11-US/10-DS Cam (2)

STREAM MEASUREMENTS: AVERAGE WIDTH: 25' AVERAGE DEPTH: 8" MAX. DEPTH 24"

LENGTH	WIDTH	DEPTHS ▷									POOL-GLD-RIF-RUN
300	25	22"	16"	8"							POOL
15	20	3"	4"	3"							RIF

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist (A) from LB	Dep (A)	Velocity (A/sec)
1.0	1.3	0.14
2.0	1.4	0.20
3.0	1.5	0.23
4.0	1.4	0.44
5.0	1.4	0.60
6.0	1.3	0.67
7.0	1.1	0.64
8.0	0.9	0.49
9.0	0.8	0.51
10.0	0.8	0.51
11.0	0.7	0.44
12.0	0.5	0.25
13.0	0.5	0.14
14.0	0.4	0.0
15.0	0.3	-0.06
16.0	0.2	-0.06
17.0	0.1	—
18.0	RWE	

WF-1
5/5/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If No:

Additional Comments/Pollution Impacts:

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10)

AESTHETIC RATING (1-10)

CANOPY (%OPEN) 90 GRADIENT: X-LOW O-MODERATE O-HIGH PHOTOS: 4-US 3-DS

STREAM MEASUREMENTS: AVERAGE WIDTH: 20' AVERAGE DEPTH: 8" MAX DEPTH 16"

LENGTH	WIDTH	DEPTHS ▷									POOL:GLD:RIF:RUN
150	16	2"	8"	6"							RUN
100	22	10"	13"	15"							POOL
80	18	5"	7"	6"							RUN

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist fm LB (ft)	Dep (ft)	Velocity
1.0	.1	—
2.0	.1	—
3.0	.1	—
4.0	.1	—
5.0	.3	.18
6.0	.3	.18
7.0	.5	.33
8.0	.6	.58
9.0	.7	1.04
10.0	.7	1.25
11.0	.8	1.60
12.0	.8	1.86
13.0	.7	1.80
14.0	.7	1.76
15.0	.7	1.66
16.0	.6	1.10
17.0	.1	—
18.0	RWE	

WF-2
5/5/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If No:

Additional Comments/Pollution Impacts:

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10)

AESTHETIC RATING (1-10)

CANOPY (%OPEN) 90 GRADIENT: X LOW O-MODERATE O-HIGH PHOTOS: 23-45 22-DS

STREAM MEASUREMENTS: AVERAGE WIDTH: 15' AVERAGE DEPTH: 8" MAX. DEPTH 16"

LENGTH	WIDTH	DEPTHS ▷									POOL:GLD:RF:RUN
300	15	10"	14"	8"							POOL
50	10'	4"	6"	3"							RUN

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist fm LB	Dep (ft)	Velocity ft/sec
1.0	0.6	-.07
2.0	0.7	+.30
3.0	.6	0.69
4.5	.5	0.90
5.0	.6	1.01
6.0	.7	0.95
7.0	1.0	0.88
8.0	1.3	0.80
9.0	1.4	0.79
10.0	1.4	0.62
11.0	1.2	0.30
12.0	0.9	0.02
13.0	0.6	-0.14
14.0	0.3	-0.15
15.0	RWE	

WF-3
5/5/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If No:

Additional Comments/Pollution Impacts:

Photos 27 & 26 of Softshell Turtle

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10)

AESTHETIC RATING (1-10)

CANOPY (%OPEN) 85 GRADIENT: ~~O~~-LOW O-MODERATE O-HIGH PHOTOS: 25-US 24-DS can (2)

STREAM MEASUREMENTS: AVERAGE WIDTH: 10' AVERAGE DEPTH: 8" MAX. DEPTH 16"

LENGTH	WIDTH	DEPTHS									POOL-GLD-RIF-RUN
300	12	10"	14"	8"							POOL
50	6	3"	5"	2"							RIF

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist from LB (A)	Dep (A)	Velocity (ft/sec)
.5	0.3	.26
1.0	0.5	.27
1.5	1.0	.38
2.0	1.2	.59
2.5	1.1	.69
3.0	1.5	.34
3.5	1.2	.48
4.0	1.2	.51
4.5	1.1	.50
5.0	0.8	.38
5.5	0.8	.28
6.0	0.7	.27
6.5	0.6	.23
7.0	0.6	.21
7.5	0.6	.20
8.0	0.6	.14
8.5	0.5	.05
9.0	0.3	-.05
9.5	0.2	-.06
10.0	RWE	

HC-1
5/5/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Comments/Pollution Impacts: _____

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) _____ GRADIENT: O-LOW O-MODERATE O-HIGH PHOTOS: US-2 DS-1 Cam 1

STREAM MEASUREMENTS: AVERAGE WIDTH: 6' AVERAGE DEPTH: 8" MAX. DEPTH 16"

LENGTH	WIDTH	DEPTHS ▷									POOL:GLD:RIF:RUN
200	6	8"	14"	14"							Pool
10	5'	3"	2"	4"							RIF
20	6'	5"	6"	4"							RUN
10	4	3"	3"	4"							RIF
100	6'	7"	10"	8"							POOL

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist FM LB (ft)	Depth (ft)	Vel (ft/sec)
.5	0.5	.11
1.0	0.7	.09
1.5	1.0	.21
2.0	1.1	.33
2.5	1.0	.43
3.0	1.0	.43
3.5	1.0	.49
4.0	1.0	.42
4.5	0.8	.24
5.0	0.7	.13
5.5	0.5	.13
6.0	0.3	0.0
6.5	RWE	

SA1
5/2/00

Figure V-4-6. Reverse side of the Ohio EPA Site Description Sheet for evaluating the geographical and physical characteristics of fish sampling locations. This is used to record additional information about the sampling site and adjacent area.

Is Reach Representative of Stream? (Y/N) Y If Not: _____

Additional Commerce/Pollution Impacts: _____

Mus Krat

	GEAR	DISTANC	WATER CLARITY	WATER STAGE
FIRST PASS				
SECOND PASS				
THIRD PASS				

SUBJECTIVE RATING (1-10) ☐ AESTHETIC RATING (1-10) ☐

CANOPY (%OPEN) _____ GRADIENT: O-LOW O-MODERATE O-HIGH PHOTOS: US-25 DS-24 cam ①

STREAM MEASUREMENTS: AVERAGE WIDTH: _____ AVERAGE DEPTH: _____ MAX. DEPTH _____

LENGTH	WIDTH	DEPTHS ▷									POOL:GLD:RIF:RUN
300'	10'	8"	16"	6"							Pool
5'	6'	2"	3"	2"							RIF
10'	8'	4"	6"	3"							RUN

CROSS-SECTIONS OF STREAM

DRAWING OF STREAM

Dist from LB	Depth (ft)	Vel (ft/sec)
	0.1	—
0.5	0.3	0.06
1.0	0.6	0.1
1.5		
2.0	0.7	0.18
2.5	0.7	0.18
3.0	0.8	0.21
3.5	0.8	0.22
4.0	0.6	0.26
4.5	0.6	0.22
5.0	0.5	0.21
5.5	0.5	0.20
6.0	0.5	0.15
6.5	0.5	0.16
7.0	0.3	0.06
7.5	0.2	0.05
8.0	0.1	—
8.5	0.1	
9.0	RWE	

APPENDIX D
AGRICULTURAL BEST MANAGEMENT PRACTICES (BMPS)

Best management practices, or BMPs, are restrictions, structures or practices that mitigate the adverse anthropogenic effects on runoff quality and/or quantity. Agricultural BMPs include various types of conservation buffers such as grassed waterways, no-till cropping, and many other structures and practices. The relative effectiveness of the BMP for reducing storm runoff peaks and volumes, and for addressing pollutants are generalized in the matrix below. Each BMP is subsequently described in more detail.

Table D-1

GENERAL EFFECTIVENESS OF SELECT AGRICULTURAL BMPS

BMP	Suspended Solids	Nitrogen	Phosphorus	Runoff Volume
Impoundments				
Dry Detention Ponds	•	•	•	•••
Wet Detention Ponds	•••	••	••	•••
WASCOBs				
Wetland Basins	•••	••	•••	•••
Wetland Channels	••	••	••	••
Vegetative Filters				
Filter Strips	••	•	•	•
Grassed Waterways	••	•	•	•
Farm Management Practices				
Residue Management	•••	••	••	••
Stripcropping	•••	••	••	••
Terracing	•••	••	•••	•••
Nutrient Management	••	•••	•••	••
Others				
Sand Filtration	•••	•	••	•

• = Usually not very effective treatment

••• = Usually very effective treatment

1. SAND FILTERS

Sand filters are a type of stormwater control structure used to treat runoff from buildings, roads, parking lots. Sand filters are also used to treat potable water, industrial process water and agricultural wastewater. Sand filters may be installed underground in trenches or pre-cast concrete boxes or above-ground in beds that can treat stormwater from drainage areas as much as five acres in size.

Sand filters are most common in urban areas and on sites with restricted space. The City of Austin, Texas and the State of Florida have built large, above-ground sand filters. Underground sand filters have been installed in several eastern states. Both versions pre-treatment to remove sediment, floating debris, and oil and grease to protect the filter. As stormwater flows through the filter bed, sediment particles and adsorbed pollutants are captured.

Pollutant removal for sand filters varies depending on the site, climate and loading. Overall removal for sediment and trace metals is better than removal of soluble pollutants. Table D-2 lists removal rates taken from the literature. Unfortunately, due to the large areas requiring treatment in agricultural crop watersheds, sand filters are generally not utilized.

Table D-2

SAND FILTER RELATIVE POLLUTANT REMOVAL EFFICIENCY
(Source: Schueler, *et al.* 1992)

Pollutant	Efficiency
Bacteria	Moderate
Oil and Grease	High
BOD	Moderate
Trace metals (sediment-bound)	Very High
Sediment	Very High
Total Phosphorus	Moderate
Total Nitrogen	Moderate

2. BUFFERS, FILTER STRIPS AND GRASSED WATERWAYS

Vegetation reduces the velocity of stormwater. This improves infltration and sedimentation, as well as prevents erosion. Vegetation is often part of a BMP system to remove particulates and slow runoff before it enters another treatment device. Buffer stips, filter strips and grassed waterways are described in this section.

The NRCS defines a filter strip as a strip or area of herbaceous vegetation situated between cropland, grazing land, or disturbed land (including forest land) and environmentally sensitive areas. NRCS defines a buffer strip similarly, as a strip or strips of perennial vegetation established in crop fields for wildlife habitat, erosion control, and water quality. Both of these BMPs generally apply in areas situated below cropland, grazing land, or disturbed land where sediment and/or contaminants may leave these areas and are entering environmentally sensitive areas. The NRCS' definition of a grassed waterway is a natural or constructed channel shaped or graded and established in suitable vegetation for the stable conveyance of runoff.

None of these BMPs are part of the adjacent cropland rotation. Overland flow entering filter strips or buffer strips shall be primarily sheet flow. Concentrated flow is dispersed by grading so that the flow is overland, as sheet flow.

Filter strips are typically areas of close-growing vegetation between pollutant sources and receiving waters. They can be used as outlet or pretreatment devices for other stormwater control practices. Filter strips can include shrubs or woody plants that help to stabilize herbaceous and grassy ground cover, or can be composed entirely of trees and other natural vegetation. Filter strips generally do not significantly reduce peak discharges or the volume of storm runoff, but they can be part of a comprehensive BMP system for meeting these needs.

According the NRCS standards, the filter strip should be located along the downslope edge of a field. The average watershed slope above the filter strip should be greater than 0.5% but less than 10%. The average annual sheet and rill erosion rate above the filter strip should be less than 10 tons per acre per year.

Strips should not be less than 20 feet, and protection of some resources may require much wider vegetation strips. Upgradient land slopes greater than 6% should have wider strips,

possibly as wide as 130 feet. Floodplain buffer strips having higher flows and longer duration flooding may need to be upwards of 200-feet wide.

Although studies indicate highly varying pollutant removal, trees in strips can be more effective than grass strips alone because of the trees' greater uptake and long-term retention of plant nutrients. Properly constructed forested and grassed filter strips can be expected to remove more than 60 percent of the particulates and perhaps as much as 40 percent of the plant nutrients in urban runoff. Filter strips function best when they are level in the direction of stormwater flow toward the stream. This orientation makes for the finest sheetflow through the strip, increasing infiltration and filtering of sediment and other solids. Filter strips fail if maintenance is irregular.

Grassed swales are waterways vegetated with a dense growth of a hardy grass such as tall fescue or reed canary grass. A grassed waterway/vegetated filter system is a natural or constructed vegetated channel that is shaped and graded to carry surface water at a nonerosive velocity to a stable outlet that spreads the flow of water before it enters a vegetated filter. Grassed waterways and swales are common in agricultural and urban settings.

Minimum capacity for design of grassed waterways is generally intended to confine the peak runoff from a 24-hour, 10-year storm. Waterways may provide some reduction in stormwater pollution through infiltration of runoff water into the soil, filtering of sediment or other solid particles, and slowing the velocity and peak flow rates of runoff. These processes can be enhanced by adding small (4-10 inches high) dams across the swale bottom, thereby increasing detention time.

Pollutants are removed from surface flow by the filtering action of the grass, sediment deposition, and/or infiltration into the soil. The pollutant-removing effectiveness of swales is moderate to negligible depending on many factors, including the quantity of flow, the slope of the swale, the density and height of the grass cover, and the permeability of the underlying soil. Pollutant removal ranges from 30 to 90 percent for sediment and 0 to 40 percent for total phosphorus loads (Table D-3).

Table D-3

VEGETATIVE PRACTICES POLLUTANT REMOVAL EFFICIENCY
(Source: Schueler, 1987, Schueler *et al.* 1992)

Pollutant	Efficiency
Bacteria	Low
Oil and Grease	Moderate
BOD	Low
Trace metals	Moderate
Sediment	Moderate
Total Phosphorus	Low
Total Nitrogen	Low

To be effective, vegetative practices require flat areas that are large in relation to the drainage area, and deep water tables. Swales should have as little slope as possible to maximize infiltration and reduce velocities. Filter strips should not be used where slopes exceed 15 percent, and best performance occurs where the slope is 5% or less. Taller grass will slow velocities more but grass cut to a short length may take up more plant nutrients.

3. CONSTRUCTED WETLANDS

Over the last two decades, interest has increased for the use of natural physical, biological, and chemical aquatic processes for the treatment of polluted waters. Aquatic treatment systems have been divided into natural wetlands, constructed wetlands, and aquatic plant systems (USEPA, 1988). Of the three types, constructed wetlands have received the greatest attention for treatment of nonpoint source pollution. Constructed wetlands are a subset of created wetlands designed and developed specifically for water treatment (Fields, 1993). Constructed wetlands may be developed strictly for mitigation of adverse effects from development on natural wetlands. But, in this context, constructed wetlands serve in a similar capacity as other water quality BMPs, that is, to minimize pollution prior to its entry into streams, lakes and other receiving waters.

Among the most important treatment processes are the purely physical processes of sedimentation, induced by reduced velocities in the wetland. Sedimentation accounts for

the relatively high removal rates for suspended solids, the particulate fraction of organic matter and sediment-bound nutrients and metals. Oils and greases are effectively removed through impoundment, photodegradation, and microbial action. Similarly, pathogens show good removal rates in constructed wetlands via sedimentation, natural die-off, and UV degradation. Dissolved constituents such as soluble organic matter, ammonia and ortho-phosphorus tend to have lower removal rates. Soluble organic matter is largely degraded aerobically by bacteria and periphyton. Ammonia is removed through microbial nitrification-denitrification, plant uptake, and volatilization. Nitrate is removed through denitrification and plant uptake. Denitrification is the primary removal mechanism. The microbial degradation processes are relatively slow, particularly the anaerobic denitrification steps, and require longer residence times, a factor which contributes to the variable performance of constructed wetlands systems for dissolved nitrogen. Phosphorus is removed mainly through soil sorption, plant assimilation and burial, processes which are slow and varied. Consequently, phosphorus removal rates are variable and typically trail behind those of nitrogen.

Constructed wetlands can achieve or exceed the pollutant removal rates as estimated for wet pond detention basins and dry detention ponds. General ranges of removal for various pollutants are given below.

Table D-4

CONSTRUCTED WETLAND POLLUTANT REMOVAL EFFICIENCY
(Source: Schueler, 1987, Schueler *et al.* 1992)

Pollutant	Efficiency
Bacteria	High
Oil and Grease	Very high
BOD	Moderate
Trace metals (sediment-bound)	High
Sediment	High
Total Phosphorus	High
Total Nitrogen	Moderate

The use of constructed wetlands for stormwater treatment remains an emerging technology and design criteria continue to evolve. General design considerations include the requirement to reduce stormwater inflow velocities and provide opportunity for initial

sedimentation. It is important to maximize the hydraulic residence time and the distribution of flow over the treatment area, and to avoid hydraulic short-circuiting. Emergent macrophytes provide substrate for periphyton and are a storage vector for carbon and nutrients. Generally, native emergent vegetation is designed for. Plants must be chosen to withstand the pollutant loading and the frequent fluctuation in water depth.

Constructed wetlands can be a very effective part of a BMP system. Associated features should incorporate minimization of initial runoff volumes; routing of runoff using grassed waterways, swale checks, and other measures; pre-treatment of collected runoff to minimize sediment and associated pollutant loads; and, off-line attenuation of larger storm event runoff to optimize wetland performance and minimize downstream erosion-related water quality impacts.

4. NATURAL AND RESTORED WETLANDS

Natural wetlands also improve water quality. Protection or restoration of wetlands to maintain or enhance water quality is acceptable. However, nonpoint source pollutants should not be intentionally diverted to wetlands for primary treatment. Wetlands should be part of an integrated landscape approach to nonpoint source control, and tied to BMPs in upgradient source areas.

5. WET RETENTION PONDS

Wet retention ponds or basins temporarily detain stormwater. The permanent pool of water enhances the removal of many pollutants. These ponds fill with stormwater and release it slowly. Pollutant removal mechanisms in wet ponds include: sedimentation; biological uptake by plants, algae and bacteria; and, decomposition. Wet ponds have some capacity to remove dissolved nutrients, an important characteristic to protect lakes from eutrophication. Because of the permanent pool, wet ponds can remove moderate to high amounts of most pollutants and are more effective in removing nutrients than most other BMPs.

Table D-5

WET DETENTION POND
POLLUTANT REMOVAL EFFICIENCY
(Source: WEF & ASCE, 1998)

Pollutant	Wet Retention Pond	Extended Detention Pond
BOD	20 – 40%	20 – 40%
Zinc	40 – 50%	40 – 50%
Lead	70 – 80%	70 – 80%
Sediment	70 – 80%	70 – 80%
Dissolved Phosphorus	50 – 70%	0
Total Phosphorus	50 – 60%	20 – 50%
Dissolved Nitrogen	50 – 70%	0
Total Nitrogen	30 – 40%	20 – 30%

6. WATER AND SEDIMENT CONTROL BASIN (WASCOB)

Water and sediment control basins, or WASCOBs, are earth embankments or combinations of ridges and channels, generally constructed across the slope and minor watercourses to form a sediment trap and a water detention basin. WASCOBs are a popular BMP, and hundreds have been constructed in Indiana alone. These structures improve the ability to farm sloping land, reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff, and improve downstream water quality.

This practice applies to sites where:

The topography is generally irregular,
Waterway and/or gully erosion is a problem,
Sheet and rill erosion is controlled by other conservation practices,
Runoff and sediment has damaged land and improvements,
Soil and site conditions are suitable, and,
Adequate outlets are available or can be provided.

This practice is not applicable to waterways where construction of the basin would destroy important woody wildlife cover and the present watercourse is capable of handling the concentrated runoff without serious erosion.

Water and sediment control basins are consistent with terrace intervals (see Table D-9). The drainage of each basin is designed to limit the duration of ponding, infiltration, or seepage so that the structure does not damage nearby crops. Where land ownership or physical conditions preclude treatment of the upper portion of a slope with terraces, a water and sediment control basin may be used to separate this area from, and permit treatment to the lower part of the slope. The uncontrolled drainage area to the basin used for this purpose should not exceed 30 acres.

The basins should be large enough to control the runoff from a 10-year, 24-hour-frequency storm without overtopping. The capacity of basins designed to provide flood protection or to function with other structures may be larger. Another storage volume design consideration is the anticipated accumulation of sediment, which could be estimated with the Universal Soil Loss Equation (USLE).

WASCOBs should be part of an overall system to protect soil and water resources. Practices such as terracing, contouring, conservation cropping, conservation tillage, and crop residue management should also be used to control erosion.

Water and sediment control basins shall not be used in place of terraces. When a ridge and channel extend beyond the detention basin or level embankment, terraces are appropriate.

This BMP may reduce the volume and rate of discharge. When underground outlets are used, infiltration through the catchment will increase and runoff will be decreased. Peak flows will be reduced by temporary storage. Where snow is present, it is trapped in the channels and catchments of the BMP and infiltrates into the soil. This BMP traps and removes sediment-attached pollutants from runoff. Trap efficiencies for sediment and total phosphorus may exceed 90 percent in Indiana's silt loam soils. Dissolved substances, such as nitrates, may also be removed from discharge from downstream areas with increased infiltration.

7. RESIDUE MANAGEMENT

There are several agricultural BMPs that increase the plant residue in soils and reduce erosion. Among these are no-till/strip till, mulch till, ridge till, and seasonal residue management. Each of these BMPs is instrumental in conserving soil moisture, increasing soil infiltration, reducing soil loss, and improving soil tilth.

The NRCS defines no-till/strip till as managing the amount, orientation and distribution of crop and other plant residues on the soil surface year round, while growing crops in narrow slots, or tilled or residue free strips in soil previously untilled by full-width inversion implements. This practice applies to all cropland and other land where crops are grown. Combines or similar machines used for harvesting are equipped with spreaders that distribute plant residue over the fields so that residues are retained on the field. Post-harvest grazing should not be allowed. Planters are equipped to plant directly through untilled residue or in a tilled seedbed prepared in a narrow strip along each row. Although not universal, no-till planting generally relies on an increased use of herbicides to control weeks, but greatly reduces soil loss from the fields. No till or strip till can be practiced continuously or may be part of a system which includes other tillage and planting methods such as mulch till.

The mulch till practice is similar, and defined by NRCS as managing the amount of crop and other plant residues on the soil surface year round while growing crops where the field surface is tilled prior to planting. This BMP applies to all crop land and applies to tillage for both annual and perennial crops. Tillage implements are equipped to operate through plant residues without clogging and to maintain residue on or near the soil surface by undercutting or mixing. Planters, drills, or air seeders plant in residue on the soil surface or mixed in the tillage layer.

Ridge till is manages the amount of crop residues on the soil surface year-round, while growing crops on preformed ridges alternated with furrows protected by crop residue. Following harvest, residues are left until planting with no additional disturbance except for normal weathering. Ridge height is maintained throughout the harvest and winter seasons by controlling equipment or livestock traffic. After planting, residues are maintained in the furrows until the ridges are rebuilt by cultivation. Ridges are rebuilt to their original height and shape during the last row cultivation. Loose plant residues are retained on the field and uniformly distributed on the soil surface. The equipment is designed to operate on ridges: cultivators equipped with ridging attachments, planters

equipped with ridge planting attachments such as row cleaning devices and guidance systems, etc. Planting and fertilizer placement should disturb no more than about one third of the row width. Soil and residue removed from the top of the ridge is moved into the furrows. After planting, the top of the ridge is at least three inches higher than the furrows.

Seasonal residue management involves using plant residues to protect cultivated fields during critical erosion periods. Wherever possible, the farmer should leave stubble standing over winter to prevent soil erosion and to trap snow. The management of crop residue is based on the amount of residue produced by the crop. When relatively small amounts of residues are available other practices will have to be used to maintain the necessary residue cover. This may include limiting grazing of the crop residues and not baling the cover.

8. STRIPCROPPING

Contour stripcropping is the growing of crops in a systematic arrangement of strips or bands on the hillside contour to reduce water erosion. The crops are arranged so that a filter strip of grass or close-growing crop is alternated with a strip of clean-tilled crop or fallow; or a strip of grass is alternated with a close-growing crop. Contour stripcropping is applicable to sloping cropland and on certain recreation and wildlife land where the topography is uniform enough to permit tilling and harvesting, and where it is an essential part of a cropping system to effectively reduce soil and water losses.

Contour strips should outlet into a stable outlet such as a waterway, water and sediment control basin, field border or other nonerosive areas and not outlet into end rows where excessive erosion down the slope might be accelerated. Contour strips are established with consideration given to the field and machinery conditions with up to 10 percent deviation of strip widths permissible (Table D-6).

Table D-6

CONTOUR STRIP WIDTHS
(Source: NRCS Conservation Standards)

Slope	P Values[1/]			Maximum Strip Width[2/]	Maximum Slope Length[3/]
(%)	A	B	C	(feet)	(feet)
1 to 2	0.30	0.45	0.60	130	800
3 to 5	0.25	0.38	0.50	100	600
6 to 8	0.25	0.38	0.50	100	400
9 to 12	0.30	0.45	0.60	80	240
13 to 16	0.35	0.52	0.70	80	160

1/ P Values:

A – For 4-year rotation of row crop, small grain with meadow seeding, and 2 years of meadow.

B – For 4-year rotation of 2 years row crop, winter small grain with meadow seeding, and 1-year meadow.

C – For alternate strips of row crop and winter small grain.

2/ Adjust strip width limit, generally downward, to accommodate widths of farm equipment.

3/ Maximum length may be increased by 10 percent if residue cover after crop planting will regularly exceed 50 percent.

Field stripcropping is similar to contour stripcropping. In field stripcropping, crops are grown in a systematic arrangement of strips or bands across the slope, not on the contour. This reduces soil erosion. A strip of grass or other close-growing crop is alternated with a clean-tilled crop or fallow down the slope. It is applicable for controlling erosion and runoff on sloping cropland where contour stripcropping is not practical. Strips are laid out across the slope as nearly on the contour as practicable. No two adjoining strips will be in clean-tilled crops or fallow. As with contour stripcropping, grassed waterways, water and sediment control structures, terraces or diversions should be established and maintained where concentrated water flow would otherwise cause gully erosion. The widths of strips are defined below.

Table D-7

FIELD STRIPCROPPING STRIP WIDTHS
(Source: NRCS Conservation Standards)

Percent Slope	Strip Width (feet)
1 – 2	130
3 – 8	100
9 – 16	80

Both field and contour stripcropping affect the water budget, especially volumes and rates of runoff, infiltration, evaporation, transpiration, deep percolation and ground water recharge. These BMPs also have filtering effects on water quality because the strip vegetation and reduces movement of sediment and dissolved and sediment-attached substances.

9. TERRACING

A terrace is an earth embankment, channel, or a combination ridge and channel constructed across the slope to reduce slope length, erosion, and sediment content in runoff water. It is a widely practiced BMP and is common for managing not only erosion, but water conservation. As with stripcropping, terrace spacing is usually determined by the Universal Soil Loss Equation (USLE). The spacing shall not exceed the slope length determined by using the allowable soil loss, the most intensive use planned, the expected level of management, and the terrace P factor (Table D-8).

Table D-8

TERRACE P FACTORS

(Source: NRCS Conservation Standards)

Horizontal Interval	Closed Outlets[1]	Open outlets, with percent grade [2]		
(feet)		0.1–0.3	>0.3-0.7	>0.7
<110	0.5	0.6	0.7	1.0
110 - <140	0.6	0.7	0.8	1.0
140 - <180	0.7	0.8	0.9	1.0
180 - <225	0.8	0.8	0.9	1.0
225 – 300	0.9	0.9	1.0	1.0
>300	1.0	1.0	1.0	1.0

NOTES:

If contouring or stripcropping P factors are appropriate, they can be multiplied by the terrace P factor for the composite P factor.

1/ "P" factor for closed outlet terraces also apply to terraces with underground outlets and to level terraces with open outlets.

2/ The channel grade is measured on the 300 ft of terrace or the one-third of total terrace length closest to the outlet, whichever is less.

The maximum horizontal interval between terraces should not exceed the distances tabulated below for the conditions shown.

Table D-9

MAXIMUM HORIZONTAL INTERVAL FOR TERRACES
(Source: NRCS Conservation Standards)

Slope	USLE – R Factors		With Contour Stripcropping
	35 to 175	>175	
(%)	(ft)	(ft)	(ft)
0 – 2	500	450	600
2.1 – 4	400	300	600
4.1 – 6	400	200	600
6.1 – 9	300	150	400
9.1 – 12	250	150	250
12.1 – 18	200	150	150
18.1 – up	200	150	150
Minimum spacing required, all slopes	150	90	90

The maximum limits should not be exceeded. Spacing may be increased as much as 10% to provide better alignment or location, to adjust for farm machinery, or to reach an outlet. Spacing may be increased an additional 10% for terraces with underground outlets. For level terraces, the spacing is determined as indicated above, but the maximum horizontal spacing should never exceed 600 feet. Additionally the terrace shall have enough capacity to control the runoff from a 10-year frequency, 24-hour storm without overtopping. Other design criteria are available from the NRCS.

Terraces should be part of the treatment system to protect soil and water resources. In addition, practices such as contouring, a conservation cropping system, conservation tillage, and crop residue management shall also be used to control erosion. Terraces should not be used in place of water and sediment control basins. The planned management system should reduce soil loss in the terrace interval to prevent excess maintenance and operation problems.

Storage terraces retain runoff, increase infiltration, and conserve soil moisture. Gradient terraces may cause a slight increase to a significant decrease in surface runoff depending on field topography and terrace channel grade. This BMP reduces slope length and the amount of surface runoff which passes over the area downslope from the structure. The erosion rate and production of sediment within the terrace interval will be reduced. Terraces trap sediment and reduce the sediment and associated pollutant content in the runoff water.

Terraces intercept and conduct surface runoff at a nonerosive velocity to stable outlets, thereby reducing gully erosion. Trap efficiencies for sediment and total phosphorus may exceed 90 percent for terraces with underground outlets in Indiana's silt loam soils. Underground outlets may collect soluble nutrient and pesticide leachates and convey them directly to surface waters. In this way, by collecting surface runoff and conveying it directly to a receiving stream, terraces may increase the delivery of pollutants to surface waters. Terraces may have a detrimental effect on water quality if they concentrate and accelerate delivery of dissolved or suspended nutrient or pesticide pollutants to surface or ground waters.

10. NUTRIENT MANAGEMENT

Proper nutrient management economizes the natural process of nutrient cycling to optimize crop growth and minimize environmental losses. According to NRCS (1999), the practice of nutrient management serves four major functions:

1. Supplies essential nutrients to plants for adequate production,
2. Provides for efficient and effective use of scarce nutrient resources,
3. Minimizes environmental degradation caused by excess nutrients in the environment, and,
4. Helps maintain or improve the physical, chemical, and biological condition of the soil.

Modern agricultural production depends on an adequate supply of nutrients being available to the crops. The agricultural yield increases during the last 50 years can be, in part, attributed to high levels of crop nutrition that support high yielding crop varieties. Unfortunately increased use of nutrients has, and continues to, damage the environment. Excess nutrients produce nuisance vegetation including algae, which diminish the economic, social and environmental benefits of aquatic and terrestrial habitats.

The objective of nutrient management is to supply adequate chemical elements to the soil and plants without creating an imbalance in the ecosystem. Protecting the environment requires controlling both the source of nutrients and their fate and transport from those sources. Nutrient management assessment tools available include tools to assess the agronomic needs of a crop and tools to assess environmental risk associated with nutrient applications. Agronomic needs assessment tools include:

- Traditional soil tests, providing an important baseline of information, should be performed every 3 to 5 years, or more often if conditions change.
- Plant tests provide information on the nutrient status of the crop, and can determine the success of the current nutrient management plan in meeting crop needs.
- Organic materials analysis, where manure or municipal sewage sludge are applied to fields, should include moisture content. These data are necessary to develop an accurate nutrient budget.

Environmental risk assessment tools provide information on the fate, transport and potential environmental risk associated with nutrient applications. These tools may identify sensitive areas where nutrient management is critical to protect a water resource. A few of the less complex risk assessment tools include:

- The leaching index (LI) assesses the intrinsic probability of leaching occurring if nutrients are present and available to leach. LI is a simple index of potential leaching based on average annual percolation and seasonal rainfall distribution.
- The Universal Soil Loss Equation (USLE) assesses the potential for soil and adsorbed nutrient loss through water erosion.
- The Water Quality Indicators Guide (WQIG) is a qualitative tool for assessing surface water quality impacts from five major sources of agriculturally related nonpoint source pollution: sediment, nutrients, animal waste, pesticides, and salts.
- The Nitrate Leaching and Economic Analysis Package (NLEAP) is a moderately complex, field scale model that assesses the potential for nitrate leaching under agricultural fields. NLEAP can be a powerful tool to assess nutrient management planning decisions.
- The phosphorus index (PI) is a simple assessment tool that examines the potential risk of P movement to streams and lakes based on various landforms and management practices.

- The 303(d) list can often be used to help assess the potential environmental risk associated with a particular land area. Indiana's 303(d) report is available at www. This report lists waterbodies designated as impaired for one or more of its designated uses.
- Water quality monitoring can be used to assess the potential impairment of waterbodies and associated environmental risk. Long-term monitoring, such as monitoring performed by the IDEM and U.S. Geological Survey can show quantitative trends in water quality over time.
- A variety of water quality models, including AGNPS, WATERSHED, ANAGNPS, SWRRB, and SWAT, may be used to look at the influence of different management scenarios and environmental conditions on the potential environmental risk of nutrient contamination to waterbodies.

A nutrient management plan is a farm's guide for making decisions on the placement, rate, timing, form, and method of nutrient application. They help producers become fully aware of the steps that need to be taken to successfully manage their nutrients and protect natural resources. Components of a nutrient management plan are listed in the adjacent text box. These elements are all-inclusive, but are guidelines for the minimum requirements for a nutrient management plan.

There are abundant references on nutrient conservation practices for pollution control and reduction. Many of the available techniques are related to soil erosion control. Nutrient control techniques generally fall into one or more of the following categories:

- Source reduction
- Reduction of nutrient availability
- Reduction of soil particle detachment
- Reduction of dissolved and suspended nutrient transport

Nutrient Management Plan Components

1. Aerial photographs or maps
2. Sensitive resource areas and nutrien restriction areas
3. Results of soil, plant and organic material analyses
4. Crop sequence and rotation plan
5. Expected crop yields
6. Quantification of nutrient sources
7. Crop nutrient budget
8. Recommended rates, timing and method of application

REFERENCES

Fields, S., 1993. Regulations and Policies Relating to the Use of Wetlands for Nonpoint Source Pollution Control. Pages 151-158 in Created and Natural Wetlands for Controlling Nonpoint Source Pollution, R.K. Olson (ed.), CRC Press, Boca Raton, FL.

Natural Resources Conservation Service (NRCS). 1999. CORE4 Conservation Practices Training Guide. The Common Sense Approach to Natural Resource Conservation. USDA NRCS, August, 1999.

Schueler, T.R., 1987. Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs. Publication no. 87703. Metropolitan Washington Council of Governments. 275pp.

Schueler, T.R., P.A. Kumble, and M.A. Heraty, 1992. A Current Assessment of Urban Best Management Practices: Techniques for Reducing Non-Point Source Pollution In the Coastal Zone. Publication no. 92705. Metropolitan Washington Council of Governments. Washington, DC. 127pp.

USEPA, 1988. Design Manual: Constructed Wetlands and Aquatic Plant Systems for Municipal Wastewater Treatment. EPA/625/1-88/022. U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC. 83pp.

Water Environment Federation (WEF) and Amercian Society of Civil Engineers (ASCE). 1998. Urban Runoff Quality Management. WEF, Alexandria, Virginia.

APPENDIX E
MODEL RIPARIAN BUFFER ORDINANCE

The attached model ordinance was provided by the Center for Watershed Protection, Inc., a 501(c)3 organization located in Ellicott City, Maryland. Funding for it was provided by a grant from the Environmental Protection Agency, Office of Water, Office of Wastewater Management.

Buffer Model Ordinance

[illegible]

This ordinance focuses primarily on stream buffers. Communities creating coastal buffers may wish to incorporate additional features. For an example of a coastal buffer ordinance, see the

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Section I. Background

Whereas, buffers adjacent to stream systems and coastal areas provide numerous environmental protection and resource management benefits which can include the following:

a) restoring and maintaining the chemical, physical and biological integrity of the water resources

b) removing pollutants delivered in urban stormwater

c) reducing erosion and controlling sedimentation

d) stabilizing stream banks

e) providing infiltration of stormwater runoff

f) maintaining base flow of streams

g) contributing the organic matter that is a source of food and energy for the aquatic ecosystem

h) providing tree canopy to shade streams and promote desirable aquatic organisms

This benefit applies primarily to forested buffer systems. In some communities, such as in prairie settings, the native vegetation may not be forest. See the example ordinance from for an example.

i) providing riparian wildlife habitat

j) furnishing scenic value and recreational opportunity

It is the desire of the (Natural Resources or Planning Agency) to protect and maintain the native vegetation in riparian and wetland areas by implementing specifications for the establishment, protection and maintenance of vegetated along all stream systems and/or coastal zones within our jurisdictional authority.

Section II. Intent

The purpose of this ordinance is to establish minimal acceptable requirements for the design of buffers to protect the streams, wetlands and floodplains of (Jurisdiction); to protect the water quality of watercourses, reservoirs, lakes, and other significant water resources within (Jurisdiction); to protect (Jurisdiction's) riparian and aquatic ecosystems; and to provide for the environmentally sound use of (Jurisdiction's) land resources.

Section III. Definitions

Active Channel: The area of the stream channel that is subject to frequent flows (approximately once

per one and a half years), and that includes the portion of the channel below where the floodplain flattens.

Best Management Practices (BMPs): Conservation practices or management measures which control soil loss and reduce water quality degradation caused by nutrients, animal wastes, toxins, sediment, and runoff.

Buffer: A vegetated area, including trees, shrubs and herbaceous vegetation, which exists or is established to protect a stream system, lake, reservoir or coastal estuarine area. Alteration of this natural area is strictly limited.

Development: 1) The improvement of property for any purpose involving building; 2) Subdivision, or the division of a tract or parcel of land in to 2 or more parcels; 3) the combination of any two or more lots, tracts, or parcels of property for any purpose; 4) the preparation of land for any of the above purposes.

Non-Tidal Wetland: Those areas not influenced by tidal fluctuations that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

The definition of "non-tidal wetland" here is adapted from the definition of "wetland" used by the US EPA and the Army Corps of Engineers. Other definitions will also be acceptable. See the Croton-on-Hudson Wetlands and Watercourses ordinance for an example.

Non-point Source Pollution: Pollution which is generated by various land use activities rather than from an identifiable or discrete source, and is conveyed to waterways through natural processes, such as rainfall, storm runoff, or ground water seepage rather than direct discharge.

One Hundred Year Floodplain: The area of land adjacent to a stream that is subject to inundation during a storm event that has a recurrence interval of one hundred (100) years.

Pollution: Any contamination or alteration of the physical, chemical, or biological properties of any waters that will render the waters harmful or detrimental to: public health, safety or welfare; domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses; livestock, wild animals, or birds; fish or other aquatic life.

Stream Channel: Part of a water course either naturally or artificially created which contains an intermittent or perennial base flow of groundwater origin. Base flows of groundwater origin can be distinguished by any of the following physical indicators:

1) Hydrophytic vegetation, hydric soil or other hydrologic indicators in the area(s) where groundwater enters the stream channel, in the vicinity of the stream headwaters, channel bed or channel banks

2) Flowing water not directly related to a storm event

3) Historical records of a local high groundwater table, such as well and stream gauge records.

Stream Order: A classification system for streams based on stream hierarchy. The smaller the stream, the lower its numerical classification. For example, a first order stream does not have tributaries and normally originates from springs and/or seeps. At the confluence of two first order streams, a second order stream begins, and so on. (See Figure 1)

Stream System: A stream channel together with one or both of the following:

1) 100-year floodplain and/or

2) Hydrologically-related non-tidal wetlands

Streams: Perennial and intermittent watercourses identified through site inspection and USGS maps. Perennial streams are those which are depicted on a USGS map with a solid blue line. Intermittent streams are those which are depicted on a USGS map with a dotted blue line.

Defining the term "stream" is perhaps the most contentious issue in the definition of stream buffers. This term determines the origin, and the length of the stream buffer. While some jurisdictions restrict the buffer to perennial or "blue line" streams, others include both perennial and intermittent streams in the stream buffer program. Some communities do not rely on USGS maps, and instead prepare local maps of all stream systems that require a buffer.

Water Pollution Hazard: A land use or activity that causes a relatively high risk of potential water pollution.

Section IV. Applications

A) This ordinance shall apply to all proposed development except for that development which meets waiver or variance criteria as outlined in Section IX of this regulation.

B) This ordinance shall apply to all timber harvesting activities, except those timber harvesting operations which are implementing a forest management plan which has been deemed to be in compliance with the regulations of the buffer ordinance and has received approval from . (*state forestry agency*)

C) This ordinance shall apply to all surface mining operations except that the design standards shall not apply to active surface mining operations which are operating in compliance with an approved (*state or federal agency*) surface mining permit.

D) The ordinance shall not apply to agricultural operations that are covered by an approved NRCS conservation plan that includes the application of best management practices.

Communities should carefully consider whether or not to exempt agricultural operations from the buffer ordinance, because buffer regulations may take land out of production and impose a financial burden on family farms. Many communities exempt agricultural operations if they have an approved NRCS conservation plan. In some regions, agricultural buffers may be funded through the Conservation Reserve Program (CRP). Consult the Conservation Technology Information Center (CTIC) at www.ctic.perdue.edu.

Livestock operations near and around streams may be regulated by communities. Livestock can significantly degrade the stream system, and accelerate streambank erosion. The King County Livestock Management Ordinance is one example of a local livestock ordinance. For more information, contact the King County Department of Development and Environmental Services at (206) 296-6602.

E) Except as provided in Section IX, this ordinance shall apply to all parcels of land, structures and activities which are causing or contributing to:

1) Pollution, including non-point pollution, of the waters of the jurisdiction adopting this ordinance.

2) Erosion or sedimentation of stream channels

3) Degradation of aquatic or riparian habitat

Section V. Plan Requirements

A) In accordance with section IV of this ordinance, a plan approved by the appropriate agency is required for all development, forest harvesting operations, surface mining operations, and agricultural operations.

B) The plan shall set forth an informative, conceptual and schematic representation of the proposed activity by means of maps, graphs, charts, or other written or drawn documents so as to enable the agency an opportunity to make a reasonably informed decision regarding the proposed activity.

C) The plan shall contain the following information:

T he ordinance can identify the scale of maps to be included with the analyses in items 2) through 7). A 1"=50' to 1"=100' scale will generally provide sufficient detail.

1) a location or vicinity map

2) field delineated and surveyed streams, springs, seeps, bodies of water, and wetlands (include a minimum of two hundred (200) feet into adjacent properties).

3) Field delineated and surveyed forest buffers

4) Limits of the ultimate one hundred year floodplain

The limits of the ultimate floodplain (i.e., the floodplain under "built-out" conditions) may not be available in all locations.

5) hydric soils mapped in accordance with the NRCS soil survey of the site area

6) steep slopes greater than fifteen (15) percent for areas adjacent to and within two hundred (200) feet of streams, wetlands, or other waterbodies.

The ordinance may also explicitly define how slopes are measured. For example, the buffer may be divided into sections of a specific width (e.g., twenty five feet) and the slope for each segment reported. Alternatively, slopes can be reported in segments divided by breaks in slope.

7) a narrative of the species and distribution of existing vegetation within the buffer

D) The buffer plan shall be submitted in conjunction with the required grading plan for any development, and the forest buffer should be clearly delineated on the final grading plan.

E) Permanent boundary markers, in the form of signage approved by (*Natural Resources or Planning Agency*), shall be installed prior to final approval of the required clearing and grading plan. Signs shall be placed at the edge of the Middle Zone (See Section VI.E).

Section VI Design Standards for Forest Buffers

A) A forest buffer for a stream system shall consist of a forested strip of land extending along both sides of a stream and its adjacent wetlands, floodplains or slopes. The forest buffer width shall be adjusted to include contiguous sensitive areas, such as steep slopes or erodible soils, where development or disturbance may adversely affect water quality, streams, wetlands, or other waterbodies.

B) The forest buffer shall begin at the edge of the stream bank of the active channel.

C) The required width for all forest buffers (i.e., the base width) shall be a minimum of one hundred feet, with the requirement to expand the buffer depending on:1)stream order; 2)percent slope; 3)100-year floodplain; 4) wetlands or critical areas.

The width of the stream buffer varies from twenty feet to up to 200 feet in ordinances throughout the United States (Heraty, 1993). The width chosen by a jurisdiction will depend on the sensitivity and characteristics of the resource being protected and political realities in the community.

1) In third order and higher streams, add twenty five feet to the base width.

2) Forest Buffer width shall be modified if there are steep slopes which are within a close proximity to the stream and drain into the stream system. In those cases, the forest buffer width can be adjusted.

Several method may be used to adjust buffer width for steep slopes. Two examples include:

Method A:

Percent Slope	Width of Buffer
15%-17%	add 10 feet
18%-20%	add 30 feet
21%-23%	add 50 feet
24%-25%	add 60 feet

Method B:

Percent Slope	Type of Stream Use	
	Water Contact Recreational Use	Sensitive Stream Habitat
0 to 14%	no change	add 50 feet
15 to 25%	add 25 feet	add 75 feet
Greater than 25%	add 50 feet	add 100 feet

3) Forest buffers shall be extended to encompass the entire 100 year floodplain and a zone with minimum width of 25 feet beyond the edge of the floodplain.

4) When wetland or critical areas extend beyond the edge of the required buffer width, the buffer shall be adjusted so that the buffer consists of the extent of the wetland plus a 25 foot zone extending beyond the wetland edge.

D) Water Pollution Hazards

The following land uses and/or activities are designated as potential water pollution hazards, and must be set back from any stream or waterbody by the distance indicated below:

1) storage of hazardous substances (150 feet)

2) above or below ground petroleum storage facilities (150 feet)

3) drainfields from on-site sewage disposal and treatment system (i.e., septic systems--100 feet)

4) raised septic systems (250 feet)

5) solid waste landfills or junkyards (300 feet)

6) confined animal feedlot operations (250 feet)

7) subsurface discharges from a wastewater treatment plant (100 feet)

8) land application of biosolids (100 feet)

For surface water supplies, the setbacks should be doubled.

A community should carefully consider which activities or land uses should be designated as potential water pollution hazards. The list of potential hazards shown above is not exhaustive, and others may need to be added depending on the major pollutants of concern and the uses of water.

E. The forest buffer shall be composed of three distinct zones, with each zone having its own set of allowable uses and vegetative targets as specified in this ordinance. (See Figure 2).

Although a three-zone buffer system is highly recommended, the widths and specific uses allowed in each zone may vary between jurisdictions.

1) Zone 1 Streamside Zone

a) The function of the streamside zone is to protect the physical and ecological integrity of the stream ecosystem.

b) The streamside zone will begin at the edge of the stream bank of the active channel and extend a minimum of 25 feet from the top of the bank.

c) Allowable uses within this zone are highly restricted to:

i) flood control structures

ii) utility rights of way

iii) footpaths

iv) road crossings, where permitted.

d) The vegetative target for the streamside zone is undisturbed native vegetation.

This ordinance assumes that the native vegetation in the stream corridor is forest. In some regions of the United States, other vegetation such as prairie may be native. See the buffer ordinance for an example of a stream buffer ordinance that protects non-forested systems.

2) Zone 2 Middle Zone

a) The function of the middle zone is to protect key components of the stream and to provide distance between upland development and the streamside zone.

b) The middle zone will begin at the outer edge of the streamside zone and extend a minimum of 50 plus any additional buffer width as specified in Section VI C.

c) Allowable uses within the middle zone are restricted to:

i) Biking or hiking paths

ii) Stormwater management facilities, with the approval of (*Local agency responsible for stormwater).*

iii) Recreational uses as approved by *(Planning Agency).*

iv) Limited tree clearing with approval from (*Forestry agency or Planning Agency*).

d) The vegetative target for the middle zone is mature native vegetation adapted to the region.

3) Zone 3 Outer Zone

a) The function of the outer zone is to prevent encroachment into the forest buffer and to filter runoff from residential and commercial development.

b) The outer zone will begin at the outward edge of the middle zone and provide a minimum width of 25 feet between Zone 2 and the nearest permanent structure.

c) There shall be no septic systems, permanent structures or impervious cover, with the exception of paths, within the outer zone.

d) The vegetative target for the outer zone may vary, although the planting of native vegetation should be encouraged to increase the total width of the buffer.

Section VII. Buffer Management and Maintenance

A) The forest buffer, including wetlands and floodplains, shall be managed to enhance and maximize the unique value of these resources. Management includes specific limitations on alteration of the natural conditions of these resources. The following practices and activities are restricted within Zones 1 and 2 of the forest buffer, except with approval by (*Forestry, Planning or Natural Resources Agency)*:

1) Clearing of existing vegetation.

2) Soil disturbance by grading, stripping, or other practices.

3) Filling or dumping.

4) Drainage by ditching, underdrains, or other systems

5) Use, storage, or application of pesticides, except for

the spot spraying of noxious weeds or non-native species consistent with recommendations of .(*Forestry Agency*)

6) Housing, grazing, or other maintenance of livestock.

7) Storage or operation of motorized vehicles, except for maintenance and emergency use approved by .(*Forestry, Planning or Natural Resources Agency)*

B) The following structures, practices, and activities are permitted in the forest buffer, with specific design or maintenance features, subject to the review of (*Forestry, Planning or Natural Resources Agency)*:

1) Roads, bridges, paths, and utilities:

a) An analysis needs to be conducted to ensure that no economically feasible alternative is available.

b) The right of way should be the minimum width needed to allow for maintenance access and installation.

c) The angle of the crossing shall be perpendicular to the stream or buffer in order to minimize clearing requirements

d) The minimum number of road crossings should be used within each subdivision, and no more than one fairway crossing is allowed for every 1,000 feet of buffer.

2) Stormwater management:

e) An analysis needs to be conducted to ensure that no economically feasible alternative is available, and that the project is either necessary for flood control, or significantly improves the water quality or habitat in the stream.

f) In new developments, on-site and non-structural alternatives will be preferred over larger facilities within the stream buffer.

g) When constructing stormwater management facilities (i.e., BMPs), the area cleared will be limited to the area required for construction, and adequate maintenance access, as outlined in the most recent edition of (*Refer to Stormwater Manual)*.

Rather than place specific stormwater BMP design criteria in an ordinance, it is often preferable to reference a manual. Therefore, specific design information can change over time without going through the formal process needed to change ordinance language.

The Maryland Stormwater Design Manual, is one example of an up-to-date stormwater design manual. For more information, go to www.mde.state.md.us. Under topics, choose "Stormwater Design Manual".

h) Material dredged or otherwise removed from a BMP shall be stored outside the buffer.

3) Stream restoration projects, facilities and activities approved by (*Forestry, Planning or Natural Resources Agency)* are permitted within the forest buffer.

4) Water quality monitoring and stream gauging are permitted within the forest buffer, as approved by (*Forestry, Planning or Natural Resources Agency)* :.

5) Individual trees within the forest buffer may be removed which are in danger of falling, causing damage to dwellings or other structures, or causing blockage of the stream.

6) Other timber cutting techniques approved by the agency may be undertaken within the forest buffer under the advice and guidance of (*State or Federal Forestry Agency*), if necessary to preserve the forest from extensive pest infestation, disease infestation, or threat from fire.

C) All plats prepared for recording and all right-of-way plats shall clearly:

1) Show the extent of any forest buffer on the subject property by metes and bounds

2) Label the forest buffer

3) Provide a note to reference any forest buffer stating: "There shall be no clearing, grading, construction or disturbance of vegetation except as permitted by the agency."

4) Provide a note to reference any protective covenants governing all forest buffers areas stating: "Any forest buffer shown hereon is subject to protective covenants which may be found in the land records and which restrict disturbance and use of these areas."

D) All forest buffer areas shall be maintained through a declaration of protective covenant, which is required to be submitted for approval by (*Planning Board or Agency*). The covenant shall be recorded in the land records and shall run with the land and continue in perpetuity.

This protective covenant can be kept either by the local government agency responsible for management of environmental resources, or by an approved non-profit organization. An example conservation easement is included later in this section.

E) All lease agreements must contain a notation regarding the presence and location of protective covenants for forest buffer areas, and which shall contain information on the management and maintenance requirements for the forest buffer for the new property owner.

F) An offer of dedication of a forest buffer area to the agency shall not be interpreted to mean that this automatically conveys to the general public the right of access to this area.

G) (*Responsible Individual or Group)* shall inspect the buffer annually and immediately following severe storms for evidence of sediment deposition, erosion, or concentrated flow channels and corrective actions taken to ensure the integrity and functions of the forest buffer.

A local ordinance will need to designate the individual or group responsible for buffer maintenance. Often, the responsible party will be identified in any protective covenants associated with the property.

H) Forest buffer areas may be allowed to grow into their vegetative target state naturally, but methods to enhance the successional process such as active reforestation may be used when deemed necessary by (*Natural Resources or Forestry Agency)* to ensure the preservation and propagation of the buffer area. Forest buffer areas may also be enhanced through reforestation or other growth techniques as a form of mitigation for achieving buffer preservation requirements.

Explicit forestry management criteria are often included in a forestry or natural resources conservation ordinance. An example forest conservation ordinance from is included in the Miscellaneous portion of this site.

Section VIII Enforcement Procedures

A) (Director of *Responsible Agency)* is authorized and empowered to enforce the requirements of this ordinance in accordance with the procedures of this section.

B) If, upon inspection or investigation, the director or his/her designee is of the opinion that any person has violated any provision of this ordinance, he/she shall with reasonable promptness issue a correction notice to the person. Each such notice shall be in writing and shall describe the nature of the violation, including a reference to the provision within this ordinance which has been violated. In addition, the notice shall set a reasonable time for the abatement and correction of the violation.

C) If it is determined that the violation or violations continue after the time fixed for abatement and correction has expired, the director shall issue a citation by certified mail to the person who is in violation. Each such notice shall be in writing and shall describe the nature of the violation, including a reference to the provision within this ordinance which has been violated, and what penalty, if any, is proposed to be assessed. The person charged has thirty (30) days within which to contest the citation or proposed assessment of penalty and to file a request for a hearing with the director or his designee. At the conclusion of this hearing, the director or his designee will issue a final order, subject to appeal to the appropriate authority. If, within thirty (30) days from the receipt of the citation issued by the director, the person fails to contest the citation or proposed assessment of penalty, the citation or proposed

assessment of penalty shall be deemed the final order of the director.

D) Any person who violates any provision of this ordinance may be liable for any cost or expenses incurred as a result thereof by the agency.

E) Penalties which may be assessed for those deemed to be in violation may include:

1) A civil penalty not to exceed one thousand dollars ($1,000.00) for each violation with each days continuance considered a separate violation.

2) A criminal penalty in the form of a fine of not more than one thousand dollars ($1,000.00) for each violation or imprisonment for not more than ninety (90) days, or both. Every day that such violations shall continue will be considered a separate offense.

3) Anyone who knowingly makes any false statements in any application, record, plat , or plan required by this ordinance shall upon conviction be punished by a fine of not more than one thousand dollars ($1,000.00) for each violation or imprisonment for not more than thirty (30) days, or both

Specific penalties will vary between communities. and should reflect realistically enforceable penalties given the political realities of a jurisdiction.

F) In addition to any other sanctions listed in this ordinance, a person who fails to comply with the provisions of this buffer ordinance shall be liable to the agency in a civil action for damages in an amount equal to twice the cost of restoring the buffer. Damages that are recovered in accordance with this action shall be used for the restoration of buffer systems or for the administration of programs for the protection and restoration of water quality, streams, wetlands, and floodplains.

Section IX Waivers/Variances

A) This ordinance shall apply to all proposed development except for that development which prior to the effective date of this ordinance:

1) Is covered by a valid, unexpired plat in accordance with development regulations

2) Is covered by a current, executed public works agreement

3) Is covered by a valid, unexpired building permit

4) Has been accepted to apply for a building permit

5) Has been granted a waiver in accordance with current development regulations.

B) The director of the agency may grant a variance for the following:

1) Those projects or activities where it can be demonstrated that strict compliance with the ordinance would result in practical difficulty or financial hardship

2) Those projects or activities serving a public need where no

feasible alternative is available.

3) The repair and maintenance of public improvements where avoidance and minimization of adverse impacts to nontidal wetlands and associated aquatic ecosystems have been addressed

4) For those developments which have had buffers applied in conformance with previously issued requirements.

C) Waivers for development may also be granted in two additional forms, if deemed appropriate by the director:

1) The buffer width made be relaxed and the buffer permitted to become narrower at some points as long as the average width of the buffer meets the minimum requirement. This averaging of the buffer may be used to allow for the presence of an existing structure or to recover a lost lot, as long as the streamside zone (Zone I) is not disturbed by the narrowing, and no new structures are built within the one hundred (100) year floodplain.

2) (*Planning Agency*) may offer credit for additional density elsewhere on the site in compensation for the loss of developable land due to the requirements of this ordinance. This compensation may increase the total number of dwelling units on the site up to the amount permitted under the base zoning.

D) The applicant shall submit a written request for a variance to the director of the agency. The application shall include specific reasons justifying the variance and any other information necessary to evaluate the proposed variance request. The agency may require an alternatives analysis that clearly demonstrates that no other feasible alternatives exist and that minimal impact will occur as a result of the project or development.

E) In granting a request for a variance, the director of the agency may require site design, landscape planting, fencing, the placement of signs, and the establishment of water quality best management practices in order to reduce adverse impacts on water quality, streams, wetlands, and floodplains.

Section X. Conflict With Other Regulations

Where the standards and management requirements of this buffer ordinance are in conflict with other laws, regulations, and policies regarding streams, steep slopes, erodible soils, wetlands, floodplains, timber harvesting, land disturbance activities or other environmental protective measures, the more restrictive shall apply.

References

Heraty, M. 1993. Riparian buffer programs: a guide to developing and implementing a riparian buffer program as an urban best management practice. Metropolitan Washington Council of Governments. US EPA Office of Wetlands, Oceans and Watersheds. Washington, DC.

Schueler, T. 1995. Site planning for urban stream protection. Metropolitan Washington Council of Governments. US EPA Office of Wetlands, Oceans and Watersheds. Washington, DC.

Welsch, D. 1991. Riparian forest buffers. US Department of Agriculture, Forest Service. Forest Resources Management. FS Pub. No. NA-PR-07-91. Radnor, PA.

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