Nonpoint source water quality problems affect every river basin in the State to various degrees depending upon the land uses and activities, soil conditions, hydrology and geology of the area. The nature and severity of the water quality problems are unique to each watershed. Both designated and non-designated area WQM plans describe nonpoint source problems for their areas.

The range of nonpoint source problems in the non-designated area is contained in the WQMP for each river basin. Critical Area Reports and their successor, Watershed Planning Profiles, identify specific land uses, physical characteristics and analyze water quality data. Included in these profiles are nonpoint source management and control recommendations.

Clean Water Act Section 319 funded projects are also included in this update and described below.

Statewide nonpoint source management and control issues are addressed in specialized nonpoint source reports. Brine Disposal From Oil and Gas Production in Ohio identified those portions of the State where contamination/spills reports have been filed as well as geological formations where problems are most likely to occur. The Report assesses management issues related to brine problems. (1982) Control of Water Pollution From Construction Activities discusses the relative importance of construction site erosion as a nonpoint source water quality issue in Ohio. (1984) The Model On-Site Sewage Disposal Management Program for the State of Ohio reviews current regulatory and administrative framework for installation, operation and inspection of on-site sewage disposal systems and makes recommendations regarding needed legal, financial and administrative actions. (1984) A screening procedure which identifies areas potentially unsuitable for on-site systems is described in PEMS0: The On-Site Screening Procedure Report. (1984)

Statewide strategies have been developed to coordinate the activities of the many governmental and private entities involved in control and management of nonpoint source problems. In 1986, a nonpoint source project review group was established to share information and coordinate implementation activities.

Ohio's WQMP is intended to be a framework for nonpoint source pollution control. Ohio's WQMP contains a five part approach to nonpoint source control and management: develop Statewide coordination and cooperation among actors; target planning and implementation at the watershed level; provide watershed profiles to identify sources and implementation needs; educate professionals as well as land owners about the problems of nonpoint source pollution and techniques for managing the problems; and monitor Ohio's streams, lakes and ground water resources to identify critical areas and track progress in controlling nonpoint sources.
Nonpoint Source Water Quality Problem Areas in Ohio (PAL) was first prepared in 1981 for agricultural problems. The list identifies the major drainage basin, watershed and county(s) in which the problem area is located. The current list contains agricultural affected watersheds, abandoned coal mine affected watersheds and potential brine affected watersheds. (1985)

The Ohio Agricultural Pollution Abatement Strategy identifies the major agricultural nonpoint source water quality issues for Ohio. Recommendations directed at local, State and federal agencies are presented which, if implemented, will result in improved management and control of agricultural nonpoint source pollution in Ohio. (1984)

Ohio's Soil and Water Conservation Districts: How They Can Fulfill Agricultural Nonpoint Source Pollution Control Responsibilities at the Local Level further assesses Ohio's institutional and program capabilities for agricultural nonpoint source management. The report identifies the resource needs of this important group of local nonpoint source management agencies. (1985)

The purpose of the State of Ohio Phosphorus Reduction Strategy for Lake Erie (1985) and its update (1989) is to quantify phosphorus loadings into Lake Erie from Ohio, and to identify the mechanisms which, if implemented, would reduce phosphorus inputs to the Lake. Both point and nonpoint sources of phosphorus are addressed, some for the first time from a phosphorus control perspective. It outlines the beginning steps needed to achieve Ohio's target reduction of 1365 MT. Ohio's Phosphorus Reduction Strategy will be put into effect in stages over a period of years, incorporating water quality monitoring and various types of evaluation techniques to track progress. Over the long term, improvement in the chemical and biological health of the Lake and its tributaries will be monitored. Anticipated costs of the control program and the entities responsible for implementing each aspect also are identified.

In 1985, based on the recommendations of the states provinces, the International Joint Commission (IJC) identified forty-two Areas of Concern (AOC) in the Great Lakes basin. An AOC is an area where water uses are impaired or where objectives of the Great Lakes Water
Quality Agreement or local environmental standards are not being achieved. Four AOCs are located in Ohio: Ashtabula, Cuyahoga, Black and Maumee rivers. The Stage I reports for the Maumee and the Ashtabula AOCs are described in their individual basins below. Technical advisory committee activities are described in element 130.6(c)(5): Management Agencies for all four AOCs.

Nonpoint Source Education Demonstration Project Evaluation Report (1981-1987) This report contains an overview of nonpoint source pollution abatement projects conducted from 1981 through 1987 for which Ohio EPA coordinated federal funding assistance. A total of 33 nonpoint source projects were fully or partially funded by Ohio EPA using $250,000 of federal funds. The projects were designed to increase awareness of nonpoint source pollution and landowner adoption of pollution control practices as well as increasing cooperation between local, state and federal agencies. The activities funded and the results accomplished by these projects show that significant implementation of best management practices can be encouraged and coordinated at relatively low funding levels.

Nonpoint source water quality monitoring is a major program need. To address that need, a nonpoint source water quality monitoring task force was formed and made recommendations to Ohio EPA in 1987. Further, a survey of public and private entities performing nonpoint source monitoring was conducted and a report on findings prepared. This effort was expanded upon in the preparation of the Ohio Nonpoint Source Assessment. (1988) The Assessment was prepared in response to the 1987 amendments to the Clean Water Act. This is the first comprehensive effort to assess the water quality effects of nonpoint pollution within Ohio. The Assessment helps State and local agencies allocate and manage funds more effectively.

The 1990 update of the Assessment was changed in format as a result of suggestions received during the public hearing on the 1988 Assessment. The initial Assessment was prepared to provide a comprehensive Statewide assessment of streams, lakes and ground water areas affected or threatened by nonpoint sources of pollution utilizing all the available data. Given the magnitude of these water

In order to target implementation resources to critical areas of nonpoint source pollution, the Ohio Nonpoint Source Assessment and Ohio Nonpoint Source Management Program will be refined and updated. Future updates will include incorporation of data and recommendations from the updates of the State of Ohio Phosphorus Reduction Strategy for Lake Erie, and other strategies and reports. The approval of the Assessment and Management Program by U.S. EPA has permitted development of the CWA Section 319 funds application which will speed up nonpoint source implementation activities.
resources in Ohio, and the significant data base accumulated, the initial Assessment was too voluminous and difficult for entities to use at the local level. To make the Assessment easier to use when evaluating local situations, it has been reorganized into five regional assessment documents. The regional documents are complete within themselves and provide an easier and quicker reference to streams and lakes within specific drainage basins and to ground water contamination incidents. (Please note that ground water aquifers can span regional boundaries.) Additional graphics and data analyses have also been added to enhance data comparison and evaluation.

In response to the 1987 amendments to the Clean Water Act, the Ohio Nonpoint Source Management Program document was prepared in 1988 and approved by U.S. EPA in December 1989. The document was updated in late 1992 and submitted to U.S. EPA in December. This document identifies the best management practices (BMPs) and measures which will be used to achieve the implementation of BMPs and develops a schedule for BMP implementation.

Strengthening Ohio's Agricultural Pollution Abatement Legislation and Control Problem program addresses the significant changes proposed for Ohio's agricultural pollution control law. These changes, when enacted, will require a protracted rule development and public participation process, and training of state and Soil and Water Conservation Service staff. This project will help ODNR carry out and institutionalize these changes. This CWA Section 319 funded program is administered by the Ohio Department of Natural Resources Division of Soil and Water Conservation (ODNR-DSWC)(1990).

The program Making Manure and Nutrient Management Work provides an education, training and data management component to carry ODNR's newly established Manure and Nutrient Management Program. This CWA Section 319 funded program is administered by ODNR-DSWC (1990).

The Bulk Fertilizer Regulations program prepares a study of the additional costs involved for fertilizer licensees to implement new bulk fertilizer regulations. The agricultural engineer which would be hired
would approve sites for existing and new fertilizer installations and ensure compliance with storing and handling regulations. This CWA Section 319 funded program is administered by the Ohio Department of Agriculture (ODA)(1990).

The Nonpoint Source Education in Targeted Watersheds project allowed SWCDs and other entities to carry out educational programs or demonstrations within watersheds or streams targeted by the Nonpoint Source Assessment. Few, if any, of these watersheds have any active nonpoint source pollution related projects. A NPS newsletter will be prepared and distributed to disseminate information and progress. This CWA Section 319 funded project is administered by Ohio EPA DWQPA (1990).

The Volunteer Lakes Education and Training Program focus will be to train citizen volunteers about pollution sources and prevention of lake pollution and the use of Secchi disks. A statewide volunteer lake database will be compiled from this information. The data base will have several purposes, including forming the basis for the eventual institutionalization of lake districts in Ohio. This CWA Section 319 funded program is administered by the Ohio Lake Management Society (1990).

The hiring of a Water Quality Specialist at the Ohio Cooperative Extension Service (OCES), will provide the OCES component to implement the Ohio Nonpoint Source Management Program. Technical recommendations and educational and training materials will be developed to supplement technical assistance programs and best management practice implementation. The hiring of the Water Quality Specialist is funded through a CWA Section 319 grant (1990).

The Implementation of Oilfield Waste Initiatives in Ohio Ground Water Protection and Management Strategy project will involve the preparation and distribution of guidance for local officials concerning brine spreading for dust and ice control. This CWA Section 319 funded project is administered by the ODNR Division of Oil and Gas (1990).
The **Integrated Urban Water Quality Management** project will coordinate all the urban water quality problems with similar solutions statewide. Assist local units of government to institutionalize construction site erosion control, storm water quantity management, and urban runoff quality control, and provide information, training, and technical assistance utilizing the resources of state, areawide and local agencies. This CWA Section 319 funded project is administered by the ODNR Division of Soil and Water Conservation (1990).

**Buffer Strip Fact Sheets** are being prepared and distributed to educate landowners about streamside buffer strips. Three fact sheets will be produced on planning and using buffer strips. A workshop on how to use this material will be organized and held. Fact sheet titles will include:

1. Restoring streambanks with vegetation,
2. Economics of filter strips,
3. Trees for ditches.

This CWA Section 319 funded project is administered by the ODNR Division of Soil and Water Conservation (1990).

**Water Quality Specialist: Ohio Department of Agriculture.** Hire an agricultural specialist to implement parts of the Ohio Nonpoint Source Management Program. The specialist will make technical and program recommendations to all agricultural nonpoint source projects. This CWA Section 319 funded position is administered by the Ohio Department of Agriculture (1990).

The **Accelerating Awareness and Use of Prescription Farming** program will expand awareness, understanding and use of prescription farming techniques and advantages to complement the ODNR/Ohio EPA phosphorus reduction program in Lake Erie and agricultural pollution control efforts elsewhere in Ohio. This CWA Section 319 funded program is administered by ODNR Division of Soil and Water Conservation (1991).

In the **Non-Agricultural Phosphorus Reduction in the Lake Erie Basin**
program, implementation projects will be developed to address urban sources of phosphorus, including sources such as construction site erosion, on-site sewage and storm water. As a result of this program, phosphorus loading to Lake Erie will be reduced. This CWA Section 319 funded program is administered by the Ohio EPA DWQPA (1991).

The Clean Lakes Program (CLP) was started in 1976 through Section 314 of the Clean Water Act, to provide financial assistance to the States for the restoration and protection of our nations lakes. The program provided grant funds for Phase I Diagnostic-Feasibility studies to determine the causes for restoration and/or protection of the lake. Additional grants, Phase II Implementation studies, would provide the financial assistance to implement the selected alternatives to achieve lake restoration and/or protection. The three Phase I Diagnostic-Feasibility studies completed in Ohio are described in the appropriate basins below. One Phase I study is still in progress and is described in the comment section in the appropriate basin.

The functions of the Technical Advisory Committees for these studies are described in elements 130.6(c)(5): Management Agencies.

Ashtabula/Grand

Primary nonpoint source problems identified in the basin include agriculture, on-site systems and brine disposal. Further information for this element can be found in the EDATA WQMP.

The Ashtabula River Remedial Action Plan Stage I Investigation Report (RAP) (1992) focuses on the lower two miles of the Ashtabula River, Ashtabula Harbor and the adjacent Lake Erie nearshore, considering the Fields Brook Superfund investigation and cleanup as a complementary project. The RAP is intended to be used as a guidance document for cleanup of the Ashtabula River AOC. It is to serve as an important step toward virtual elimination of persistent toxic substances and toward restoring and maintaining the chemical, physical and biological integrity of the Great Lakes Basin ecosystem. The resulting recommendations will draw largely on the existing framework of institutional programs, but new rules, regulations and legislation may also be identified and recommended.
Black River Basin  

The Black River Basin Remedial Action Plan Implementation project will provide technical assistance to landowners in applying conservation practices and implement an equipment buy-down program for cost-sharing on the purchase of conservation tillage equipment. This CWA Section 319 funded project is administered by the Ohio EPA DWQPA (1991).

Central Ohio River Tributaries  

Primary nonpoint source problems identified in the basin include agriculture, on-site systems, brine disposal and mine drainage. Analysis of mine drainage and mine waste disposal problems is contained in the WQMP (1980). Recommendations for management and control of these problems including identification of BMPs are included in the Plan.

Cuyahoga River Basin  

The Cuyahoga River Remedial Action Plan Nonpoint Source Education project will develop education materials dealing with NPS pollution associated with the Cuyahoga River that impact the Area of Concern. Workshops will be conducted for education and to aid input into evaluation of remedial measures for the Remedial Action Plan, Phase I. This CWA Section 319 funded project is administered by the Cuyahoga River Community Development Organization (1990).

Great Miami  

Primary nonpoint source problems in the basin include agriculture, on-site systems, animal waste and urban storm water runoff. Watershed Planning Profile for Nonpoint Source Pollution Control: Buck Creek Agricultural Demonstration Project, Champaign County, Ohio (1985), and Watershed Profile for Nonpoint Source Pollution Control: Upper Mad River; Champaign and Logan Counties, Ohio (1989) contain nonpoint source problem area identification, evaluation of best management practices and nonpoint source pollution control recommendations for the watersheds. In addition, the results of a demonstration project with the Champaign County Soil and Water Conservation District are presented in the Buck Creek Profile. The Upper Mad River Profile documents the needs for this high quality water.

The 1987 report, Animal Feedlot Inventory and Assessment Report for Darke County, documents the magnitude of animal waste related to...
water quality problems and located individual feedlots. The Upper Four Mile Creek Watershed Nonpoint Source Pollution Assessment, Preble County, Ohio (1988), examines nonpoint source contributions to water quality degradation of surface and ground water.

The Indian Lake Implementation Project will focus on the hiring of a conservation technician to work with hydrologic unit personnel and agricultural producers to install best management practices. The technician will implement a tax rebate program for agricultural producers implementing conservation plans. This CWA Section 319 funded position is administered by Ohio EPA Division of Water Quality Planning and Assessment (1990).

The Indian Lake Phase I Diagnostic/Feasibility Study was completed in 1990 with funding from a CWA Section 314 Clean Lakes Program grant. The intent of this study was to quantify incoming loads to the lake, analyze lake and stream water quality and to examine alternatives to reduce the reliance on the dredging operations. Through this analysis a comprehensive feasibility plan has been developed.

The Upper Four Mile Creek Watershed: Agricultural Nonpoint Source Pollution Abatement project will promote the proper use of agrichemicals through nutrient and pesticide management. It will also promote proper livestock watering techniques and protect soil from erosion by promoting cover crops, conservation tillage, filter strips and other methods. It will also educate producers, staff and students about agricultural NPS pollution and water quality. Will monitor water quality and assess project effectiveness. Will assist in PL-566 plan implementation. this CWA Section 319 project is administered by the Preble County SWCD (1990).

For further information on this element for the Great Miami River Basin see WQMP Content for Miami Valley Regional Planning Commission (MVRPC) and Ohio-Kentucky-Indiana (OKI).

Hocking

Primary nonpoint source problems identified in the basin include agriculture, on-site systems, brine disposal and mine drainage. An
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analysis of mine drainage and mine waste disposal problems is contained in the WQMP (1980). A spaghnum moss bog project was carried out to demonstrate low cost biological treatment of mine drainage. Recommendations for management and control of these problems, including identification of BMPs also are included in the Plan. Identification of potential on-site system problem areas for the Hocking River basin is contained in PEMSO: The On-Site System Screening Procedure Report (1984). Watershed Planning Profile for Nonpoint Source Pollution Control: Upper Rush Creek, Perry County, Ohio (1985), contains an assessment of nonpoint source pollution problems and recommendations for nonpoint source management and control. Small Community Planning Profile for Appropriate Wastewater Treatment Technology, Village of Amanda, Fairfield County, Ohio (1985), contains an assessment of the on-site system problems and alternatives for meeting wastewater treatment needs.

In the Acid Mine Drainage Treatment Using Wetland Technology project, a wetland will be constructed to intercept acid mine drainage and monitor the effectiveness of the wetland system, including the chemical, microbiotic and macrobiotic components. The final report will include a comparison with other Ohio constructed wetlands. This CWA Section 319 funded project is administered by the ODNR Division of Reclamation (1990).


Watershed Profile for Nonpoint Source Pollution Control - Upper Vermilion River; Ashland, Huron, and Richland Counties (1990). This watershed profile provides documentation on nonpoint source pollution in the upper Vermilion River. Water quality monitoring, soil sampling, and land use surveys were used to evaluate potential pollution sources

Agricultural controls are especially critical in this basin due to the need to reduce total phosphorus loading to Lake Erie.
and water quality impacts. The report contains recommendations for best management practices to be used in addressing the identified pollution problems as well as recommendations on prioritizing areas for funding and pollution abatement efforts.

In the Upper Vermilion Watershed project a nutrient management component in the Upper Vermilion River watershed will be implemented. Soil and manure samples will be taken and analyzed and used to prepare and implement nutrient management plans. A limited monitoring program will document changes in water quality. This CWA Section 319 funded project is administered by the Ohio State University Research Foundation (1990).

The Impact of BMPs on Surface Runoff and Ground Water in a Solutioned Limestone Area of Ohio project will examine Best Management Practices to be implemented in an area of solutioned limestone to assess impacts on surface and ground water quality. Sampling of wells and surface water on a seasonal and storm event basis around a sinkhole will be compared to a control area. Data will be analyzed for hydrologic relationships and BMP impacts. Comparisons to DRASTIC data will be made. This CWA Section 319 funded project is administered by ODNR Division of Water (1990).

Lake Erie

Enhancing Phosphorus Reduction Efforts From Agriculture in the Central and East Lake Erie Basin (1990). Through the development of local phosphorus reduction committee, localized agricultural and control strategies, nutrient management plans based on the principles of prescription farming, increased acreage in fall cover, and altered cropping practices, the phosphorus load to Lake Erie from the central and eastern Lake Erie drainage basin will be reduced. This CWA Section 319 funded project is administered by the ODNR Division of Soil and Water Conservation.

Little Beaver

Primary nonpoint source problems in the basin included brine disposal and mine drainage as identified in the WQMP (1980).

Little Miami/Southwest Ohio River Tributaries

Primary nonpoint source problems in the basins include agriculture and animal wastes as identified in the WQMP (1980). Critical area
demonstration projects were established with SWCDs in Cowan-Dutch Creeks and Caesar Creek (mainstem and north branch). Activities included identification of problem areas and provision of technical assistance for conservation techniques and animal waste management. The results of the demonstration projects as well as an assessment of nonpoint source water quality problems for these watersheds are contained in Cowan-Dutch Creeks Agricultural Critical Areas Project, Clinton County, Ohio (1984), and Caesar Creek Agricultural Critical Area Project, Warren, Clinton and Green Counties, Ohio (1984). These reports contain nonpoint source management and control recommendations for the watersheds. A demonstration project was conducted with the Adams County SWCD which focused on reducing erosion in the Ohio Brush Creek watershed. Watershed Planning Profile for Nonpoint Source Pollution Control: Ohio Brush Creek, Adams County, Ohio (1985) contains an assessment of nonpoint source problem areas, evaluation of the demonstration project results and recommendations for nonpoint source management and control for the watershed. Further information for this element can be found in the EDATA WQMP.

The Upper East Fork, Little Miami River project will accelerate technical assistance and educational activities to improve on-site wastewater treatment and accelerate application of conservation tillage, cover crops, grassed waterways, nutrient management, filter strips, and other BMPs to reduce sediment and nutrient loading in the Upper East Fork. This CWA Section 319 funded project is administered by the Brown, Clinton and Highland Counties SWCDs (1991).

Maumee/Portage

Primary nonpoint source problems in the river basins are agriculture (phosphorus), on-site systems and urban storm water. Analysis of agricultural and on-site problems is contained in the WQMP. (1980) A detailed prioritization and evaluation was prepared for watersheds in Williams, Fulton, Defiance, Henry and Paulding counties. Existing conditions and technical alternatives were identified and discussed in WQMP. Control measures for agricultural runoff and on-site systems were presented in WQMP (1980). The State of Ohio Phosphorus Reduction Strategy for Lake Erie update (1989) contains phosphorus Agricultural controls are especially critical in this basin due to the need to reduce total phosphorus loading into Lake Erie pursuant to the State of Ohio Phosphorus Reduction Strategy for Lake Erie.
loading estimates and recommendations for phosphorus reduction for watersheds in Maumee/Portage River basin.

Heavy metals and organic chemical sediment contamination has led to the Lower Maumee River being classified as an Area of Concern (Great Lakes Water Quality Board, 1985). The Lower Maumee River Remedial Action Plan Stage I: Investigation Report was completed in 1992 and is organized to first discuss the environmental setting, and the existing beneficial uses including current water biological and sediment quality data. It also describes intensive or short-term monitoring surveys which have occurred in the RAP area along with an analysis of the water biological and sediment quality data.

This report also describes water pollution sources within the RAP area and the impacts of each of these sources on the beneficial uses. These include phosphorus sources, NPDES permitted wastewater dischargers for the industrial and municipal sectors, package sewage treatment plants, agricultural runoff, open water disposal of dredged materials, urban storm water, home sewage disposal, active and closed landfills/dumpsites and pits, ponds and lagoons, and atmospheric deposition related to acid rain. Maps in each source section indicate the level of degradation in the individual, smaller watersheds within the AOC.

The Enhancing phosphorus reduction efforts in the Maumee River Remedial Action Plan Area of Concern program through the development of local phosphorus reduction committee, localized agricultural phosphorus reduction goals and control strategies, nutrient management plans based on the principles of prescription farming, increased acreage in fall cover, and altered cropping practices, the phosphorus load to Lake Erie from the Maumee River Remedial Action Plan Area of Concern will be reduced. This CWA Section 319 program is administered by the ODNR-DSWC (1990).

The Upper Tiffin Watershed Protection PL-566 project will treat high erosion areas (20,100 acres) and water quality areas (139,000 acres) to reduce off-site sediment and phosphorus transport. Soil Conservation Service funding will provide financial assistance for practices to
maintain cover and reduce erosion on basin cropland in the 215,000 acre watershed. This CWA Section 319 funded project is administered by the Soil Conservation Service (1990).

Upper Lost Creek - Tracking and Monitoring Effectiveness of USDA Best Management Practices (1990). As the conservation compliance provisions of the Food Security Act (FSA) are implemented, changes in USDA agricultural management practices applied in Lost Creek Watershed will be tracked and monitored to assess the effectiveness of the Food Security Act and the resulting water quality benefits.

This CWA Section 319 funded program is administered by the Defiance County SWCD (1990).

In the Ottawa County Agricultural Education and Implementation project the Ottawa County SWCD will work with farmers to increase their knowledge and skill in using conservation practices. The Toledo Metropolitan Area Council of Governments will coordinate the project, and prepare reports to document the conservation improvements accomplished. This CWA Section 319 funded project is administered by the Ottawa County SWCD (1990).

The Tracking Changes in Nonpoint Source Phosphorus Loads with Fertility Management project will develop methodology and prediction models to evaluate the impacts of phosphorus reduction best management practices, including fertilizer input management. It will be integrated with other Section 319 projects to evaluate the success of these projects in reducing phosphorus inputs to Lake Erie. This CWA Section 319 funded project is administered by the Ohio State University Research Foundation (1990).

The Dog Creek Nonpoint Source Pollution Reduction Strategy project will implement a multifaceted approach to develop, demonstrate and install nonpoint source reduction practices. No-till farming, wetland development, windbreak promotion and establishment, and vegetative berms will be promoted to reduce agri-chemical, and sediment loads to improve water quality. This CWA Section 319 funded project is administered by the Van Wert County SWCD (1991).
The Flat Creek Watershed Water Quality Improvement project will focus on the reduction of sediment loading and delivery of pollutants through conservation farming and demonstration, development of manure and nutrient management plans, promotion of ASCS/ACP cost share funds, water quality testing and intense educational efforts, increase acreage in fall cover, and improve management practices. This CWA Section 319 funded project is administered by the Paulding County SWCD (1991).

In the Ottawa River/Swan Creek Urban Runoff Control project the Toledo Metropolitan Area Council of Governments (TMACOG) will work with the Lucas County SWCD, Bowling Green State University and developers to demonstrate erosion control during construction of a commercial site. Install and demonstrate oil adsorbent catch basin. Put construction site controls into use in both watersheds by providing technical assistance and cost sharing and hold seminars to educate developers and engineers. This CWA Section 319 funded project is administered by TMACOG (1991).

The Harrison Lake/Mill Creek Watershed Management project will provide an accelerated and concentrated program of information and education, and installation of water quality projects in the Mill Creek watershed. Develop a volunteer oriented long-term lake water quality monitoring program. This CWA Section 319 funded project is administered by the Fulton County SWCD (1991).

The Maumee River Basin Remedial Action Plan Implementation project will provide technical assistance to landowners in applying conservation practices and implement an equipment buy-down program for cost-sharing on the purchase of conservation tillage equipment. Conduct a livestock waste evaluation program in Fulton and Putnam counties. Provide technical assistance to landowners in applying conservation practices. This CWA Section 319 funded project is administered by the Ohio EPA DWQPA (1991).

Mill Creek The Winton Lake Phase I Diagnostic/Feasibility Study was completed in (1989) with funding from a CWA Section 314 Clean Lakes Program The Phase II Implementation Study was not funded.
grant. The intent of this study was to determine the causes of the massive sediment loading that occurs in this urban watershed and determine feasible means to correct this problem.

Muskingum

Primary nonpoint source problems in the river basin are agriculture, brine disposal and mine drainage. Mine drainage is addressed in detail in the WQMP. (1980) Watershed Profile for Nonpoint Source Pollution Control: Buffalo Fork; Guernsey, Muskingum and Noble Counties, Ohio (1989) and Watershed Profile for Nonpoint Source Pollution Control: Rocky Fork; Knox and Licking Counties, Ohio (1989) contain nonpoint source problem area identification, evaluation of best management practices and nonpoint source pollution control recommendations for the watersheds. Also, six education and demonstration projects have been completed in the river basin. A residential on-site sewage disposal improvement program was funded for Morrow County to survey conditions of on-site systems, develop pumper and installer standards and educate homeowners. Education programs on oil and gas well site restoration and education programs were completed in Holmes, Ashland, Coshocton, Perry and Morrow counties.

The Wills Creek Watershed is rated as the number one total sediment contributor in Ohio. Over 34,000 acres of woodland are grazed, with an average of 5.8 tons per acre of sediment loss annually. Nearly 200,000 tons of soil loss are attributed to grazed woodland within the watershed. Technical assistance and implementation of BMPs to control erosion from grazed forestland will be addressed in this project. This CWA Section 319 funded project is administered by the Guernsey County SWCD (1990).

The Middle Branch of the Nimishillen Creek, Water Quality Improvement project will focus on urban nonpoint source in the Middle Branch of Nimishillen Creek. An educational program addressing septic system maintenance will be initiated with homeowners. The project will also assist in the repair of on-site sewage systems and design ways to correct laundry room/basement hookups to the owners' current system. This CWA Section 319 funded project is administered NEFCO has prepared NPS studies for this area which may be useful. NEFCO is also a member of the Water Quality Committee formed by the SWCD for this project.

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by the Stark County SWCD (1991).

The Muskingum County Dillon Lake Watershed project will be implemented in two phases. Phase I will address the identification and inventory of failed residential on-site sewage systems and abandoned wells and the sealing of some of the abandoned wells. Phase II will identify NPS loading to Dillon Lake from three subwatersheds and prepare and implement watershed management plans. This CWA Section 319 funded project is administered by the Muskingum County SWCD (1991).

Tropic Coal Refuse and Acid Mine Discharge (AMD) Abatement, Black Fork of Moxahala Creek (1991). Reclamation of 17 acres of coal refuse and 3 acres of AMD precipitate within the floodplain of Black Fork would involve regrading refuse, treatment with bactericide, routing of underground mine flow into wetland, resoiling with composted yard waste and revegetation. This project includes monitoring of the wetland. This CWA Section 319 funded project includes monitoring of the wetland. This CWA Section 319 funded project is administered by the ODNR Division of Reclamation.

The Lower Muskingum Sediment Control project will focus on the reduction of grazed woodland and associated sediment problems in the lower Muskingum watershed. Work directly with landowners to install BMPs to: 1) Improve water quality, 2) Improve woodlands, and 3) Improve the management of the resource base. This CWA Section 319 funded project is administered by the Morgan County SWCD (1991).

A Phase I Diagnostic/Feasibility Water Quality Study in Dillon Lake and its Watershed is currently being conducted. Ohio EPA received from a Clean Water Act Section 314 Clean Lakes Program Grant to conduct the study. The study will determine the causes and extent of pollution, evaluate possible solutions, and recommend the most feasible and cost effective measures for restoring and protecting water quality at Dillon Lake, the Ohio EPA has collected water quality data from the lake and watershed, sediment samples from the lake bottom and physical and biological data. The Muskingum SWCD and the USGS are also collecting data from Dillon Lake.
In the East Branch, Rocky River Urban Nonpoint Source project municipal officials and local developers will be trained to properly plan and install erosion control practices. Educate and mobilize local citizens and officials in urban pollution control. This CWA Section 319 funded project will be administered by the Cuyahoga County SWCD (1991).

Primary nonpoint source problems in the river basin are agriculture and on-site. Agricultural nonpoint source pollution problems were addressed in detail and subbasins were ranked but not prioritized, in the WQMP (1980). An agricultural critical area project was established with the Seneca County SWCD. The report, Seneca County, Ohio Agricultural Critical Area Project (1984), assesses nonpoint source water quality problems for the study area and makes recommendations for nonpoint source management and control. The State of Ohio Phosphorus Reduction Strategy for Lake Erie update (1989) contains phosphorus load estimates and recommendations for phosphorus reductions for watersheds in the Sandusky River basin.

The Impact of BMPs on Surface Runoff and Ground Water in a Solutioned Limestone Area of Ohio project will examine Best Management Practices to be implemented in an area of solutioned limestone to assess impacts on surface and ground water quality. Sampling of wells and surface water on a seasonal and storm event basis around a sinkhole will be compared to a control area. Data will be analyzed for hydrologic relationships and BMP impacts. Comparisons to DRASTIC data will be made. This CWA Section 319 funded project is administered by ODNR Division of Water (1990).

Primary nonpoint sources in the river basin are agriculture, on-site systems, urban storm water and mine drainage. Critical areas were identified by a technical subcommittee of the Policy Advisory Committee and included in the Scioto River Basin Agriculture Report (1982). The report addresses general programmatic costs, agency responsibilities, water quality data and general best management practices needs. Critical area demonstration projects were undertaken.
via contract in Buck Run (Union SWCD), Clear Creek (Highland SWCD) and Deer Creek (Madison SWCD). The results of problem area identification and provision of technical assistance, as well as recommendations for nonpoint source pollution abatement, are included in final project reports: Buck Creek Agricultural Critical Area Project, Highland County, Ohio, and Somerford Township Agricultural Critical Area Project, Madison County, Ohio. Urban Storm Water Analysis for Franklin County assesses storm water related water quality problems in the study areas. (1984)

The Reduction of Nutrients and Pesticides to the City of Columbus’s Water Supply in the Bokes Creek Watershed project compares various methods and types of fertility and pesticide management practices to determine their effect on the quality of the water entering Bokes Creek. This information will be used to develop and demonstrate the most effective measures to be implemented to reduce inputs to surface streams. This CWA Section 319 funded project is administered by the Union County SWCD and the Ohio State University Research Foundation (OSURF) (1990).

The Big Darby Creek Nonpoint Source Implementation Project - Franklin County will focus on the development of an urban and agricultural demonstration project on Hellbranch Creek and Buck Run tributaries to Big Darby Creek State Scenic River. This project involves the coordination of a multiagency/organizational structure to provide educational materials and BMPs in the watershed. This CWA Section 319 funded project is administered by the Franklin County SWCD (1990).

The Big Darby Creek Nonpoint Source Implementation project - Union County will focus on the development of an urban and agricultural demonstration project on Hellbranch Creek and Buck Run tributaries to Big Darby Creek State Scenic River. This project involves the coordination of a multiagency/organizational structure to provide educational materials and BMPs in the watershed. This CWA Section 319 funded project is administered by the Union County SWCD (1990).

The Big Darby Creek NPS Implementation project - SCS will focus on
the development of an urban and agricultural demonstration project on Hellbranch Creek and Buck Run tributaries to Big Darby Creek State Scenic River. This project involves the coordination on a multiagency/organizational structure to provide educational materials and BMPs in the watershed. This CWA Section 319 funded project is administered by the Soil Conservation Service (1990).

The Big Darby Creek NPS Implementation Project - Ohio EPA/ODNR will focus on the development of an urban and agricultural demonstration project on Hellbranch Creek and Buck Run tributaries to Big Darby Creek State Scenic River. This project involves the coordination of a multiagency/organizational structure to provide educational materials and BMPs in the watershed. This CWA Section 319 funded project is administered by the ODNR Division of Forestry (1990).

In the Ohio Buried Valley Aquifer Management Systems Evaluation Area project, funds will be used to develop educational materials for a state funded project and will support the submission of a farm overlying a buried valley aquifer as a management system evaluation area in the USDA Midwest Initiative. The program will attempt to reduce water quality impacts due to agriculture. This CWA Section 319 funded project is administered by the Ohio State University Research Foundation (1990).

The Load Allocation Development for Nonpoint Source Pollution project will focus on the development of the formal policies and procedures necessary to address load allocations for nonpoint source pollutants in each of the state’s ecoregions and test, verify and apply the developed policies and procedures in the Bokes Creek watershed. This CWA Section 319 funded project is administered by the Ohio EPA DWQPA (1991).

Primary nonpoint sources in the river basin are agriculture, on-site systems, brine disposal and mine drainage. An analysis of mine drainage and mine waste disposal problems for the river basin is contained in WQMP (1980). Watershed Planning Profile for Nonpoint Source Pollution Control: Little Raccoon Creek, Jackson/Vinton
Counties, Ohio, assesses nonpoint source pollution problems from multiple sources and makes recommendations for management and control of problems in the watershed. The problems of mine drainage are highlighted (1985).

Wabash

Primary nonpoint source problems in the river basin are agriculture, on-site systems and animal waste, WQMP (1980).

EDATA

Primary nonpoint source problems in the EDATA region are agriculture, on-site systems, construction site erosion, urban runoff, silviculture and acid mine drainage.

Volume Three of the WQMP, Preventative Measures to Abate the Pollution of Storm Water Runoff, presented and evaluated best management practices (BMPs) for control and treatment of storm water runoff, and proposed a technical and planning study process to evaluate the effectiveness of the proposed voluntary control program. The BMPs were grouped according to the type of activity or pollutant being controlled, i.e., construction, pesticide use, storm water conveyance, etc. The report recommends prevention and/or reduction of storm water pollution through on-site controls and proper conveyance of storm water. The reduction in storm water pollution is to be achieved through a voluntary program promoted through a general education program.

Volume Four of the WQMP, Nonpoint Pollution Abatement Sub-Plan for Mahoning and Trumbull Counties, 1977, comprehensively surveyed existing and proposed nonpoint source pollution programs and responsible agencies, and described the cultural and natural processes which generate nonpoint source pollution. EDATA recommended that the nonpoint source abatement program rely upon existing programs of economic incentives and voluntary adoption of best management practices to achieve nonpoint source control. The report also assessed potential sources of nonpoint source pollution using the Ohio Soil and Water Conservation Needs Inventory (1971), and inventoried conservation needs.

The WQMP report, Identification of Nonpoint Loadings to the Mill
Creek Park System, 1980, identified sediment, water quality and dredging studies developed concerning the three lakes in the Mill Creek Park Lake System. The data and studies (included in this report) were used to identify preliminarily, the most significant sources of nonpoint sources adversely impacting the lake system. Proposed and actual construction sites were evaluated for potential erosion problems. The report presented site specific mitigation plans and general BMPs to reduce nonpoint source impacts from identified nonpoint source problems, and recommended planning processes to refine nonpoint source problem identification and promote the administrative and regulatory changes necessary to implement regulations and programs to reduce nonpoint source pollution.

The Mill Creek Park Assessment, Lake Newport - Identification of Pollutant Loadings to the Mill Creek Park Lake System, 1981, assembled water quality, discharge, and land use information for the Mill Creek Park Lake System watershed. This information was used to determine general sources of pollutants to the system, estimate general loadings from sources and identify specific sources for further research as funds become available. Further quantification of specific loads and their sources is necessary to develop a remediation plan to restore beneficial and social constraints. The report identified specific storm water and on-site systems problem areas and partially documented instream and lake water quality problems, but did not disaggregate loads to determine relative nonpoint source contributions.

The report, Storm Water Runoff Mahoning and Trumbull Counties, 1981, identified storm water problem areas and recommended remedial activities necessary to reduce adverse water quality impacts from storm water runoff in these two counties. The report identified problem areas using the best professional judgement of local land resource professionals (county engineers, Soil Conservation Service, county health departments, etc.) and also evaluated each site using a Land Resource Information System, the Ohio Capability Analysis Program (OCAP). The OCAP model quantified the potential for excessive runoff and erosion if sites were denuded for development based on the USLE. Mitigation activities were then proposed for each identified site in the two-county area.
The report, *Disposal of Municipal Wastewater Treatment Sludge*, 1983, identified sludge volume generation and disposal practices for municipal wastewater treatment facilities in Mahoning and Trumbull counties. The report evaluated disposal practices for potential adverse impacts to air and water quality and recommended revised sludge disposal practices for each facility based upon environmental and economic considerations. Regulations for land spreading of sludge were presented and reviewed to inform readers of the current regulations and the environmental reasons for the regulations. This extensive review of the sludge disposal problem builds upon the 1978 WQMP document, *Municipal Wastewater Treatment*, which overviewed sludge management options.

The WQMP is being updated to identify current sludge generation rates and disposal practices for all municipal WWTPs. The update will investigate joint disposal options and facilitate implementation of joint disposal agreements in order to provide WWTP facilities with the access to optional disposal methods.

The report, *Agricultural Education to Abate Sources of Nonpoint Pollution*, 1984, reviewed agricultural sources of nonpoint source and surveyed agricultural education programs in Mahoning and Trumbull counties. Programs specifically oriented to reducing nonpoint source impacts were not identified; however, recommendations for activities to reduce nonpoint source generation and delivery were included.

The report, *Identification of Areawide Best Management Practices for Meander and Shenango Watersheds Mahoning and Trumbull Counties, Ohio*, 1985, developed two watershed-specific plans for reducing nonpoint source generation and delivery to the Meander and Shenango rivers. BMPs appropriate to the nonpoint source problems in these watersheds are identified and explained. The SCS Technical Guides for BMPs is appended to this report, and provides farm operators and land resource management professionals with both an assessment of the nonpoint source problems in the region and detailed guidance on how to implement BMPs to mitigate those problems.

The report, *Nonpoint Water Quality Ranking Mahoning and Trumbull Counties*, 1985, provides the WQMP with a document which qualifies potential erosion problem areas by watershed in those counties using the USLE and a factor for sediment yield. The report utilized OCAP to input watershed boundaries and to determine potential erosion rates for each watershed under different management conditions. Each watershed was ranked according to its potential to deliver sediment to
The revised Areawide WQMP contains analyses of both urban and rural nonpoint sources as contributors to water pollution in the Miami Valley region. In all counties except Montgomery, rural nonpoint source pollution is far more significant than urban. The analyses in the Plan are the result of modeling rather than field data. The model produces a stream segment/subwatershed estimate and ranking of pollutant loads for urban runoff, rural runoff and the combined instream impacts of the two. The Plan also sets forth the management structure for nonpoint sources. The Plan update includes on-site waste disposal studies for Darke, Greene, Miami, Montgomery and Preble counties. The 1987 report, Animal Feedlot Inventory and Assessment Report for Darke County Ohio, documents the magnitude of animal waste related to water quality problems and locates individual feedlots. The Upper Four Mile Creek Watershed Nonpoint Source Pollution Assessment, Preble County, Ohio (1988) examines nonpoint source contributions to water quality degradation of surface and ground water.

Using Darke and Montgomery counties as test areas, two techniques were developed for assessing high risk locations for ground water contamination for on-site disposal system concentrations. Both techniques use MVRPC's data on system concentrations, one in conjunction with detailed information from the Darke County soil survey, and one in conjunction with OCAP-generated data on physical characteristics including depth to bedrock, soil permeability, and depth to water table.

The Plan describes a variety of control measures for both urban and rural runoff. It recommends that Priority Subwatershed Plans (PSPs) be developed and that appropriate control measures be incorporated in these on a subwatershed basis. The Plan also sets forth the management structure for nonpoint sources.

Considerable emphasis was placed on control of pollution from on-site disposal facilities in 1985. Much of this work focuses on Darke County (Stillwater Basin) for which both a model local implementation program and a strategic plan for on-site systems management were

The existing assessment within the MVRPC WQMP for nonpoint sources of pollution needs additional analyses. The Plan should include data from various reports, i.e., NURP, LEWMS, USGS Field Studies, water quality data in STORET, and for some watersheds ACOE data is available. Additional studies on particular components of nonpoint source pollution need to be prepared (utilizing data sources listed above), including urban/rural/agricultural runoff and residuals (sludge) disposal. Urban/rural runoff control strategies should be developed as part of Priority Subwatershed Plans (PSPs).

Further analysis of nonpoint source control needs is largely dependent upon the availability and assessment of WQ data on the impacts of the various pollution sources. Such analysis should be completed when possible and the results incorporated into the WQMP.

In order to improve the status of this element, MVRPC should further analyze urban storm runoff by political jurisdiction, including needed improvements and costs, and identify unsewered areas and needed control measures for them; refine/clarify management structure with regard to DMAs for urban storm water; and integrate local storm water control system into WQMP.

The studies and plans mentioned above have been useful in addressing NPS issues in the region, but an updated comprehensive NPS component should be done. It should be watershed or subwatershed
completed. Based and should take the stormwater permit program into account.

Management of on-site systems in the region has been further strengthened through the execution of Memoranda of Understanding between MVRPC and four of the Region's county health districts. (Health districts are the DMAs for on-site systems under MVRPC’s AWQMP.) These instruments, now in effect for Darke, Miami, Montgomery and Greene counties, set forth the responsibilities of the health districts and MVRPC in attempting to reduce and control water pollution from such systems.

Memoranda of Understanding have also been executed between MVRPC and the five soil and water conservation districts serving the Region. SWCDs are the DMAs for agricultural and some urban nonpoint pollution sources under the AWQMP. Like the M.O.U.s with the health districts, these instruments also set forth the responsibilities of the parties regarding control of pollution resulting from storm runoff.

The WQMP assesses urban storm water as a source of nonpoint pollution. Modeling was employed to estimate nonpoint pollution loads generated by urban runoff for each subwatershed/stream segment of each river basin.

Subwatersheds comprising each basin are ranked according to a composite pollution index. Various control measures for urban runoff are described and the development of Priority Subwatershed Plans is recommended.

In 1985, a major study pertaining to urban storm runoff was completed. An Evaluation of the Current and Future Use of Runoff Control/Sediment Abatement Legislation for Development Sites as a Nonpoint Source Pollution Control Techniques in Miami Valley Communities examines five jurisdictions in the Miami Valley region which have enacted RC/SA legislation based on MVRPC’s model ordinance. The study compares each local law with the model, reviews the local process for administering the regulations, and presents information on actual development projects to which they have been
applied. It also includes a method of analyzing the applicability of such legislation to other Miami Valley communities and prioritizes them according to the results of this analysis.

MVRPC developed Handbook(s) of Sub-Basin Profiles for Nonpoint Source Planning and Management in the Miami Valley Region (1989) to make the data in the Ohio NPS Assessment Report more usable for local planning commissions. In 1991 MVRPC published four county animal feedlot inventory reports: Animal Feedlot and Poultry Operation Inventory for Greene County, Ohio (Little Miami River Basin), Animal Feedlot and Poultry Operation Inventory for Miami County, Ohio (Upper Great Miami Basin), Animal Feedlot and Poultry Operation Inventory for Montgomery County, Ohio (Lower Great Miami Basin), Animal Feedlot and Poultry Operation Inventory for Preble County, Ohio (Twin Creek Basin). In addition the report Animal Feedlot and Poultry Operation Inventory and Assessment, Nonpoint Source Documentation Forms for Greene, Miami, Montgomery, and Preble Counties provided data to Ohio EPA for inclusion in its NPS database and 305(b) report. The Animal Feedlot and Poultry Operation Inventory for Darke County, Ohio (Stillwater River Basin) (1992) report updated the 1987 report for Darke County was necessitated by an increase in the poultry industry.

Recommended controls for all known significant nonpoint pollution sources are included in the Plan as follows: WWTP residuals (Volume One, p. 51ff and Volume Three, p. 510ff), septage (Volume One, p. 97ff, and Volume Four, p. 75ff), urban storm water (Volume One, p. 129ff and Volume Four, p. 273ff), and solid waste facilities (Volume One, p. 141ff and Volume Four, p. 79ff). Nonpoint source controls which are in place in priority watersheds are described in Volume Four (pp. 187-194, 217, 287-289). Best management practices also have been recommended for six priority watersheds in separate reports funded under Section 205(j): Fish Creek and Plum Creek in Portage County, Upper Tuscarawas and Mud Brook in Summit County, East Branch Nimishihlen Creek in Stark County and Chippewa Creek in Wayne County.

Finally, nonpoint source controls in effect within those watershed are

On-site wastewater treatment and disposal systems are regarded as permanent systems throughout the NEFCO area. Health and water quality problems caused by such systems need to be documented completely. Implementation strategies need to be developed in certain counties in which higher density development of public health problems occur in unsewered areas. In the remaining counties, on-site disposal problems need to have updated documentation. Runoff from storage of salt and road deicing chemicals is thought to be a significant nonpoint source of water pollution but information regarding the number and locations of storage facilities is needed by Ohio EPA. The section of CWP Volume Four which describes impacts from oil and gas production needs to be updated to reflect recent changes both in State regulations and in oil and gas production and attendant water quality problems. Information regarding nonpoint source controls in effect needs to be updated and local government implementation of nonpoint
The nonpoint sources identified in 40 CFR 130.6(c)(4)(iii) correspond to the above described sections of the Plan in the following manner:

(A) Residual waste: WWTP residuals, septage and brine, Volume Four, pp. IV-67-46 to 53 and IV-67-79 to 87, contains new recommendations for septage disposal.

(B) Land disposal: same; in addition, agricultural, solid waste and all above listed 205(j) reports except Mud Brook.

(C) Agricultural and silvicultural: agricultural and all above listed 205(j) reports. No silvicultural activities have been identified as significant nonpoint sources of pollution.

(D) Mines:

(E) Construction:

(F) Saltwater intrusion: not addressed in the Plan other than in relation to the chloride pollution described in the Upper Tuscarawas report.

(G) Urban storm water: urban storm water and all watershed reports prepared with 205(j) funding.

A Majority of the model regulations have been adopted by the City of Akron.

The Model Oil and Gas Regulations for Municipalities and Townships and an Overview of Oil and Gas Regulations in the NEFCO Region (1986) reports centered around the development of model regulations for oil and gas well drilling and brine disposal. Meetings were held throughout NEFCO's region to increase the awareness of this work. On the basis of feedback received from meeting participants, NEFCO developed model regulations for oil and gas well drilling and brine disposal. NEFCO developed this report to improve the awareness by local governments of these regulations.

The Review of Brine Production, Disposal and Pollution in Portage, Stark, Summit and Wayne Counties (1987) report is an analysis of production well reports and brine hauler data to determine the amount of brine produced and hauled in the four county area.

The Road Salt Storage Sites Inventory Data Analysis and Recommendations (1987) report is an evaluation of the distribution of road salt and/or other materials, storage sites within the NEFCO source controls needs to be evaluated to determine whether additional or updated recommendations are needed. Work with member local governments to develop appropriate control strategies for nonpoint source pollution including stormwater should continue.
region, examination of the adequacy of such facilities and their
distribution, the types and amounts of materials used and the
examination of problems evolving from improper storage practices.
the Road Salt Storage Sites Inventory Data Analysis and
Recommendations (1987) report includes an inventory of all storage
sites, the type of facilities and their distribution, the types and amounts
of materials used and an examination of problems evolving from
improper storage practices.

The East Branch Nimishillen Creek Watershed Nonpoint Source
Pollution Implementation Cost Study (1988) report is an update of the
nonpoint source assessment and implementation plan for the East
Branch Nimishillen Creek Watershed done by NEFCO in 1985. The
watershed was identified by Ohio EPA in a 1988 statewide assessment
as a watershed that had been "impacted" and "impaired" by nonpoint
source pollution. This report was developed to determine the extent
and locations of nonpoint source pollution and to qualify the state for
funds to mitigate this pollution.

The Upper Tuscarawas River Watershed Nonpoint Source Pollution
Implementation Cost Study (1988) report is an update of the 1985
nonpoint source pollution control study of the watershed. The Upper
Tuscarawas River Watershed was identified by the Ohio EPA in a 1988
statewide assessment as a watershed that had been impaired by
nonpoint source pollution. This report was developed to determine the
extent and locations of nonpoint source pollution and to qualify the
state for funds to mitigate this pollution.

The Chippewa Creek Nonpoint Source Pollution Control
Implementation Cost Study - Phase I (1989) report categorizes seven
major nonpoint source pollution sources identified for the Chippewa
Creek Watershed in an assessment done by NEFCO in 1984. As part
of the current study, a Chippewa Creek Watershed Nonpoint Source
Pollution Study Committee was formed. The identification of
additional pollution sources and recommendations for pollution
abatement were recommended by the committee. The information
from this report will be used to determine which nonpoint sources of
pollution warrant the most attention, and as a basis to develop studies
and projects to address the problems.

The Analysis of Nonpoint Source Pollution within the Lake Hodgson Watershed Phase I (1989) report is an analysis of contributors of nonpoint source pollution in the watershed. An extensive review of existing water quality data and land use data was conducted. Agriculture and on-site sewage disposal systems were the largest contributors of nonpoint source pollution in the watershed. The Analysis of Nonpoint Source Pollution Within the Lake Hodgson Watershed - Phase II (1990) report focused on the development of a framework to determine costs for implementation of methods of abating the impacts of nonpoint source pollution on the watershed. The Lake Hodgson Nonpoint Source Monitoring Plan (1990) was developed with recognition that excess nutrients appear to be the primary pollutant to Lake Hodgson. A variety of sources are implicated including rural residential development and agricultural runoff. The monitoring sites were selected to differentiate contributions from various areas of the watershed.

An Inventory of Animal Waste Sites in the Upper Killbuck Creek Watershed - Wayne County, Ohio (1991) report identifies the number of animal farms and their distribution within the Upper Killbuck Creek watershed. The Killbuck Creek and several of its tributaries have been identified in the Nonpoint Source Assessment as being impacted by nonpoint source pollution to varying extents. Wayne County has some of the largest concentrations of animal feedlot operations in the State. A map showing the distribution of these operations was produced.

The Springfield Lake Water Quality Task Force - Phase I (1991) was formed to facilitate discussions on protecting the lake. Data from the 1988-89 Volunteer Lake Monitoring Program showed that the lake exhibited good water clarity and in a mesotrophic condition. A series of educational workshops were hosted by NEFCO for the officials in the surrounding communities to facilitate the development of a management plan.

The report A Characterization of Point Source and Nonpoint Source Pollution in the Middle Branch of the Nimishillen Creek Watershed -
Phase I Stark County, Ohio (1991) included a description of the watershed and subwatersheds, landuses, an update of point sources of pollution and identification of possible nonpoint sources of pollution. The Middle Branch Nimishillen Creek Study - Phase II Monitoring Plan (1991) report is a characterization of the effects of septic tank contamination to area waterways as well as to assist the Stark SWCD in evaluating the effectiveness of septic tank remediation, under a Section 319 Clean Water Act grant, to improve water quality in the Middle Branch of the Nimishillen Creek. A monitoring plan is described for three subwatersheds.

The Water Quality Impacts from Septage Spreading - Phase I Stark County (1991) report describes the evaluation of a stream segment for impacts from land applied septage. Site characteristics including soils, geology and land use land cover were described. Analysis of the geology in the study area revealed highly permeable soils and a connection of ground water to surface water. Although analysis of the water samples failed to indicate contamination of the stream by human waste, agricultural contributions were present. Best management practices were recommended for land applied septage disposal.

Since FY 1988 through FY 1992 NEFCO has administered the operation of a Volunteer Lake Monitoring Program (VLMP) in their four county region which includes Portage, Stark, Summit and Wayne counties. Secchi depth measurements are taken and Carlson Trophic State Index (TSI) values are calculated for the lakes in the program. As a spinoff of the VLMP, NEFCO started a Volunteer Lake Sampling Program FY 1991. In this program chlorophyll a and total phosphorus samples are collected for selected lakes in the VLMP. In the 1992 sampling season, NEFCO implemented a program to mail the samples to the approved laboratory. Problems developed with storage of the samples and the project was discontinued. Associated reports of the VLMP and sampling program are listed in Attachment B.

The Portage Lakes Study - Phase I (1991) report is a study of lake and watershed data compiled in an attempt to characterize the pollution contributors causing degradation of water quality in the Portage Lakes region. The Portage Lakes Task Force (1991) was formed to facilitate

The Portage Lakes studies need to be continued to better understand the types and sources of pollution affecting the Lakes and to increase the awareness and coordination of the various agencies and activities located within the watershed.
discussions on the pollution problems in the region and secure funding for remediation measures. The Portage Lakes Study - Phase I Landuse Description (1991) report is an analysis of the landuse in the Portage Lakes watershed. The data for the analysis were provided by the Ohio Department of Natural Resources (ODNR) - Division of Soil and Water through the Ohio Capability Analysis Program (OCAP). A series of five landuse maps were produced as a result of this analysis. The Portage Lakes Study - Phase II Point and Nonpoint Source Information (1992) report provided insight into the pollution sources that are largely responsible for degradation of water quality in the Portage Lakes. this report provided the initial presentation of impacts by nutrient and sediment contributors and a description and discussion of the types and sources of pollution.

The Sippo Lake Clean Lakes Program Phase I Diagnostic/Feasibility Study (1992) assembled the causes and extent of pollution, evaluated possible solutions and recommendations were made for the most feasible and cost effective measures for restoring and protecting water quality at Sippo Lake. NEFCO's role in the Phase I study was to assist in data gathering, analysis and to compile and document the data into a complete Phase I study.

A phase II Implementation Study is currently in progress for Sippo Lake. Restoration activities under this study include conservation and education efforts, as well as dam reconstruction, dredging, on-stream sediment basins and macrophyte harvesting.
NOACA

NOACA has developed a series of NPS assessment tools during the plan development and continuing planning phase to date. These include a comprehensive mapping of small watersheds in the area NOACA WQM Technical Appendix A07, Delineation of Study Area Subbasins, 1978, the development of the "biological reach" concept NOACA WQM Technical Appendix A35, Catalog of Technical Products, and the analysis of the Cuyahoga Restoration NOACA WQM Technical Appendix A10, Analysis of Cuyahoga Restoration Study Suspended Sediment Data, 1978. A method for applying the areawide nonpoint source controls: The Storm Water Runoff/Sediment Control Subplan, recommended that comprehensive storm water/sediment policies be implemented areawide, but most particularly in developing areas. The NOACA Land Use Element 24978 identified areas within the designated planning area projected to be developed. The Environmental Health Subplan recommended a comprehensive and vigorous management program for home septic systems areawide, but particularly in Geauga, Medina, southern Lorain, and eastern Lake counties. The Rivers and Waterways Subplan recommended areawide enactment of environmental review procedures for local zoning and subdivision reviews, and Statewide legislation to protect critical areas in watersheds. The original plan development also involved specialized studies addressing Best Management Practices on rural lands NOACA WQM Technical Appendix A03, Control of Nonpoint Source Pollution from Rural Lands Through the Use of Best Management Practices, 1978, inventory of on-site systems areawide, a review of environmental impacts of road salt usage NOACA WQM Technical Appendix A23, Road Salt: A Profile of Environmental and Property Impacts, 1978, a ranking of all area subbasins for the Rural Water Program NOACA WQM Technical Appendix A42, Ranking of Subbasins for the Rural Water Program, 1981, soil erosion surveys of selected area small watersheds NOACA WQM Technical Appendix A43, Soil Erosion Survey of Seven Selected Subbasins in Cuyahoga and Lake Counties, Ohio: Data for All Basins Except Abrams Creek: (Cuyahoga and Lake SWCDs), 1981 and NOACA WQM Technical Appendix A44, Soil Erosion of Seven Selected Subbasins in Cuyahoga and Lake Counties, Ohio: Data for Abrams Creek: (Cuyahoga SWCD), 1981 and a study of contributing source impacts in the Mentor Marsh NOACA WQM Technical Appendix A49, Mentor Marsh, Lake

Participate in development of Cuyahoga River Remedial Action Plan Stage 2 and incorporate into plan findings and implementation related to nonpoint sources including storm water and combined sewer overflows. Incorporate into plan needs passed on storm water permitting procedures.

Existing land use needs to be updated, and projected land use needs to be reviewed and revised as a basis for maintaining an up to date understanding of nonpoint problems. Identification of nonpoint source also needs to be updated as new water quality information becomes available from sources such as the Ohio Nonpoint Source Assessment. For priority watersheds additional assessment is needed for nonpoint source problems and control alternatives.

NOACA continues to provide planning support to the Cuyahoga Remedial Action Plan and the Black River Remedial Action Plan which can provide a basis for nonpoint source control in the two respective watersheds. NOACA development and implementation of a GIS system in coordinations with area water quality management agencies and state agencies will be continued for evaluating nonpoint source problems. NOACA participation in the planning, development and implementation of the Ohio EPA storm water permits will be continued to provide for enhancing local participation in the program.
The Regional Water Quality Management Plan describes existing and projected land uses, and estimates urban and rural runoff loads by drainage area and their water quality impacts in the basin chapters. Nonpoint source control alternatives, recommendations and costs are also presented in the basin chapters. Rural acreage needing treatment to reduce soil loss to allowable levels are estimated by type of land use by drainage area. (1977) Additional assessments of rural sources of pollution, with an emphasis on local conservation agency perspectives and prioritization of problem areas, are provided in OKI's 1979 reports on Ranking of Agriculture Nonpoint Source Problem Areas and Turtle Creek Project Area, Warren County: Application for Rural Clean Water Programs, and in OKI's 1983 report on Priority Areas for Rural Nonpoint Source Control. A "plan of action" for four of these priority watersheds, identifying specific problems and control procedures, is contained within individual Nonpoint Source Profile reports for Seven Mile Creek; Reeder's Run; Moores Fork; and Poplar Creek, prepared by OKI in 1984. Profile information on nonpoint source problems in suburban area is developed in OKI's 1983 report, Assessing Water Pollution Controls for Sharon Woods Lake. Management techniques for both urban and rural nonpoint sources are described in Chapter V. Recommendations for agricultural best management practices are further refined in the Section "Control Source Problems" in OKI's report on 1979 Continuing Water Quality Management Planning. The management resources of local conservation agencies are inventoried in the same 1979 report in the section "Assess Agricultural Agencies." More current information on the management resources of these agencies is provided in the 1984 report, Assessing Local Agricultural Implementation of Nonpoint Source Control Measures. Financial resources for rural nonpoint source control are discussed in another 1984 report, Agricultural Stabilization and Conservation in Southwest Ohio. To support control of erosion from construction processes, alternative control measures and a model ordinance are discussed in OKI's 1978 report, Guide to Controlling Sediment from Construction Activities. The 1984 report, Rural Erosion Control Programs, documents the efforts of rural governments in southwestern Ohio to use ordinances for reducing construction-related sediment. Managerial and
technical alternatives for reducing pollution from on-site systems are discussed in OKI's 1978 report On-Site Wastewater Treatment Systems. Existing management of on-site systems is assessed in the 1984 report, Evaluating On-Site Wastewater Treatment Programs: A Survey of County Health Agencies, which also summarizes local health official's perspectives on the strengths and weaknesses of their on-site management activities. Control alternatives, recommendations and cost estimates are developed for both storm and combined sewer systems in the basin chapters, and loads are quantified. Procedures and data used to estimate pollutant loads are described in a series of five Urban Runoff Control summaries, prepared by OKI in 1983 and 1984.

Onsite wastewater treatment status and needs are described in Onsite Wastewater Treatment and Disposal Systems in Warren County, Ohio (1986), and Assessment of Onsite Wastewater Treatment Systems in Clermont County, Ohio (1987). Soils unsuitable for onsite septic systems in unsewered areas were delineated on Maps of Soil Suitability for Onsite Septic Tank-Leach Field Wastewater Treatment Systems in Butler, Clermont, Hamilton, and Warren Counties, Ohio (1987).

Watershed investigations of nonpoint source pollution contributions to streams have been documented in Seven Mile Creek - Target Water Body Profile (1986). Data from the Ohio Nonpoint Source Assessment were used to create a Stream Database for Butler, Clermont, Hamilton, and Warren Counties, Ohio (1987) and Watershed Maps (1989). The condition of Winton Lake was documented in Winton Lake - An Analysis of Pollution Sources (1986) and Phase I Study of Winton Lake in Hamilton County, Ohio (1989). The Homeowners Conservation Guide (1990) educates property owners on an array of topics related to nonpoint source pollution. The Stonelick Lake watershed was also examined in Stonelick lake - An Analysis of Pollution Sources (1986) and Watershed Investigation Into Water Pollution Sources of Stonelick Lake, Clermont County, Ohio and Addendum (1991). Nonpoint source Pollution: A Decision Makers' Guide (1992) addresses nonpoint sources at the grassroots level and includes a map showing the State's nonpoint source designation of watersheds in Butler, clermont, hamilton and Warren County.
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TMACOG

The Ottawa County Paired Watershed Demonstration Project Plan of Study (1982) was prepared to provide detailed information on a project to be conducted to show the water quality benefits of intensive efforts to implement conservation practices.

The Clay Township Home Sewage Demonstration Project (1986) is to develop actions for solving problems associated with on-site home sewage disposal systems. The results are being applied as a prototype model for other critical areas in the region. To assist the local health departments in the region, TMACOG developed a 13 minute slide presentation of How to Properly Care for Your Home Septic System (1986). The script concentrated on the operation and maintenance of the septic tank and leach fields, including recommended pumping times, and described the necessary household habits important to avoiding costly repairs to the overall system. In 1988, TMACOG developed a nonpoint source abatement proposal entitled On-Site Wastewater Pollution Abatement in Wood County, Ohio which was not funded. It concentrated in two areas: the high urbanizing areas of Lake Township and the high bedrock areas of Liberty and Portage townships.

TMACOG organized and presented in 1986 a workshop for municipal personnel and civil engineers on the issue of CSOs, what is being done in Northwest Ohio, and what alternate technologies are available. To accompany the workshop, TMACOG published a Combined Sewer Overflow Seminar Workbook (1986) with background materials on technologies for addressing CSOs, and an extensive bibliography.

The Areawide Water Quality Planning Council has worked with the Soil and Water Conservation Districts to assist in demonstrations of ridge tillage, no-till and other forms of conservation tillage. TMACOG has leased ridge till planters and ridges in Ottawa County and published the Lucas and Wood County Conservation Tillage Test Plot Results, (1986). TMACOG worked with Lucas County and the municipalities along Swan Creek to assemble known information about the state of Swan Creek's water quality, and helped develop the Swan Creek Watershed Strategy (1986) for solving the problems identified. In the lower reaches of Swan Creek, accumulation of metals and toxics in the sediments have been identified and are a serious problem. What is

Water quality monitoring needs to be performed to locate the sources of urban nonpoint source pollutants. The storm water management needs of the TMACOG area should be studied.

A plan is being developed for creating a wetland area along Swan Creek which can be used for the abatement of nonpoint source pollutants. The Swan Creek Wetlands Task Force currently is reviewing scenarios for sorting and conceptual design of the wetland.

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unknown are the sources if these pollutants, and whether discharges still are occurring, or whether the sources have been eliminated.

The Chronic Toxicity of Agricultural Runoff: Nonpoint Source Abatement Proposal (1988) was prepared in anticipation of funding for nonpoint source projects being appropriated under Section 319 of the Water Quality Act of 1987.

TMACOG proposed, in Swan Creek Toxics from Urban Nonpoint Sources (1988), to work with Toledo Environmental Services Division and Bowling Green State University to perform monitoring which would answer these questions.

The Water Quality Sampling Site Inventory (1988) of water quality monitoring covers Lucas, Wood, Erie, Ottawa and Sandusky counties in Ohio. Monitoring programs are described by the stream sampled and specific location on the stream, a listing of the parameters tested, the year(s) of the sampling and the source of the data.


Toledo Metropolitan Area Storm Water Management Needs, Summary of Draft Regulations and Project Progress Report; First Half, FY 1990. Summary of draft regulations for regulating separate storm water discharges; TMACOG progress reports on storm water management project.


A Summary of the Final NPDES Storm Water Regulations for the TMACOG Region; December 1990, revised June 1991. Includes who is required to obtain a permit, types of permits and application requirements.

Toledo Metropolitan Area Urban Runoff Needs Assessment -- Update; and A Summary of U.S. EPA's Draft General Permits; (1991). Includes charts of local municipalities' contribution to urban storm water runoff, and what actions are needed to address problems, in addition to information on Federal requirements.

Toledo Metropolitan Area Best Management Practices for Urban Storm Water; (1991). Includes a discussion of the legal framework, a variety of BMP's by mode of implementation and by function, and a model erosion control ordinance.