Area(s) Addressed	WQM Plan	Comments
All	The Residuals/Ground Water Project Report (1984) reviews and summarizes results of previous ground water monitoring for 29 landfills in the State. The report also presents and analyzes ground water quality data collected at four landfills monitored specifically for the residuals project: Ashland county (Muskingum River Basin), Erie County (Huron River Basin), Hardin County (Scioto River Basin), and Huron County (Huron River Basin). The report reviews present solid waste management by State and local authorities and presents recommendations for alternative management practices and continued impact assessment. Needs and Recommendations for an Ohio Ground Water Strategy (1984) provides recommendations for developing improved ground water quality management in Ohio. This report examines current policy, legislative, regulatory and institutional structures for ground water protection (including residuals disposal) and identifies program needs for State agencies. The Ohio Ground Water Protection and Management Strategy (1986) summarizes the threats to ground water; describes both regulatory and non-regulatoryground water protection and management programs at the federal, State and local level; and makes 128 recommendations on specific actions the State can take to further the protection and management of Ohio's ground water resources. The Strategy established two principal goals: Manage Ohio's ground water resources to prevent depletion and contamination; and take corrective action to protect ground water from contamination. These goals are intended to provide the high level of protection needed to safeguard public health and welfare, protect Ohio's environment, and preserve Ohio's economic vitality The specific recommendations to achieve the Strategy's goals are organized into six major initiatives: 1) Controlling sources of Ground Water Contamination; 2) Assessing Ohio's Ground Water; 3)	The Ground Water Protection and Management Strategy has been an effective tool in promoting protection and management of Ohio's ground water resources. since it was completed, the Strategy has been the catalyst for program reorganization, rule development and legislative initiative. Some level of implementation has occurred on almost all of the 128 specific recommendations for action. The State of Ohio recognizes, however, that in order for progress to continue, the Strategy needs to be revised. Many of the original recommendations have been accomplished and a new plan for future actions needs to be outlined. In addition, the Strategy needs to be updated to incopporate the many changes that have occurred in the States's environmental laws, regulations and programs. Updating the Strategy was initiated through the Inter-Agency Gound Water Advisory Council in mid 1990, but was put on hold in late 1991 as a result of U.S. EPA's Comprehensive State Ground Water Protection Program (CSGWPP) initiative. U.S. EPA released its final guidance on criteria to fulfill a CSGWPP in February 1993. The guidance also outlines the steps a State should take to achieve a fully implemented CSGWPP. The State Coordinating Committee on Ground Water (SCCGW) passed a resolution in May 1993, to finalize the updates to the Strategy and revise it in accordance with the initial steps outlined in the final guidance for CSGWPPs. Volume 4 of the Ohio Water Resource Inventory Section 305(b) Report provides an analysis of the extent to which Ohio's ground waters provide for healthy and viable water supplies that are virtually free from contaminants at concentrations of concern.

Coordinating Agency Activities; 4) Targeting Ctitical Areas; 5) Regional and Local Ground Water Protection and Management; 6) Education, Training, Research and Technology Transfer.

The Ohio Nonpoint Source Assessment (1990) summarizes ground water data collected from federal, State, regional and local agencies and from universities. This is the first Statewide comprehensive ground water data collection effort. Results are incorporated into the Ohio Nonpoint Source Management Program (1989) which includes recommendations for ground water activities to prevent and correct pollution problems.

The objective of the Ohio Wellhead Protection (WHP) Program is to prevewnt contamination of thoses ground waters being used as a source of public drinking water, and, if contamination does occur, to detect and remediate contaminaiton prior to its impacting the public water system. Under Ohio's Program, public water purveyors are responible for developing a WHP Plan and submitting to Ohio EPA for review. The program outlines what specific steps a public water purveyor should take to develop a WHP Plan. This includes 1) identifying roles and responsibilities; 2) delineating a WHP area; 3) identifying potential sources of contamination; 4) developing a strategy to prevent contamination; 5) Contingency and emergency planning; 6) planning for future water needs and new wells; and 7) public outreach and education.

The Ohio's WHP Program was formally approved by U.S. EPA in May 1992. Ohio EPA developed this program in response to the `986 Safe Drinking Water Act Amendments that mandated every state develop a program to protect public water systems using ground water. Within Ohio EPA, the Division of Drinking and Ground Water has the principal responsibility for developing and implementing the WHP Program.

The Ground Water NPS Assessment and Monitoring Program rectifies and enhances the ground water component of Ohio's Nonpoint Source Assessment. It also begins the development of a comprehensive Statewide NPS ground water monitoring program, computerized data

management system, compiles and analyzes site-specific data to assess NPS impacts on ground water quality. This CWA Section 319 funded program is administered by the Ohio EPA Division of Drinking and Ground Water (1990).

The Assessment of Surface/Ground Water Systems and Nonpoint Source Impacts in a Buried Valley Aquifer project will assess the surface/ground water relationships, NPS impacts, and ground water vulnerability in a buried valley aquifer. To determine the aquifer characteristics that affect NPS contaminant transfer and to provide information to guide implementation priorities and provide BMP recommendations. This CWA Section 319 funded project is administered by ODNR Division of Water (1990).

Sandusky

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).

The Class V Injection Well Education/Outreach program through education outreach program workshops, will provide local officials and the public with information concerning wellhead protection and the potential impact of Class V injection wells on ground water quality. The project will also produce an educational brochure on Class V injection wells for public distribution. This CWA Section 319 funded project is administered by the Ohio EPA Division of Drinking and Ground Water (1991).

The Nonpoint Source in Wellhead Protection Areas project (1992) will assess potential ground water quality impacts from agricultural and other nonpoint sources of pollution in a wellhead protection area and then determine potential management options communities can implement to reduce the risks of their public water system being

impacted by these activities. Phase I includes delineation of a WHP are, identifying potential sources of contamination, and developing a management strategy. Phase II will involve the design, installation and sampling of a ground water monitoring system to access actual ground water quality impacts from certain nonpoint contamination prior to its reaching the public water wells. The final component of this project focuses on the public education and implementation aspects of WHP planning. This CWA Section 319 funded project is being conducted jointly by the Ohio EPA and the ODNR.

The Wellhead Protection/Geographic Information System Prototype Demonstration Project (1992) focuses on the final design, installation and prototype demonstration of Ohio EPA-DDAGW's geographic information system (GIS) and Statewide wellhead protection data access system. Full implementation of a GIS will greatly enhance the Division's ability to develop many components of a comprehensive State ground water protection program as well as providing technical assistance to communities developing local wellhead protection plans. While WHP is being used as the catalyst to bring this system on line, when operational this will be an tntegrated system for maintaining, evaluating and manipulating ground water quality, geologic, hydrogeologic, and other related data generated, received or used by the Division. This project is being funded in part with monies from the CWA Section 106.

EDATA

The WQMP assesses potential adverse impacts of sludge disposal and on-site wastewater treatment and recommends regulatory program and site standards for disposal of wastes to protect ground water quality. The report, Disposal of Municipal Wastewater Treatment Sludge, identified sludge volumes, disposal practices and recommended disposal methods with the least potential for degrading the environment.

MVRPC

The WQMP addresses residuals through two key Plan elements, sludge disposal and residuals potentially affecting ground water quality. The Plan contains a thorough analysis of sludge disposal, including existing and projected production, alternative disposal and a recommended residuals management program. The effects of residuals on the region's

ground water are documented in Existing and Potential Groundwater Problems in the Miami Valley Region (1980). The study identifies, by county, existing residuals disposal sites (including landfills and surface impoundments) in relationship to the regional aquifers. The Plan update includes An Evaluation of Ground Water Contamination at Disposal Sites South of Dayton, Ohio, Phase II/February 1983," and "Factors Potentially Impacting Groundwater Quality of the Great Miami Buried Valley Aquifer in the Miami Region, December 1983.

The AWQMP identified the protection of ground water as high priority due to the use of the Great Miami Buried Valley Aquifer as a sole source of drinking water for more than 600,000 persons. MVRPC analyzed the local governmental powers and practices for protecting the aquifer in The Role of Local Governments in Protecting the Great Miami Buried Valley Aquifer in the Dayton, Ohio Metropolitan Area (1986). The report also examines existing and planned land uses over the aquifer and the proper role of local governments in protecting the aquifer. Guidelines for local governments to use in protecting the aquifer are given in Potential Pollutant Source Guidelines for Groundwater Protection in the Miami Valley Region. (1987)

MVRPC and OKI cooperated to publish Petition Requesting Sole Source Aquifer Designation for Portions of the Buried Valley Aquifer System if Great Miami/Little Miami Basins in the Miami Valley Region in Southwestern Ohio (1987) which resulted in designation by U.S. EPA in 1988. The designation provides a modest level of protection for the aquifer but more importantly it serves to make people aware of the aquifer's existence and its importance. As a result, a number of subsequent efforts aimed at protecting the aquifer have been completed. Among these are: Recommendation Report for a Groundwater Resources Information Management System (GRIMS) for Southwestern Ohio (1988) (prepared in cooperation with OKI and Ohio EPA), Annotated Bibliography of Hydrology for the Miami Valley Region (1991), Sole Source Aquifer Revision Criteria Project, Miami Valley Region (1991), and Sole Source Aquifer Revision Assessment, Miami Valley Region (1992).

The most notable achievement in the process has been publication of A Groundwater Protection Strategy for the Miami Valley Region (1990). This document which is in eight volumes covers each of MVRPC's five basins and includes data and maps of different aquifer types, land uses, wellhead protection areas and resource protection areas. MVRPC then expanded the strategy through Miami Valley Groundwater Protection Strategy - Implementation Programs for Priority Groundwater Protection Areas; City of Bellbrook Well Field Protection Program (1991), City of Fairborn Well Field Protection Program (1991), and City of Oakwood Well Field Protection Program (1992).

The Well Field Proection Program documents listed here have not been officially reviewed by Ohio EPA DDAGW staff and their listing in the WQMP does not mean that they meet requiremnets of Ohio's WHP Program.

NEFCO

Sources for which updated assessments and recommendations have been prepared include the following: STP Residuals and Sludge Management, (Volumes One and Three) and Home Sewage Disposal Systems, Septage, Salt pollution (highway deicing salt and generation and disposal of waste brine) and Solid Waste Management (Volume One and Four). Animal waste management in the Chippewa Creek, Upper Tuscarawas, Fish Creek, Plum Creek and East Branch Nimishillen Creek watersheds is assessed in separate watershed reports incorporated into Volume Two. Management agencies are identified for each of those areas. In addition to the assessments and recommendations in the Clean Water Plan, NEFCO continues to inform its members, through the Water Quality Management Committee and through cooperative sponsorship with Ohio EPA of ground water strategy meetings, of the need for a State ground water strategy.

In the Potential Ground Water Pollution Sources to the Killbuck Valley Aquifer Wooster, Ohio - Maps and Ranking of Pollution Sources (1989) report a series of maps were prepared showing the distribution of land uses considered as potential sources of pollution to the ground water in the Wooster area. The report also developed a rating system to prioritize these land uses and the study area in terms of pollution potential and susceptibility. The report explained the usefulness of the maps and examined the relationship between the land uses and the critical ground resource areas.

The Potential Pollution Sources to Ground Water in Wooster Township and Environs Wayne County, Ohio (1988) report was written to further

educate public officials, citizens and especially the various land users on the importance of the ground water resources in the study area.

The Potential Pollution Source Guidelines for Ground Water Protection in the Wooster, Ohio Area (1990) report reviewed in detail the zoning code and other existing regulations for the City of Wooster including fire codes, building codes and business codes. The review examined the strengths and weaknesses of such regulations in terms of ground water and/or wellhead protection. The report also examined several options or mechanisms which the City may be able to use as guidelines in developing wellhead and ground water protection programs.

The Wellhead Protection Inventory for Stark County - Phase I (1991) report involved the preparation of a county map which identified the locations of all community water supply wells and identify potential sources of pollution to selected wellfields. Options for protecting these areas were also discussed.

Listing of these reports in the WQMPC does not imply that they meet the requirements for delineating WHP areas or for conducting a pollution source inventory as described in Ohio's WHP Program.

In the Initial Wellhead Protection Programs for the Village of Canal Fulton and the Village of Waynesburg, Stark County, Ohio (1991) report initial wellhead protection areas (WPHA) were delineated for each community using the arbitrary fixed radius method for Waynesburg and the calculated fixed radius method for Canal Fulton. For each community the county ground water resources map and the pollution potential map were examined to get a better understanding of some of the hydrogeologic factors affecting water quality and quantity in the study areas which will be relevant in the development of a wellhead protection program. The inventory of land uses was accomplished through the use of 1988 land use maps. Management options were also recommended for the WHPAs.

Listing of this report in the WQMPC does not imply that it meets the requirements for conducting a pollution source inventory as described in Ohio's WHP Program.

NOACA

The NEOLEB 208 Water Quality plan recommended areawide residuals controls as follows: The STP Residuals Subplan recommended that an inventory and projection of residuals and a comprehensive management strategy be developed for each basin by the CWQs. The Industrial Residuals Subplan recommended further study and implementation of

an area residuals storage and disposal site to service the local industrial base. A study of area STP residuals management needs was completed in 1978 NOACA WQM Technical Appendix A16, Sewage Treatment Plant Residual Subplan Technical Component, 1978. Demonstration projects involving the land application of sludge in Medina County NOACA WQM Technical Appendix A26, The Land Application of Sludge (Medina County), 1979 and NOACA WQM Technical Appendix A38, The Land Application of Sludge, Program Update: Heavy Metal Pickup and Other Factors (Medina County), 1980 septage lagooning in Geauga County NOACA WQM Technical Appendix A39, Septage Disposal by Lagooning (Biological Resource Recovery) (Geauga County), 1980, and septage management Medina County NOACA WQM Technical Appendix A40, Home Sewage System Control: Septage Management Strategies (Median County), 1980 were completed in 1979-80.

OKI

Residual Waste disposal practices, alternatives and types of potential problems are discussed in OKI's 1978 report on Land Application of Residual Solids from Wastewater Treatment Plants. The 1984 report Field Testing a Method for Projecting Wastewater Treatment Residuals outlines a general methodology for estimating current and future quantities of sludge and describes how the method was refined and validated.

Planning for ground water protection began in 1988 with Petition for Sole Source Aquifer Designation of the Great Miami Buried Valley Aquifer System in Butler, Clermont, Hamilton, and Warren Counties, Ohio. Subsequent to the petition A Planning Framework to Protect and Manage Ground Water in Butler, Clermont, Hamilton, and Warren Counties, Ohio (1989) established a mechanism for coordination of future planning efforts in the region. Planning efforts were further enhanced in Methodology for Mapping Land Use Over the Aquifer in Butler, Clermont, Hamilton and Warren Counties,. Ohio (1989), Recommendations Report for a Ground Water Resources Information Management System for Southwestern Ohio (1989) and Status of Ground Water Management Efforts in Butler, Clermont, Hamilton and Warren Counties, Ohio (1992).

To support the implementation of the State's Ground Water Strategy and Wellhead Protection Program, public water supply wellfields and ground water recharge areas need to be delineated and well field protection plans need to be developed. In addition, regional protection and management plans are needed for aquifer systems shared by local governments--particularly those aquifers most vulnerable to contamination. This work would include preparation of detailed aquifer and well field maps; examination of land uses, especially in critical ground water recharge areas, evaluation of local land use controls and regulations used to protect ground water quality and quantity; and development of ground water protection and management plans.

Ground water protection strategies need to be developed for the aquifers in OKI's area. Local DMAs and other governmental units must be made aware of the need for protecting the aquifer. OKI should be a leader in developing an initiative for planning ground water protection. Industrial withdrawals of ground water should also be assessed along with municipal withdrawals for impact on the aquifer. Local ground water problem areas and sources of contamination need to be identified. A sole source aquifer petition for OKI's region is being developed.

GROUND WATER 130.6(c)(9)

Data on threats to ground water were researched and presented on several reports including: Potential Sources of Groundwater Pollution in Butler, Clermont, Hamilton, and Warren Counties, Ohio (1988), The Status of Groundwater Monitoring in Butler, Clermont, Hamilton, and Warren Counties, Ohio (1988), Survey of Industrial Groundwater Usage and Data (1990), Selected Data for the Great Miami Buried Valley Aquifer System in Butler, Clermont, Hamilton, and Warren Counties, Ohio (1990), and Index of Potential pollution Sources of Groundwater Pollution in Butler, Clermont, Hamilton, and Warren Counties, Ohio (1992).

TMACOG

To assist local health departments in the region, TMACOG developed a 13 minute slide presentation on How to Properly Care for Your Private Water System (1989)

Village of Whitehouse, Ohio; Wellhead Protection, Preliminary Plan; April 1991. TMACOG Element Number 189.81. Includes background information on geology and groundwater characteristics; potential sources of groundwater contamination; and recommendations for wellhead protection. U.S. EPA Element 130.6(c)(9).

Listing of this report in the WQMP does not imply that it meets the requirements for delineating a WHP area or for conducting a pollution source inventory as described in Ohio's WHP Program.

Lindsey, Ohio: Wellhead Protection, Volume 2; Delineation of Wellhead Protection Areas and Inventory of Potential Pollution Sources; April 1992. TMACOG Element Number 30.81 includes map of land use and potential pollution sources, maps of areas through which contaminants are likely to move (time-of-travel zones), and recommendations. U.S. EPA Element 130.6(c)(9).

Listing of this report in the WQMP does not imply that it meets the requirements for delineating a WHP area or for conducting a pollution source inventory as described in Ohio's WHP Program.

Pemberville, Ohio: Groundwater Protection, Second Report; Delineation of Wellhead Protection Areas and Inventory of Potential Pollution Sources; April 1992. TMACOG Element Number 30.81 includes map of land use and potential pollution sources, map of areas through which contaminants are likely to move (time-of-travel zones), and recommendations. U.S. EPA Element 130.6(c)(9).

Listing of this report in the WQMP does not imply that it meets the requirements for delineating a WHP area or for conducting a pollution source inventory as described in Ohio's WHP Program.