

Chapter 5

Management of Nonpoint Source Pollution and Storm Water Runoff

This chapter recommends the adoption of land regulations in six areas of nonpoint source and storm water runoff control by local and county units of government in the NEFCO 208 Clean Water Planning area (CWP). It provides model regulations to be considered for this purpose. This program is intended to address the nonpoint source problems that are characteristic of Northeast Ohio's streams. The chapter concludes with an implementation strategy and policies for a program of ongoing planning support.

I. Introduction

Northeast Ohio depends on its water resources. They are economically and ecologically important to the health and welfare of its citizens. These water resources provide drinking water from both surface and groundwater sources. They provide very important recreational benefits as well as contribute to a diverse ecosystem which provides important functional and economic benefits. However, changes in land use and population shifts have increased demands for these water resources and this, in turn, threatens many of them.

The threats to surface and groundwater resources are changing. Historically, point sources were viewed as the primary threat. However, most point source problems are being controlled, and now it is nonpoint pollution and storm water effects which appear to provide the greater threat to our water resources in many portions of the region.

Nonpoint problems are both water quality and quantity based. Nonpoint pollution is a result of activities that take place on the land surface, and how water runs off the land surface or seeps into the ground. Most land use activities have the potential to contribute to nonpoint pollution problems. There is an emerging realization that unchecked storm water runoff from more intensively used land surfaces is also a major threat to water resources. This occurs due to the alteration of the surface runoff regime and alteration of the hydrologic processes involved in groundwater recharge.

The solution to nonpoint source and storm water runoff problems are watershed specific. Therefore, successful solutions must be carried out using a watershed approach which often involves multiple governmental jurisdictions. Also, the nonpoint management programs that need to be utilized in any given watershed will vary depending upon the type of water resources present, the threats to those resources that exist locally, the existing land use, the future land use trends, the governmental structure having jurisdiction over land use decisions, the financial resources available and the level of citizen involvement.

An effective watershed program seeks to coordinate the management of all point and nonpoint sources of pollution in a watershed. This effort will provide guidance to assist in identifying

watershed-wide solutions and in identifying priorities. Remedial Action Plan (RAP) programs are designed with these principles in mind. The CWA's Total Maximum Daily Load (TMDL) Regulation and Program being implemented by the USEPA and Ohio EPA is based on the same premise.

Generally, because of the complexity of the problems and multiple jurisdictions involved, no one protective measure will wholly solve the problem caused by nonpoint sources of pollution in a given watershed. More likely, a combination of mechanisms will be necessary, and in many cases may be preferred, to give locally based and supported initiatives maximum flexibility in achieving their protection goals and needs. Improved linkages between different levels of government and existing protective mechanisms are needed to ensure that actions taken do actually provide the desired protection of the region's water resources. Local programs can benefit from, and need to be coordinated with, the Ohio Nonpoint Source Management Plan and the Coastal Nonpoint Source Control Program supported by State agencies.

There are two conditions that confuse the distinction between point and nonpoint sources of pollution. These are combined sewer overflows (CSO) and sanitary sewer overflows (SSO). Both result in a discharge of a mix of sanitary wastewater and storm water. For purposes of this discussion, these overflows are considered to be part of the point source family and not discussed here. NPDES permit holders have requirements for managing, and eventually eliminating CSOs and SSOs. Sanitary sewer overflows must be sought out and eliminated as a condition of each wastewater treatment plant's NPDES permit. Combined sewer outfall elimination is regulated by a national policy that calls for the USEPA or delegated states to negotiate a phased remediation program with each discharger that currently has combined sewers. New, updated SSO elimination regulations were originally proposed January, 2001 but were subsequently withdrawn, pending USEPA's resolution of issues with the proposed rule on blending of wastewater treatment flows. The SSO Rule requires USEPA and/or delegated states to implement a phased remediation program including a far reaching capacity, management, operation and maintenance (CMOM) provision.

II. Summary of Nonpoint Pollution Problems in the NEFCO Region

Chapter 2 described water quality conditions in overall terms for Northeast Ohio's major rivers. This chapter focuses on the extent to which these streams are impaired by nonpoint sources or conditions, and identifies priority nonpoint sources of pollution that impact the area's streams.

Table 5-1 lists the miles of streams impaired by nonpoint sources, or conditions for each of the four watersheds subject to this plan. It is derived from the Ohio EPA's assessment which summarizes the causes and sources of aquatic life impairments statewide (documented in Appendix D-2 of the 2004 Ohio Water Resource Inventory).

Table 5-1

**Nonpoint Source Impairments
to NEFCO Region Streams**

Name	Watershed Size (mi ²)	Attainment Percent			Causes	Sources
		Full	Partial	Non		
Tuscarawas River (Headwaters to Wolf Creek)	151.0	0	70	30	1,2,3,4,5,9	1,2,3,4,5,7, 10,14,17
Tuscarawas River (Wolf Creek to Sippo Creek)	169.5	19	81	0	1,3,4,8,9,16,17	1,2,3,6,7,8,9, 14,17
Chippewa Creek	187.6	6	51	43	5,6,7,8	3,5,6
Nimishillen Creek	187.9	18	45	37	3,6,8,9,10,11, 12,13,14,15	5,6,9,10
Sugar Creek	97.3	27	3	70	2,5,6,4,14, 15	3,7,10,11,12, 13,14,15
Killbuck Creek (Headwaters to Apple Creek)	138.6	74	18	8	4,6	3,10,12,16
Killbuck Creek (Apple Creek to Salt Creek)	171.1	57	12	31	4,6	3,16

Causes

1. Unknown Toxicity
2. Siltation
3. Flow Alteration
4. Habitat Alteration
5. Nutrients
6. Organic Enrichment
7. Suspended Solids
8. Unknown
9. Metals
10. Zinc
11. Unionized Ammonia
12. pH
13. Thermal Modification
14. Pathogens
15. Natural Limits (wetlands)
16. Salinity, TDs, chlorides
17. Chlorine

Sources

1. Urban Run-off/Storm Sewers
2. Land Fill
3. Channelization
4. Dam Construction
5. Industrial Point Sources
6. Municipal Point Sources
7. Onsite wastewater treatment system
8. Upstream Impoundment
9. Unknown
10. Nonirrigated crop production
11. Pasture lands
12. Feedlots
13. Animal holding/Management Area
14. Removal of Riparian Vegetation
15. Streambank destabilization
16. Natural
17. Contaminated Sediments

Source: Ohio EPA 2004 Integrated Water Quality Monitoring and Assessment Report - Appendix D-2.

III. Recommended Program of Local and County Nonpoint Source and Storm Water Management

Six nonpoint source management programs are recommended for implementation by local and county agencies in the planning area. These are as follows:

1. Storm water runoff management from development and redevelopment actions;
2. Construction site erosion and sediment control programs;
3. Riparian zone protection program;
4. Conservation design for storm water management;
5. Road salt minimization and storage program; and
6. Nonpoint source management plans for low interest loan programs.

Each of these programs are introduced as a plan recommendation which is followed by a summary discussion that addresses the program's purpose, legal authority for implementation, and how the program works.

The recommendations that are presented to better manage nonpoint sources of pollution are supported by model ordinances or policy guidelines. This is done to help insure the development of adequate control programs while minimizing the costs and difficulties of implementation. Implementation of the control programs identified in the models serves as one measure by which existing and future programs can be assessed. Appendix 5-1 contains references and contacts for each of the recommended programs.

Each local or county jurisdiction is requested to undertake a nonpoint source program evaluation process as a prelude to implementing the recommendations in this chapter. This evaluation process includes the following steps:

- a. Compare existing legislation and regulations to a model ordinance with the intent of identifying inconsistencies or shortcomings.
- b. Decide whether shortcomings can be adequately addressed by implementing administrative policy changes.
- c. Where substantial change is needed, decide whether it is better to upgrade the existing legislation or to adopt the model ordinance as a replacement for the existing base.
- d. With enactment of legislation or administrative policy changes, provide for the training of all staff who are charged with implementing the changes adopted. In the case of counties, provide for training of township personnel as appropriate.

NEFCO, in concert with other county and state agencies, will assist local and county jurisdictions in undertaking implementation of these recommendations. Refer to the implementation strategy outlined in Section VI below.

Local and county jurisdictions identified for nonpoint source implementation actions in this plan are encouraged to consult Chapter 6 of this plan which outlines a program of nonpoint source controls for protection of critical water resources in the region.

Recommendation 5-1: All municipalities and counties in the CWP area are encouraged to adopt and implement Storm Water Management Programs for all development and redevelopment activities which affect an area equal to one acre or more as part of a common plan of development or sale. These programs need to address the management of both storm water quantity and quality.

Storm water management regulations, which apply to new developments and to major redevelopment actions and which are adopted and enforced locally, accomplish several objectives. They reduce the flood risk to downstream areas, provide for the protection of stream channels, and can protect water quality. Municipalities and counties are authorized under Ohio law to implement these programs.

Storm water management in developing areas is critical to the maintenance of water resources. Beyond the obvious advantages of flood control, water quality benefits in several important ways. Altered runoff patterns following the creation of large tracts of impervious surfaces can upset the hydraulics of stream channels. This often destroys stream habitat thereby degrading aquatic communities present in the stream. These same forces contribute to the creation of channel instability and increases in the rate of bank erosion and problems in downstream areas. This is a major concern to local communities and abutting property owners with increasing costs to stabilize existing channels.

Many cities have already or are implementing storm water management programs within the Northeast Ohio region. The City of Akron has adopted a storm water management program as per a Storm Water NPDES permit (Phase I of the NPDES Storm Water Program). Geauga, Medina, and Summit Counties have or are developing programs for unincorporated areas. All communities need to adopt formal storm water management programs and work to coordinate their control efforts with other communities in the same watershed. Even where communities have existing storm water management programs in place, their design standards may need to be upgraded to be more protective of downstream channels.

Comprehensive storm water management ordinances focus on reducing downstream flooding and channel erosion through the use of on-site detention and/or retention of storm water runoff. They also need to establish post-construction maintenance requirements for installed retention systems. Ordinances require on-site detention to maintain predevelopment peak flow rates for the 1-year through 100-year storm. Ordinances also need to require consideration of the critical storm which is more protective of downstream flow conditions.

The Cuyahoga River Remedial Action Plan's Storm Water Committee worked with the Cuyahoga SWCD and the Cuyahoga Valley Communities Council to draft a model ordinance that meets the needs discussed here. All communities are encouraged to review this ordinance for use in their jurisdiction.

Phase II of the NPDES Storm Water Permits Program (effective March 10, 2003) requires storm water management programs to be implemented by: municipalities in urban areas with populations 50,000 and above, areas with populations of 1,000/per square mile, and municipalities outside urban areas with populations greater than 10,000. The ordinance discussed here will help cities to comply with Phase II requirements.

Continuing education programs will be needed to train local management personnel in the application of storm water management programs. New technologies and fresh approaches to managing storm water in less expensive and more aesthetically pleasing ways are constantly being developed. Storm water controls can become an asset to the landscape when applied by persons trained in innovative techniques. The Soil and Water Conservation Districts serve as a resource for this training.

Recommendation 5-2: All municipalities and counties in the CWP area are encouraged to adopt and implement Soil Erosion and Sediment Control Management Programs for all nonagricultural land disturbance activities which affect an area equal to one acre or more as part of a common development.

Soil erosion and sediment control occurs best when locally adopted regulations guide construction and development activities. The main objective is to demand more accountability so as to prevent significant stream damage from occurring downstream from development. Regular inspection of construction sites by local building and zoning inspectors who can issue stop work orders helps to insure that all planned controls are properly installed and maintained. All municipalities can implement soil erosion and sediment control programs through home rule powers. Counties are authorized under Section 307.79 of the Ohio Revised Code to establish such a program.

Many existing programs regulate only land disturbance activities that affect five acres or more. There is a recognized need to decrease this threshold to include all projects that disturb one acre or more. In heavily urbanized areas that already have hydrologic problems, there may be a need to decrease the size of the disturbed area to a lower value. Phase II of the NPDES storm water permits program brings small municipal storm sewer systems and construction sites between 1 and 5 acres into the NPDES program.

Communities in the region should implement urban sediment control programs consistent with the specifications contained in the "Rainwater and Land Development Guide", and in concert with the Ohio EPA-administered provisions of the NPDES storm water permit program. The program, encompassing erosion control methods to address sediment from construction sites, is a means of preventing adverse environmental impacts from new urban development on water quality and aquatic communities in the region's rivers, streams, and lakes.

The program should take a watershed approach and be implemented consistently in both unincorporated and incorporated areas. County Commissioners or County Council are encouraged to consider this program for the unincorporated areas by enacting legislation that establishes procedures consistent with HB 501. Parallel programs should be legislated by municipalities throughout the region.

Approved plans need to be implemented and monitored for effectiveness over the course of the development action. Elements of an effective urban sediment control program should include the following:

- Subdivision review procedures;
- Education of developers and local public officials;
- Required installation of BMPs for both erosion minimization and sediment control;
- Monitoring and enforcement of BMPs;
- Coordination with Ohio EPA's storm water permits program; and
- Adherence to the principles and guidance contained in the Ohio Department of Natural Resources' "Rainwater and Land Development Guide".

All management practices used to comply with soil erosion and sediment control programs should meet the specifications contained in the "Rainwater and Land Development Guide" produced jointly by ODNR, Ohio EPA and NRCS. The Cuyahoga Soil and Water Conservation District has developed a model ordinance which can be used by communities to meet the objectives of this element. See Appendix 5-1 for contact information.

Continuing education programs are needed to assist in the implementation of sound erosion and sediment control programs. There is a wide variety of techniques and circumstances that can apply at any given site. Not all erosion and sediment control management practices are applicable everywhere. Programs to acquaint developers, contractors, and site inspectors with available practices and their proper usage will need to be conducted on a regular basis.

Local soil and water conservation districts and the Ohio EPA are two of the agencies that provide training and support to local officials and developers to help them design and implement better control plans. Local interaction and cooperation are often better mechanisms to achieve soil erosion and sediment control than is reliance on State enforcement of the NPDES program. Local regulations can be used to identify and fix problems in an expedient manner before damage is done. This is preferable over a system that fines developers for damages caused. Costs to implement soil erosion and sediment control programs are most often recovered from permit fees charged to the developer/builder.

Recommendation 5-3: Developing communities in the CWP area are encouraged to adopt and implement Riparian Zone Protection Ordinances. All other areas are encouraged to protect existing vegetation in riparian corridors and work to restore the integrity of the zone in disturbed areas.

A riparian buffer ordinance prevents/minimizes the alteration of the riparian zone along stream segments to ensure that functions provided by riparian areas are protected. The riparian zone generally covered by a buffer ordinance includes the vegetative corridor adjacent to a perennial or intermittent stream. Building setbacks may be necessary to protect the riparian zone and may range from 75 to 300 feet depending on the stream's characteristics (slope, size, soil type, land use, function, etc.). The ordinance requires building setbacks which apply to new subdivisions and major redevelopment actions. Riparian protection programs encourage the restoration of previously disturbed areas where practical but do not affect existing structures or uses.

The purpose of the riparian buffer ordinance is to ensure that the existing functions provided by the existing riparian vegetation are maintained as much as possible, and that any future encroachment within the buffer zones meets certain standards and conditions. Riparian zones provide several important functions including flood control, erosion control, nonpoint source pollution control, groundwater purification, and habitat protection. Economic benefits are realized by a community when it protects these functions and when it acts to minimize future property damage by preventing encroachment on the stream channel.

The specific purpose and intent of this ordinance is to regulate uses and developments within the riparian buffer area that would impair its ability to:

1. Reduce flood impacts by absorbing peak flows, slowing the velocity of flood waters and regulating base flow.
2. Stabilize the banks of watercourses to reduce bank erosion and the downstream transport of sediments eroded from watercourse banks.
3. Reduce pollutants in watercourses during periods of high flows by filtering, settling and transforming pollutants already present in watercourses.
4. Reduce pollutants in watercourses by filtering, settling and transforming pollutants in runoff before they enter watercourses.
5. Provide high quality watercourse habitats with shelter and food sources for aquatic organisms.
6. Reduce the presence of aquatic nuisance species to maintain a diverse aquatic system.
7. Provide habitat to a wide array of wildlife by maintaining diverse and connected riparian vegetation.
8. Benefit the community economically by minimizing encroachment on watercourse channels and the need for costly engineering solutions such as dams, retention basins and constructed slope protection measures to protect structures and reduce property damage and threats to the safety of watershed residents, and by contributing to the scenic beauty and environment of the community, thereby preserving the character of the community, the quality of life of the residents of the community and corresponding property values.

Riparian buffer ordinances are implemented at the local level. Further support could be provided for the use of these ordinances through state policy or legislative changes. To work effectively, a fixed width or setback may be specified. Enforcement mechanisms need to be clearly developed. The Chagrin River Watershed Partners, Inc. has prepared “Riparian Buffers, Technical Information for Decision Makers” which summarizes national research completed to document the benefits of riparian buffers. In Summit County the following cities, townships, and villages have adopted riparian protection resolutions: City of Green, City of Hudson, City of Twinsburg and City of Stow, Bath Township, Copley Township, Coventry Township, Franklin Township, Sagamore Hills Township, Twinsburg Township; Village of Clinton, and the Village of Richfield. The Ohio Department of Natural Resources and USEPA have prepared useful guides on the subject. Summit County has passed a Riparian Ordinance for the unincorporated areas of Summit County and has encouraged townships to adopt and administer the ordinance.

A locally-staffed Technical Advisory Committee may develop a model ordinance for possible use in riparian protection programs in the region. This model may specify fixed setbacks

relative to stream size as defined by upstream drainage area. The recommended setbacks are to be consistent with the latest scientific findings as to the minimum distances needed to maintain riparian functions and may consider criteria such as: stream flow characteristics; stream size; stream order; flood plain areas; wetlands; topography; soil types; slope; existing terrestrial and aquatic communities; existing land use; and the function or objective of the riparian protection zone ordinance. It is desirable that a riparian protection zone ordinance be flexible and based on criteria that are defensible and equitable in nature.

Educational programs are critical in all areas prior to implementing an ordinance. Misunderstandings of the intent and content of riparian protection efforts are commonplace. Township residents need to be assured that riparian protection programs are designed to protect the stream side landowner as well as the environment. Downstream interests are benefited only if upstream problems are averted. The clarification of the intent and content of riparian protection measures has been a challenge in areas within the region where ordinance adoption has already been proposed. For this reason, public education programs need to be stressed in the region.

Educational efforts targeted to riparian landowners can result in substantial protection without the need for a protection ordinance. The implementation of an educational program might be an appropriate first step in communities that are experiencing little development pressure that affects riparian corridors.

Recommendation 5-4: Developing communities in the CWP area are encouraged to consider the use of Conservation Design for Development to enhance storm water management.

Conservation design for development is often referred to as “low impact design”. This design involves the principle of maintaining open space areas in the layout of a development project. This minimizes infrastructure needs and preserves the natural character of much of the land. It reduces the cost of development while protecting the environment. It is important to strictly limit the number of building lots created under a conservation design to that number supported on a particular property under existing zoning and building ordinances.

Central to the design is the consideration of controls for storm water quantity and quality management during the design process rather than after the site layout has been completed. The objective is to provide storm water control measures to manage and minimize the amount of imperviousness created while maintaining tracts of open space. Structural and nonstructural measures are considered and used to maintain water quality and minimize the impact of the storm water.

The benefits of a conservation design land subdivision include the 1) minimization of increased watershed imperviousness, 2) moderation of hydrologic and hydraulic impacts on downstream waters, 3) prevention of the increased risks to flooding in downstream areas, 4) protection of environmentally sensitive areas such as wetlands and riparian corridors, and 5) maintenance of wildlife habitat. Conservation designs accomplish this by encouraging changes in local subdivision regulations that are more environmentally friendly.

These benefits are realized while decreasing the actual cost of building the development due to a minimization of infrastructure needs (it is easier and less costly to supply utilities and construct road access to concentrated housing units than to scattered ones). Conservation designs also reduce soil erosion and storm water management costs.

Subdivision regulations are created, adopted, implemented and enforced by county planning commissions for unincorporated areas and by municipalities for incorporated areas. Cities and villages can require conservation design subdivisions as part of their zoning districts, architectural review and subdivision regulations. Townships have no architectural review authority and must rely on the county subdivision regulations as the means to govern subdivision development.

Allowing for conservation design in subdivisions regulations is not a new idea, nor is the idea of using the design to manage storm water. Many states actively promote the use of conservation designs. Several areas locally allow conservation design subdivisions. The Countryside Program sponsored by the Western Reserve Resource Conservation and Development (RC&D) Council assists local governments interested in implementing this measure. The Countryside Program has prepared model regulations for conservation development. These are contained in the Conservation Development Resource Manual, prepared by the Western Reserve RC & D in 1998. The document contains model zoning regulations for townships, model subdivision regulations for counties, and guidelines for adaption and use of the conservation development approach by municipalities. The Countryside Program is the model recommended for use under this element of the CWP.

The implementation of conservation design subdivisions is facilitated in areas served by a centralized sanitary sewer system. It is also possible in areas where local soils are highly suitable for the use of individual on-site wastewater treatment systems. In areas where soils limit individual systems, alternative community-based systems may be required. Ohio EPA's policies currently limit the use of such systems. Ohio EPA is encouraged to pursue the development of such a policy that is compatible with conservation design subdivisions before they can be used in many unsewered areas of the region.

Recommendation 5-5: All political subdivisions, governmental agencies, or private entities in areas that are tributary to surface water or groundwater drinking supplies are encouraged to adopt, implement, and/or maintain Road Salt Minimization and Storage Management Programs.

Many communities in Northeast Ohio are implementing environmentally responsible road salt programs. They seek to minimize applications and most have constructed adequately protected storage facilities. The application of road salt remains the most efficient and cost-effective method of keeping roads free of ice. Maintenance of roads during the winter months varies depending on the geographic location, weather and temperature conditions, use of alternatives other than salt, road types and level of service, types of available equipment, financial resources, and road maintenance staff.

A winter maintenance program consists of several elements ranging in degrees of importance depending on the size of the operational jurisdiction and the complexity of its road network.

However, every winter maintenance program needs to ensure safety and flow of traffic, be protective of the environment, while also being fiscally responsible.

The Ohio Department of Transportation (ODOT) provides guidance that is in accord with these needs. The Snow and Ice Standard Operating Procedures combined with the District's Guidelines provides the basis for ODOT's Snow and Ice Policy. These efforts need to be continued regionally and enhanced in areas that could threaten drinking water supplies and surface waters.

It is well understood that road salt programs are driven by the need to provide for safe driving conditions. This objective cannot be compromised. Management programs seek to use only the amount of salt that will be needed to provide the desired level of safety and to apply that amount at the time when it will deliver the most good. Under some conditions, substitutes to road salt are used. Sand and other grit materials can be used in many locations that are not served with storm sewers (which quickly become clogged if sand is used). Calcium chloride is one substitute that is used locally in limited quantities. Research continues regarding cost-effective alternatives that are more environmentally friendly.

Local officials understand that it never pays to over salt or to apply quantities at times when it is not needed or cannot work. A responsible program ensures that all road maintenance personnel are fully trained in application procedures and policies. It also includes a commitment not to apply road salt when the temperature is too low for it to work. The adoption of a policy to spot apply is another mechanism that can help to reduce the impacts of salting. Such a policy calls for the salting of intersections, steep grades, and high use areas while limiting the application on flat, straight stretches of road and on side streets. Whereas not all measures of road salt minimization work everywhere, each community needs to strive to find those that can most effectively protect its citizens while minimizing off-road effects.

Recommendation 5-6: Soil and Water Conservation Districts are encouraged to take the lead in developing nonpoint source pollution management plans which would allow local watershed organizations to participate in the Ohio EPA-Division of Environmental and Financial Assistance (DEFA) Water Pollution Control Loan Fund (WPCLF) Linked Deposit Program which provides low-interest financial assistance to individuals and private organizations for implementation of agricultural management practices, for the conversion to conservation tillage systems, and for other nonagricultural capital projects to reduce nonpoint source pollution in the waterways of Northeast Ohio.

The objective of this mechanism is to promote the use of WPCLF monies to individuals who seek to implement approved agricultural management practices including cropping practices, pesticide reduction practices and animal waste handling practices. It also provides a mechanism to include other nonpoint source control efforts that address nonagricultural sources of pollution.

The linked deposit program provides low interest loans to farmers who work to reduce nonpoint source pollution from their agricultural operations which include both crop production and animal production. The program requires the completion of a watershed management plan that identifies needed nonpoint source controls and provides for targeted

implementation. These plans are usually developed by the Soil and Water Conservation Districts in the watershed in concert with the County Agricultural and Cooperative Extension Agents.

Loans are issued directly by local banks to individual farmers to cover the cost of approved practices. The loan rate is reduced by three per cent from market conditions. Farmers can use the program to purchase conservation tillage equipment or to retrofit existing equipment to be used for this purpose. Pesticide application equipment that reduces the amount of chemicals used, or prevents the migration of applied chemicals, is eligible under the program. Animal waste handling facilities and equipment can also receive program support. Other eligible practices include fencing to exclude livestock from streams and filter strips to trap sediment and pollutants before they can enter a waterway. Non-agricultural practices are also eligible, including horse feedlots, kennels and other animal handling operations in urban areas. Funds are available to help finance on-site wastewater treatment system repairs and replacements. Storm water management structures may also be eligible. Ohio EPA continues to expand the list of eligible projects for controlling nonpoint source pollution.

IV. Planning Strategies for Nonpoint Source Management

This section reviews some of the initiatives that are being increasingly used to manage problems associated with nonpoint sources of pollution and storm water runoff. These initiatives will form the core of future management planning efforts to be implemented during the continuing planning phase of the CWP. Under the 208 Plan, NEFCO has continuing planning responsibilities. They include providing for education outreach and implementing demonstration projects designed to advance the state of management of nonpoint source pollution within the region. Areas where there is a logical and viable role for continuing planning are discussed below. The participation of local management agencies is central to the success of these activities.

Strategy 5-1: Intercommunity Storm Water Management Planning Support

Storm water retention/detention basins are generally approved on a site-by-site basis in lieu of a watershed approach. This could actually result in worse downstream flooding at some locations during certain storm events unless the location, size, and other design features of storm water basins are developed within the context of an overall comprehensive storm water management program. Coordination in storm water planning by all communities in a watershed is necessary to avoid causing such a condition. Development is needed of an on-line hydrologic and hydraulic model that is capable of assisting in the interactive design of storm water control basins. All communities in a watershed need to share in the development, financing, and maintenance of such models. Efforts to develop State legislation that requires such cooperation are supported by the CWP. **See Recommendation 5-1.**

Strategy 5-2: Highway Runoff Management Planning

The design and maintenance of highways can influence the type and amount of pollutants in the runoff from the roadway. Vehicular traffic introduces a wide variety of potentially harmful chemicals into surface runoff. There are practices that can reduce the impacts associated with

these chemicals. Local officials, acting in concert with the Ohio Department of Transportation (ODOT), need to develop management programs that can be implemented locally to control these releases. The melding of water quality and transportation planning capabilities can be drawn on to help realize this objective.

There is a need to develop educational programs which demonstrate how to minimize or mitigate the hydraulic impacts of highway runoff. There are techniques that can be used during the engineering phase, during actual construction, and as part of long-term operation and maintenance. It is even possible in some cases to provide partial mitigation of previous impacts.

Strategy 5-3: Cooperation with Stream Channel Stabilization and Stream Restoration Programs

The disturbance of the natural landscape has many consequences. One of these is that stream hydrology is altered as we clear native vegetation and convert the land to agricultural and urban uses. As the hydrology of a watershed is altered, the stream responds by adjusting its hydraulic forces to compensate for the new conditions. These adjustments have serious consequences such as increased flood damages, stream bank erosion, and the loss of quality stream habitat. In the past, we have responded to the changing conditions within the stream channel with a series of engineered approaches that have not proven wholly successful in dealing with the complete problem within the stream. Channelization and hard bank armoring, which have commonly been used to deal with problems in the channel, often pass the problem somewhere else because they have not dealt with the cause of the problem.

New approaches are being recognized as ways to address some of these shortcomings. These approaches incorporate the use of bioengineering principles which use natural plant materials instead of concrete. Bioengineering maximizes the establishment of terrestrial and aquatic habitat. Other aspects involve the recreation of stable channel patterns and cross-sections that mimic natural conditions. Numerous demonstration projects are underway in the region. The Indian Hollow Lake Golf Course, the Lorain County Metroparks, and the Village of Lodi are involved in projects in the Black River. The City of Medina is undertaking a project in the Rocky River. The Cities of Highland Hills, Seven Hills, and Cleveland have joined the Cuyahoga River RAP, Cleveland Metroparks, and Metro Parks serving Summit County in projects in the Cuyahoga River watershed. The Lake County Soil and Water Conservation District led a project along the Chagrin River. Local officials are being asked to take part in this growing technology. The City of Canton has completed construction of a wetland to treat storm water along Nimishillen Creek.

The area's SWCDs can be contacted for more information on how to incorporate bioremediation measures in stream management projects (See Appendix 5-1).

Programs for the maintenance or improvement of drainage ditches need to adopt soil bioengineering principles. These principles will allow the ditch to better provide its drainage function while still providing aquatic habitat.

Strategy 5-4: Cooperation with Watershed Stewardship Projects

Watershed stewardship programs are being established to raise public awareness which can help to build a constituency for protecting or restoring local streams. They do this by involving the public in efforts to clean up or to preserve local streams with the cooperation of the public agencies who are responsible for those streams. Stewardship programs emphasize voluntary actions as the means to accomplish stream improvement objectives. They energize watershed residents to take an active role in the protection of the stream through participation in clean-up campaigns, stream monitoring activities, vegetative planting projects, and similar activities. Local officials participate through their support of the citizen projects and by targeting their resources to the problems documented by stewardship activities.

Stewardship programs raise awareness of a watershed's problems and seek to coordinate efforts to deal with them in an efficient manner. The public/private partnerships that are established by the programs are the mechanism by which this happens. The key element of stewardship programs is the consensus-building process involved. Volunteers identify problems, research cost-effective solutions, and provide manpower to help implement these solutions. They are assisted in this process by the professional environmental staffs working for a host of public agencies. Local communities step in with the resources needed to carry out the recommended actions. When done in a coordinated manner, public support is organized to take care of the priority problems without overtaxing a community's ability to respond. This generation of community support is the key to real and lasting change.

Stream Stewardship Programs are becoming commonplace in the NEFCO and NOACA 208 water quality management areas. Programs are now underway in all of the following streams: Big Creek, Doan Brook, Grand River, Mill Creek, West Creek, Yellow Creek, Sugar Creek (Wayne County), Nimishillen Creek, and Tuscarawas River.

The Ohio Department of Natural Resources (ODNR), in conjunction with the Soil and Water Conservation Districts in the region, have initiated an Urban Stream Program which provides each SWCD in Northeast Ohio with an employee whose responsibilities include fostering stream stewardship activities. This program is intended to demonstrate that community-based efforts can help to restore streams impacted by previous urbanization. The Urban Streams' personnel can help interested communities develop stewardship programs of their own (See Appendix 5-1). NEFCO and ODNR have sponsored a Watershed Coordinator in the Upper Tuscarawas River Basin, in Stark, Summit, and Wayne Counties. The Watershed Coordinator's job is to facilitate local watershed groups to develop watershed plans and assist with procuring resources to implement the plans.

Strategy 5-5: Coordination of Geographic Information System (GIS) Opportunities

One of the difficulties in dealing with nonpoint sources of pollution is that it is characterized by small incremental loadings generated from a very large land base. It is difficult to identify and estimate the contribution from each specific portion of a watershed. This limits the ability to target priority sources or areas within problematic watersheds.

The development of computerized mapping and analysis tools is providing new opportunities for the management of nonpoint sources. It is now becoming a matter of course to be able to

manipulate very large data bases that allow one to overlay land use, soil type, land slope, hydrologic data, and other parameters in ways that provide insight into those combinations that are most important in any given watershed. It is also possible to link these overlays to stream performance data including chemical monitoring data, biological assessments, and stream channel instability problems. Hydrologic modeling, which demands large amounts of land-based inputs, is becoming more efficient, allowing for a better analysis of flooding and water quality problems. The ability to link numerous causes and effects related to our use of the landscape increases the support for action by combining several objectives into one coordinated solution. This information is instrumental in helping public officials to recognize and understand these interrelationships.

As new tools are developed to help identify and prioritize remediation actions in nonpoint source impaired watersheds, numerous agencies will have to actively coordinate their data collection and reporting procedures. This will allow for the generation of up-to-date computer files of land based information that can readily and easily be shared among all parties needing it. Support for the maintenance of this data base is important if GIS technology is to be maximized. The outputs of the technology can then be used to assist in the education of local public officials regarding their role in the management of nonpoint sources of pollution.

Strategy 5-6: Encouragement of Land Preservation Programs

A variety of land preservation and conservation programs are being developed in an attempt to offset the effects of continued land development trends. These programs seek to accommodate growth while maintaining the land and water resources in developing areas. Farmland Preservation and Land Conservancy Programs are two examples of such efforts.

Farmland preservation efforts seek to maintain the character of rural landscapes by maintaining the conditions that enhance the sustainability of agriculture in growth pressure areas. They involve the purchase of land development rights on those tracts of agricultural land deemed crucial to the continued agricultural viability in a particular area. They also work to buffer agriculture from development by employing the concept of conservation design in which residential development is clustered in areas surrounded by open space.

Land Conservancy Programs seek conservation easements from landowners interested in helping to preserve the natural character of undeveloped areas. Conservation easements can be an important tool which can provide tax benefits to the donee and at the same time provide important protection for a water or land resource. A conservation easement is a recorded deed restriction under which a property owner gives up all or some of the development rights associated with their property. The conservation easement is generally managed by a charitable organization in the conservation field or a unit of government. In granting a conservation easement, the owner is in essence giving up any future development rights on the property and giving the management organization the right to enforce the extinguished development rights. The property can be sold but it will always be subject to the terms of the conservation easement. Stream banking programs can make use of conservation easements for the protection of riparian areas.

Land conservation projects can receive funding support from several programs. The State of Ohio's Nature Works Program is one of these. Section 319 Nonpoint Source Demonstration Grants have also been used in this regards. The Wetlands Preserve Program administered by NRCS-USDA is another source of this protection. Local SWCD offices can be contacted for more information on all of these initiatives.

Strategy 5-7: Cooperation with Phase II Storm Water NPDES Program

USEPA is in the process of expanding the scope of the NPDES storm water program. The expansion, referred to as "Phase II", will bring small municipal storm sewers systems and construction sites between 1 and 5 acres into the NPDES program. Local governmental units responsible for the following discharges will be affected by Phase II:

- Discharges from small municipal separate storm sewer systems (MS4s) in incorporated areas, or in counties, that are located in an Urbanized Area as defined by the 1990 Census.
- Discharges associated with construction activities disturbing between 1 and 5 acres,
- Discharges from any small MS4 that the Ohio Environmental Protection Agency (EPA) determines is in need of storm water controls, or
- Any other discharge that EPA determines contributes to a violation of a water quality standard or is a significant contributor of water pollutants.

Under the proposed rules, designated small MS4s will be required to develop a storm water management program and submit this with their application. This program must contain the following minimum control measures:

- (1) Public education and outreach programs
- (2) Public involvement and participation
- (3) Illicit discharge detection and elimination
- (4) Construction site storm water runoff, including soil erosion/sediment control best management practices (BMPs)
- (5) Post-construction storm water management in new development and redevelopment
- (6) Pollution prevention and BMPs for municipal operations

The management of storm water runoff is a complex and inexact undertaking. Peak flow reductions and runoff volume management can be realized with the use of engineered structures bolstered by runoff reducing land practices. In order to be fully effective, each flow management structure needs to be coordinated with other sites within the watershed. This most often requires broad cooperation among a number of communities. Communities will also need to share innovative storm water and pollutant loading reduction strategies with one another in order to maximize the effects of this program. A commitment, to developing watershed-wide management strategies will go a long way towards implementation of effective and efficient storm water management programs by all communities.

Implementation of the model regulations and policy guidelines identified in Recommendations 5-1 through 5-6 will help all affected jurisdictions to comply with Phase II requirements.

V. Policies for Encouraging Local Actions for the Control of Nonpoint Source Pollution

NEFCO encourages local initiatives for control of storm water and nonpoint source pollution. The adoption of the following policies are presented as a beginning point to ameliorate the impacts of nonpoint source pollution arising from runoff.

Policy 5-1: NEFCO will promote and support the implementation by local and county jurisdictions in the CWP area of the nonpoint source management programs presented in this chapter. These programs include:

- 5-1. Storm water runoff management from development and redevelopment actions**
- 5-2. Construction site erosion and sediment control programs**
- 5-3. Riparian zone protection program**
- 5-4. Conservation design for storm water management**
- 5-5. Road salt minimization and storage program and**
- 5-6. Nonpoint source management plans for low interest loan programs**

Policy 5-2: A local or county jurisdiction that agrees to implement one or more of these nonpoint source recommendations will be recognized as a management agency for that purpose in this plan.

Policy 5-3: Local and county jurisdictions will be encouraged to pursue implementation of the recommended nonpoint source management programs by cooperating on an interjurisdictional watershed basis.

Policy 5-4: NEFCO encourages state and federal funding agencies to provide on a priority basis nonpoint source and watershed grants to support implementation of nonpoint source management programs by management agencies recognized for nonpoint source management in this plan.

Policy 5-5: NEFCO will cooperate with the planning initiatives outlined in the nonpoint source management planning strategies presented in this chapter. These strategies include:

- Strategy 5-1: Intercommunity Storm Water Management Planning Support**
- Strategy 5-2: Highway Runoff Management Planning**
- Strategy 5-3: Cooperation with Stream Channel Stabilization and Stream Restoration Programs**
- Strategy 5-4: Cooperation with Watershed Stewardship Project**
- Strategy 5-5: Coordination of Geographic Information System (GIS) Opportunities**
- Strategy 5-6: Encouragement of Land Preservation Programs**
- Strategy 5-7: Cooperation with Phase II Storm Water NPDES Program**

VI. Strategy for Implementing Recommended Nonpoint Source Management Programs

Implementation of the programs recommended in this chapter will require an active sustained effort at promoting and supporting local implementation initiatives. This is an effort that will require the sustained interest and cooperation of a number of agencies with nonpoint source technical resources, including the areawide planning agencies, county level support agencies such as the soil and water conservation districts, county engineers, county planning agencies, and state agencies including Ohio EPA, ODNR, ODH, ODOT, and the OWDA among others, and the watershed planning organizations discussed in Chapter 8.

The presentation of the draft plan to local jurisdictions for review and comment provides an initial opportunity for promoting these recommendations. However, the effort to secure local adoption of these recommendations will require a sustained effort over a period of time. The ongoing areawide planning process outlined in Chapter 10 discusses the issue in more detail.

APPENDIX 5-1

Nonpoint Source Management: Recommended Model Ordinances Resource and Agency Contact List

Nonpoint Source Management: Recommended Model Ordinances

I. Recommended Model Ordinances

Please contact the Northeast Ohio Four County Regional Planning and Development Organization (NEFCO) for copies of the following documents. Please consult the attached Resource/Agency Contact List to obtain additional information.

Recommendation 5-1: Storm Water Management from Development and Redevelopment Actions

Cuyahoga Valley Communities Council. "A Model Ordinance for Local Storm Water Management in the Cuyahoga Valley Communities." 1994.

Cuyahoga Soil & Water Conservation District. "A Model Ordinance for Construction Site Erosion Control & Storm Water Management." 1994.

Northeast Ohio Areawide Coordinating Agency. "NOACA Model Approach to the Phase II Storm Water Management Plan." 2003.

Recommendation 5-2: Construction Site Erosion and Sediment Control Programs

Ohio Department of Natural Resources. "Rainwater and Land Development Guide." 1996.

Cuyahoga County Soil & Water Conservation District. "A Model Ordinance for Construction Site Erosion Control & Storm Water Management." 1994.

Recommendation 5-3: Riparian Zone Protection Program

Chagrin River Watershed Partners. "A Model Ordinance for the Establishment of a Riparian Buffer Area" 1999.

Summit County Riparian Ordinance, 2002, Summit Soil and Water Conservation District.

Recommendation 5-4: Conservation Design for Storm Water Management

Western Reserve Resource Conservation and Development Council: The Countryside Program. "Conservation Development Resource Manual." 1998.

Recommendation 5-5: Road Salt Minimization and Storage Programs

Ohio Department of Transportation. "The Snow and Ice Standard Operating Procedure." 1995.

Resource and Agency Contact list

II. Resource/Agency Contact List

Cuyahoga Soil and Water Conservation District

6100 West Canal Road

Valley View, Ohio 44125

Phone: (216) 524-6580

Fax: (216) 524-6584

E-mail: jstorer@cuyahogaswcd.com

Web site: Not available at this time

Portage Soil and Water Conservation District

6970 State Route 88

Ravenna, Ohio 44266

Phone: (330) 297-7633

Fax: (330) 296-5917

E-mail: portageswcd@oh.nacdnet.org

Web site: www.portageswcd.org

Stark Soil and Water Conservation District

2311 Columbus Road, NE

Canton, Ohio 44705

Phone: (330) 489-9764

Fax: (330) 489-9765

E-mail: Gloria-hostetler@oh.nacdnet.org

Web site: www.starkswcd.org

Summit Soil and Water Conservation District

2795 Front St. Suite D

Cuyahoga Falls, Ohio 44221

Phone: (330) 929-2871

Fax: (330) 929-2872

E-mail: summitswcd@aol.com

Web site: <http://members.aol.com/summit/swcd/>

(source for information about the Summit County Riparian Ordinance)

Wayne Soil and Water Conservation District

428 W. Liberty St.

Wooster, Ohio 44691

Phone: (330) 262-2836

Fax: (330) 226-7422

E-mail: swcd@bright.net

Web site: www.bright.net~swcd/

Ohio Department of Natural Resources (ODNR), Division of Soil and Water Conservation

2045 Morse Road
Building E-2
Columbus, Ohio 43229
Phone: (614) 265-6610
Fax: (614) 262-2064
E-mail: rama.jones@dnr.st.oh.us
Web site: <http://www.dnr.state.oh.us/odnr/soil+water/>

Copies of the "Rainwater and Land Development Guide" are available through ODNR, Division of Soil and Water Conservation for \$20.00 plus \$4.00 shipping charge. Excerpts of this document, including an overview and the Table of Contents, can be found on NOACA's web site www.noaca.org

Ohio Environmental Protection Agency, Division of Environmental and Financial Assistance (DEFA)

Lazarus Government Center
P.O. Box 1049
Columbus, Ohio 43216
Phone: (614) 644-2798
Fax: (614) 644-3687
E-mail: james.bonk@epa.state.oh.us
Web site: <http://www.epa.state.oh.us/defa/>

Ohio Environmental Protection Agency, Northeast District Office (NEDO)

2110 East Aurora Road
Twinsburg, Ohio 44087
Phone: (330) 963-1200
Fax: (330) 487-0769
E-mail: mbergman@epa.state.oh.us or dbogolveski.@epa.state.oh.us
Web site: <http://www.epa.state.oh.us/dist/nedo>

Please call Ohio EPA for information related to nonpoint source pollution control at (330) 963-1215 or storm water management at (330) 963-1145.

Ohio Department of Transportation (ODOT)

District 4
2088 South Arlington Road
Akron, OH 44306
Phone: 1-800-603-1054 or (330) 786-3100
Fax: (330) 786-2232
E-mail:
Web site: <http://www.dot.state.oh.us/dist4/>

Ohio Department of Transportation (ODOT)

District 3
906 North Clark Street

Ashland, OH 44805

Phone: (800) 276-4188 or (419) 281-0513

Fax: (419) 281-0874

E-mail:

Web site: <http://www.dot.state.oh.us/dist3/>

Northeast Ohio Areawide Coordinating Agency (NOACA)

1299 Superior Ave.

Cleveland, OH 44114

Phone: (216) 241-2414

Fax: (216) 621-3024

E-mail: jbeeker@mpo.noaca.org

Web site: <http://www.noaca.org>