

Chapter 6

Management of Nonpoint Source Pollution and Stormwater Runoff

Nonpoint source pollution has become an overbearing problem to all water bodies across the Nation. Due to their dispersed nature, nonpoint sources are not easily identified and have become the fastest growing threat to the health and stability of our surface waters.

6.1 Introduction

The Clean Water Act defines pollution as “man-made or man-induced alterations of the chemical, physical, biological, and radiological integrity of the water”¹. Nonpoint source pollution is a direct result of activities taking place on land or from a disturbance of a natural stream system. Natural pollutant agents such as flow alteration, loss of riparian zone, physical habitat alteration, and the introduction of nonnative species to a water system produce nonpoint source pollution byproducts directly correlated to man-made alterations. According to the Ohio EPA’s Division of Surface Water, nonpoint sources are classified into two categories: polluted run-off and physical alterations, a result of how water moves over land surfaces or infiltrates into the ground.

All land use activities have the potential to pollute our critical water resources. Loose sediment, pesticides and fertilizers, petroleum products, harmful bacteria, pet waste, septage from failing HSTS’s, and trash are all common sources of nonpoint source pollution. As water moves across our changing land surfaces, the pollutants are carried away and deposited in our surface waters via storm sewers or direct deposition.

The amount of impervious surfaces increases as land transitions into urbanized settings. Associated with development, roadways, parking lots and household driveways prohibit the infiltration of stormwater into the ground, forcing rainwater to linger on the surface. Eventually the water will run off the surface and carry with it pollutants, such as gasoline, vehicle oil, diesel fuel, and other toxic chemicals, on its way to a storm sewer. Once in the storm sewer system, stormwater gathers velocity as it is channeled through straight conduits, and empties into a nearby surface water. Landscaping and poor housekeeping practices produce potential nonpoint sources of pollution in urban runoff. Fertilizers, herbicides, and pesticides contain nitrogen and phosphorous that both lead to water quality impacts. When applied incorrectly and/or abundantly, these chemicals can easily wash away during a rain event and flow into storm sewers and receiving surface waters. Although aquatic plants thrive on phosphorus, too much phosphorus can cause algal bloom formation, which in turn can harm fish populations. These blooms decrease the amount of light entering the water and eventually decreases the amount of food available for some organisms.

Agricultural practices have never been exempt from falling under the nonpoint source pollution category. Historically, the agricultural community has been cited as a leading contributor of sediment, nutrients, and chemicals (fertilizers and pesticides) in

surface waters. Unrestricted livestock access to streams has forced stream banks to erode, adding extra sediment to streams. Land application of manure and the use of pesticides, fertilizers, and herbicides, when carried away by water, add excess nutrients and organics that impact surface water quality. However, with better conservation practices in place, their contribution has moderately decreased.

The lack of adequate erosion control measures at construction sites has also increased the amount of sediment entering our surface waters. Because soil is exposed during the stages of development, it is easily carried away during a rain event, collecting other pollutants on its way to a storm sewer system. Increasing the sediment load into water systems has been proven to be detrimental to the aquatic ecosystems. When sediment is suspended in water, it prohibits light penetration, thus impairing photosynthesis, modifies oxygen demands, and reduces the food supply for many organisms. As sediment settles, it destroys fish populations by covering spawning beds, and increases the potential for flooding by reducing a water body's holding capacity.

6.2 Summary of Nonpoint Sources in Mahoning and Trumbull Counties

Over the years, a new pattern has emerged in Ohio regarding point and nonpoint source pollution. Impairments caused by point source pollution are decreasing, while those caused by nonpoint sources are increasing. Based on results from state wide surveys, the Ohio EPA asserts that nonpoint source impacts, such as:

“urban storm water, siltation of substrates, and habitat degradation are becoming increasingly evident as historically more pronounced impacts from point sources (i.e. municipal WWTPs, some industrial effluents) are reduced. Since 1988, there has been a 48% decline in point sources as a major source of impairment in reassessed stream and river segments... Nonpoint sources have emerged as a major source of impairment in streams and rivers during this period, with increases including 70% for agricultural sources to 123% for hydromodification related nonpoint source impairments. While successes resulting from the abatement of point sources have been documented, there are other indications that impacts from nonpoint source runoff, habitat degradation, and watershed disturbances may be worsening. Siltation of substrates and habitat degradation are now the second and third leading causes of aquatic life impairment in Ohio streams and rivers, surpassing ammonia and heavy metals. These impairments are principally the result of agricultural land use, intensive urbanization, and suburban development, the latter of which is emerging as one of the most significant threats to watersheds... Increasingly, water pollution problems are associated with nonpoint sources such as construction sites, farm land, abandoned mines, landfills, pits and lagoons, oil and gas wells, domestic sewage systems, manure and treatment processing residuals”.

According to the Ohio EPA the top seven major causes of impairment (state-wide)

are habitat modification, siltation, organic enrichment/low dissolved oxygen (D.O.), flow alteration, nutrients, metals, and ammonia. The major sources of impairment include hydro-modification, agriculture, municipal (including CSOs) and industrial discharges, mining, and urban runoff². According to the 2016 Integrated Report, the leading “High Magnitude Causes” of impairment in Mahoning County and Trumbull County surface water systems include:

- Direct Habitat Alterations;
- Organic Enrichment/Dissolved Oxygen;
- Nutrients;
- Flow Alteration, Siltation, Wetland Alteration, and Unionized Ammonia; and
- Unknown sources.

The sources complimenting the causes are “High Magnitude Sources”, and those include:

- Channelization Due to Development and Natural Causes;
- Major Municipal Point Sources, Dam Construction, Urban Runoff/Storm
- Sewers, Combined Sewer Overflows (CSO);
- Unknown sources;
- Contaminated Sediments; and
- Riparian/Stream Bank Vegetation Removal.

The water quality of Mahoning and Trumbull County is dependent upon land use activities that exist within four watersheds: Grand River Watershed, Pymatuning Watershed, Mahoning River Watershed, and the Little Beaver Creek Watershed. Figure 2-1 illustrates the two-county area and the four watershed boundaries. The following is a summary of the nonpoint sources of pollution existing within the watersheds based on the Ohio EPA’s various monitoring reports and existing watershed plans. Pollution sources mentioned are of those found within Eastgate’s planning region. However, it is important to note that pollution originating outside and downstream of the planning region can and does find its way into the watersheds shared by Mahoning and Trumbull Counties (i.e. Mahoning River Watershed).

6.2.1 Grand River

The Grand River watershed is in rural, northwest Trumbull County. A Biological and Water Quality Study of the Upper Grand River was conducted in 2007. According to the report, agricultural practices make up the majority of the watershed’s nonpoint source pollutants. Animal and crop farming practices lend some of the heaviest nonpoint sources within the watershed. Runoff of agricultural chemicals (i.e. fertilizer, pesticides) have affected the health of aquatic life, while unrestricted livestock access to streams has contributed to stream bank erosion, depositing sediment into the waters. Land application of manure has been identified by the Watershed Action Plan as a runoff concern for the abutting surface waters. According to the draft Grand River Watershed Action Plan, habitat destruction has removed valuable riparian cover that is utilized to keep exposed sediment in place. The Grand River (upper) Watershed Total Maximum Daily Load

(TMDL) Report was approved by U.S. EPA on April 10, 2013. TMDL reports identify and evaluate water quality problems in impaired water bodies and propose solutions to bring those waters into attainment with water quality standards. TMDLs were calculated for nutrients (total Kjeldahl nitrogen, total phosphorus and ammonia), total dissolved solids, habitat and *E. coli* bacteria.

Recommendations for regulatory action resulting from this TMDL analysis include an effluent limit for total phosphorus for one facility and monitoring for total Kjeldahl nitrogen, ammonia and total phosphorus for several other small facilities. Nonpoint sources of direct habitat alterations should be addressed by bank and riparian restoration, stream restoration and investigation into dam modification or removal; for nutrients, total dissolved solids and bacteria by tying unsewered areas into sewer systems where feasible and further investigation sources in some locations; and for bacteria by inspecting and replacing or repairing failing home sewage treatment systems and agricultural best management practices. In some cases of natural impairment, wetland restoration and/or conservation easements may improve water quality. Nonpoint sources are typically addressed by voluntary actions.

In the Spring of 2003, the Ohio State University Extension joined with the Grand River Partners and the Trumbull County General Health Department to conduct a survey of residents within the upper portion of the Grand River watershed. The survey was constructed to determine resident's attitudes toward water quality protection and land preservation within the watershed, specifically those lands abutting the Grand River and its tributaries. Respondents rated their views on the extent to which activities or events posed a threat to the watershed. Results from the survey indicated the perceived problems in the watershed were failing septic systems and urban sprawl. Trailing the top two concerns, but not lacking importance, were habitat alteration, industry, construction, logging, flooding, animal farming, crop farming, and mining.

6.2.2 Pymatuning Watershed

The Pymatuning watershed covers the rural, northeast portion of Trumbull County, but transitions to an urban setting as it stretches south towards Mahoning County. Though the mainstem of Pymatuning Creek is buffered by the Pymatuning Wildlife Area, tributaries to it are not and serve as express lanes for sediment and pollution transport. According to the Integrated Report, nutrients, flow alteration, direct habitat alterations, organic enrichment/dissolved oxygen, and pathogens have been cited as causes of impairment. The report further lists contributing impairment sources include major municipal point sources, urban runoff/storm sewer, hydromodification due to development, habitat modifications other than hydromodification, channelization due to agriculture, natural and unknown sources. Additionally, the creek and its tributaries flow through several rural townships of Trumbull County troubled by failing septic systems. A TMDL report is in preparation for this watershed.

6.2.3 Little Beaver Creek Watershed

The Little Beaver Creek watershed weaves in and out of southern Mahoning County. Though mainly located in Columbiana County, land activities upstream in Mahoning County can be detrimental to downstream water quality. The 2006 Integrated Report lists nutrients, siltation, pesticides, organic enrichment/dissolved oxygen, unionized ammonia, flow alteration, natural limits (wetlands), and direct habitat alterations as high magnitude causes of impairment within the watershed. Sources of the causes include major industrial point sources, combined sewer overflows, pasture lands, channelization (development/agriculture), removal of riparian vegetation, onsite wastewater treatment systems (septic systems), and surface mining. According to the Columbiana County Soil and Water Conservation District, the leading nonpoint sources that impact the watershed's water quality include development, sediment, toxic substances, failing septic systems, damaged riparian areas, urban runoff, logging, and animal manure applications.

6.2.4 Mahoning River Watershed

The Mahoning River watershed spans across six counties (Columbiana, Stark, Mahoning, Portage, Geauga, and Trumbull Counties) and is the largest watershed within the two-county area. Nonpoint sources of pollution appear numerous and sporadic throughout the watershed. Agricultural practices along main tributaries such as Meander Creek, the southern segments of Mill Creek and Yellow Creek, in Mahoning County, and along Mosquito Creek and Eagle Creek in Trumbull County appear to contribute organic enrichment, nitrate-nitrite, nutrients, and phosphorus to the impairment of the watershed's water quality. Riparian zones, have been destroyed by unrestricted livestock access and by farming in riparian zones and urban development. Residential and commercial development have sprawled out of the central cities and into the rural areas as seen happening in southern and southeastern Mahoning County and throughout Trumbull County. The outward migration of development leads to deterioration of water quality by habitat and flow alterations, the importing of sediment and nutrients into the tributaries, and by decreasing the amount of dissolved oxygen within the waters. Failing commercial and home septic systems have become a nuisance throughout the watershed with "hot spots" occurring near Mosquito Creek Reservoir, a drinking water supply in Trumbull County and along tributaries Yellow Creek and Mill Creek in Mahoning County. The Integrated Report cites numerous nonpoint sources that impair the watershed's water quality including (but not limited to) metals, suspended solids, siltation and urban runoff/storm sewers.

6.3 Policy Implementations

Two laws exist to aid in controlling runoff: one focusing on point source pollution and the second focusing on nonpoint sources. Under the Clean Water Act's (CWA) National Pollution Discharge Elimination System (NPDES) Program, stormwater runoff and point

sources are addressed. Meanwhile, nonpoint source programs are covered under Section 319 of the CWA. According to the Ohio EPA, the “Total Maximum Daily Load (TMDL) Program focuses on identifying and restoring polluted rivers, streams, lakes, and other surface waterbodies”.

6.3.1 NPDES Program

The Clean Water Act (CWA) of 1972 was established to enforce regulations under the Federal Water Pollution Control Act of 1948. The CWA was written with the intent to “restore and maintain the chemical, physical, and biological integrity of our nation’s waters³” by achieving two goals⁴:

- to eliminate the discharge of pollutants into surface waters; and
- to achieve a level of water quality that allots the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the water

The CWA also contains a national policy measure that states the “discharge of toxic pollutants in toxic amounts” is prohibited⁵.

The CWA’s original intent was to combat industrial and municipal waste discharging into surface waters. The Act prohibits any discharge of pollutants into waters of the United States, unless authorized by an NPDES permit. The NPDES program tracks point sources, monitors discharges from permitted sources, and minimizes the amount of pollutants discharged. However, as pollution measures were implemented and redefined, newer, more diffuse sources of water pollution were emerging and causing significant water quality impairments. Stormwater runoff, in connection with urban land use practices and construction site activity, and agricultural practices have been identified as the new causes of water quality impairments.

In 1987, the CWA was amended by Congress to establish regulations and issue permits for addressing non-agricultural stormwater discharges. The amendment created a phased implementation strategy for the NPDES Permit. In 1990, Phase I of the plan was activated, followed by Phase II in 2002.

6.3.2 Phase I

Phase I of the two-phase strategy was established in 1990 and depends on the NPDES permit coverage to address storm water runoff from:

- Medium or Large Municipal Separate Storm Sewer Systems (MS4s) serving a population of 100,000 or more;
- Construction activity disturbing 5 acres of land or more; and

- Ten categories of industrial activity listed in 40 CFR Subpart 122.26(b)(14).

Phase I entities are required to obtain an NPDES stormwater permit and implement stormwater pollution prevention measures or management programs that efficiently reduce or prevent the discharge of pollutants to surface waters. Under Phase I, Best Management Practices (BMPs) are encouraged to help achieve site-specific NPDES requirements.

6.3.3 NPDES Phase II

The second phase of the stormwater water regulation expands Phase I to require small sized MS4s in urbanized areas as well as construction site operators to apply for NPDES permitting. Phase II was designed to create programs and practices to curb stormwater runoff. The phase covers two classes of stormwater dischargers:

- Operators of small MS4s located in “urbanized areas” as defined by the Bureau of Census; and
- Operators of construction sites that disturb 1-5 acres of land.

In addition, the following federal, state, local, and tribal agencies are regulated under this phase:

- US Department of Defense;
- State Hospitals;
- State Prisons;
- State Departments of Transportation (not previously covered under Phase I);
- Universities; and
- Tribal Areas identified as a small MS4owner/operator.

Phase II of the program was finalized in December 1999 and the Ohio EPA passed the final permit requirements to meet the Phase II rule in December 2002. Under the finalized phase, 6 minimum control measures must be addressed as requirements of the program.

The 6 measures include:

- Public Education and Outreach;
- Public Involvement and Public Participation/Involvement;

- Illicit Discharge Detection and Elimination;
- Construction Site Runoff Control;
- Post- Construction Runoff Control; and
- Pollution Prevention/Good Housekeeping.

Many of the communities in the Eastgate Planning Area have begun implementing Stormwater Management Plans (SWMPs) to fulfill their Phase II requirements. **Table 6-1** summarizes the entities within Mahoning and Trumbull Counties having SWMPs, with both counties having regional programs in place that include joint permittees.

Table 6-1: Phase II Stormwater Regulated Entities

Mahoning County	Trumbull County
Mahoning County*	Trumbull County**
Austintown Township*	Bazetta Township**
Beaver Township*	Brookfield Township**
Boardman Township*	Champion Township**
Canfield Township*	Howland Township**
Coitsville Township*	Hubbard Township**
Poland Township*	Liberty Township**
Springfield Township*	Newtown Township**
Mill Creek MetroPark*	Vienna Township**
City of Struthers	Warren Township**
City of Campbell	Weathersfield Township**
City of Canfield	City of Cortland**
Village of New Middletown	City of Girard**
Village of Poland	City of Hubbard**
	City of Newton Falls**
	Village of McDonald**
	City of Niles**
	City of Warren

* Joint, regional plan with the Mahoning County Engineers Office as the lead role.

** Joint, regional plan with Trumbull County with Trumbull County Soil and Water implementation.

Under the State of Ohio’s Phase II regulations, operators of construction sites are required to implement site BMPs as required by the Ohio EPA General Permit for Storm Water Discharges Associated with Construction Activity. In addition, Phase II designated communities are required to adopt a local ordinance or regulatory mechanism as stringent or more stringent than OEPA requirements addressing storm water runoff from earth disturbing construction projects resulting in the disturbance of one or more acres of land. The Boards of Commissioners in Mahoning and Trumbull Counties, by the authority given under O.R.C 307.79, as modified by H.B. 411, adopted Erosion and Sediment Control Rules applicable to the entire unincorporated area of each county. Administration of the Rules was

assigned to the County Engineers office in Mahoning County and the Soil and Water Conservation District Office in Trumbull County. Subsequently, each zoned, Phase II designated township began adopting local zoning legislation requiring compliance with the Rules prior to the issuance of a zoning permit.

An Erosion and Sediment Control (E&SC) Manual is a tool created by counties and utilized to assist developers with compliance in storm water management regulations at construction sites. The purpose of an E&SC manual is to provide detailed and supportive information and examples allowing developers, designers, contractors, builders, and planners the appropriate information necessary to address state and local requirements for construction site runoff and post-construction stormwater management. BMPs are a component of an E&SC and must be discussed thoroughly (standards and specifications) and submitted with a construction site E&SC plan. A BMP's goal is to prevent the discharge of pollutants into a surface water. In addition, the Ohio Department of Natural Resources Division of Soil and Water created the 2006 edition of the Rainwater and Land Development Manual as a guide for BMP selection and preparation of E&SC plans.

The Illicit Discharge Detection and Elimination minimum control measure is central and interrelated and a component of the other five. This control measure requires regulated communities develop a storm sewer system map detailing the locations of MS4 discharges into natural drainageways or "waters of the state". In addition, communities must provide a map and a list by address of residences operating a home sewage treatment system that discharges to the MS4 otherwise referred to as off-lot septic systems. Communities are required to adopt ordinances prohibiting non-storm water discharges to their MS4. However, many communities such as county and township government lack the legal authority to adopt such regulations. Therefore in Mahoning and Trumbull Counties, a protocol has been established utilizing existing authority given by the state legislature. Discharge of septic or grey water from HSTS's is currently enforced under ORC 3745, 3701.352 and OAC 3701-29, illicit plumbing connections are enforceable under 4104.41, 4104.43 and Chapter 6 of the Ohio Plumbing Code, litter is enforceable under ORC 3767, solid waste and open dumping by ORC 3734 and OAC 3745 and spills by ORC 745 and ORC 6111. Finally, as mentioned above, sediment discharge is regulated under ORC 307.79 for the unincorporated area of the counties.

MS4 outfalls must be mapped and observed for flow. Each outfall location must be observed once throughout the permit term in a dry weather screening process following 72 hours without a rain event. Flows composed entirely of storm water such as sump pump discharge or infiltration into the storm sewer system are possible during such an observation. Sampling of flows is not required by the permit but will be performed in potential enforcement cases.

The Ohio Agricultural Pollution Abatement Rules, passed by the legislature in 1979, handles nonpoint source sediment pollution from agricultural

communities. Additionally, the 1987 Water Quality Act exempted nonpoint source pollutants from agricultural activities, (i.e. runoff from orchards, cultivated crops, pastures, and range lands) from storm water regulations. The Chief of the Ohio Department of Natural Resources (ODNR) Division of Soil and Water Conservation is responsible for handling the agricultural community's. Through an agreement with local Soil and Water Conservation Districts (WCD), the local District's Board of Supervisors have the ability to address agricultural nonpoint source pollution complaints from landowners.

Due to the fact the Ohio EPA is empowered to regulate urban stormwater, the agricultural communities in our region work with the Mahoning County Soil and Water Conservation District and the Trumbull Soil and Water Conservation District (respectively) to address and manage sediment and nutrient issues through various BMPs. Several BMPs encouraged include conservation tillage, contour strip cropping, the establishment of buffer or filter strips along streams, and exclusionary fencing for livestock. Numerous governmental programs, such as the Ohio EPA's 319 Grant and funds from the U.S. Department of Agriculture, are accessible to help farmers design and pay for BMPs that prevent and control nonpoint source pollution on their lands.

6.4 Ohio Nonpoint Source Pollution Control Program

6.4.1 CWA Section 319

The CWA was amended in 1987 to include Section 319, which established a Nonpoint Source (NPS) Management Program that recognized the need for greater leadership to focus on State and local NPS efforts. Section 319 enables states to receive grant money to support a variety of activities such as providing technical and financial assistance, education, training, technology transfer, demonstration projects, and monitoring to assess the success of specific nonpoint source implementation projects.

The Ohio EPA is the designated water quality agency in Ohio and is responsible, through the Division of Surface Water, for administering the 319 Grant Program. Since 1990, Ohio EPA has annually applied for, received and distributed 319 Grant funds to correct water quality impairments to Ohio's surface and groundwater resources caused by nonpoint sources. Education, public participation, and implementation based on innovation, cost-sharing and voluntary compliance with locally developed watershed management plans are the focal point of the Ohio 319 Grant Program.

In the Eastgate planning area, numerous entities are actively engaged in Ohio's 319 Grant Program. Through this program, watershed action plans for the Grand River, Pymatuning, Lower Mahoning River and Mosquito Creek, and Mill Creek (subwatershed of the greater Mahoning River Watershed) watershed have been created and submitted to the Ohio EPA for review and approval. AWARE, in

conjunction with the Mahoning County Soil and Water Conservation District, has utilized the 319 Grant monies to purchase various conservation easements within the Mill Creek and Yellow Creek watersheds. The Trumbull County Soil and Water Conservation District has utilized 319 Grant funding for agricultural exclusionary fencing alongside streamside agricultural lands. Additionally, volunteer stream monitoring and educational components have been initiated with grant monies from the program.

6.4.2 Total Maximum Daily Load (TMDL)

Established under the CWA's Section 303(d), the TMDL program emphasizes identifying and restoring polluted rivers, streams, lakes, and other surface waters. A TMDL is a "written, quantitative assessment of water quality problems in a waterbody and contributing sources of pollution"⁶. It specifies the amount a pollutant needs to be reduced to meet water quality standards (WQS), allocates pollutant load reductions, and provides the basis for taking actions needed to restore a waterbody. The TMDL Program is a watershed approach to quantifying and reducing point and nonpoint sources of pollution in impaired surface waters. The program builds on current "monitoring, modeling, permitting, and grant programs and works"⁷ within their "five-year monitoring strategy"⁸.

Ohio is required to submit a list of prioritized impaired waters to the U.S. EPA for approval. This list identifies the waters in Ohio that are currently impaired and require TMDL development to achieve Ohio's water quality standards. Based on information provided in the Ohio EPA's 2006 303(d) List of Impaired Waters, the following surface waters are scheduled for field monitoring and projected TMDL reporting:

- Upper Mahoning River: 2006-2007 (field survey), 2011 (TMDL report);
- Lower Mahoning River: 2013-2014 (field survey), 2015 (TMDL report);
- Upper Grand River (headwaters to upstream Rock Creek): 2007 (field monitoring), 2013 (TMDL report);
- Pymatuning River: 2008-2009 (field survey), "In preparation" (TMDL Report)
- The Mahoning River Watershed has a fecal coliform TMDL report that was approved by the US EPA in 2005.

6.5 Regional Policy Recommendations

Several nonpoint source management programs have been identified for implementation and continuation by local and county agencies in the Eastgate planning area. Recommendations for this chapter echo those found within other chapters of the AWTMP and reinforces action items found within the region's watershed action plans.

Recommendation 6-1: Both counties and their zoned communities are encouraged to adopt and implement riparian setbacks on all streams, rivers, and their tributaries. Because flowing water does not follow political boundaries, it is important for communities that share a common water course work together to create uniform language. Uniform Language will help prevent downstream flooding and ensure the health of the entire watershed.

Riparian setbacks have been identified as non-structural BMPs in the SWMPs. When the NPDES Phase II regulations were finalized in December of 1999, 6 minimum control measures were required, of which “postconstruction runoff control” measures were identified. Section 3.2.5.2.3.1 of both county’s Phase II, SWMPs, require “policies or ordinances that provide requirements and standards to direct growth to identified areas, protect sensitive areas such as wetlands and riparian areas, maintain and/or increase open space (including dedicated funding source for open space acquisition), provide buffers along sensitive water bodies, minimize impervious surfaces, and minimize disturbance of soil and vegetation”. Riparian setbacks are just one tool utilized to fulfill this requirement.

The purpose of a riparian setback ordinance is twofold. When properly applied, a setback protects the health, safety, and welfare of residents, prevents property damage or loss due to flooding and erosion, and protects the water quality of the creeks, streams, and rivers within a watershed system. The second purpose of riparian setback ordinances is not to make lots unbuildable, but to regulate uses of riparian areas and limit development within specific distances of streams. By creating setbacks, the riparian area can naturally slow stormwater, store this water, and release it over time, thus providing cost effective flood and erosion control and water quality protection.

Educational programs and workshops are a crucial component to making riparian setbacks acceptable to officials and residents. Many misconceptions regarding the ordinance are common. Township officials and residents need to be assured that riparian setbacks are designed with the landowner as well as the environment in mind.

Recommendation 6-2: Developing communities within the Eastgate Planning Area are encouraged to consider incorporating low impact development techniques within their subdivision or zoning regulations to enhance stormwater management within the watersheds.

A well-designed conservation development benefits the whole community and the watershed it resides in via its built-in stormwater management techniques. Through the practice of reducing the amount of impervious surface cover (road surfaces) and land preservation, natural, stormwater infiltration is able to occur. By instilling these requirements in a development, the amount of stormwater runoff exiting a conservation development is reduced, decreasing the chances the new development will add to downstream flooding problems. The preserved open space areas set aside within a conservation development naturally help control the flow of stormwater by reducing the volume of stormwater runoff and by cleaning the stormwater during infiltration. Unlike

traditional subdivision construction, where engineered sediment and erosion control measures are utilized, a conservation development relies on grassy swales (as road ditches) instead of curb and gutter techniques to catch soil runoff from land disturbing activities.

Subdivision regulations are created, adopted, and enforced by county planning commissions for unincorporated areas and by the municipalities for incorporated areas. Conservation design developments can be required by both city and village zoning districts. Zoned townships within the counties can adjust their zoning regulations to include conservation design development.

Recommendation 6-3: The Ohio EPA is encouraged to follow up on the actions and recommendations drinking water suppliers list in their Source Water Assessment and Protection (SWAP) program as steps to be taken to reduce the risk of contaminating public drinking water source.

The Ohio EPA Division of Surface Water is responsible for restoring and maintaining the quality of Ohio's rivers and streams, while the Division of Drinking and Ground Water informs citizens of where their drinking water comes from (surface or ground sources) and informs Ohio's citizens of whether or not their drinking water is safe to drink. The Ohio EPA is encouraged to develop a system to monitor the progress of public drinking water suppliers in their ability to address the protective strategies mentioned in their SWAP. Meanwhile, each drinking water supplier is encouraged to follow the recommendations within their SWAP to protect not only their asset, but to protect the public's health and the quality of their supply source.

Recommendation 6-4: Nine-Element Nonpoint Source Implementation Strategic Plans (NPS-IS) need to be created for all major watersheds and sub-watersheds within the Eastgate Planning Area.

Several watersheds within Eastgate's Planning Area have watershed action plans and received conditional endorsement from the Ohio EPA. However, these plans have been replaced with the NPS-IS plans. If an entity is seeking 319 Grant funds, a NPS-IS plan either needs to be endorsed or in progress to apply for the program.

Recommendation 6-5: Public Drinking Water Suppliers are strongly encouraged to preserve any and all lands surrounding not only their drinking water sources, but those lands immediately surrounding the rivers, streams, and tributaries to the surface water source.

Many impacts to surface water are in the form of nonpoint source pollution. Each SWAP provides strategies and recommendations public water suppliers can take to minimize impacts to their surface water. One such recommendation includes purchasing the lands adjacent to the drinking water sources. By protecting the lands surrounding the source, a buffer is created to help filter pollution before it enters the waters. Although protection of immediate, adjacent lands is important, many pollutants find their way into

our surface drinking water via a tributary.

Recommendation 6-6: Although agricultural activities are exempt from stormwater regulations, several BMPs should be carefully selected to not only protect the water bodies, but to allow farmers to continue with their respective business.

As noted in this chapter, many of the waterways located in the rural portions of each county have been impacted by agricultural activity. It has been recognized by the watershed action plans that through funding, cooperative agreements, and education a balance between water quality and agricultural activity can be reached. This plan encourages the local SWCD to continue educating local farmers on the BMPs that are available to them at no cost. Additionally, where a cost to implement a BMP is involved, local SWCDs are encouraged to continue reapplying for Section 319 Grant funding to help farmers implement BMPs. In the same turn, the Ohio EPA is encouraged to continue the 319 program to offer cost sharing benefits for farmers for the purchase of conservation tillage equipment, riparian planting, and animal exclusionary fencing. Other funding sources available for BMPs include the Environmental Quality Incentives Program (EQIP) from the Natural Resource Conservation Service (NRCS) for farmers to install conservation practices.