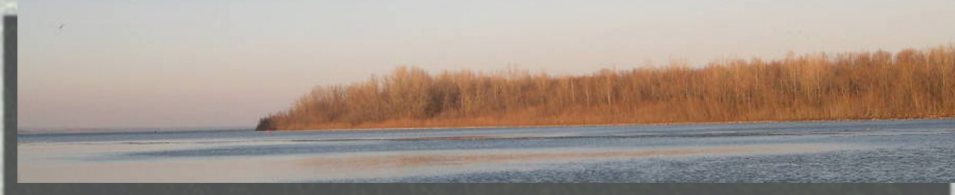
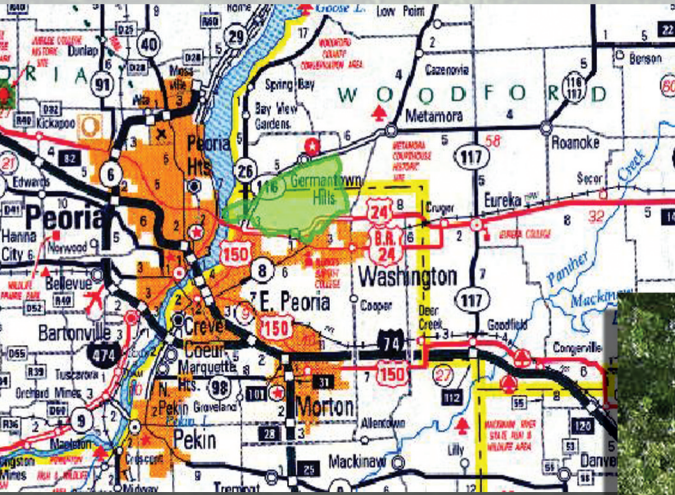


Tennmile Creek Watershed Restoration Plan

2004



Prepared By:
Tri-County Regional Planning Commission
www.tricountyrpc.org

Funded By: Illinois Department of Natural Resources' Conservation 2000 Program

Tennile Creek Watershed Restoration Plan

January, 2004

Tri-County Regional Planning Commission
Prepared by: Melissa Eaton, Planner II

With funding from Illinois Department of Natural Resources'
Conservation 2000 Program

Executive Summary

Tenmile Creek and its tributaries deliver approximately 23,500 tons of sediment to Upper Peoria Lake on an annual basis (Windhorn, 2003). This sediment fills the navigable channels of the Illinois River, depletes deep water habitat, and creates polluted, murky water that suffocates fish and prevents sunlight from reaching aquatic plants, a necessary start to the food chain of the Illinois River.

According to a recent study of the United States Department of Agriculture/Natural Resource Conservation Service, much of this sediment originates in the gullies formed from uncontrolled stormwater runoff from forested, urban, and agricultural land uses. This stormwater and resulting erosion can only be controlled through proper forest management, strategic/low impact development of urban areas, and the adoption of a tri-county unified stormwater ordinance that further restricts post development stormwater runoff. While individual streambanks can be stabilized and pockets of wetlands restored, it will take a great deal of community action and commitment to create the necessary ordinances and proper urban planning to truly reverse the declining trend of local water quality.

While soil erosion and sedimentation are the main focus of this report, other water quality and natural resource concerns are addressed. Individual homeowners can have a large collective impact on water quality by reducing fertilizer application on lawns, directing downspouts to pervious surfaces, disposing household chemical pollutants properly, etc. There is also potential for landowners of large and small tracts of land to aid in the preservation of biodiversity of the Tenmile Creek Watersheds by utilizing such informational resources as *Creating Habitats and Homes for Illinois Wildlife* by the Illinois Department of Natural Resources.

When the action items identified in this plan are engaged, the Tenmile Creek Planning Committee expects a dramatic decline in the sediment produced in the Tenmile Creek Watershed, an improvement in the fresh water species diversity, and an overall heightened awareness of the natural resources that Tenmile Creek Watershed has to offer.

Tenmile Creek Watershed Restoration Plan

January, 2004

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B – Tri-County Unified Stormwater Model Ordinance (created by the Tenmile Creek Watershed Technical Advisory Committee)

C – Conservation Funding List by The Nature Conservancy’s Volunteer Stewardship Network

Mission Statement

The mission of the Tenmile Creek Watershed Planning Committee is to develop and promote, through education, the implementation of the Tenmile Creek Watershed Management Plan. We seek to:

- *Reduce erosion and sediment load to the Illinois River*
- *Protect natural resources in the watershed*
- *Identify funding sources for implementation*



Acknowledgments

The creation of this watershed plan was truly a partnership. Citizens, public officials, interest group members, and natural resource professionals from public and private organizations worked together on a volunteer basis to create a watershed plan that empowers all the citizens of the Tenmile Creek Watershed to begin the process of restoring the environmental integrity of our land and water. The amount of time spent by these volunteers is valued at \$3,500 (350hrs x \$10/hr) by the granting agency, Illinois Department of Natural Resources, but to the citizens of the watershed, their time is priceless. As the reader will see in the committee members' autobiographies, the technical advisors that helped create this plan are some of the most knowledgeable in the State of Illinois on the subjects of hydrology, ecosystem management and restoration, ordinance development, and wildlife protection. In addition to the technical knowledge and expertise brought to the table, it is well recognized by all partners that a successful plan could not be created without the input of local citizens that understand the history and problems witnessed on a daily basis in the watershed. A very special thank you to all that contributed time and vehicles as we toured the watershed, collected data, and hashed through appropriate actions to restore the Tenmile Creek Watershed.

-Melissa Eaton, Tri-County Regional Planning Commission

Biographies

Planning Committee Members

Mr. Bob Jordon received a builder's certificate for building design specification and estimating in 1955 from Bradley University. He then started an excavating business in the Peoria area, doing foundations, basements, grading, water and sewer installation, and cutting in streets. For commercial sites, Mr. Jordon installed water retention ponds, dams and seeding for erosion control. Mr. Jordon also has built 70 golf courses across the United States. This work involved earthmoving, shaping, irrigation, drainage, runoff control, and seeding as well as complying with environmental regulations in a number of states including the Chesapeake Bay area. Mr. Jordan is also an appointed official on the East Peoria Zoning Board.

Roger Barry is the Facility Support Services Section Supervisor and Facility Engineer at Caterpillar, Inc.'s Peoria Proving Ground located in the Tenmile Creek Watershed in Tazewell and Woodford Counties.

Angelo Zerbonia, graduated from Bradley University in 1963 with a B.S. degree in Civil Engineering. He worked with the Corps of Engineers from 1963 to 1992 and was the Chief Engineer at the Illinois Waterway Corp Office from 1972 to 1992 covering the operation and maintenance of the Illinois waterway from Chicago, IL to the LaGrange lock and dam. He now serves as chairman of Tri-County Riverfront Action Forum, a group dedicated to preserving the Illinois River. Mr. Zerbonia is also a member of the Peoria Lakes Basin Alliance.



Mr. Wayne Ingram is a water resource engineer and professional engineer in Illinois, with Mactec Engineering and Consulting. Mr. Ingram is also a member of the Natural Resources and Your Development Taskforce, a volunteer organization that works to promote, educate, and assist with implementation of economically and environmentally sound development in the tri-county area. See also “Technical Advisory Committee”

Roseann Tomko is a program supervisor for Fon Du Lac Park District in East Peoria, Illinois, where she designs programs in horticulture and conservation. For the past three years Roseann has served as a mentor for East Peoria High Schools Senior project with students who worked on the topics of Loosestrife, Garlic Mustard, and Wetlands Restoration. She is on the Board of Directors for Peoria Academy of Science and a member of the Clean Water Celebration, a statewide conference held every March at the Peoria Civic Center. Ms. Tomko has a Bachelor of Science in Art Education from Eastern Illinois University and a Masters Degree in Fine Arts Photography from Illinois State University and is currently working on her associate’s degree in Horticulture from Illinois Central College.

Tim Malone is the District Conservationist for the USDA Natural Resources in Tazewell County. He is responsible for providing technical assistance to landowners in Tazewell County through the Tazewell County Soil & Water Conservation District.

Mike LaHood is a landowner and developer in the Tenmile Creek Watershed. He has enrolled a number of acres of farmland in the Conservation Reserve Enhancement Program on the Tenmile Creek delta.

Technical Advisory Committee

Wildlife & Ecology Subcommittee

Illinois Department of Natural Resources

Thomas Lerczak is a Natural Area Preservation Specialist with the Illinois Nature Preserves Commission. His main focus is the protection and management of Illinois Natural Area Inventory (INAI) Sites located on non-IDNR-owned properties. Mr. Lerczak also collects base-line biological data and develops restoration management plans on non-INAI sites and determines if such lands qualify for the designation.

Trees Forever

Tom Miller is a Field Coordinator and has been involved in conservation issues for over fifteen years in the Illinois River Watershed. He works with landowners to plant riparian buffers along streams in Illinois to improve water quality. Mr. Miller also is a naturalist at Wildlife Prairie State Park teaching natural resources Boy Scout merit badges.

The Illinois Chapter of The Nature Conservancy

Dr. Maria Lemke earned her PhD in aquatic ecology at University of Alabama. She studied floodplain invertebrates and fish at the Illinois Natural History Survey and is currently working for the Illinois Chapter of The Nature Conservancy to restore floodplains and study agricultural impacts on freshwater systems.



Peoria Park District

John Mullen is Assistant Chief Naturalist at Forest Park Nature Center of Peoria Park District. Mr. Mullen holds a bachelor's degree in Ecology and a master's degree in Secondary Education. Throughout his career, he has worked as a field biologist, endangered species biologist, research technician, and avian biologist for governmental, university, and private organizations. Mr. Mullen is currently the president of Peoria Wilds, a volunteer stewardship group and Peoria Audubon Society.

Soil Erosion & Sediment Delivery Subcommittee

Mactec Engineering and Consulting

Wayne Ingram is a water resources engineer and professional engineer in Illinois. He has more than 23 years experience performing hydrologic and hydraulic engineering services as a consultant and as an employee of a state water management agency. He has completed studies and design projects related to storm water management, river engineering, erosion and sedimentation, and other hydrologic related services for a wide variety of clients and project types across the nation. Mr. Ingram also has experience as an expert witness. He has made presentations at conferences related to water resources management, including presentations to engineers as an instructor at stormwater management training workshops. He has volunteered on numerous watershed, stormwater, and erosion control committees. Mr. Ingram has a B.S. in Civil Engineering from the University of Illinois and has also completed numerous graduate courses in hydrologic engineering.

Mactec Engineering and Consulting

Chris Everts is a Water Resources/Environmental Engineer with a focus in surface and groundwater quality. His career includes university research and extension experience prior to his thirteen years of consulting project work.

Illinois State Water Survey

Bill White joined the State Water Survey as a Professional Scientist in the Watershed Science Section in January, 2003. Mr. White serves as Manager of the Survey's Peoria Office and oversees day-to-day operations of the Survey's Stream and Watershed Restoration Crew. Bill received a Masters Degree in Science from the University of Illinois, Champaign-Urbana, in 1980. Bill is author of dozens of papers, investigative reports, and documents including a chapter on Geomorphology in a book entitled *American Bottom Archaeology* published by the University of Illinois Press. Prior to joining the ranks of the Illinois State Water Survey, Mr. White served as Science Advisor to the Director of the Office of Realty & Environmental Planning for the Illinois Department of Natural Resources. He also directed the Science & Planning Section of the Ecosystems Division at IDNR and coordinated planning and science issues for the acclaimed Conservation 2000 Program.

Illinois State Water Survey



John Beardsley is a Restoration Coordinator/ Supporting Scientist for Illinois State Water Survey. Mr. Beardsley has been working in the field of stream channel restoration for 17 years.

USDA/NRCS

Mark Jacob graduated from the University of Illinois with a BS and MS in Agronomy. In 1989, he began working for the Soil Conservation Service as a soil conservation technician in Tazewell County. In 1999, he became the district conservationist for the Natural Resources Conservation Service in Woodford County.

USDA/NRCS

Tim Malone is the District Conservationist for the USDA Natural Resources in Tazewell County. He is responsible for providing technical assistance to landowners in Tazewell County through the Tazewell County Soil & Water Conservation District.

Illinois State Water Survey

Steve Wilson has an MS in Civil Engineering from the University of Illinois, with an emphasis on soil and water systems and hydrology. He is currently in the Ph. D program in the Agricultural Engineering Department at the U of I. He has been a part of the ground-water section at the ISWS since 1983 and has spent the majority of his career researching water quantity and quality issues related to the Mahomet aquifer and private wells.

Urban Stormwater Subcommittee

USDA/NRCS

Kent Sims has worked for the USDA-Natural Resources Conservation Service since 1978 in several different positions and locations in central and northern Illinois. For the past 18 years his work has focused almost exclusively on urban conservation and community assistance related activities. Mr. Sims currently is NRCS' Community Assistance Specialist, concentrating his efforts in 19 counties in northeastern Illinois and major urban areas in other parts of the state. He has also been an active participant at the local, state, regional and national levels for NRCS in the areas of strategic planning, policy development, and the development and review of materials used in urban and urbanizing environments. A native of Peoria, Mr. Sims holds a B.S. in Agriculture from the University of Illinois at Urbana-Champaign.

Mactec, Inc.

Wayne Ingram, see above "Soil Erosion & Sediment Delivery Subcommittee"

Prairie Rivers Network

Beth Wentzel joined Prairie Rivers' staff in July, 2002 as a full-time Watershed Scientist. She earned her MS in Environmental Engineering and her BS in Civil Engineering at the University of Illinois. Ms. Wentzel served in the Peace Corps for two years, teaching schoolchildren in Gambia. Since 1999 she has worked on water pollution control issues



for the Alabama Rivers Alliance, gaining valuable experience scrutinizing pollution permits, TMDLs, and reviewing the technical aspects of policy decisions.

Clark Dietz, Inc.

Gregory Kacvinsky is a Senior Staff Engineer at Clark Dietz in Champaign, Illinois. Mr. Kacvinsky earned a Bachelor's Degree in Civil Engineering from the University of Wisconsin - Madison in 1995 and earned his MBA at the University of Michigan - Ann Arbor in 2002. He has extensive experience in civil/environmental engineering, specializing in stormwater-related analysis, planning, and design. Mr. Kacvinsky's experience includes stormwater utility master planning, stormwater and wastewater hydrologic/hydraulic analyses, residential and commercial site design, site feasibility studies, retention and detention pond design, site plan review, and municipal water system analysis and design.

Education & Outreach Subcommittee

Patrick Meyer & Associates

Patrick N. Meyer earned a Bachelor of Science degree in Civil Engineering from Bradley University, magna cum laude. Mr. Meyer was able to perform a cooperative education program with the Illinois Department of Transportation during his undergraduate education at Bradley. He worked for a local consulting engineering firm for several years while simultaneously earning a Master Degree in Business Administration, also from Bradley University. Mr. Meyer currently owns and operates his own engineering firm, Patrick N. Meyer & Associates, Inc. He is the designated Engineer for several municipalities. Mr. Meyer is intricately involved in assisting local municipalities, townships, and counties in complying with the requirements of the National Pollutant Discharge Elimination System (NPDES) Phase II Storm Water Program for Municipal Separate Storm Sewer Systems.

East Peoria Community High School

GeorgeAnn Siwicke is an English teacher at East Peoria Community High School. She holds a Bachelor's degree in Education from Illinois State University and a MLA from Bradley University. Ms. Siwicke was a lead writer and trainer in *Rivers Language Arts* in conjunction with the Rivers Project Curriculum. She piloted *Exploring Science Writing: An Environmental Focus* published by Sea Grant: Illinois-Indiana; Michigan and is on the Navigating Committee for the annual Clean Water Celebration held in Peoria. East Peoria High School has been participating in river and environmental projects through the Rivers Project and other groups since 1991.

East Peoria Community High School

Cathleen R. Bartlow is an English teacher at East Peoria Community High School. She holds a Bachelor's degree from Illinois State University and a MA from Bradley University. Ms. Bartlow is a member of Fondulac Park District's Conservation Commission and is an instructor with SIUE's River Project. She is a member of the Navigating Committee for Clean Water Celebration and is a Leopold Education teacher.



Agency Acronyms

IDNR – Illinois Department of Natural Resources

IEPA – Illinois Environmental Protection Agency

INHS – Illinois Natural History Survey

ISGS – Illinois State Geological Survey

ISWS – Illinois State Water Survey

USDA/NRCS – United States

Department of Agriculture/ Natural Resource Conservation Service



Watershed Description

A watershed, synonymous with drainage basin, is an area of land that drains into a river or a lake. Depending on the size of the body of water, a watershed can be very large, such as the Mississippi Watershed draining the United States east of the Rocky Mountains and west of the Appalachians, or it can be very small, such as the residential neighborhoods draining stormwater into local streams. Water that hits the Earth is intimately connected to the land through which it flows. A healthy watershed will produce clean water, a necessity for all life; on the contrary, an unmanaged watershed that has undergone urbanization risks high levels of contamination. It is for this reason that the Tenmile Creek Watershed Planning Committee and many other organizations across the state are working diligently to protect watersheds throughout the Illinois River Basin and conserve their ability to filter ground and surface water, recharge aquifers, and supply habitat for wildlife as well as recreation for residents of the watershed.

Tenmile Creek Watershed is a subwatershed of the Illinois River Watershed, which is a subwatershed of the Mississippi River Watershed. Although small in comparison to the Mississippi, streams such as Tenmile have a profound effect on all the rivers into which they drain. Draining 11,027 acres in Worth and Springbay Townships of Woodford County, and Washington and Fondulac Townships in Tazewell County, Tenmile Creek is approximately 10 miles long and flows northwest from Washington Township to the Narrows of Peoria Lake at the Illinois River (Map 1). Most of Tenmile Creek Watershed is in unincorporated areas of Woodford and Tazewell County; however, 136 acres in the northern section are in the Village of Germantown Hills and 415 acres of the City of Washington are located in the southwest portion of the watershed. From source to mouth, Tenmile Creek falls from approximately 820 feet above sea level at the source to 440 feet at the mouth at Illinois River mile 166.

Table 1 contains the various classification names and numbers that federal and state agencies use to identify Tenmile Creek Watershed:

Table 1

Type of classification	Classification name/number
Hydrologic Unit Code (HUC) - 12	071300011705
HUC-8	07130001
Segment ID (IEPA)	DZZS

Based on the year 2000 Census blocks, the population of this watershed is 2,967. The Tazewell County projected population growth for the next twenty years is approximately 8% and Woodford 21%. Table 2 contains data obtained from the Census and Data User Services on the Illinois State University website

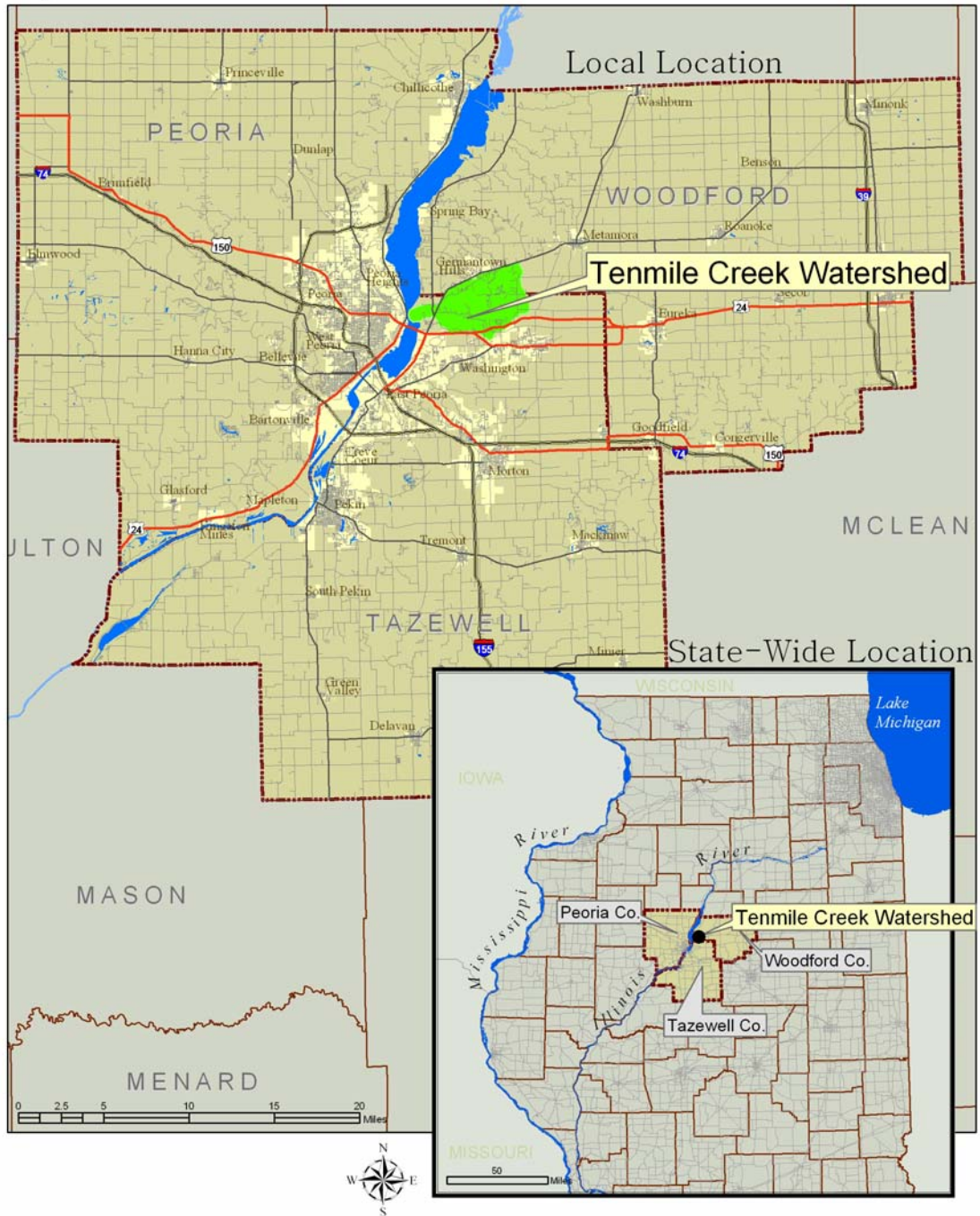
Table 2 Tazewell and Woodford County Population Projections

	1990	1995	2000	2005	2010	2015	2020
Tazewell	123,692	128,500	129,771	131,222	131,537	132,167	133,791
Woodford	32,653	34,903	36,454	37,995	39,399	41,472	44,055



Tenmile Creek Watershed Location

Map 1



Watershed Activities

Tenmile Creek Watershed Planning Committee

The Tenmile Creek Watershed Planning and Technical Advisory Committees were formed in October of 2002 with a goal to create this watershed plan. Committee members worked to collect baseline data on the natural resources of the watershed, formulate environmental problem statements and objectives, identify appropriate action items to address the issues of the watershed plan, and finally compile the watershed plan in such a way that the document can be used as a tool for the general public, local governmental agencies, and developers to improve environmental conditions of the watershed.

Illinois River Bluffs Ecosystem Partnership

This watershed planning effort was funded by the Illinois Department of Natural Resources' Conservation 2000 (C2000) program. Through this program, thirty-nine (39) partnerships have been formed throughout the State of Illinois and it is through the Illinois River Bluffs Ecosystem Partnership that private landowners, non-profit organizations, and governmental organizations within the Tenmile Creek Watershed apply for funds to preserve and enhance Illinois' natural resources. In September of 2003, the Tenmile Creek Watershed was selected as one of seven priority watersheds in the Illinois River Bluffs Ecosystem Partnership due to its high degree of habitat quality, threat of degradation from development, and the planning efforts underway. This means that well designed and cost effective conservation projects within the Tenmile Creek Watershed will get special preference for funding through the C2000 program. The priority watersheds however may change year-to-year depending on the biologic conditions, planning activities, and developmental pressures on the watershed. **It is important that members of the Tenmile Creek Watershed Planning Committee become involved in the Illinois River Bluffs Ecosystem Partnership to maintain their status as priority.** A contact for the Partnership can be found on the IDNR's website: www.dnr.state.il.us. Or you can call the Illinois Department of Natural Resources for more information.

Illinois River Basin Restoration

The United States Army Corps of Engineers and the Illinois Department of Natural Resources are partnering to restore the Illinois River Basin with funding through the *Illinois Rivers 2020* program. These agencies will solicit local input through the development of regional teams to promote the Illinois 2020 initiative and to work cooperatively with watershed organizations and landowners that wish to conserve natural resources in the basin. The Peoria Pools and more specifically, the Tenmile Creek Watershed have been chosen as priority project areas to begin the Illinois River restoration. This planning document and the input of the Tenmile Creek Watershed Planning Committee will be an asset to this initiative.

Spring Creek Preserve Restoration Committee

Fondulac Park District has partnered with Illinois State University, Illinois Department of Natural Resources, Bradley University, and Tri-County Regional Planning Commission



to develop a management plan to restore over 200 acres of forested bluffs along Spring Creek, a tributary to Tenmile. Fondulac Park District was awarded a grant through the Illinois Department of Natural Resources' Conservation 2000 program in 2004 to purchase the necessary equipment and to implement the management plan for the Spring Creek Preserve.



Problem Statements & Objectives

The following is a summary of the problem statements and objectives identified by the Planning Committee. You will see these statements associated with specific action items in the next section of this plan.

Problem Statement (a): Stormwater flow volume in the watershed has increased due to human impacts such as drainage and land cover changes on both urban and agricultural land. Existing and future development in urban areas particularly, increases impervious surfaces resulting in larger volumes and faster rainwater runoff which causes erosion.

Objectives (a):

- Minimize the amount of impervious areas directly connected to streams and ravines.
- Slow water down from impervious areas before it hits the stream channel.
- Reduce volume of water reaching streams during runoff events (first priority).
- Use in-stream flow controls to reduce peak flow rates in the streams.

Problem Statement (b): Lack of concern for, knowledge of, and adoption of construction best management practices is a problem in the developing areas of the watershed. There is also a lack of awareness of the damage caused by construction practices. There is a cost to the public resulting from the lack of use of best management practices.

Objectives (b):

- Increase use of and effectiveness of construction best management practices.
- Educate/empower the public on construction best management practices and effects of construction on natural resources within the watershed.



Improperly installed siltation fence in the tri-county area

Problem Statement (c): Soil Erosion is occurring in areas that lack suitable vegetation to protect the soil including steep wooded slopes, agricultural land, and construction sites.

Objectives (c):

- Manage wooded slopes to provide adequate ground cover.
- Implement agricultural soil conservation programs.
- Implement effective soil conservation programs for construction sites.



- Improve site design standards for development to reduce impacts on erosion.

Problem Statement (d): The invasive plant species, garlic mustard, sugar maples, honey suckle, buckthorn, autumn olive, and others are decreasing species diversity in our natural areas, and are resulting in erosion and habitat loss. Lack of education creates a barrier for control of invasive species in the watershed.

Objectives (d):

- Improve habitat and species diversity by managing invasive species.
- Reduce erosion and sedimentation caused by invasives by controlling populations of invasive species.
- Educate landowners/future taxpayers on the effects of invasive species on natural resources.
- Identify management approaches/protocol for landowners.

Problem Statement (e): Lack of a stable stream channel contributes to downstream sedimentation, loss of aquatic habitat, and property damage. Stability problems can be localized or more widespread.

Objectives (e):

- Identify unstable stream channel segments and evaluate potential for problems to migrate.
- Prioritize problem sites according to their overall impact on the watershed and identify technical and economic solutions to address the problems identified.
- Address the problem through both voluntary and regulatory approaches.
- Educate landowners and public officials on the cause and effects of an unstable stream channel.
- Obtain commitments and economic assistance so that stream channel stabilization can be addressed.

Problem Statement (f): Channelization has occurred in the watershed and appears to contribute to stream erosion/instability and loss of aquatic habitat in the channel.

Objectives (f):

- Identify problem locations in the watershed.
- Identify priority locations and work towards restoration/mitigation of those areas to reduce stream erosion to environmentally sustainable levels. The restoration efforts should aim to reproduce the stream geometry that is closer to a natural stream and may include such procedures as remeandering, grade stabilization and streambank stabilization with priority restoration methods being bioengineering.
- Work with landowners in priority locations to gain support for restoration and protection initiatives. These landowners should be educated regarding: 1) regulations on channelization (Section 404 permits CWA, dredge and fill permits), 2) impacts of channelization including downstream flooding, decreased aquatic habitat, and channel instability, and 3) the options to correct, minimize and reduce the impacts of channelization.
- Identify funding sources to implement corrective measures regarding the impacts of channelization.



- Remediation of channelized areas should correlate with comprehensive systematic plan for streambank/bed stabilization.

Problem Statement (g): Large amounts of sediment from the Tenmile Creek Watershed are carried through the delta and deposited in lower Peoria Lake.

Objective (g): Implement the watershed plan to prevent erosion occurring in the watershed and prevent sediment delivery to the Illinois River.

Problem Statement (h): Environmental damage occurs when community members are unaware of the impacts of human activities on the watershed. People need to be educated on ecology, their connection to the watershed, watershed hydrology, and regulations protecting the watershed.

Objectives (h):

- Increase awareness of environmental damage occurring in the watershed and promote change in behavior to improve our water quality.
- Target all of the following in educational outreach:
 - Home owners
 - Contractors
 - Public officials
 - Farmers
 - Developers, engineers
 - Students
 - Business community
- Everyone should know his or her watershed address (i.e. Mississippi River, Illinois River, Tenmile Creek).
- Educate public so there is more push for elected officials and developers to address watershed quality issues.
- Provide public information source for people to educate themselves on Tenmile Creek Watershed issues and solutions.



Action Items: Urban Stormwater

Problem Statements/Objectives

Problem Statement (a): Stormwater flow volume in the watershed has increased due to human impacts such as drainage and land cover changes on both urban and agricultural land. Existing and future development in urban areas particularly, increases impervious surfaces resulting in larger volumes and faster rainwater runoff which causes erosion.

Objectives (a):

- Minimize the amount of impervious areas directly connected to streams and ravines.
- Slow water down from impervious areas before it hits the stream channel.
- Reduce volume of water reaching streams during runoff events (first priority).
- Use in-stream flow controls to reduce peak flow rates in the streams.

Problem Statement (b): Lack of concern for, knowledge of, and adoption of construction best management practices is a problem in the developing areas of the watershed. There is also a lack of awareness of the damage caused by construction practices. There is a cost to the public resulting from the lack of use of best management practices.

Objectives (b):

- Increase use of and effectiveness of construction best management practices.
- Require the use of specific Best Management Practices and provide proper permitting and inspection.
- Educate/empower the public on construction best management practices and effects of construction on natural resources within the watershed.

Problem Statement (c): Soil erosion is occurring in areas that lack suitable vegetation to protect the soil including steep wooded slopes, agricultural land, and construction sites.

Objectives (c):

- Manage wooded slopes to provide adequate ground cover.
- Implement agricultural soil conservation programs.
- Implement effective soil conservation programs for construction sites.
- Improve site design standards for development to reduce impacts on erosion.
- Improve enforcement of erosion control ordinances.

Discussion

A lack of stormwater management is a primary cause of degraded water quality in the Tenmile Creek Watershed. Stormwater runoff is a difficult environmental issue because it contains non-point source pollutants. No one can point to a factory or single entity to place the blame of environmental degradation; in fact what is even harder to swallow is that if we are going to point fingers, we must point them at ourselves. **EVERYONE CONTRIBUTES TO POLLUTING OUR WATERWAYS** as stormwater speeds off our rooftops, picks up oil, fertilizers, and pesticides from our lawns and driveways, and



rushes into a curb and gutter system where it discharges into a local tributary of Tenmile Creek. What we are missing in our contemporary method of stormwater conveyance is:

- 1) Rain Water Infiltration – Before this land was developed, rainwater would soak into the ground, get sucked up by plants, and evaporate. Now driveways, rooftops, streets and sidewalks reduce the amount of stormwater infiltration, and a large quantity of water is delivered to our streams causing erosion and directly contributing to the sedimentation of Peoria Lakes.
- 2) Contaminant Filters – Natural vegetation *can* be used to filter contaminants (i.e. oil and pesticides) if stormwater is conveyed through a system of prairie or wetland vegetation (note: do not degrade preexisting wetland and prairie ecosystems, rather plant certain species for the purpose of stormwater decontamination). This process is not allowed under a curb and gutter system.

Stormwater runoff from homes built adjacent to steep wooded slopes (i.e. along Caterpillar Trail) hosts its own environmental/safety issues with erosion. While the wooded lots are an attractive place to live, much of our remaining wooded areas are on steep slopes. When we flush large quantities of stormwater runoff down these slopes, gully erosion occurs at a rapid pace causing large ravines to form in residents' back yards.

Action Items

1) Homeowner Best Management Practices

There are a number of things that community members can do on their own properties to decrease stormwater pollution.

- a) Redirect downspouts onto the grass and off the pavement.
- b) Use fertilizers, herbicides, and pesticides as recommended by the manufacturer. Overuse will damage vegetation and increase stormwater pollutants.
- c) Keep lawn chemicals off hard surfaces (driveways, sidewalks) and store indoors (i.e. garage) when possible.
- d) Pick up pet waste.
- e) Mulch yard clippings and bag leaves.
- f) Clean up litter in your neighborhood.
- g) Keep hard surfaces clear of dirt and debris.
- h) Prevent motor oil and gas from spilling. One quart of oil can pollute one-quarter million gallons of water.

The Environmental Protection Agency has an abundance of information on homeowner BMPs. For more information see the following websites:

www.epa.gov/owow/nps/facts/point10.htm

www.epa.gov/owow/nps/dosdont.html

www.epa.gov/owow/nps/pubs.html

2) Low-Impact Development



If you, the Reader, take one piece of information from this plan, it should be that **what we place on the land directly affects the quality of water**. Development is occurring throughout the Tenmile Creek Watershed in unincorporated areas as well as the Village of Germantown Hills and the City of Washington. The Tenmile Creek Planning Committee expresses no interest in prohibiting this development; however, it is advised that the basic principles of low-impact development be applied. These principles aim to facilitate development while maintaining the most valuable natural features and functions (stormwater infiltration/filtration) of the site. By incorporating the following practices into a development site, one can limit the environmental damage caused by post-development stormwater runoff (The following information was obtained from the *Conservation Design Resource Manual* of NIPC and Chicago Wilderness, 2003):

- a) **Eliminate minimum lot size requirements**; rather, regulate overall density of development – Flexibility in allowable lot sizes involves the reduction of lot sizes in exchange for more contiguous open space and natural areas to provide for recreation, habitat preservation, and stormwater conveyance. One reason for minimum lot sizes, particularly in unincorporated areas, is the area needed for septic leach fields. There are several alternatives to the standard septic leach field that would permit more flexible project layouts. Coordinate with the Tazewell and Woodford County Health Departments or see the Northeastern Illinois Planning Commission’s publication *Protecting Nature in Your Community* (Chapter 7) for more information.
- b) **Group buildable lots together** to maximize the area of undisturbed land – The developer would first identify all potential conservation areas, then locate the building sites and design the street and trail systems, and draw the lot lines last.
- c) **Eliminate setback requirements** for the interior of development sites while maintaining expectations on the perimeter - This calls for smaller yards in exchange for large expanses of contiguous natural areas. It is suggested that the perimeter of the site be developed in such a way that there is consistency with surrounding development to minimize opposition from existing residents.
- d) **Update ordinances** to substantially restrict development on or near natural areas, and require or encourage undeveloped buffers around these areas (i.e. stream and ravine buffers).
- e) Encourage developers to design sites to fit the topography, features, and soils of the natural landscape.
- f) **Update landscaping ordinances** to encourage the use of plant materials native to central Illinois. Require natural landscaping in and around stormwater facilities, wetlands, lakes, and streams.
- g) Require clear specification of how natural areas will be managed, and designate a legal entity (homeowners association, park district, private ownership) responsible for maintenance for all natural areas.
- h) Enact **flexible standards for road** length, width, right-of-way, and design. It is a common belief, locally, that wider streets are necessary to allow for emergency vehicle access when, in general, widening roads by a few additional feet does not increase the capacity of the road, but it *does*



encourage higher driving speeds. The following recommended road widths are in compliance with the American Association of State Highway and Transportation Officials' *Greenbook* recommendations.

RECOMMENDED PAVEMENT WIDTHS	
Local Streets:	
No parking expected	16-18 feet
Restricted parking	22-24 feet
Normal residential parking	24-26 feet
Residential Collector	Follow local standards

24-26 feet is adequate width for either parking on both sides of the street with a single lane for traffic (i.e. one-way traffic flow, or where oncoming cars must yield), or for parking on one side with two slow moving traffic lanes.

- i) Enact **flexible parking lot design** – reduce minimum parking requirements, allow pervious materials for spillover parking, promote use of parking garages, design drainage and landscape systems that filter and infiltrate runoff.



Pervious pavement for stormwater infiltration

- j) Require that **vegetated swales** be used in street rights-of-way, parking lots, and other paved areas to convey and treat stormwater runoff.
- k) Eliminate length and width requirements for driveways, and permit alternative driveway surfaces and shared driveways.
- l) Discourage direct discharge of rooftop runoff into storm sewers – redirect runoff to grass, utilize green roof design, dry wells, and rain barrels.

Tazewell County, Woodford County, the Village of Germantown Hills, and the City of Washington should integrate low impact development into local plans and ordinances by including conservation goals and objectives within comprehensive plans or allowing/requiring low impact development in certain zoning districts.

Estimated Cost

Professional to facilitate/conduct workshops to educate municipal staff and elected officials and incorporate low-impact development into local development plans:

$$800 \text{ hrs} * \$45/\text{hr} = \$36,000$$



3) Ravine/Steep Slope Overlay District

Identify the highly erodible, steep sloped areas that have developmental potential and create specific rules and regulations for developing these areas. Regulations should include but should not be limited to (*Mossville Bluffs*, 2002):

- Plant vegetated buffers between development and ravine slopes.
- Prohibit turf on ravine slopes and in buffers.
- Prohibit dumping of grass clippings or other natural or man-made debris that may damage underlying vegetation or prevent re-vegetation.
- Prohibit downspouts within 10 feet of steep ravine.
- Allow cutting of smaller trees on ravine slopes for the purpose of vegetative restoration for ground cover.
- Limit concentrated discharges to storm events larger than the 1-year frequency.



Headcut in a wooded ravine of Tenmile Creek Watershed

A number of these concepts could apply to existing developments as well.

Estimated Cost

Identifying areas to protect/creation of ordinance: 850 hrs * \$45/hr = \$38,250

4) Streamside Buffer Ordinance

For those areas that are not on steep slopes and wooded ravines, it is still important to buffer the stream system from development. By requiring a vegetative buffer to the stream, stormwater will have a greater capability to infiltrate and contaminants can be filtered before the rainwater hits the stream. Furthermore, the hydraulic characteristics of the stream/channel will be maintained, thus protecting the stream/channel from erosion while maintaining flood levels. A sample Draft Buffer Ordinance (drafted by the City of Peoria) is included in this document as Appendix A.

Estimated Cost

Professional staff to facilitate modification and adoption of a streamside buffer ordinance that meets community needs: 600 hrs * \$45 = \$27,000

5) Tri-County Unified Stormwater Ordinance



A stormwater ordinance to mitigate the environmental impacts of future development is never an easy thing for a governmental entity to develop, implement, and enforce. It is for this reason that the Stormwater Technical Advisory Committee recommends that not only the governmental bodies within the Tenmile Creek Watershed, but all municipalities and counties within the tri-county area (Woodford, Tazewell, and Peoria) adopt one unified stormwater ordinance. By working together, the tri-county local units of government will save tax dollars and time as they work to: 1) Administer the stormwater ordinance; 2) Enforce the ordinance; and 3) work to comply with EPA’s stormwater regulations (NPDES Phase II, and future permit cycles).

A model ordinance developed by the Bi-State Regional Planning Commission and further refined by the Stormwater TAC is included in this plan as Appendix B. This ordinance is more comprehensive in nature than the “Tri-County Erosion, Sedimentation & Storm Water Management Program” used today in that it covers the following issues:

- a) **Controlling sediment** leaving the construction site.
- b) **Restricting peak discharge rates** from stormwater in new construction using *calculated* release rates based on the impacts of flooding and channel damage, as opposed to pre-development conditions. Currently, a developer is required to restrict peak discharge rates from a new development based on pre-project conditions, which is usually cropland. The problem with this is that cropland has a high runoff potential so as a result, we see few new developments that require stormwater detention. The calculated release rates seen in the model ordinance are based on field data from a hydrologic study of the Farm Creek Watershed (East Peoria, Washington) in a study performed by Mactec, Inc. (2003). While more thought should be given to these numbers by each municipality adopting the ordinance (every watershed is different), defining a release rate that will protect the stream channel is a more realistic way of mitigating erosion rather than simply stating that pre-project runoff levels are adequate for the stream system.



Bioretention Area

- c) **Improving water quality** by promoting responsible use of herbicides, pesticides, motor oils, concrete mix on construction sites, etc.
- d) Promoting **Best Management Practices** (preserving wetlands, minimizing impervious surfaces) by requiring developers to follow a BMP Hierarchy.
- e) Includes regulation of public infrastructure improvements.



It is important to note that the TAC has adjusted this model stormwater ordinance to meet the needs of the tri-county area. For example, areas draining directly into the Illinois River would have limited post construction site runoff responsibilities because direct drainage to the Illinois River has no adverse flooding and channel erosion impacts. This ordinance also meets many regulatory requirements of the EPA's Phase II Stormwater Program in which most local units of government must comply.

Once again, it is recommended that all units of government in the tri-county area collaborate to make a successful stormwater program. If the program is coordinated properly, there will be little confusion or competition for development as developers work in the area. *One-Stop-Shops* (as seen in the City of Peoria) where developers can learn about stormwater, safety, and infrastructure requirements can be performed on a tri-county regional scale. Technical manuals, such as those created by the USDA/Natural Resource Conservation Service can be used to further aid developers as they work to comply with the stormwater ordinance. And finally, a **regional oversight committee** could be coordinated to implement and enforce the stormwater ordinance in an effort to lessen the burden of these tasks on every individual unit of government.

Estimated Cost

Professional staff to facilitate modification and adoption of a Tri-County Unified Stormwater Ordinance that meets community needs: 800hrs * \$45 = \$36,000

6) Stormwater Master Plan

While the Unified Stormwater Ordinance mitigates the environmental degradation from future development, existing infrastructure needs must be assessed. It is recommended that the Village of Germantown Hills, the City of Washington, Tazewell County, and Woodford County create a Stormwater Master Plan to both guide the governmental entities as they work to combat this non-point source pollutant and come into compliance with EPA's federal mandates. The following guidelines may be of use as the local units of government work to create a Stormwater Master Plan:

- a) Identify problems and inventory existing conditions (i.e. storm sewer outlet identification, erosion problem areas).



Exposed sewer pipe from stream downcutting

- b) Identify and implement early action projects such as streambank stabilization and strengthening ordinances.
- c) Project future conditions and stormwater impacts on natural resources.
- d) Plan to minimize these impacts using conservation design and stormwater control ordinances.
- e) Design a funding and management structure for implementation.



The process of developing a Stormwater Master Plan could and perhaps should go hand-in-hand with the ordinance development. While certain issues are localized, a regional effort to create Stormwater Master Plans would assure consistency within the Peoria Lakes Watershed and eliminate a redundancy of efforts as local municipalities work to create a plan for similar issues.

Estimated Cost

Development of stormwater plan for Tazewell and Woodford County, the Village of Germantown Hills, and the City of Washington: 4 plans * \$45,000 = \$180,000
*this number will vary depending on the level of flooding/erosion problems found in the inventory

7) Stormwater Utility

Stormwater planning and mitigation requires a reliable funding source. Stormwater utilities have become one of the most popular options for funding stormwater programs during the past thirty years. A stormwater utility is essentially a special user fee set up to generate funding specifically for stormwater management. This involves public recognition that the management of stormwater is a *service* similar to that of garbage pick up and decontaminating drinking water. However, the smaller communities in Illinois face a challenge with the stormwater utility; **there is no enabling legislation allowing stormwater utilities in the State of Illinois for non-home ruled districts**. This needs to be addressed in the General Assembly so smaller communities can take advantage of this funding opportunity. The issue has been challenged in the courts and as demands increase from the smaller communities, it is hoped that enabling legislation will be provided in the near future.

If a local unit of government decides to acquire monies from the public in the form of a stormwater utility or other mechanism (i.e. property taxes), a stormwater plan should be in place. In order to get support for the program, it is crucial to have the capability to communicate with the public the services they will receive as a result of the utility.

The following is a basic outline of some principals that must also be considered in preparing a stormwater utility:

- a) Have a stormwater plan available to communicate to the public the services the utility will provide.
- b) Establish a basis of charge. The basis can be broad in scope such as those based on zoning classifications, flat rates, or property location (varies by drainage basin). Or there are more labor-intensive options that would involve measuring each property and calculating an appropriate charge.
- c) Identify the possibility of exemptions or credits. If the program can afford to allow exemptions, this is a great way to provide incentives for homeowners to apply best management practices to their properties.
- d) Establish a utility structure and determine who will administer the program. This is another opportunity to **work on a regional scale**. Perhaps the regional



oversight committee mentioned above would be a useful vehicle for the implementation of the stormwater utility.

8) Promote responsible stormwater and land use planning for proposed Eastern Bi-pass

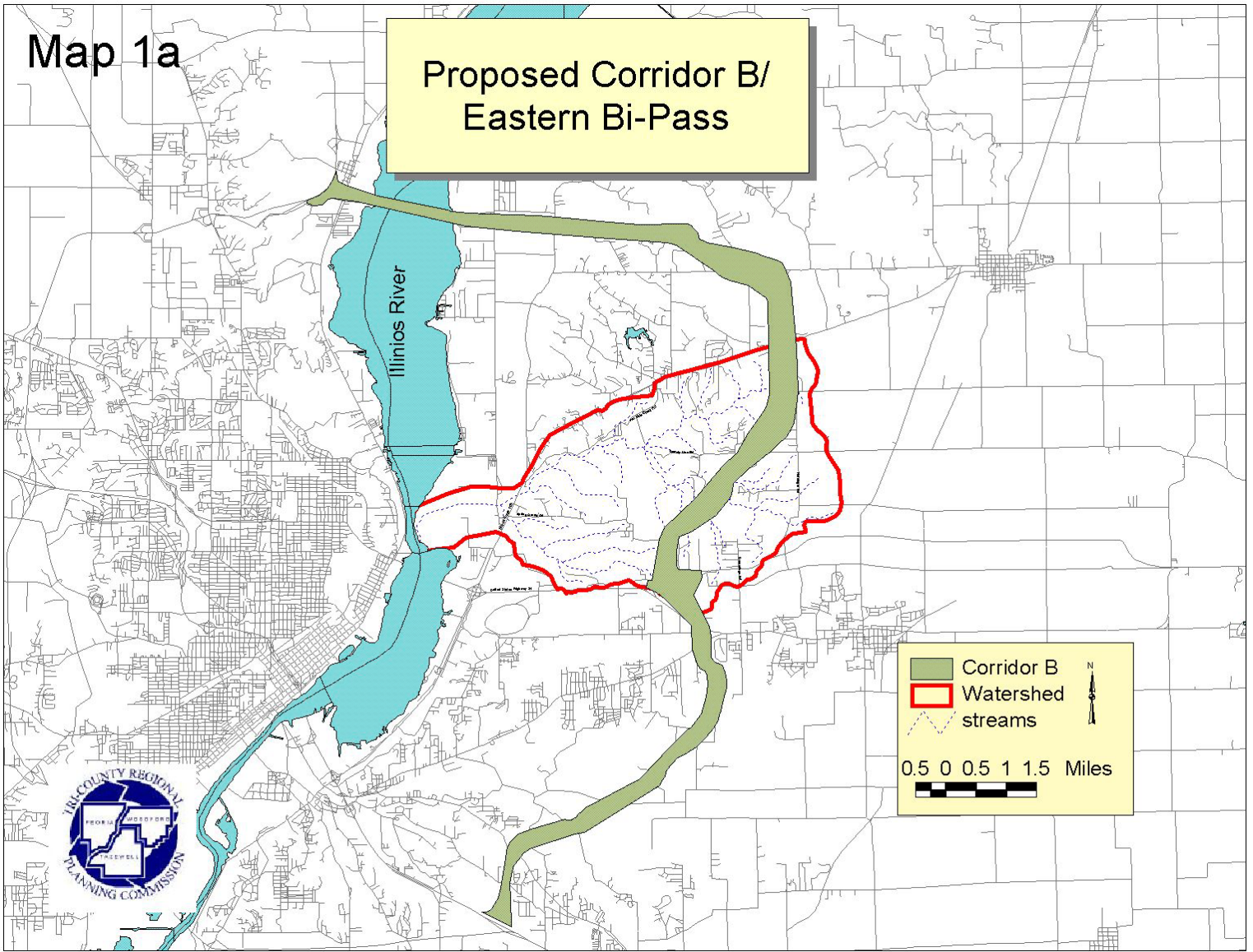
In 1995, the Illinois Department of Transportation funded the development of a feasibility plan for the development of a Peoria to Chicago Highway. In this plan, the Eastern Bi-Pass, Corridor B, was identified as a feasible corridor to complete the loop of interstate system around the Peoria urbanized area, and create an appropriate route to begin the Peoria to Chicago Highway. Corridor B runs through the middle of the Tenmile Creek Watershed (Map 1a) and the development of an interstate system would have profound effects on: 1) the amount of stormwater flushed into the creek system from the additional impervious areas; 2) the non-point source pollutants (oils, antifreeze, litter) entering the stream; and 3) the urbanization of the watershed.

Appropriate stormwater detention and filtration should be a priority as the planning efforts for Corridor B continue. Impacts on stream channel stability downstream of the corridor should also be investigated and appropriate grade stabilization structures should be put into place *before* road construction. Finally, the City of Washington, the Village of Germantown Hills, Woodford County, and Tazewell County should incorporate appropriate conservation zoning classifications into zoning ordinances to protect valued forested bluffs and prime farmland in the watershed.



Map 1a

Proposed Corridor B/
Eastern Bi-Pass



Action Items: Wildlife & Ecology

Problem Statements

Problem Statement (c): Soil Erosion is occurring in areas that lack suitable vegetation to protect the soil including steep wooded slopes, agricultural land, and construction sites.

Objectives (c):

- Manage wooded slopes to provide adequate ground cover
- Implement agricultural soil conservation programs
- Implement effective soil conservation programs for construction sites.
- Improve site design standards for development to reduce impacts on erosion.

Problem Statement (d): The invasive plant species, garlic mustard, sugar maples, honey suckle, buckthorn, autumn olive, and others are decreasing species diversity in our natural areas, and are resulting in erosion and habitat loss. Lack of education creates a barrier for control of invasive species in the watershed.

Objectives (d):

- Improve habitat and species diversity by managing invasive species and working towards eradication of non-native species
- Reduce erosion and sedimentation caused by invasives by controlling populations of invasive species
- Educate landowners/future taxpayers on the effects of invasive species on natural resources
- Identify management approaches/protocol for landowners.

Discussion

The layman may not think that the uninhabited wooded areas within the Tenmile Creek Watershed are a major contributor of erosion and sediment to the Illinois River when in fact, they are. Due to the suppression of naturally occurring forest fires in the area, ‘weedy’ species such as the native sugar maple and exotic invasive species such as the buckthorn, garlic mustard, etc. have grown rampant in the forested bluffs of Tenmile Creek Watershed. These species shade the forest floor allowing virtually no undergrowth that would otherwise act as a carpet to protect vulnerable soils from eroding. This issue is compounded with the fact that a majority of the forested areas are located on steep slopes.





Erosion undermining tree roots in an unmanaged forest.
Photo courtesy of Peoria Park District

In order to address this issue, natural resource professionals suggest that landowners apply appropriate management techniques (these vary depending on the physical environment) to promote biodiversity of native species and protection of valuable soil.

Action Items

1) Promote the use of the Illinois Department of Natural Resources' ***Creating Habitats and Homes for Illinois Wildlife*** and Web-Based Expert System.

The 2003 document *Creating Habitats and Homes for Illinois Wildlife* is an extraordinary resource tool for landowners to create appropriate habitats on large and small plots of land to benefit wildlife as well as water quality. This book describes in detail the proper locations, plant species, and management techniques needed to establish grasslands, woodlands, wetlands, cropland, and backyard habitat. *Creating Habitats and Homes for Illinois Wildlife* can be purchased at the Illinois Department of Natural Resources' book store in the Springfield Office building.

To further assist landowners in their efforts to restore native Illinois habitats, the Illinois Department of Natural Resources is in the process of creating a *Web-based Expert System* in which one will be able to collect information on: 1) the types of flora and fauna inhabiting a certain area; 2) recommendations for management of certain habitats; and 3) grant opportunities for habitat preservation and restoration. Look for this site to be posted later this year.

2) Forest management in Fondulac Park District:

Map 2 is a map of all the wooded areas in the watershed. Much of area #1 is owned by Fondulac Park District (over 343 acres). The park district is working with habitat restoration professionals from Illinois State University and the Illinois Nature Preserves Commission to determine appropriate methods for management; however funding is needed to complete the labor-intensive work of restoration.

Estimated Cost

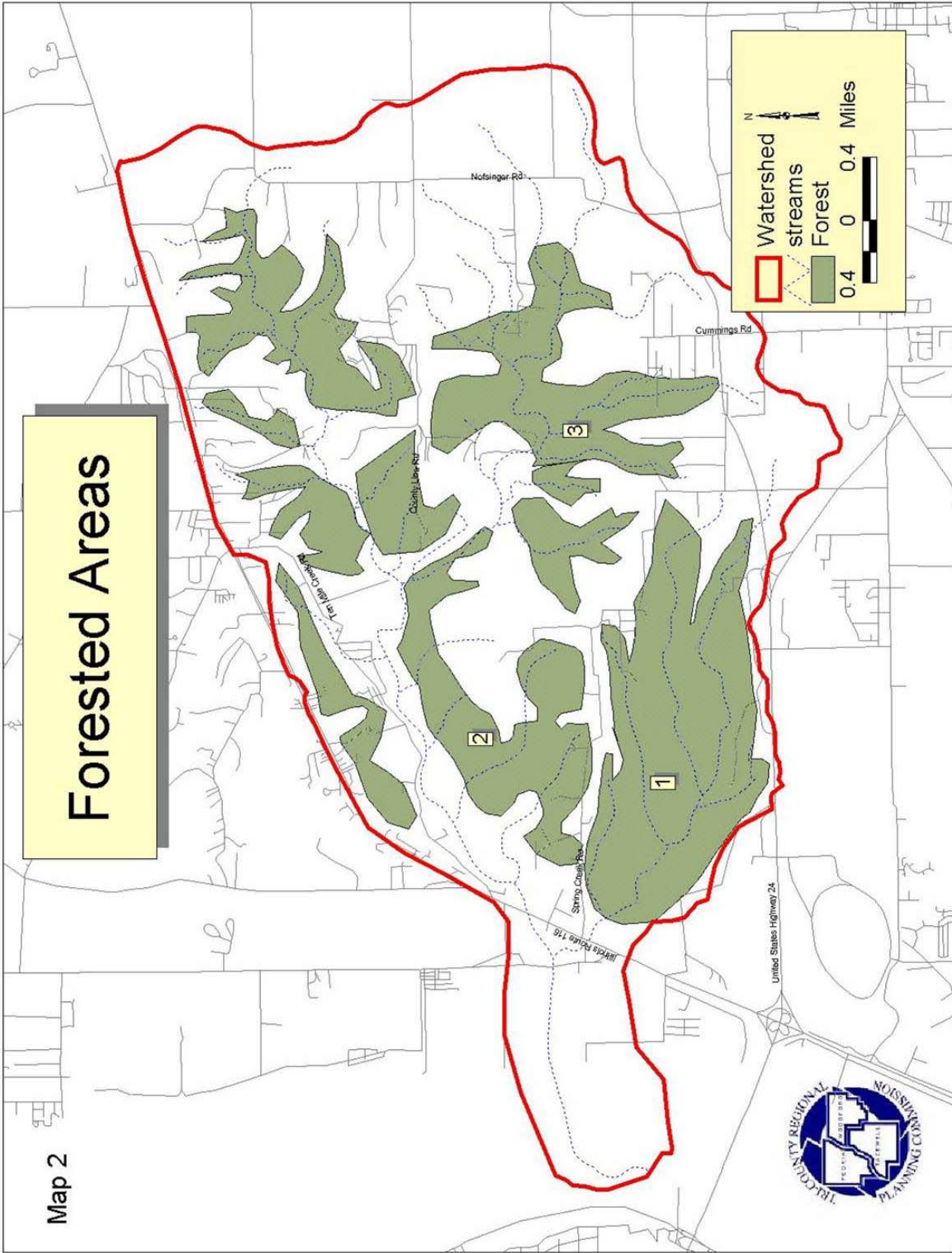
Forest management: 343 acres * \$250 = \$85,750

3) Forest management on Caterpillar Proving Grounds:



Map 2

Forested Areas



Caterpillar owns much of the wooded areas in #2 and #3 for a proving ground facility. These areas are used as a noise and site buffer between the proving grounds and nearby residents. Applying forest management techniques to these buffer areas would be beneficial for Caterpillar as these areas are supplying a certain amount of sediment load filling the stormwater retention facilities. Habitat restoration would also benefit species diversity and water quality throughout the watershed.

Estimated Cost

Forest management: 1222 acres * \$250 = \$305,500

4) Management of the Illinois Natural Areas Inventory site at Caterpillar: Caterpillar Proving Grounds contains a remnant hillside prairie that has been identified as a unique, priority area by the Illinois Department of Natural Resources. Currently, Caterpillar is working with the Illinois Nature Preserves Commission toward registering this site as an Illinois Natural Heritage Landmark. This designation will allow the site to be eventually managed with prescription burning and other best management practices by Illinois Department of Natural Resources staff. The Tenmile Creek Watershed Committee supports Caterpillar's efforts to maintain this biologically unique site.

5) Forest management in residential areas:

Many of the subdivisions and residential neighborhoods of the Tenmile Creek Watershed are situated in steep slope and wooded areas. While the forests supply a country-like setting in the midst of urban development, erosion occurring in the forest ravines is compounded by the phenomena described above and the stormwater runoff from the roads, roofs, and landscaped lawns of the residents. In this case, eroding ravines are more than a threat to water quality; yards and homes are often in danger of the eroding soil undermining infrastructure. To quote a resident of the Tenmile Creek Watershed whose side yard property lines have developed ravines, "When I was a kid I could ride my bike across this small ditch, now it's a twenty (20) foot ravine!" Homeowners can implement a number of best management practices in the forested areas and ravines to protect soils:

- a) Do not throw yard waste into ravines. This inhibits plant growth that would otherwise protect the soil from eroding.
- b) Thin the tree canopy to allow sunlight to penetrate the soil to foster plant growth.
- c) Work with forest management professionals (Peoria Park District, Illinois Department of Natural Resources) to perform prescription burns.
- d) Contract with engineering firms to place check dams in ravines to slow stormwater runoff and catch sediment to "fill in the scar of the ravine" (look for grant opportunities for implementation).
- e) Plant vegetative buffers of prairie grasses and flowers between your lawn and the forest to slow runoff as it enters steep slope areas.
- f) Retain as much rainwater on your lawn as possible using rain barrels on gutters, rain gardens, and drywells (device that stores water underground and allows it to slowly percolate into the ground).



Estimated Cost

Personal contact/educational outreach to approximately 20 neighborhoods:

700 hrs * \$45/hr (professional) = \$31,500

Ravine vegetation buffers 30 acres * \$400 = \$12,000

Installation of rain gardens: 750 gardens * \$250 = \$187,500

It is recommended that the residents of neighborhoods work together with a professional natural resource specialist to manage their section of privately owned forest. For more information on residential management of steep wooded areas, contact Tri-County Regional Planning Commission for a copy of the *Mossville Bluffs Watershed Restoration Master Plan*.



Action Items: Soil Erosion & Sediment Delivery

Problem Statements & Objectives

Problem Statement (e): Lack of a stable stream channel contributes to downstream sedimentation, loss of aquatic habitat, and property damage. Stability problems can be localized or more widespread.

Objectives (e):

- Identify unstable stream channel segments and evaluate potential for problems to migrate.
- Prioritize problem sites according to their overall impact on the watershed and identify technical and economic solutions to address the problems identified.
- Address the problem through both voluntary and regulatory approaches.
- Educate landowners and public officials on the cause and effects of an unstable stream channel.
- Obtain commitments and economic assistance so that stream channel stabilization can be addressed.



Streambank erosion in
Tenmile Creek

Problem Statement (f): Channelization has occurred in the watershed and appears to contribute to stream erosion/instability and loss of aquatic habitat in the channel.

Objectives (f):

- Identify problem locations in the watershed.
- Identify priority locations and work towards restoration/mitigation of those areas to reduce stream erosion to environmentally sustainable levels. The restoration efforts should aim to reproduce the stream geometry that is closer to a natural stream and may include such procedures as remeandering, grade stabilization and streambank stabilization with priority restoration methods being bioengineering.
- Work with landowners in priority locations to gain support for restoration and protection initiatives. These landowners should be educated regarding: 1) regulations on channelization (Section 404 permits CWA, dredge and fill permits), 2) impacts of channelization including downstream flooding, decreased



- aquatic habitat, and channel instability, and 3) the options to correct, minimize and reduce the impacts of channelization.
- Identify funding sources to implement corrective measures regarding the impacts of channelization.
 - Remediation of channelized areas should correlate with comprehensive systematic plan for streambank/bed stabilization.

Problem Statement (g): Large amounts of sediment from the Tenmile Creek Watershed are carried through the delta and deposited in lower Peoria Lake.

Objective (g): Implement the watershed plan to prevent erosion occurring in the watershed and prevent sediment delivery to the Illinois River.

Discussion

It is a fact that the soils in the Tenmile Creek Watershed are highly erodable. The geologic surface consists of 10-15 feet of a fine material known as loess. This material was wind-blown after the last glacial episode 10-15,000 years ago and is by nature highly erodable. Below the loess is 250-450 feet of glacial till, another highly erodable soil (in most cases) deposited from glacial action.

Streambank erosion and stream meandering are natural processes; however; the result of prairies, wetlands, and forests being inundated with agricultural and urban development is an increased amount of rainwater being flushed into Tenmile Creek. By increasing the amount of water in the stream system, land use change has accelerated the natural cycle of erosion and sedimentation of the Illinois River.

When streams undergo such disturbance the first reaction to dissipate the energy from increased water flow is to cut down into the earth. This is referred to as ‘downcutting’ or ‘channel incision’. This isolates the stream channel from what used to be its connected floodplain. The stream then widens as it attempts to re-meander in the new channel and create a new floodplain; this is referred to as streambank erosion.

Action Items

The problem statements and objectives described above are quite ambitious and many of the objectives may also be considered action items for this plan. What the technical advisors have done, however, is identify areas for stormwater retention and detention as well as streambank and streambed control.

Uplands

1) Wetland Restoration





Wetlands filter stormwater runoff and create biodiversity in a watershed
Photo courtesy of USDA/NRCS

Wetlands perform a valuable function of retaining and filtering pollutants from stormwater. By retaining water in the uplands, we can mitigate problems with flooding and stream channel erosion throughout the watershed. Map 3 is a map of the hydric soils in the Tenmile Creek Watershed. These soils are suitable for wetland restoration.

Cost estimate

Wetland construction: 553 acres * \$725 = \$400,925

2) Grassed waterways/dry dams:

In order to reduce ephemeral, rill, and sheet erosion from farmlands, grassed waterways or dry dams can be placed within the row-crop agricultural fields in the upper portion of the watershed. Both practices serve the same purpose of reducing ephemeral erosion, but dry dams are more convenient for tilling and applying herbicide to fields. From 1997 photographs, the TAC analyzed areas where ephemeral erosion seemed to occur and identified a number of areas where these practices could be utilized. Map 4 is a map of the Tenmile Creek Watershed with potential sites for grass swales or dry dams.

Estimated Cost

Waterways: 19 acres * \$1,250 = \$23,863

Or

Dry dams: 35 dams * \$5,000 = \$175,000

3) Other agriculture conservation practices:

A number of other agricultural best management practices can be applied to the farm fields in the uplands of the Tenmile Creek Watershed. These practices include conservation tillage, terraces, contour buffer strips, residue management, windbreaks, and more. Contact the Tazewell or Woodford County United States Department of Agriculture/ Natural Resource Conservation Service for information on cost-sharing programs.

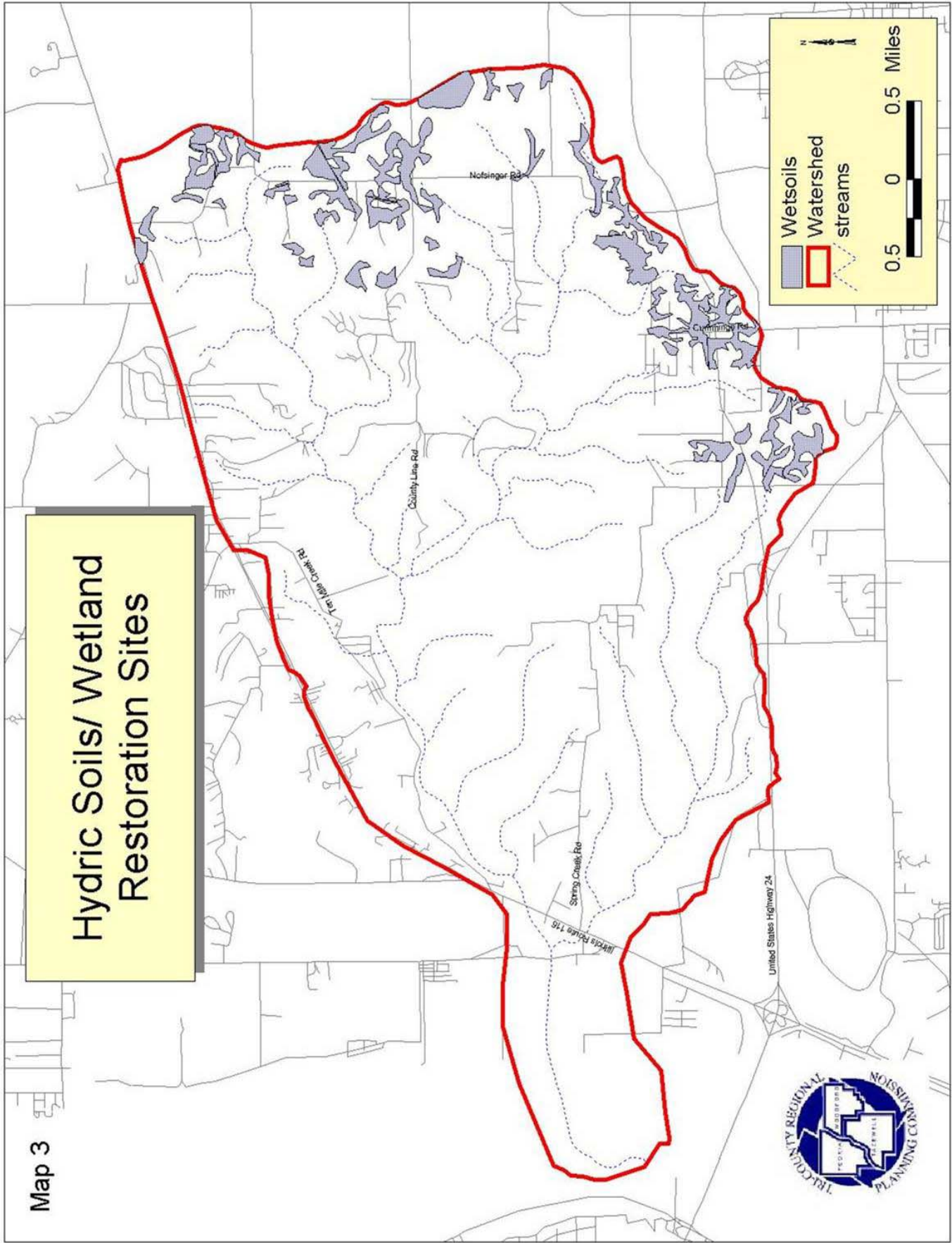
4) Stormwater detention/retention areas:

Farm ponds or dry dams can serve as stormwater detention/retention areas where gully erosion is occurring. These structures would reduce the speed at which stormwater enters the stream, thus reducing streambank erosion. Due to the large cost of installing farm

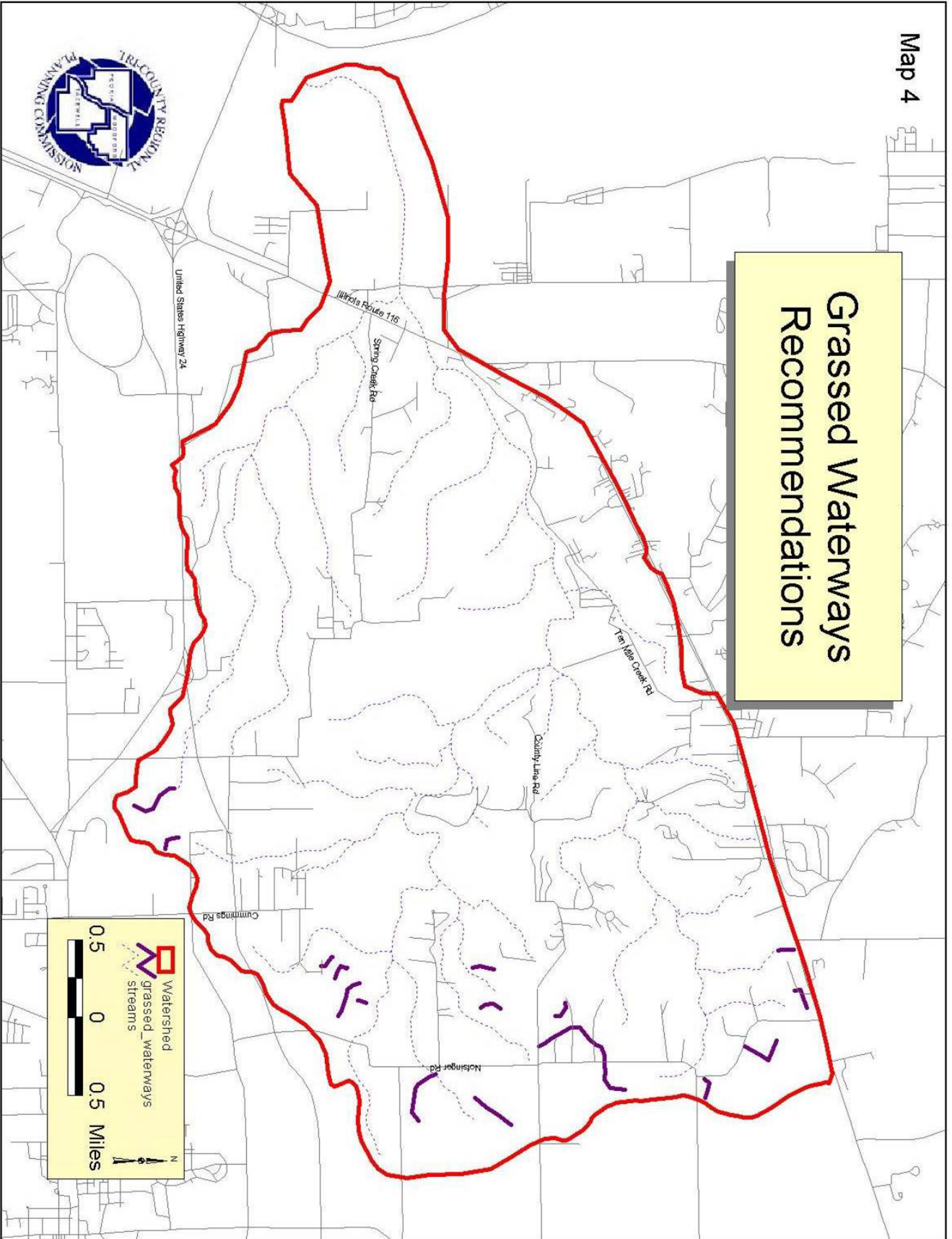


Map 3

Hydric Soils/ Wetland Restoration Sites



Grassed Waterways Recommendations



ponds (\$30-\$40k), there is little governmental funding available for cost-sharing. Dry dams, on the other hand are cost-shared through USDA programs.

The TAC recommends that grade stabilization techniques be utilized in the discharge ravines/gullies of these retention/detention structures. As odd as it may sound, streams do need to carry a certain amount of bedload to help efficiently and effectively dissipate energy. Often water exiting a detention/retention pond is too clean and is starving for sediment. This causes the stream to erode at the exit of the detention pond hence the need for streambed control measures. Map 5 is the Tenmile Creek Watershed with appropriate sites for detention and retention ponds. All sites are adjacent to a ravine/gully cut and the intent is to prevent future downcutting. **Keep in mind that with every pond it is expected that grade stabilization such as check dams or log drop structures be used in the ravines to prevent gully erosion.**



Dry detention basin
Photo courtesy of
USDA/NRCS

Estimated cost

Farm ponds: 53 ponds * \$35,000 = \$1,855,000

OR

Dry dams: 53 dams * \$5,000 = \$265,000

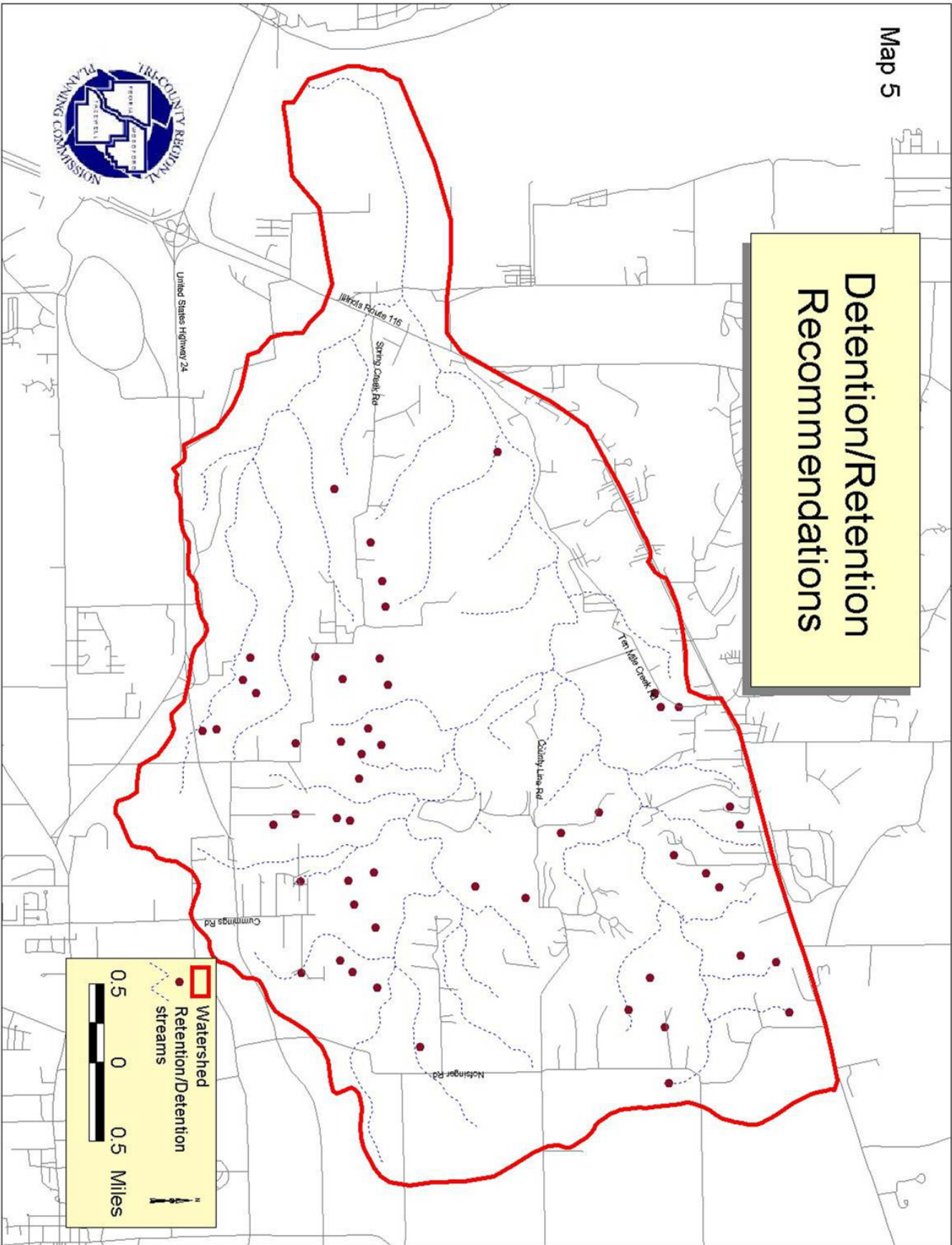
Riparian

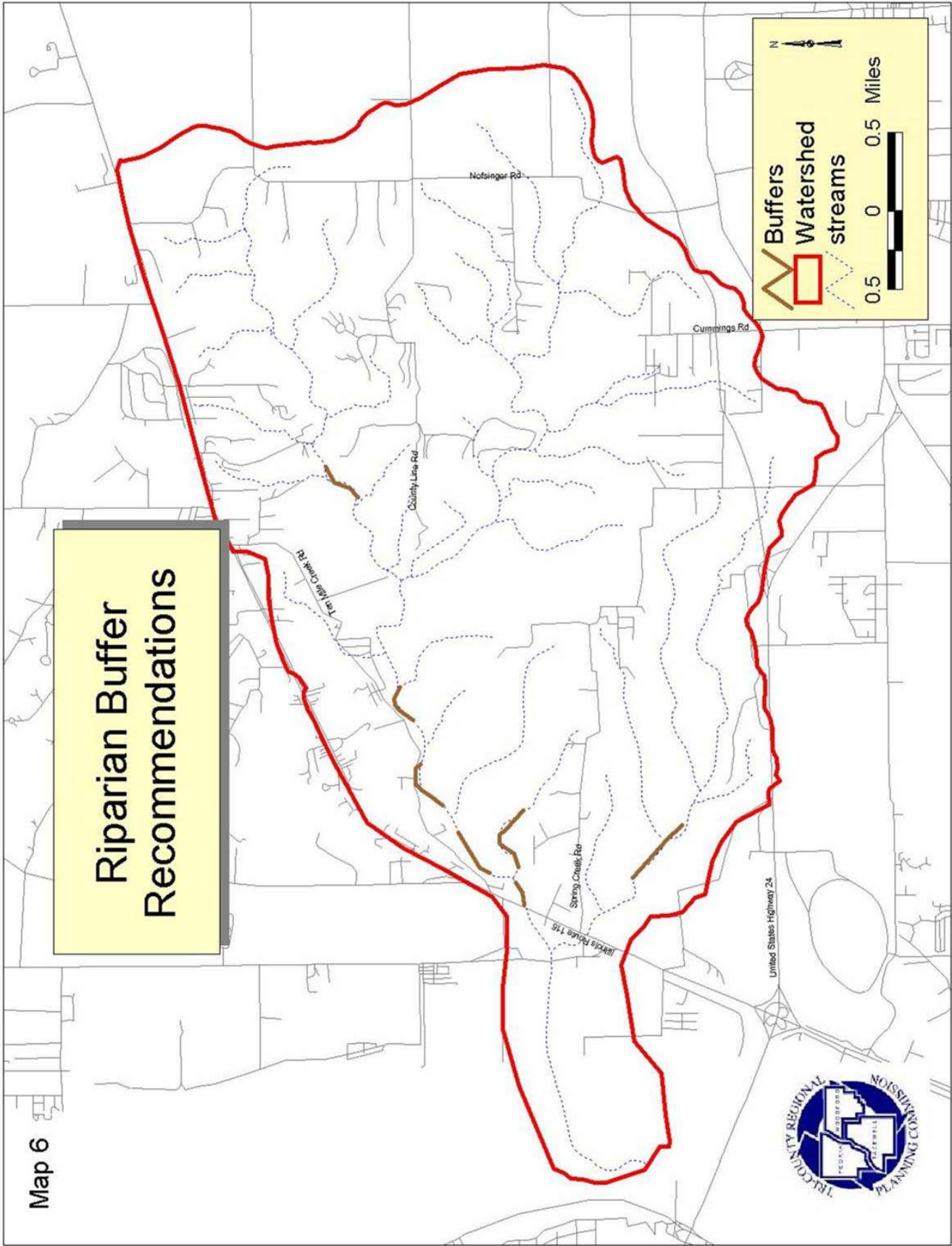
5) Buffer strips:

The land directly connected to the streams is known as the riparian area. Buffer strips vegetating the riparian areas serve to decrease sheet, rill, and ephemeral erosion from farm fields, as well as infiltrate and slow water as it enters the stream system from both urban and rural environments. Even if trees are bordering the stream, erosion may still be occurring due to sheet stormwater flow and more appropriate vegetation may need consideration. Once again, from looking at 1997 aerial photographs as well as on site analysis, the TAC identified areas that seemed to lack riparian protection (Map 6).



Detention/Retention Recommendations





Cost estimate

Riparian buffers: 18acres * \$400 = \$7,200

In-Stream

6) Geomorphology study

The grade and streambank recommendations listed below are based on a minimum amount of data collected from landowner complaints, on site analysis, and aerial photographs. Due to the dynamic nature of a stream system, stabilization in one area often fails due to a lack of knowledge of the remaining watershed. It is recommended that a complete geomorphic study be completed within the watershed to guide the decision-making process regarding stream stabilization. This study would include stream cross-sections, profiles, and an erosion and sedimentation analysis.

Estimated Cost \$45,000

7) Grade stabilization

Grade stabilization in the Tenmile Creek Watershed is a must. Gully erosion is the largest contributor of sediment to the Peoria Lakes from this watershed. While every ravine and stream segment in the Tenmile Creek Watershed could use grade stabilization, areas can be prioritized based on three measures (Map 7).

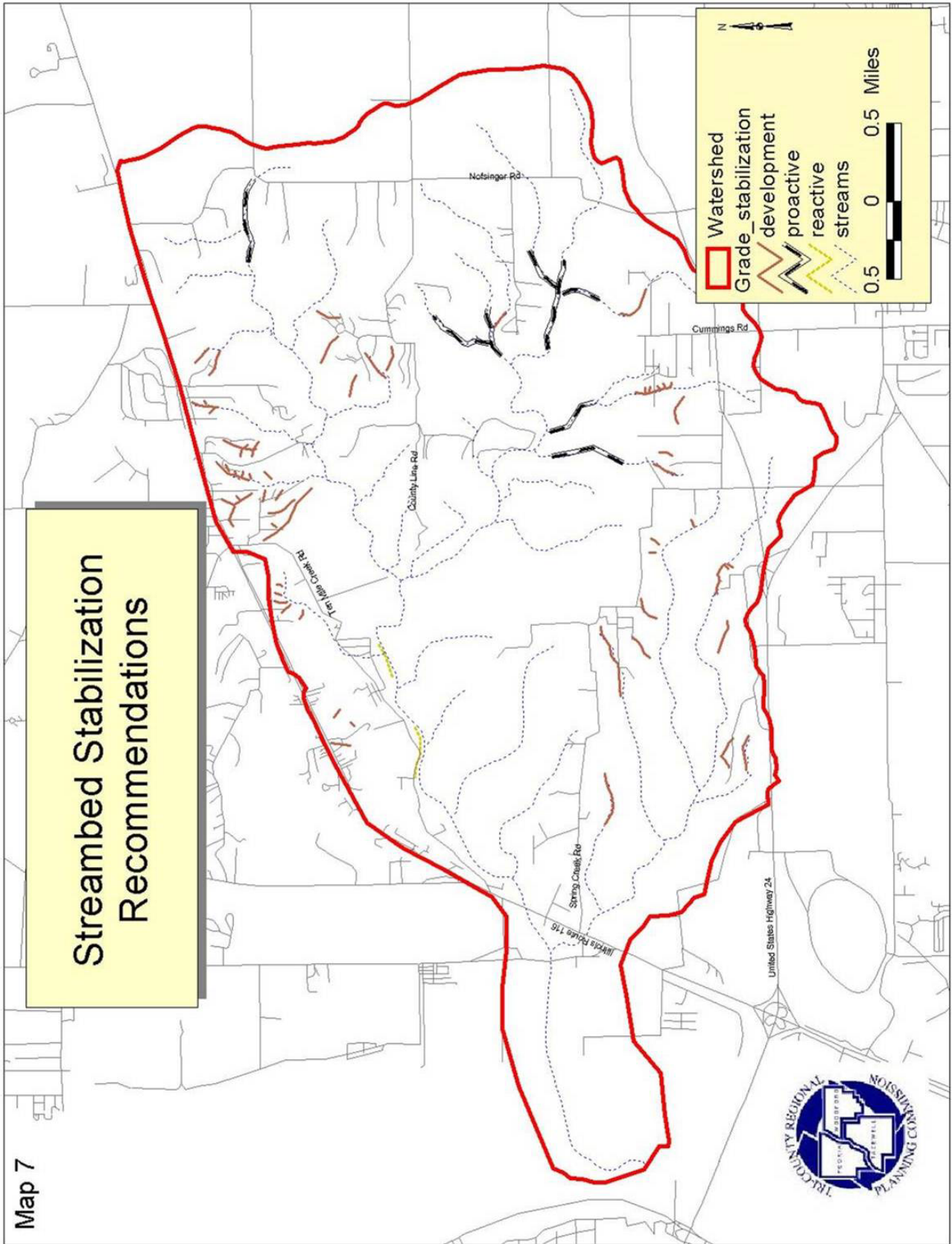
- a) As stated above, check dams or other grade stabilization techniques should be placed in ravines where de/retention areas are recommended and where they already exist.
- b) In developed and developing areas where homeowners are discharging stormwater from streets, rooftops and driveways into ravines and streams. In addition to a number of other Best Management Practices (see STORMWATER) in which these homeowners could participate, the ravines accepting stormwater discharge should be stabilized.
- c) Areas of the watershed that are in threat of downcutting. Map 8 shows the stream segments in Tenmile Creek that are actively eroding. The larger circles indicate more severe erosion. Notice that in the upper portions of the watershed, Tenmile Creek has not been impacted to the degree of the downstream segments. Channel incising is working upstream and these currently “stable” stream segments are referred to in Map 7 as “proactive” sites and should be protected with grade stabilization techniques.

Gully erosion
Photo courtesy of
USDA/NRCS

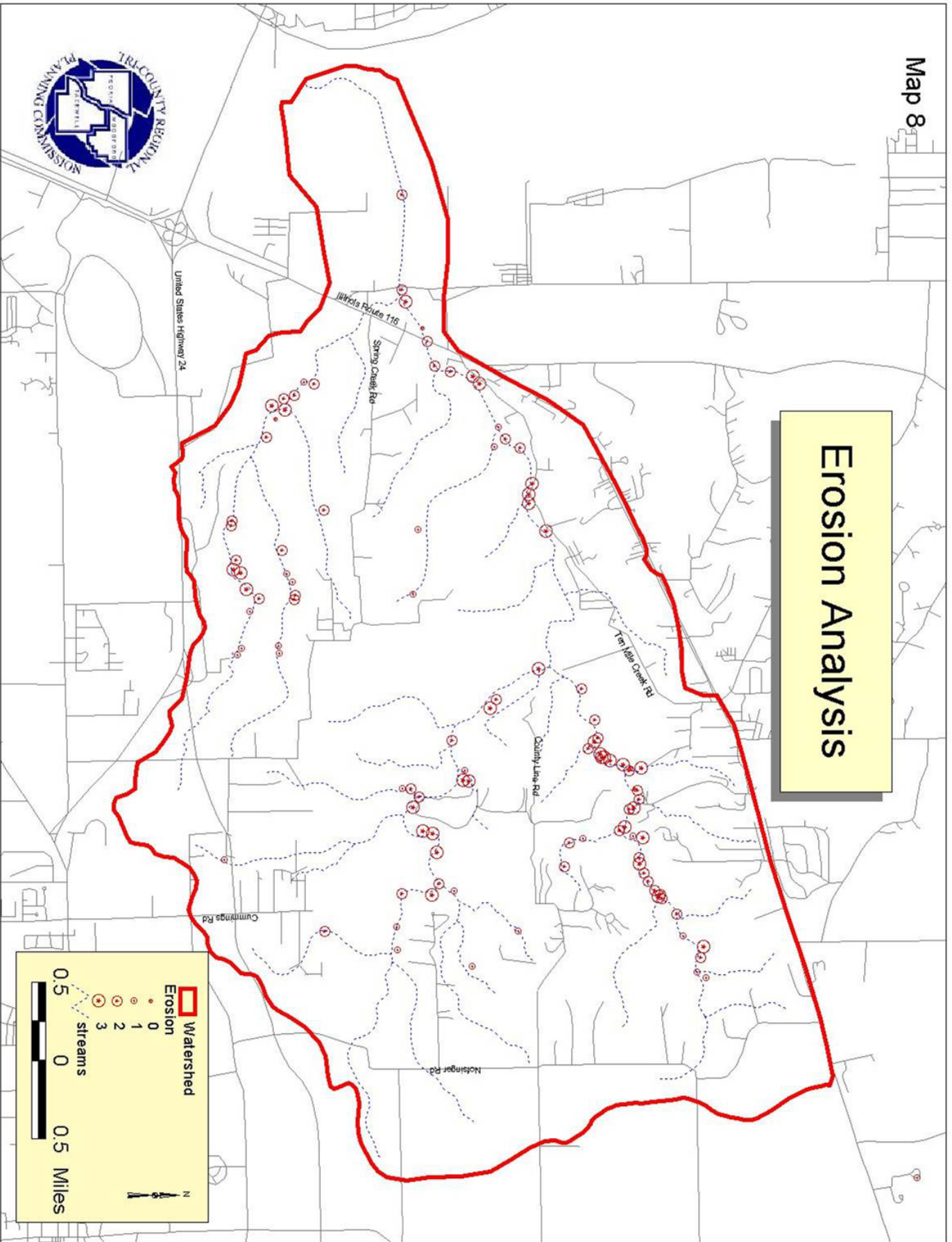


Map 7

Streambed Stabilization Recommendations



Erosion Analysis



Grade stabilization techniques recommended include check dams in the steep ravines and pool and riffle systems in the perennial stream segments.

Estimated Cost

Ravine check dams: 600 dams * \$750 = \$450,000

Pool and riffle structures: 90 riffles * \$2,000 = \$180,000

8) Streambank stabilization:

Streambank stabilization is also recommended in areas where the stream banks are collapsing into the stream itself (Map 9). Streambank erosion is a major concern as 100% of the eroded sediment enters the stream system increasing water turbidity and temperature, decreasing habitat quality, and threatening the integrity of the property itself. Priority areas for streambank stabilization were chosen based on:

- a) Landowner complaints and concerns and a willingness to apply conservation measures to their land (Fondulac Park District)
- b) Geologically active sites identified by locating non-vegetated point bars on 1996 aerial photographs as well as in-the-field inspections.

Estimated Cost

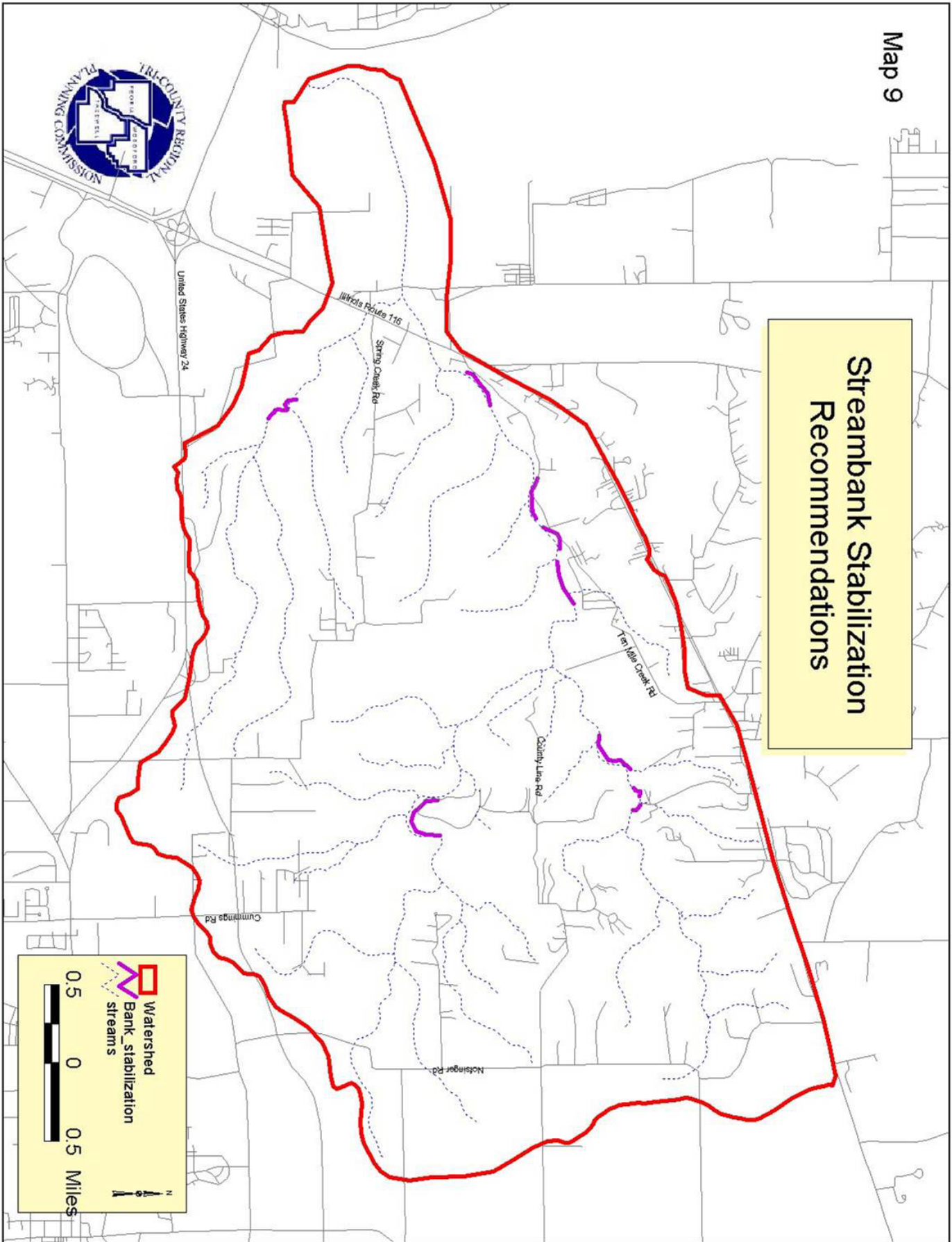
Streambank treatment: 11,900ft * \$25 = \$297,500



Eroded streambank along Wolf Creek, a tributary to Tenmile



Streambank Stabilization Recommendations



Action Items: Education

Problem Statements/Objectives

Problem Statement (h): Environmental damage occurs when community members are unaware of the impacts of human activities on the watershed. People need to be educated on ecology, their connection to the watershed, watershed hydrology, and regulations protecting the watershed.

Objectives (h):

- Increase awareness of environmental damage occurring in the watershed and promote change in behavior to improve our water quality.
- Target all of the following in educational outreach:
 - Home owners
 - Contractors
 - Public officials
 - Farmers
 - Developers, engineers
 - Students
 - Business community
- Everyone should know his or her watershed address (i.e. Mississippi River, Illinois River, Tenmile Creek).
- Educate public so there is more push for elected officials and developers to address watershed quality issues.
- Provide public information source for people to educate themselves on Tenmile Creek Watershed issues and solutions.

Discussion

Getting the word out to the public regarding water quality issues is perhaps the most important component of this watershed management plan. By the nature of democracy, public interest and involvement directly affect the actions of our elected officials, municipal staff, and ultimately the community itself. By learning about stormwater impacts, individual citizens can make better decisions on how to handle such issues as household waste, stormwater management on their property, and development in their community.

According to the National Pollutant Discharge Elimination System Phase II Stormwater Program established by the U.S. Environmental Protection Agency, all municipalities participating in the program must perform water quality education in their community. Not only should the public be educated on these environmental issues, but they should be given the option for public participation in stormwater planning and implementing best management practices in the community. This section of the Tenmile Creek Watershed Plan particularly, has potential to be of assistance to the municipalities needing to comply with the public education component of NPDES Phase II Stormwater.

Action Items



The purpose of the following action items is to educate the community on watershed issues. The following list includes the action item, the target audience, and the potential implementer:

1) Item: Tri-county watershed curriculum training (i.e. River Project) for school teachers. This training should be performed in conjunction with a certified Professional Development Unit provider (i.e. Sun Foundation)

Target Audience: Elementary, Middle, and High School students, teachers

Implementer*: Regional Offices of Education (i.e. Two-Rivers Professional Development Center and Mid Illini) and/or municipalities

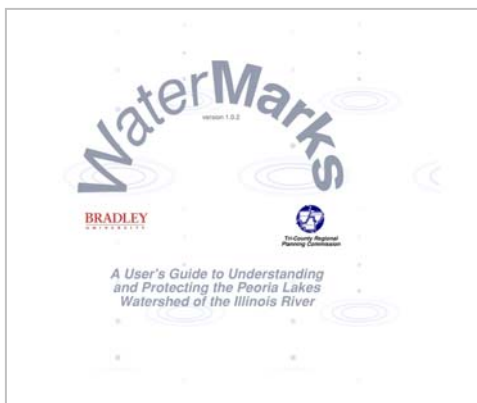
Estimated Cost

3 training sessions: 3 sessions * \$7,000 = \$21,000

2) Item: Promotion of *WaterMarks* watershed educational CD-ROM and associated curriculum for use in middle school classrooms

Target Audience: Middle school students

Implementer: Tri-County Regional Planning Commission, Illinois Department of Natural Resources, Bradley University



WaterMarks Educational CD-ROM and watershed curriculum

Estimated Cost

Reproduction of CD ROM and curriculum:

500 CDs * \$10 + 500 curriculum packets * \$20 = \$15,000

3) Item: Conduct a round-table discussion/field trip for homeowners/farmers and elected officials to discuss water quality and erosion control issues. This should be performed by a professional facilitator with the goal of promoting the implementation of the *Urban Stormwater* section of this watershed plan.

Target Audience: Landowners/homeowners and elected officials

Implementer: Municipalities, as part of the NPDES Phase II Stormwater compliance.

Estimated Cost

Professional facilitator & outreach/invitations:

400 hrs * \$45 = \$18,000



4) Item: Coordinate Earth Day celebrations among local communities. Currently, the City of East Peoria, Bradley University, Illinois Central College, Lakeview Museum, and a number of other agencies hold separate Earth Day Celebrations with less than desirable public participation. Combining these efforts could increase public participation and increase networking among environmental interest groups, municipalities, and students.

Target Audience: ALL* (see explanation below)

Implementer: College students, elementary/high schools, municipalities, environmental organizations, businesses, health departments, park districts

Estimated Cost

Usually volunteer effort, but with professional staff:

$$400 \text{ hrs} * \$45 = \$18,000$$

5) Item: Tours of erosion problems and stormwater systems

Target Audience: ALL

Implementer: Public Works Directors, Municipalities, Environmental Organizations

Estimated Cost

Advertisement/outreach, municipal staff conducting tour: 300 hrs * \$45 = \$13,500

6) Item: Water quality videos to be played on public access channels

Target Audience: ALL

Implementer: ALL* (see description below), Public Broadcasting Stations

Estimated Cost

Video production: 1 video * \$15,000 = \$15,000

7) Item: Curb and gutter stenciling. By stenciling educational messages on curbs and gutters (i.e. “This flows to Tenmile Creek”) the public can become more aware of how the dumping pollutes the stream.

Target Audience: ALL

Implementer: ALL

Estimated Cost

Professional staff & supplies:

$$300 \text{ hrs} * \$45 + \$250 = \$13,750$$

8) Item: Newspaper advertisements (i.e. “Keep the Water Clean”) outlining a number of best management practices to help homeowners manage stormwater

Target Audience: ALL

Implementers: Health Departments, Environmental Organizations, Park Districts, municipalities

Estimated Cost

Creation and publication of colored advisement in Sunday newspaper edition:

$$20 \text{ hrs} * \$45 + \$7,000 = \$7,900$$



9) Item: Interpretive stream walks and stream pick ups. Natural resource professionals can educate volunteers on the workings of a stream system as they collect litter in a community clean up.

Target Audience: ALL

Implementers: Clubs, environmental organizations, municipalities, park districts, natural resource professionals

Estimated Cost

Professional staff: 200 hrs * \$45 = \$9,000

10) Item: Watershed tours. Offer tours of Tenmile Creek Watershed to highlight the good (wetlands, conservation development), the bad (struggles as municipalities and developers work to comply with regulations), and the ugly (bluff, ravine, and streambank erosion). A tour would be particularly appropriate in conjunction with conferences held in the area (i.e. IL Rivers Conference, Environmental Education Association, etc.)

Target Audience: ALL and out of town visitors attending conferences (a good way to get the word out across the state and perhaps the nation regarding the Tenmile Creek Watershed planning initiative)

Implementers: Interest groups, environmental organizations, municipalities, park districts

Estimated Cost

Professional staff 70hrs * \$45 = \$3,150

11) Item: Watershed Maps. Everyone should know their watershed address and understand the connection of land and water. City maps can be created outlining watershed boundaries. These maps can be placed in the newspaper, on websites (PJ Star, municipalities, interest groups), in water bills, and in the classroom.

Target Audience: ALL

Implementer: ALL, the water company

Estimated Cost

Map making, distribution: 70 hrs * \$45 = \$3,150

12) Item: Stormwater education brochure distribution (especially during Stormwater month in June). Many brochures, posters, CD-ROMs, etc. are available through the Environmental Protection Agency and other organizations. Students needing community service hours, boy/girl scouts, and other groups can go door to door handing out educational materials or simply hand out brochures at participating retailers and Earth Day celebrations.

Target Audience: ALL

Implementer: Clubs, students, environmental organizations

Estimated Cost

This could be done on volunteer basis, but with professional staff:

50 hrs * \$45 = 2,250



13) Item: “Living Downstream” workshops for adults and kids. This role-playing activity, created by Southern Illinois University and published in *Rivers Curriculum Project*, puts participants in a difficult position as they struggle to determine the best option for land use change in a hypothetical watershed. The end lesson is always the same, what you do to the land directly affects your quality of water, habitat, and those living down (and in some cases up) stream from the disturbance. This can be done at a variety of events including: in the classroom, at Bradley University public sessions, at an Earth Day Celebration, etc.

Target Audience: Students, interested citizens

Implementer: Teachers, municipalities, park districts, museums, Bradley University, Illinois Central College, interest groups, geography clubs

Estimated Cost

Professional staff: 25 hrs * \$45 = \$1,125

14) Item: Encourage regional database for Rivers Project data collection projects. One component of the *Rivers Curriculum Project*, used frequently in local high schools, is the collection of water quality data from the Illinois River and its tributaries. Currently the project coordinator, Dr. Robert Williams with Southern Illinois University, is developing a webpage where all the data in the state can be recorded and made available to the public. The Tenmile Creek Watershed Planning Committee supports and encourages this effort.

Target Audience: Citizen scientists, students

Implementer: Dr. Robert Williams, Project Director of *Rivers Curriculum Project*

Estimated Cost

Professional staff: 650 hrs * \$45 = \$29,250

15) Item: Create historical land use presentation for interest groups to use. With the condition the Peoria Lakes are in now, it is difficult to get a lot of public enthusiasm in the movement to restore this resource. A formal presentation should be made available demonstrating the natural history of the Illinois River and the biological diversity it once hosted. The Tenmile Creek Watershed Planning Committee also supports the idea of developing a natural history museum with the central theme being the Illinois River.

Target Audience: Present at meetings for public officials, interest groups, school assemblies

Implementer: Museums, historical society, Illinois Natural History Survey, interest groups, boat clubs, IL Historic Preservation Agency

Estimated Cost

Professional staff: 40 hrs * \$45 = \$1,800

16) Item: Create Tenmile Creek Watershed Webpage with interactive maps and interviews with natural resource professionals to educate public on the watershed plan as



well as the progress of the Tenmile Creek Watershed Planning Committee. See www.interactivewatersheds.net for a good example.

Implementer: Tri-County Regional Planning Commission, the Tenmile Creek Watershed Committee

Audience: ALL

Estimated Cost:

Professional staff, purchase of server space:

$$750 \text{ hrs} * \$45 + \$150 = \$33,900$$

*Implementer = The above list is just intended to be a guide for the community. Anyone with the knowledge, enthusiasm, and will can implement the above items. Please do not limit yourself to what is written in this plan.

*Target Audience: ALL = the entities listed below

- Homeowners and citizens
- Contractors
- Public Officials
- Developers, engineers
- Students
- Business community
- Farmers

*Implementers: ALL = the following potential implementers

- Municipalities
- Health Departments
- Universities/college students
- Environmental Interest groups (non-profit)
 - Student environmental clubs
 - The Nature Conservancy
 - Heartland Water Resource Council
 - Tri-County Riverfront Action Forum
 - Peoria Wilds
 - The Green Party
 - Heart of Illinois Sierra Club
 - Natural Resources and Your Development Taskforce
- Environmental Organizations (government)
 - Illinois Department of Natural Resources
 - Prairie Rivers Resource Conservation and Development
 - USDA/ Soil and Water Conservation Society
 - USDA/ Natural Resource Conservation Service
 - Tri-County Regional Planning Commission
 - US/IL Environmental Protection Agency
- Elementary/high school students



- Businesses
- Neighborhood/homeowner associations
- Park Districts
- Clubs (i.e. Rotary, Ivy Club)

A very important audience to target with water quality education is the students in East Peoria and Morton grade schools and high schools. These citizens are the future stewards of the land and will eventually need to deal with the challenges resulting from increased/contaminated stormwater runoff. A rapid investigation indicated that the following schools have participated in watershed curriculum training.

- City of East Peoria
 - East Peoria Community High School
 - Central Jr. High School
 - Paul Bolin School
 - Riverview School
 - Robein School
- Village of Germantown Hills
 - Germantown Hills Middle School
 - Metamora High School
- City of Washington
 - Beverly Manor School
 - Central Grade School
 - Washington High School
 - Washington Middle School

The high schools indicated above have participated in *Rivers Curriculum Project* consisting of six river-based units including biology, chemistry, earth science, geography mathematics, and language arts. The students in East Peoria and Morton collect water quality data in the Illinois River and its tributaries through this curriculum.

The grade schools listed above have participated in the *Illinois Middle School Groundwater Project*, created through Rivers Project from 1994-1997 (Beckman, 2003). This curriculum was developed by middle school teachers and includes general water and geological information, as well as water quality testing activities.

All schools in the region should have some form of watershed education. Illinois has been referred to as the “River State” with over 26,000 miles of flowing water and there is great potential to educate our students on this natural resource. To accomplish the task of promoting watershed education in the classroom, teachers, superintendents, and students need to be exposed to water quality issues and energized through presentations and activities in school assemblies, field trips, and yearly teacher workshops. Hands on activities should be prepared for teachers and students to follow up on the process of water quality education. Story tellers (Brain Fox Ellis), the Glen Oak Zoo, Lakeview Museum, and a number of other citizens have the potential to supply the spark needed to ignite environmental interest in our educational institutions.



Action Items: Funding

As stated in the Mission Statement, the Tenmile Creek Watershed Planning Committee seeks to identify sources of funding for the implementation of this plan. The following action items are meant to empower private landowners, interest groups, and others to seek out and secure grant funding to improve water quality. Please note that Appendix C contains a comprehensive list of granting agencies. The Illinois Department of Natural Resources has similar grant information on their website, <http://dnr.state.il.us/orep/c2000/grants/>

Discussion

Currently, there is a large movement in the State of Illinois to protect local watersheds and water quality. There is an understanding that what we do to the land directly impacts the quality of water and we must begin at the subwatershed level to ultimately have an impact on larger river systems such as the Illinois River. Many watershed groups are forming around the state and these groups vary in the amount of funding and information available to them. In an effort to support these watershed groups, professionals from the Illinois Environmental Protection Agency, the Illinois Department of Natural Resources, U of I Extension, Soil and Water Conservation Society, Natural Resource Conservation Service, planning commissions, and interest groups are investigating the feasibility of creating an Illinois Watershed Association that would: 1) provide technical assistance to watershed groups; 2) direct groups to appropriate funding sources; 3) facilitate networking among watershed organizations; and 4) provide many other needed services. Guidance by a larger, structured watershed organization could be invaluable to the Tenmile Creek Watershed Committee.

Action Items

- 1) Verbally and perhaps financially support the formation of the Illinois Watershed Association
- 2) Hold grant writing workshops for landowners/watershed groups

Cost Estimate

5 workshops in Tenmile Creek Watershed region
 $5 * \$30,000 = \$150,000$

- 3) Distribute the "Conservation Funding List" (Appendix C)

The Conservation Funding List seen in Appendix C of this plan was created by the Funding Resource Working Group of the Volunteer Stewardship Network (VSN) Steering Committee for the VSN. The VSN is coordinated by The Nature Conservancy, Illinois Chapter and the Illinois Natural Preserves Commission. This is a comprehensive list of funding opportunities from governmental, private, and non-profit organizations.



**4) Promote the use of the Illinois Department of Natural Resources’
Natural Resource Grant Opportunities in Illinois website:**

<http://dnr.state.il.us/orep/c2000/grants/>

This site contains a database of grant opportunities from private, non-profit, governmental organizations and more.



Cost Summary

Tennmile Creek Watershed Plan Implementation Budget Summary

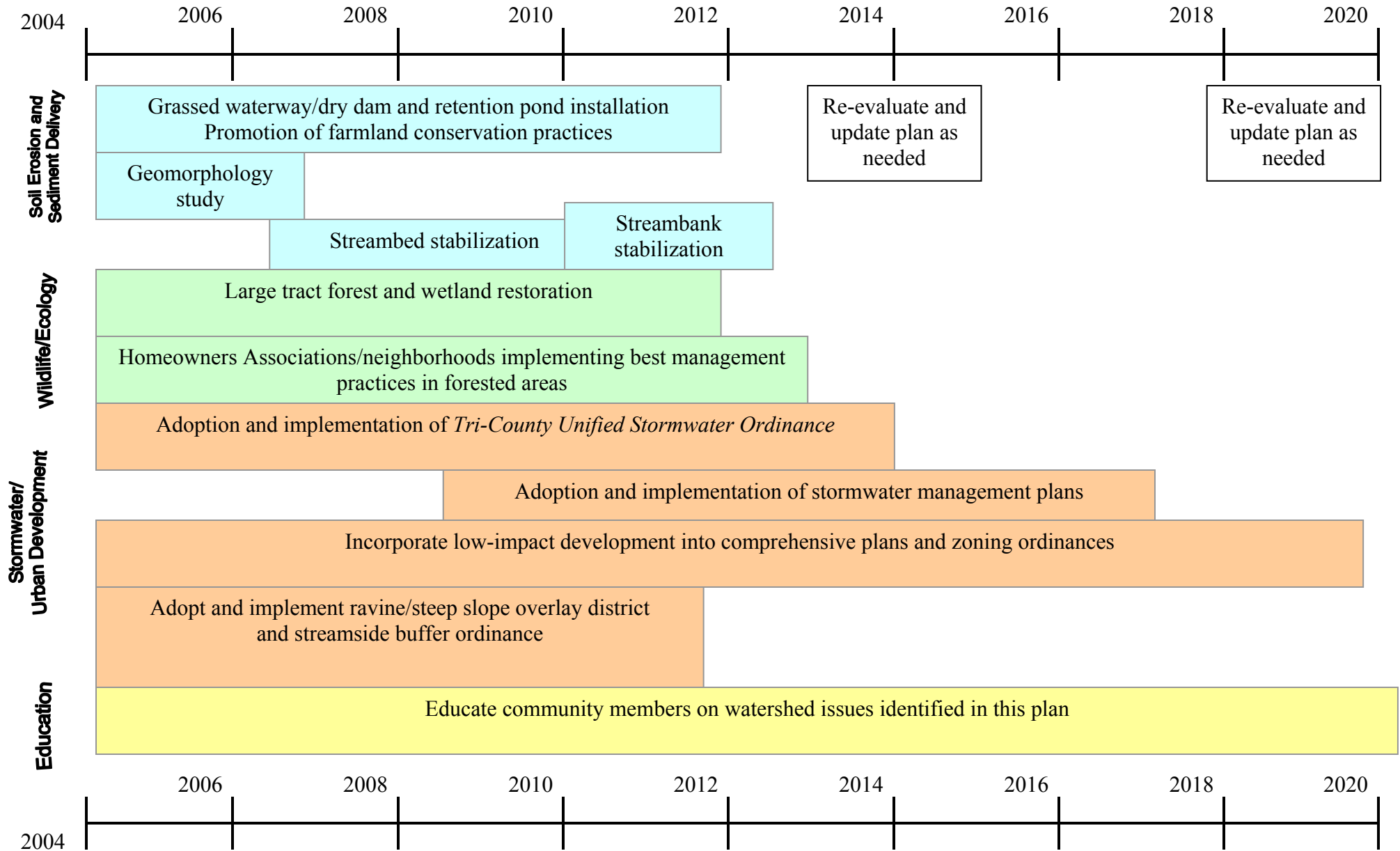
Table 3

Action Item Category	Cost to implement all identified action items
Urban Stormwater Management	\$317,250
Soil Erosion and Sediment Delivery	1,820,625
Wildlife/Ecology	622,250
Education/Outreach	205,775
Grant Education/ Funding	150,000
Total	\$3,115,900

*note: this cost summary does not include general agricultural conservation practices such as limited tillage, enrollment in CREP, etc. and only includes dry dams in Action Item #2 and #4.



Timeline for watershed plan implementation

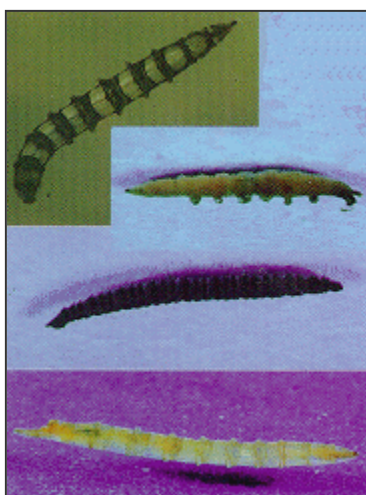


Measuring Progress & Success

Measuring the progress of the implementation of the Tenmile Creek Watershed Plan using quantifiable data is imperative as the Planning Committee works towards successfully improving the environmental conditions of the watershed. The table on the following page lists the biologic, geologic, and sociologic goals of the planning committee. Each category is described below:

Aquatic Insects

As stated in the “wildlife” section of the natural resources inventory, The Nature Conservancy performed an aquatic insect survey of Tenmile Creek in 2003. Overall, the number of species (taxa richness) and the species diversity calculated using the Shannon Weiner Index (H') was high compared to similar studies of local tributaries, but there is still room for improvement. For each time frame identified, the Planning Committee plans to see a gradual increase in taxa richness and species diversity as wetlands are established and as water quality improves from the urban areas of the watershed.



Aquatic insect order Diptera.
These species are tolerant to
water pollution.

Fish Species

The Illinois Department of Natural Resources conducted a fish survey in conjunction with the aquatic insect survey in 2003 (see “fish/aquatic invertebrates” section of this plan). Once again, species richness and the distribution of individuals within those species (diversity = H') was higher than those seen in similar studies on local watersheds, but as environmental conditions improve in the watershed, the Tenmile Creek Watershed Planning Committee expects to see a gradual increase in both parameters of fish species.

Soil Erosion

In 2003, the USDA/NRCS conducted a soil erosion and sediment delivery survey (see “soil erosion” section of this plan). From this study, the amount of sheet/rill, ephemeral, gully, and streambank erosion taking place within the watershed was estimated and can be seen as “baseline data” in the table on the following page. The greatest impact on sheet/rill and ephemeral erosion will be the adoption of cropland conservation practices and the *Tri-County Unified Stormwater Ordinance*. Gully erosion should decrease



dramatically with forest management, the adoption of a ravine overlay district ordinance, and grade stabilization in ravines. Almost every action item identified in this plan will have a direct effect on the discharge rates of stormwater through Tenmile Creek and consequently will impact streambank erosion, thus the planning committee expects to see a large decline in the amount of streambank erosion by 2020.

Overall, if the Tenmile Creek Watershed Planning Committee is successful in meeting these goals for soil erosion, they will prevent an estimated 300,000 Tons of sediment from entering Tenmile Creek and its tributaries by 2025.

Education

A survey of the citizens of the watershed would be an appropriate means to determine the success of the education/outreach activities identified in this plan. The main question in this survey would be “What is your watershed address?” Simply knowing that they live in the Mississippi, Illinois River, Tenmile Creek Watershed means that they understand the connections among our streams and rivers and more importantly, the connection between the land and the water.

Future Data Collection

The Tenmile Creek Watershed Planning Committee hopes to have the continued support of the Illinois Department of Natural Resources, The Illinois Chapter of the Nature Conservancy, and the United States Department of Agriculture/Natural Resource Conservation Service in the future as they work to measure their progress. Other opportunities, however, are available. Environmental organizations are becoming more scientifically savvy every day. High school students are learning to monitor water quality on the Illinois River. Local colleges and universities such as Bradley University, Illinois Central College and Illinois State University are partnering with park districts and other local units of government to collect and analyze data that will benefit the community. The Planning Committee will work to foster these partnerships and utilize the resources the community has to offer.



Measuring the Progress & Success of the Tenmile Creek Watershed Restoration Plan

Year	2004	2010	2015	2020
Actions	Baseline Data	1) Streambed stabilization 2) Large tract forest & wetland restoration 3) Homeowners implementing BMP's 4) General outreach/education	1) Streambank stabilization 2) Large tract forest and wetland restoration (cont'd) 3) Homeowners implementing BMP's (cnt'd) 4) Adoption of <i>Tri-County Unified Stormwater Ordinance</i> 5) Adoption of ravine overlay and streamside buffer ordinance 6) Installation of farmland conservation practices 7) General outreach/education	1) Adoption and implementation of municipal stormwater plans 2) incorporation of low-impact development into comprehensive plans and zoning ordinances 3) General outreach/education
Aquatic Insects				
Taxa Richness	30	32	34	34
H'	2.14	2.35	2.59	2.59
Fish Species				
Taxa richness	17	18	20	22
H'	1.74	1.8	2.0	2.0
Soil Erosion (tons/year)				
Sheet/rill	9,615	8,000	5,000	5,000
Ephemeral	560	500	300	300
Gully	24,800	15,000	10,000	7,000
Streambank	2,700	2,000	1,000	500
Total	37,675	25,500	16,300	12,800
Education				
% of population that knows their watershed address	NA	20	50	80

Natural Resource Inventory

Waterbodies

Illinois River: The Illinois River has been an important water source to communities in Central Illinois for thousands of years providing benefits such as fishing, recreation, natural habitat, and transportation. One of the first detrimental impacts of man on this fresh water ecosystem occurred in 1900 when a canal was created from Lake Michigan to the Illinois River to carry untreated sewage from the City of Chicago down the Illinois River (IDENR, 1986). Drainage Districts also began to form along the Illinois River in the first part of the nineteenth century. During this time, much of the river's floodplain was lost to agriculture (IDENR, 1993). As would be expected, water quality rapidly degraded, and aquatic and terrestrial organisms depending on this river system underwent massive reduction in population sizes.

Other alterations to the Illinois River include locks and dams built throughout the nineteenth and twentieth century. In order to facilitate transportation to and from the Mississippi River, five locks and dams have been erected along the Illinois River to create six navigational pools from the beginning of the River at the junction of the Des Plaines and Kankakee Rivers to the mouth at the Mississippi River. Thus, the entire length of the Illinois River has undergone anthropogenic alteration.

Peoria Lake: Today's bottomlakes seen throughout the Illinois River are remnants of a larger river that once occupied the Illinois River Valley. Glacial advance altered the existing river system approximately 10,000 years ago to create a more sluggish Illinois River incapable of transporting sediment from its tributaries. Alluvial fan and delta formations caused water to back-up into the flood plain creating bottomlakes. Peoria Lake specifically, was formed as an alluvial fan developed at the mouth of Farm Creek, tributary approximately 160 miles up the Illinois River, thus constricting flow. The Ten-Mile Creek delta has since then restricted flow in a similar fashion approximately four miles upstream of Farm Creek dividing the Lake into the Upper and Lower Peoria Lake (IDENR, 1986).

Improper drainage from local watersheds and decreased velocity due to the lock and dam system has led to a serious contamination of sediment in the Peoria Lakes. The average depth of the Peoria Lake has decreased from eight feet in 1903 to an average of approximately two feet today causing the need for constant dredging to maintain deep water habitat needed by many fish species. The Illinois Department of Natural Resources conducted a study of the local sediment sources from ten tributaries draining into Peoria Lakes (1993). The researchers found that during an average rainfall year, the local watersheds at Peoria Lake (3% of the total watershed) contribute approximately 50% of the total sediment delivered to the lake.

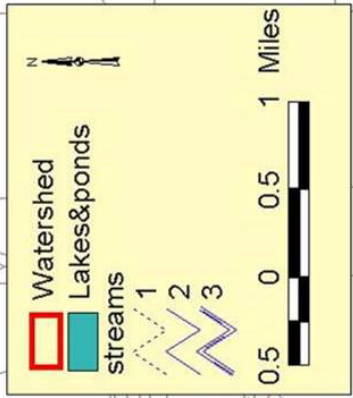
Lakes and ponds: Tenmile Creek Watershed contains 30 lakes and ponds totaling approximately 11 acres (Map 10). These man made lakes are commonly used for flood control, irrigation, and recreational activities. The largest pond in the watershed is Caterpillar's stormwater retention pond totaling about 17 acres. This pond serves to



Map 10

Waterbodies

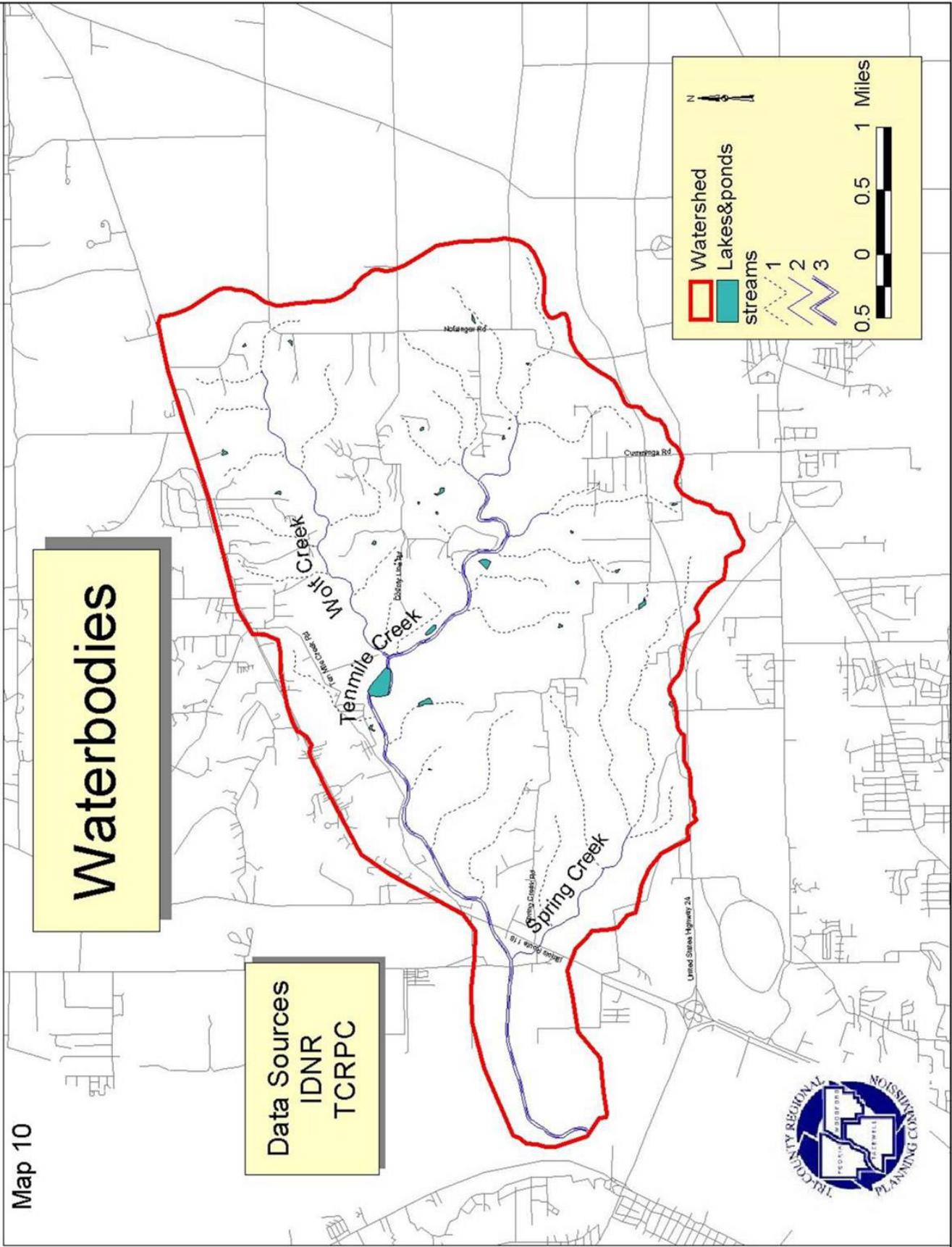
Data Sources
IDNR
TCRPC



Legend:
Watershed (Red outline)
Lakes&ponds (Blue fill)
streams (Blue lines)
1 (Single line)
2 (Double line)
3 (Thick double line)

Scale: 0.5, 0, 0.5, 1 Miles

North arrow pointing up.



collect sediment from the demonstration site to: 1) prevent sediment from entering the Illinois River; and 2) recycle sediment to be dredged and re-used on the demonstration site.

Streams: Tenmile Creek flows westerly through the townships of Washington and Fondulac of Tazewell County. At stream mile 3.5, a small portion (1 ¼ miles) of the stream as well as all of Wolf Creek, a major tributary to Tenmile, flows in Woodford County at Worth Township. Originating at an elevation of 820 ft in Section 11 of Washington Township just north of the Village of Washington, Tenmile Creek drops a total of 370 ft in ten miles where it empties into the Narrows of Peoria Lake at Illinois River mile 166.



In the background is the Tenmile Creek delta forming the narrows of Peoria Lakes

Including all the tributaries that drain into Tenmile Creek, the entire freshwater system is composed of 44 miles of streams draining approximately 11,700 acres of land. Using Stahler’s method of stream ordering (1957), the various streams can be classified by ‘stream orders’ depending on the level of tributary drainage. A first order stream, for example, has no other tributaries draining into that system; these are the smaller, more numerous streams. A second order stream is formed when two first order streams drain into a common tributary, a third order stream exists where two second order streams come together, and so on. The majority of the stream length in the Tenmile Creek Watershed (as with most watersheds) is seen in the first order streams. These small but numerous tributaries branch in all corners of watershed boundary and, due to their dominant nature in the stream system, play an important role in determining the health of the ecosystem. Tenmile Creek is a 3rd order stream and contains major tributaries such as Wolf and Spring Creek (Map 10). Wolf Creek is a second order stream in the northern section of the watershed; it is 2 ¾ miles long and drains into Tenmile 4 ¾ miles from the narrows. Spring Creek is a second order stream flowing westerly in the southern portion of the watershed for 4 miles until it empties into Tenmile Creek at stream mile 2. The dimensions of the various stream orders are as follows:

Table 4

order	# of streams	stream length (mi)	ave. individual length (mi)	% of total stream length
1	33	31	0.7	71%
2	5	6	1.2	13%
3	1	7	7	16%



Designated Uses

In accordance with the Federal Clean Water Act, Section 305(b), the Illinois Environmental Protection Agency (IEPA) has issued the *Illinois Water Quality Report 2002* in which 18.3% of all stream miles in Illinois (15,933 mi.) have been evaluated or monitored through September 1998. These streams are set to certain water quality standards by the Illinois Pollution Control Board and are assigned “designated uses” which include such categories as aquatic life, fish consumption, swimming, indigenous aquatic life, and public water supply. The ability of a water body to support a specified use is influenced by the activities within the watershed.

Levels of support as defined by the EPA:

Full Support- Water quality meets the needs of all designated uses protected by applicable water quality standards.

Full Threatened- Water quality is presently adequate to maintain designated uses, but a declining trend continues only partial support may be attained in the future.

Partial Support- Water quality is impaired and the waterbody is only partially meeting the needs of its designated use.

Nonsupport- Water quality is severely impaired and not capable of supporting the designated use to any degree.

In Illinois, overall use was fully or partially supported on 98.6% of all stream miles assessed in the water quality report. Major potential causes of impairment include: nutrients, organic enrichment/low dissolved oxygen, habitat alterations, PCBs, pathogens (fecal coliform bacteria), metals, siltation, and suspended solids. The major potential sources of impairment include: agriculture, hydromodification, municipal point sources, resource extraction, and urban runoff/ storm sewers.

Data for Tenmile Creek specifically was collected via evaluation from records more than five years old, or adjacent land use availability, and/or best professional judgment. While Tenmile Creek has been classified for *overall* and *aquatic life* use, this stream was not assessed in this Water Quality Report.

Impairments

Major causes of declining water quality in Illinois streams include: agriculture, hydromodification, municipal point sources, resource extraction, and urban runoff/ storm sewers (IEPA, 2002).



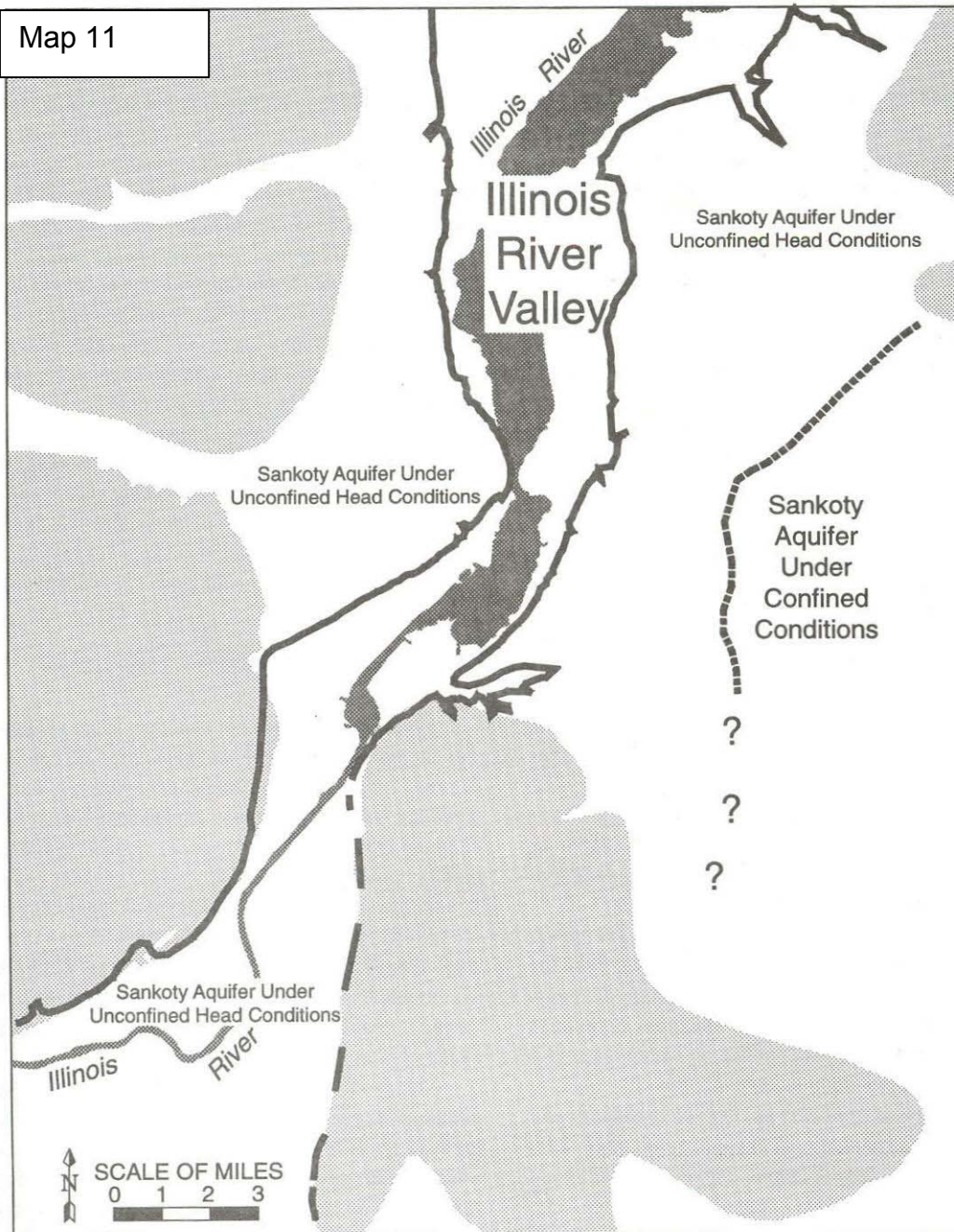
Groundwater

As the Wisconsin glaciers pushed through central Illinois during the Pleistocene Epoch, sheets of ice deposited stratified layers of sand-and-gravel that currently serve as the Sankoty sand aquifer. This aquifer, which underlies the Tenmile Creek Watershed, is approximately 100 feet thick and is the largest in Illinois. Map 11 shows the boundary of the aquifer. Confined conditions are those in high water pressure systems in which water levels in wells reach higher elevations than the aquifer. The ground water in the Tenmile Creek Watershed flows toward the Illinois River seeking out areas of lowest elevation thus contributing to the base flow of this larger body of water (Burch, 1993).

In 1993, the Illinois State Water Survey conducted a study on the Sankoty aquifer to assess ground water quality. A quantitative analysis of major, secondary, and trace constituents as well as organic compounds were recorded from various well sites. Those values pertaining to the Tenmile Creek Watershed can be seen in Table 5. Major constituents including calcium, magnesium, sodium, bicarbonate, and sulfate found in the Tenmile Creek Watershed can be attributed to the removal of these elements and compounds from naturally occurring rocks as the running water dissolves these materials from the Earth's crust (Burch,1993). Overall, the researchers at the Illinois State Water Survey found that ground water quality in the Peoria-Pekin area was excellent with no significant regional water quality problems; however, highlighted in red/darker color are the contaminants that exceed the current drinking water standards of the EPA and the yellow/lighter color highlighted contaminants are those that the equipment was unable to precisely detect if the pollutant was above acceptable levels.



Map 11



- Areas where aquifer is not present
- Boundary of Illinois River Valley
- Approximate boundary between confined and unconfined hydraulic conditions. Question mark where inferred



Results of Ground Water Sampling
At Locations in the
Tenmile Creek Watershed*

Table 5
Parameter (mg/L)

Sample Station Number

	11	22	23	26	43	74	75
Major Constituents							
Calcium	140.9	76.5	106.0	79.7	71.0	62.5	66
Magnesium	51.5	34.2	47.0	38.7	32.4	29.9	32.2
Sodium	97.3	18.1	14.1	36.7	22.8	8.82	27.8
Nitrate (as N)	3.6	<0.1	0.8	<0.1	<0.1	<0.1	<0.1
Sulfate	46.0	10.	60.0	<0.9	0.9	<0.9	<0.9
Chloride	105.	4.4	40.1	26.8	1.8	1.1	4.4
Alkalinity	388.	373.	387.	429.	367.	305.	371
TDS @ 180° C	859.	378.	512.	449.0	364.	289.	355
Secondary Constituents							
Iron	0.04	1.53	0.45	2.37	2.68	0.70	0.35
Manganese	0.010	0.106	0.17	0.123	0.047	0.059	0.268
Potassium	7.9	1.5	1.3	2.1	1.4	0.88	0.99
Fluoride	0.8	0.2	0.3	0.3	0.2	0.1	0.2
Ammonia	<0.02	0.24	<0.02	1.20	0.74	0.17	1.13
Boron	<0.02	0.06	0.07	0.11	.11	<0.04	0.07
Trace Constituents							
Aluminum	<0.025	<0.027	<0.027	<0.027	<0.027	<0.024	<0.024
Antimony	0.27	<0.16	<0.16	<0.16	<0.16	<0.15	<0.15
Arsenic	<0.03	<0.05	<0.05	<0.05	<0.05	<0.04	<0.04
Barium	0.13	0.12	0.14	0.39	0.22	0.13	0.16
Beryllium	<0.002	<0.005	<0.005	<0.005	<0.005	<0.003	<0.003
Cadmium	<0.009	<0.005	<0.005	<0.005	<0.005	<0.004	<0.004
Chromium	<0.008	<0.010	<0.010	<0.010	<0.010	<0.008	<0.008
Copper	0.023	0.010	<0.009	<0.009	<0.009	<0.006	<0.006
Lead	<0.03	<0.033	<0.033	<0.033	<0.033	<0.024	<0.024
Mercury	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Molybdenum	<0.008	<0.014	<0.014	<0.014	<0.014	<0.008	<0.008
Nickel	<0.018	<0.017	<0.017	<0.017	<0.017	<0.015	<0.015
Orthophosphate	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phosphorous	<0.06	<0.17	<0.17	<0.17	<0.17	<0.15	<0.15
Selenium	0.1	<0.60	<0.60	<0.60	<0.60	<0.5	<0.5
Silicon	10.05	8.54	7.30	9.64	7.34	7.78	8.00
Silver	<0.016	<0.010	<0.010	<0.010	<0.10	<0.010	<0.010
Strontium	0.298	0.236	0.209	0.349	0.222	0.195	0.373
Sulfur	14.6	3.8	19.1	<0.11	<0.11	<0.10	<0.10
Thallium	0.22	0.15	<0.15	0.16	0.18	0.12	0.12



Vanadium	0.007	<0.013	<0.013	<0.013	<0.013	<0.008	<0.008
Zinc	0.228	0.130	0.093	0.488	0.091	0.070	0.126
Organic Compounds							
TOC – 1 st round		1.8	0.7	3.6	2.9	1.9	6.4
POC – 1 st round		<0.05	<0.05	<0.05	<0.01	0.44	3.70
NPOC – 1 st round	1.58						
TOC – 2 nd round						1.6	4.1
POC – 2 nd round						0.06	3.6

* This data was extracted from Research Report 124: Peoria-Pekin Regional Ground-Water Quality Assessment. Illinois Water Survey.

Irrigation

Information on Woodford and Tazewell County irrigation was attained via the 1997 Census of Agriculture. From 1987 to 1997 acres of irrigated cropland in Woodford Co. decreased by 14% from 371 acres to 319 acres, while irrigated acres in Tazewell county increased by 44%, a total of 14,097 acres. During the same period, total crop acreage has increased 1.3% from 271,532 acres to 275,256 acres in Woodford County, but decreased in Tazewell County by 6%, or 18,464 acres. A very small percentage (0.1%) of Woodford County farms are irrigated according to the 1997 Census of Agriculture; much of Woodford County is well watered by Partridge and Tenmile, and Richland Creeks. 10% of Tazewell County cropland was irrigated in 1997. Tables 6 and 7 contain information on irrigated cropland for Woodford and Tazewell Counties, respectively.

Table 6

Woodford County Irrigated Acres And Total Cropland Acres 1987, 1992, 1997

	1987	1992	1997
Total Cropland	271532	272684	275256
Total Cropland Farms	1021	891	865
Total Irrigated Acres	371	*	319
Total Irrigated Farms	9	14	14

*data withheld to avoid disclosing data for individual farms

Table 7

Tazewell County Irrigated Acres and Total Cropland Acres 1987, 1992, 1997

	1987	1992	1997
--	------	------	------



Total Cropland	323850	313429	305386
Total Cropland Farms	1076	941	854
Total Irrigated Acres	16390	22625	30487
Total Irrigated Farms	84	93	107

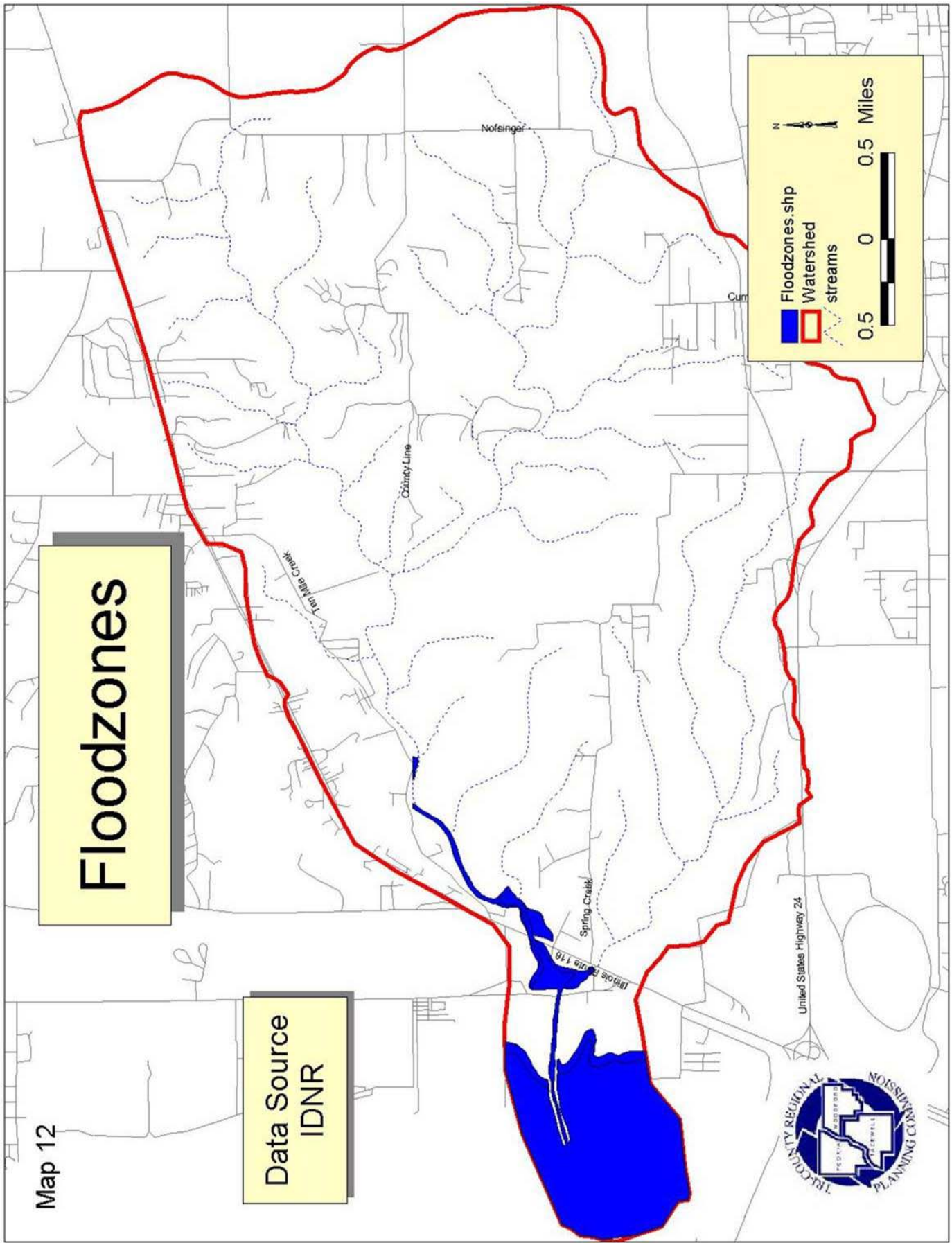
Drainage

There are no active drainage districts in the Tenmile Creek Watershed. Stormwater runoff is generally conveyed by means of a swale/ditch in both the rural and urban areas.

Floodplain Boundaries

Map 12 contains the 100-year floodplain boundaries in the Tenmile Creek Watershed. The area of the floodplains identified is approximately 600 acres. Currently, the Federal Emergency Management Agency is working with the Illinois Department of Natural Resources to update these maps and supply more detail to the sub-watersheds in Illinois.





Municipal/Industrial

The Resource Conservation and Recover Information System (RCRIS) is a national program governed by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984. Under RCRA, the EPA requires generators, transporters, treaters, storers, and disposers of hazardous wastes to provide documentation of their activities to state Environmental Agencies. This information is then given to regional and national EPA offices and is available on-line through EPA's website. The only facility in the Tenmile Creek Watershed that is required to report hazardous waste activity is Poly Generics Co. Inc. with a home office in Creve Coeur.

Table 8 lists National Pollutant Discharge Elimination System sites within the watershed. The NPDES permit program regulates direct discharges from municipal and industrial wastewater treatment facilities that discharge into the navigable waters of the United States. Wastewater treatment facilities (also called "point sources") are issued NPDES permits regulating their discharge.

Table 8
NPDES Permits for Tenmile Creek Watershed (1997)

Facility	Location	Discharge Stream
Caterpillar Proving Grounds	Peoria	Tenmile Creek
Germantown Hills WWTP #2	Germantown Hills	Wolf Creek

Riparian Corridor

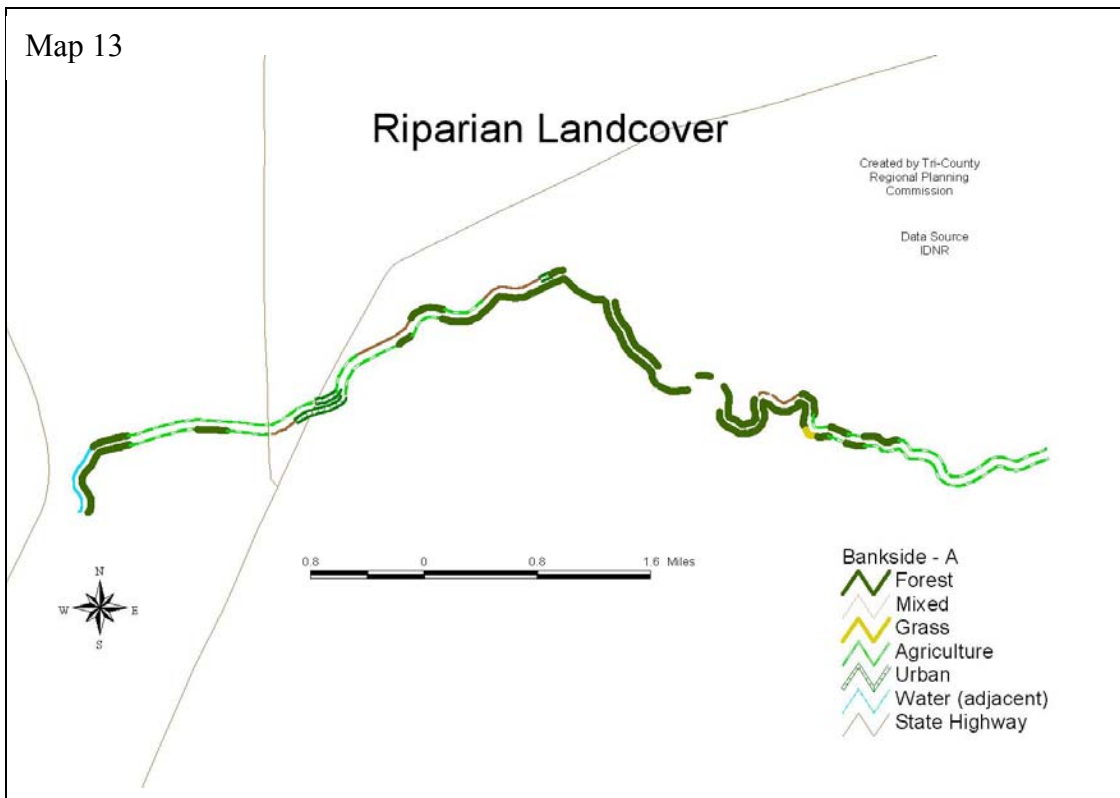
The term *riparian corridor* refers to the land adjacent to a flowing body of water. These areas usually consist of unique vegetation adapted to cope with occasional flooding. Much like wetlands, these plant communities serve to filter pollutants, stabilize stream banks, and provide food and habitat for wildlife. Table 9 contains the percentages of streambank land cover along that can be seen along the mainstem of Tenmile Creek on Map 13.

Table 9
Streamside Land Cover (IDNR, 1999)

Forest	40.00%
Mixed	7.50%
Grass	0.50%
Agriculture	38.50%
Urban	3.50%
Disturbed	7.50%
Water adjacent	2.50%



Map 13



Hydrological Modifications

Tenmile Creek Watershed contains approximately 56 miles of surface transportation infrastructure with an average density of 3 ¼ miles of pavement per square mile. From 1996 aerial photographs, 26 distinct bridges or culvert structures were identified intersecting major streams throughout the watershed. At each of these locations, some modification of the stream has taken place to accommodate the overpass. In addition, 7 miles (16 %) of stream course has been straightened to parallel transportation routes and to accommodate agricultural production (Map 14). Due to the topography of the watershed this frequently results in stream flow being channeled between roadbeds or agricultural fields and steep bluff areas. The resulting streambank erosion from the bluffs is a contributor of sediment to the streams. Finally, with no ability to dissipate energy through a meandering stream course, streambed down cutting takes place.

Stormwater Management

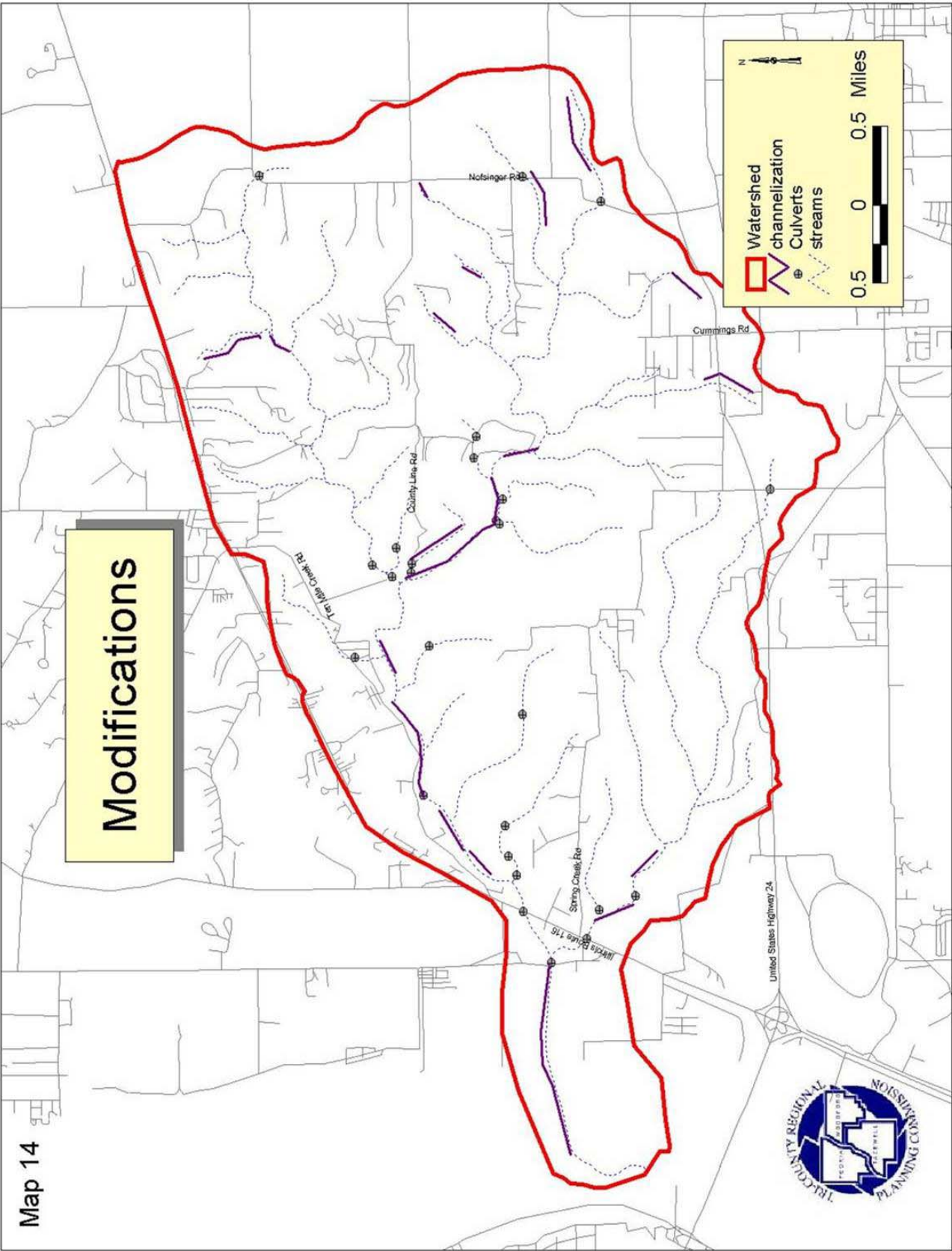
All the municipalities in the watershed have adopted an erosion, sediment, and stormwater control ordinance. This ordinance provides a control mechanism for developing commercial and residential areas in that land disturbing activities over 5,000 square feet require erosion control during construction and stormwater control for post-construction runoff (detention ponds). Woodford and Tazewell counties require post-development runoff to equal pre-development runoff with calculations made from the Soil Conservation Services' SCS Runoff Curve Number method. Storm water permits are required at a cost of \$50-\$100, which then last for a two-year duration. Enforcement of permits includes a penalty for violation and a stop work order.

Counties and municipalities are currently putting more focus than ever before on stormwater management with the onset of U.S. Environmental Protection Agency stormwater regulations. Phase II of EPA's National Pollutant Discharge Elimination System (NPDES) program requires municipalities with a population of 10,000 or more, operators of small municipal separate storm sewer systems (MS4s) in urbanized areas, and operators of construction activities that disturb an area equal to or greater than one acre to take greater responsibility for the non-point source pollution caused by stormwater. The regulations are divided into six categories:

- public education and outreach,
- public participation/involvement,
- illicit discharge detection and elimination,
- construction site runoff control
- post-construction runoff control
- pollution prevention/good housekeeping.

All municipalities and counties under regulation were required to submit a Notice of Intent to comply with the federal mandate by March, 2003. These governmental entities include the City of East Peoria, the Village of Morton, and Tazewell County.





Municipalities are urged by the IEPA to submit joint permits and to participate in a regional strategy for complying with the newly created ordinances. For more information on the NPDES program see the US EPA website:
www.epa.gov/npdes/stormwater/phase2.cfm

Wetlands

Wetlands are a valuable component to a watershed and are defined as transitional land between aquatic and terrestrial systems in areas of low elevation in which the water table is typically at or slightly above the land surface. The great varieties of plants and animals that inhabit these lands have evolved specific traits, which make them suitable for this environment. Cypress trees, for example, grow roots above the water (called knees) in order to oxygenate the entire plant body. Known as “biological supermarkets”, these ecosystems are among the most productive in the world and are often compared to tropical rain forests and coral reefs for their diversity. The plants and decomposing materials in wetlands provide an essential base to the food web as well as shelter to many freshwater fish and other wildlife valued in commercial and recreational activities. Other functions of wetlands include improved water quality, flood protection, and shoreline erosion control. These ecosystems act like natural sponges as they store and slowly release flood and runoff water. The combined action of storing and slowly releasing massive amounts of water lowers flood heights, reduces the water’s erosive potential, and gives the system time to filter contaminants from urban runoff.

Table 10 is a listing of the 24 wetlands types existing in the Tenmile Creek watershed complete with the National Wetlands Inventory Code and description. The locations of these wetlands are on Map 15. The Tenmile Creek Watershed contains 114 wetlands composing 2,583.41 acres, which is approximately 22 % of the total watershed acreage. 0.3% of these wetlands are farmed and 93.3% are a result of excavation or impoundment. All wetland information was retrieved from the National Wetlands Inventory initiated by the U.S. Fish and Wildlife Service. Please see the following webpage for a more complete description of wetland communities: <http://www.dnr.state.il.us/wetlands>

Table 10

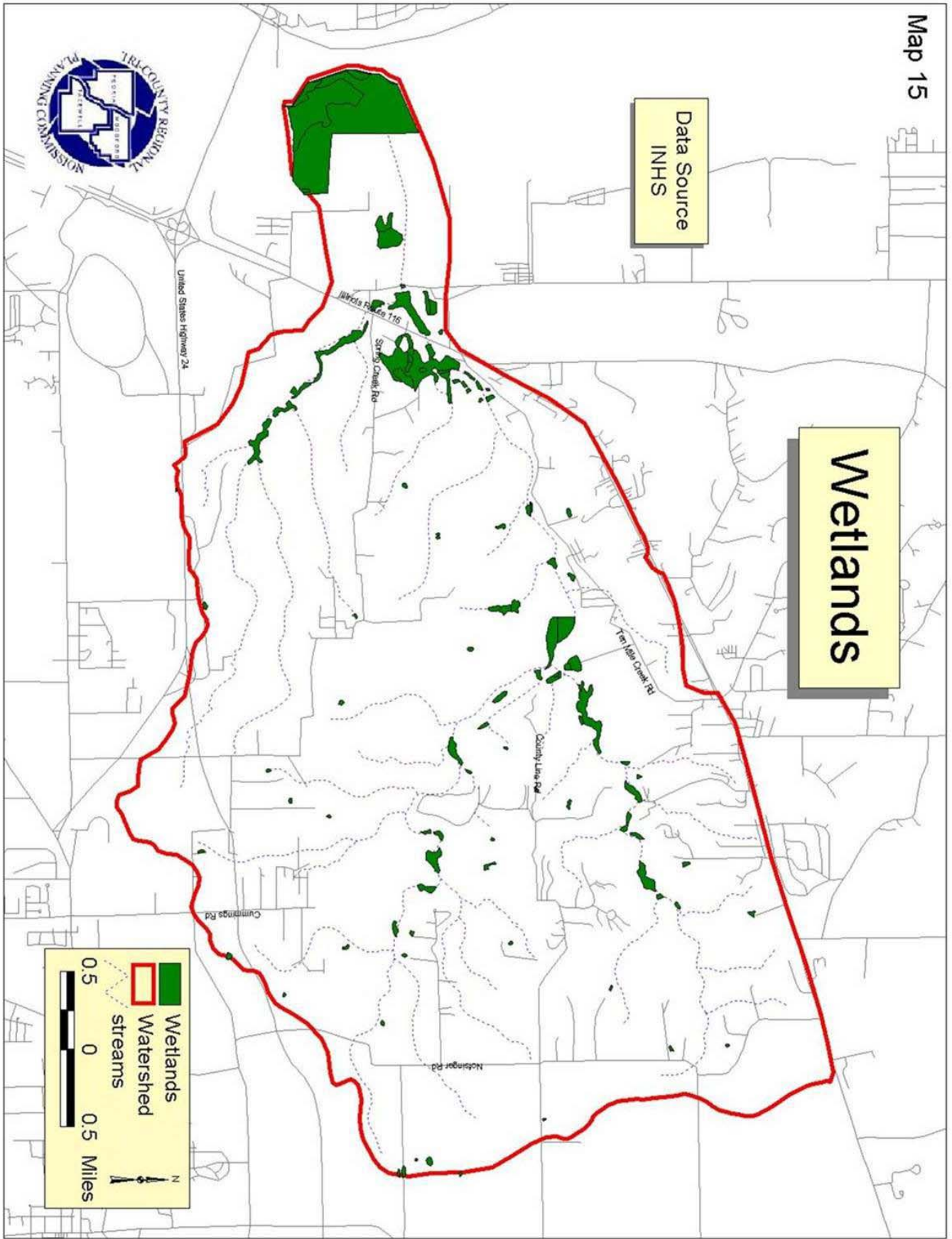
Wetland Types for Tenmile Creek Watershed

Wetland Type	Description	Acres	% of Watershed
L1UBHH	lacustrine-limnetic-unconsolidated bottom-diked & impounded	134.12	1.15
PEM/F01A	palustrine-emergent vegetation-forested-broad leaved deciduous-temporarily flooded	4.78	0.04
PEMA	palustrine-emergent vegetation-temporarily flooded	5.15	0.04
PEMAF	palustrine-emergent vegetation-temporarily flooded-farmed	3.09	0.03
PEMC	palustrine-emergent vegetation-seasonally flooded	4.19	0.04
PEMCF	palustrine-emergent vegetation-seasonally flooded-farmed	1.15	0.01



PEMCX	palustrine-emergent vegetation-seasonally flooded- excavated	3.83	0.03
PF01A	palustrine-forested-broad leaved deciduous- temporarily flooded	133.95	1.14
PF01AH	palustrine-forested-broad leaved deciduous-temporarily flooded-diked & impounded	177.02	1.51
PFO1C	palustrine-forested-broad leaved deciduous-seasonally flooded	1.21	0.01
PF01CH	palustrine-forested-broad leaved deciduous-seasonally flooded-diked & impounded	56.96	0.49
PSS1/EMA	palustrine-scrub shrub-broad leaved deciduous- emergent vegetation-temporarily flooded	4.95	0.04
PSS1A	palustrine-scrub shrub-broad leaved deciduous- temporarily flooded	4.12	0.04
PSS1C	palustrine-scrub shrub-broad leaved deciduous- seasonally flooded	5.61	0.05
PUBFH	palustrine-unconsolidated bottom-farmed diked & impounded	0.78	0.01
PUBFX	palustrine-unconsolidated bottom-farmed-excavated	1.62	0.01
PUBG	palustrine-unconsolidated bottom- intermittently exposed	0.84	0.01
PUBGH	palustrine-unconsolidated bottom-intermittently exposed-diked & impounded	31.17	0.27
PUBGX	palustrine-unconsolidated bottom-intermittently exposed-excavated	6.85	0.06
PUS/EMAH	palustrine-unconsolidated shore-emergent vegetation- temporarily flooded-diked & impounded	3.88	0.03
PUSAX	palustrine-unconsolidated shore-temporarily flooded- excavated	2.06	0.02
R2USA	riverine-lower perennial-unconsolidated shore- temporarily flooded	3.94	0.03
Total		591.27	5.06





Soil Classification

Four major soil associations compose the Tenmile Creek Watershed. These four associations include the Ross-Landes-Lawson, the Onaraga-Jasper-Dakota, the Birkbeck-Miami-Hennepin, and the Rozetta-Strongurst associations. The descriptions of each as well as the area percentage of Tazewell are in Table 11 (USDA. 1996).

Table 11

Soil Associations of Tenmile Creek

Association	Description	% of Tazewell Co.
Ross-Landes-Lawson	nearly level, well drained and somewhat poorly drained, frequently flooded, loamy and silty soils that formed in alluvium	8%
Onarga-Jasper-Dakota	nearly level to sloping, well drained, loamy soils that formed in loamy and sandy material or in loamy sediments over sandy material	9%
Birkbeck-Miami-Hennepin	sloping to very steep, well drained and moderately well drained soils that formed in glacial till or in loess and glacial till	17%
Rozetta-Stroghurst	nearly level and gently sloping, moderately well drained and somewhat poorly drained, silty soils that formed in loess	11%

Table 12 contains information on the general size and nature of the soil types found in the Tenmile Creek Watershed. Prime farmland, defined by the USDA as the ‘land that is best suited to food, feed, forage, fiber, and oilseed crops’, is also indicated in Table 12. Prime farmland has an adequate and dependable supply of water as well as an appropriate level of acidity and alkalinity. This soil contains little to no rocks, is not susceptible to erosion, is not frequently flooded during the growing season, and has a slope ranging from 0 to 6 percent. As a result, these lands are capable of growing the highest yields with the least amount of energy and resources. Urban or built up areas are not classified as prime farmland (USDA, 1996).

Table 12

Summary of Soils found in the Tenmile Creek Watershed

Series	Soil Type	Acres	% of County	Prime Farmland
Dakota	Dakoat loam, 2-5% slopes	6822	1.6	X
Birkbeck	Birkbeck silt loam, 5-10% slopes, eroded	28636	6.8	



Hennepin	Hennepin loam, 30-60% slopes	10738	2.5	
Jasper	Jasper loam, sandy substratum	7580	1.8	X
Landes	Landes fine sandy loam frequently flooded	589567	1.4	X (where protected from flooding)
Lawson	Lawson silt loam, frequently flooded	2526.7	0.6	X (where protected from flooding)
Miami	Miami silt loam, 10-15% slopes	15749.8	3.7	
Onarga	Onarga sandy loam, 0-3% slopes	10991	2.6	X
Ross	Ross silt loam, frequently flooded	1221247	2.9	
Rozetta	Rozetta silt loam, 1-5% slopes eroded	19918	4.7	X
Stronghurst	Stronghurst silt loam, 0-2% slopes	12970	3.1	X (where drained)

For more information on the soils of Tazewell County, see *Soil Survey of Tazewell County, Illinois* (1996) by the USDA and NRCS as well as the website at <http://www.nrcs.usda.gov>.

Key Terms

Alluvium. Material, such as sand, silt, or clay deposited on land by streams.

Glacial Till. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine-grained material, dominantly of silt-sized particles, deposited by wind.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of a very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Soil Erosion

Erosion from joining tributaries and their sediment delivery to the Peoria Lakes has been and will continue to be a pressing issue driving watershed planning in the tri-county area. Very high costs are involved to dredge the Upper and Lower Peoria Lakes in order to allow through traffic on the Illinois River. Sedimentation has decreased the depth of the Illinois River from eight feet in 1903 to approximately 16 inches today (IDENR, 1993). At the current rate of siltation, there is great concern that this portion of the Illinois River will soon be reduced to mere mudflats. The U.S. Army Corps of Engineers has focused a



considerable amount of resources on improving environmental conditions in the Illinois River. This organization recently completed a feasible plan to dredge the Peoria Lakes near McClugage Bridge and create islands. This project will create deep-water habitat virtually unseen in the Peoria Lakes as well as generate a diversity of habitats within this ecosystem.



Evidence of siltation at the Farm
Creek Delta

In September of 2003, the Natural Resource Conservation Service with the volunteer efforts of the Tenmile Creek Watershed Technical Advisory Committee completed a *Soil Erosion and Sediment Delivery Survey*. The estimated amount of sheet/rill, ephemeral, gully, and streambank erosion that occur in the watershed per year as well as an estimate of the amount of sediment that makes it way to the Illinois River from Tenmile Creek are listed in Table 13. This information supplies the Planning Committee members with the baseline data necessary to compare future progress with watershed plan implementation. For a complete copy of this report, please contact Tri-County Regional Planning Commission.

Key Terms

Sheet erosion occurs when unprotected soil is detached by the impact of raindrops. Soil erodes uniformly in a blanket effect.

Ephemeral erosion cuts shallow areas where water is concentrated between row crops or tillage channels.

Gully erosion is a form of advanced rill erosion in which the land can no longer be smoothed over by normal tillage procedures.

Stream bank erosion occurs due to the scouring of stream water during heavy rains or in unstable soil material. This form of erosion is especially detrimental to the watershed because 100% of the soil eroded falls into the stream channel.



Table 13

Erosion and Sediment Totals for Tenmile Creek Watershed

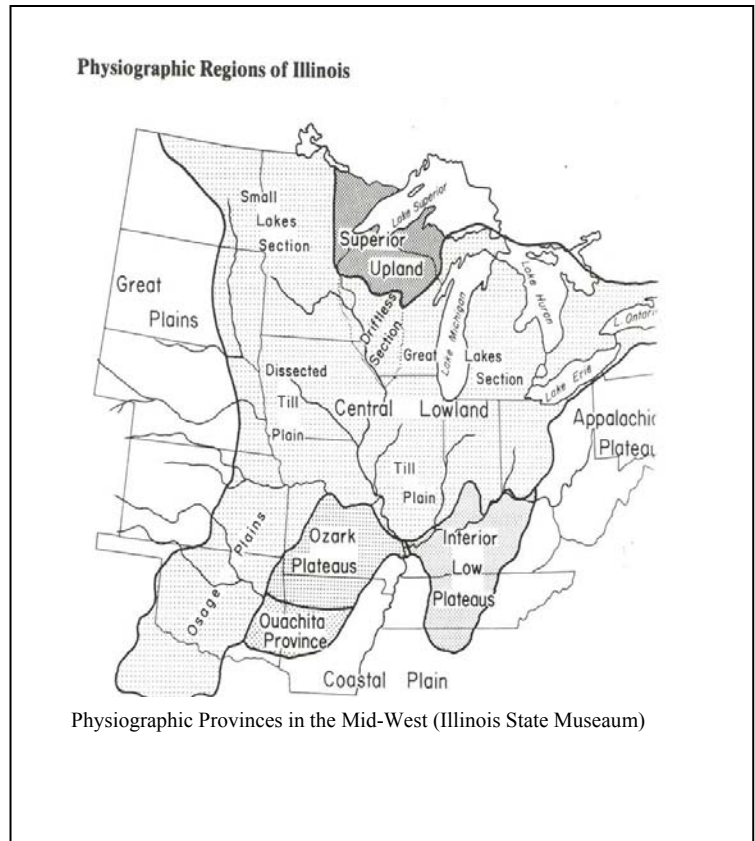
	Erosion (tons)	SDR	Sediment Produced (tons)
<i>Sheet/rill</i>			
Cropland			
A/B	7,430	0.25	1,860
C/C+	3,300	0.64	2,100
Grassland	500	0.52	260
Woodland			
A/B	110	0.22	25
C/D	550	0.65	350
E/E+	6,560	0.75	4,900
Urban			
Residential	265	0.45	120
Subtotal	18,700	-----	9,615 (26%)
<i>Ephemeral</i>	750	0.75	560 (1%)
<i>Gully</i>	27,600	0.90	24,800 (66%)
<i>Streambank</i>	2,700	1.00	2,700 (7%)
Total	49,750	-----	37,700
	Sediment Transport Factor		0.50
			18,800 tons
		Estimated Bedload	4,700 tons
	TOTAL TO UPPER PEORIA LAKE		23,500 tons/year



Geology

The Earth has undergone numerous geologic transformations since its formation 4.6 billion years ago. Volcanoes, earthquakes, erosion, sedimentation, and glaciation are just a few of the geologic activities that have shaped our planet into its current state. The Earth is dynamic and as a result, much of our current landscapes are a result of recent geologic action. Glaciation is the dominant process of Illinois' recent geologic history. Powerful mile-high mountains of ice have scraped and scoured 90% of Illinois, modifying the landscape to Illinois' current state. This recycling and rejuvenation of Illinois soils lead to the flat topography, gently sloping hills, and the fertile, erodible soils that are so characteristic of the area.

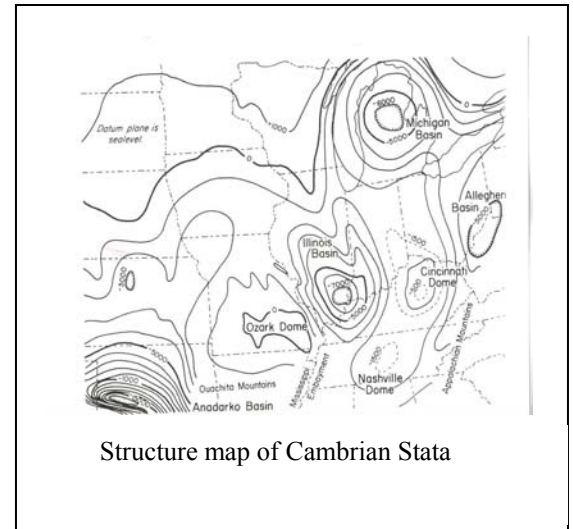
Scientists have classified the United States into 23 natural regions called physiographic provinces based on the structure of the bedrock. Most of Illinois is part of the largest physiographic province in the county, the Central Lowland Province. This area stretching from Ohio to the Dakotas contains an underlying structure with undeformed, horizontal layers of sedimentary rock. The Central Lowland Province was periodically submerged in ancient seas between 600 and 300 million years ago. The advancement and retreat of these seas left tens of thousands of feet of limestone and shale sedimentary stata (Schuberth, 1986). Carbondale bedrock underlies the entire Tenmile Creek Watershed.



Each province is further divided into sections. Illinois, Indiana, and Western Ohio are all part of the Till Plains Section. This Section has been covered by two of the most recent glacial advances, the Illinoian (200,000 – 120,000 years before the present) and Wisconsin (25,000 – 14,000 years ago). As the glaciers moved south into Illinois from Canada, they transported vast amounts of sand, rock, clay, silt, and gravel. Streams flowed from the retreating glaciers and great quantities of the transported material, known as glacial till, was deposited by the water and spread over the state by wind. This unsorted, unconsolidated sediment was later inhabited by a diverse array of vegetation creating the valuable, fertile soil that drives Illinois' agricultural economy today (Schuberth, 1986).



Prior to glaciation, Illinois was mostly lowland caused from erosion of the sediment laid down by seawater 300 million years ago. These sedimentary strata were epeirogenically downwarped (depression without internal disruption of rock structure) to form a basin centered in Illinois, known as the Illinois Basin . A higher, more rugged and resistant terrain stood along the basin edges to the north, west and south. When great quantities of glacial till were deposited in Illinois, the Basin accumulated the thickest deposits while the uplands were thinly covered and in some cases received no glacial till (Schuberth, 1986). Tenmile Creek lies in the northern section of the Illinois Basin and the glacial till lying above the bedrock ranges from 250 to 450 feet thick in this watershed (IDNR topo maps).



Structure map of Cambrian Strata

Another distinct geologic feature of Illinois is its glacial moraines. As the Wisconsin glacier episode dumped new land, the till was shoved to the outer edges of the moving sheets of ice creating the gently rolling hills seen in the southern and eastern portions of the watershed. The three moraines existing in the Tenmile Creek Watershed are the Washington, Metamora, and the Bloomington (undifferentiated) Moraines, which are part of the larger Bloomington Marainic System Map 16. This System formed on the outermost edge of the ice front and due to its concentric pattern, geologists believe that these moraines formed from the pulsating retreat and advance of the Wisconsin glaciers (Schuberth, 1986).

Topography

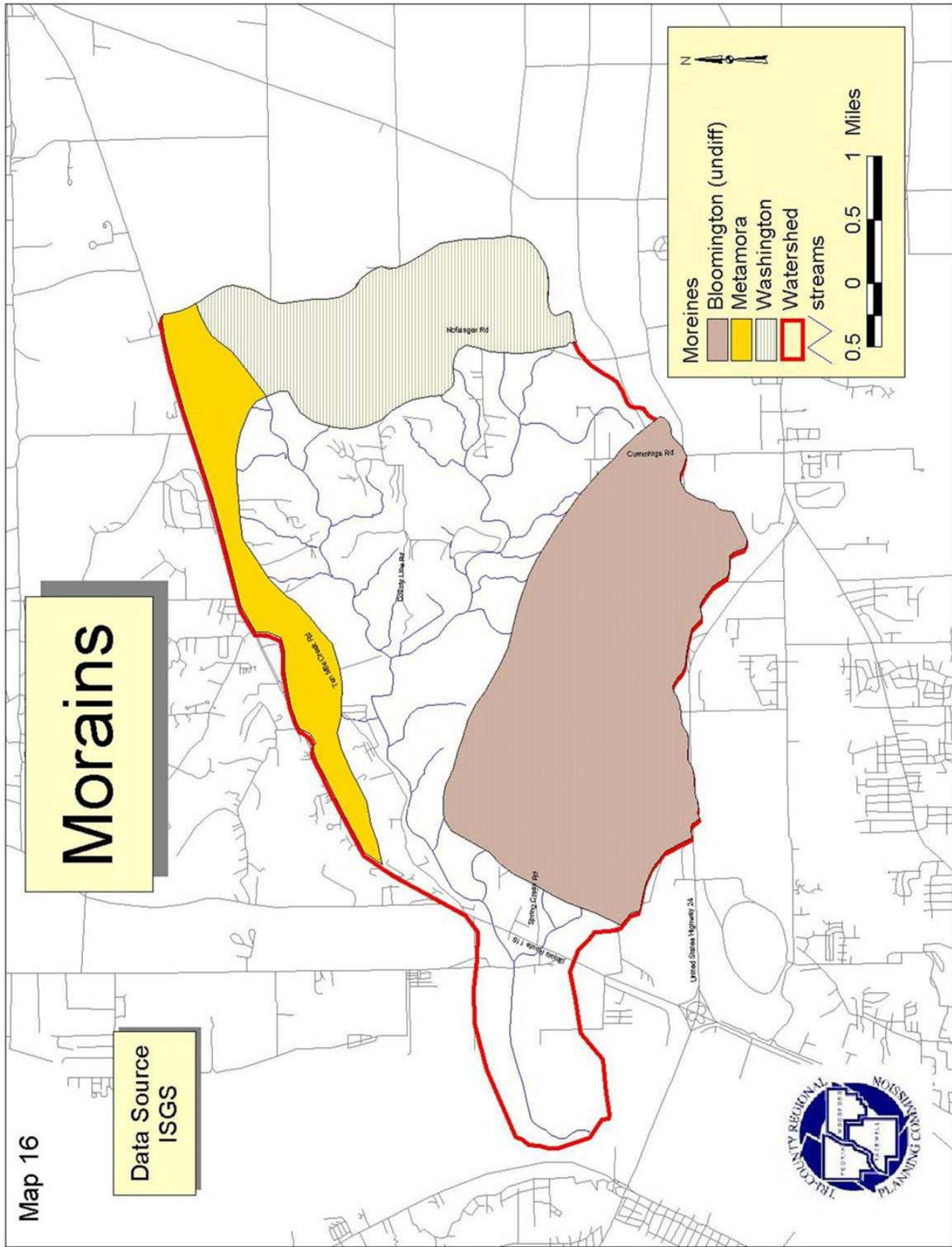
Tenmile begins its course at 820 ft above sea level in section 11 of Washington Township in Tazewell County. The stream flows westerly for ten miles dropping an average elevation of 38 feet per mile as it winds northwest into Woodford County and then south re-entering Tazewell County and Fondulac Township. It is in Fondulac Township that Tenmile Creek forms a broad delta that separates the Upper and Lower Peoria Lakes at an elevation of 440 feet at Illinois River mile 166. The steep gradient of short length enables Tenmile Creek to carry heavy amounts of sand, silt, gravel and rock during heavy rainfall and runoff events. Figure 1 is the Tenmile Creek profile including tributaries Spring and Wolf Creek created by Wayne Ingram with Mactec, Inc.



Map 16

Moraines

Data Source
ISGS



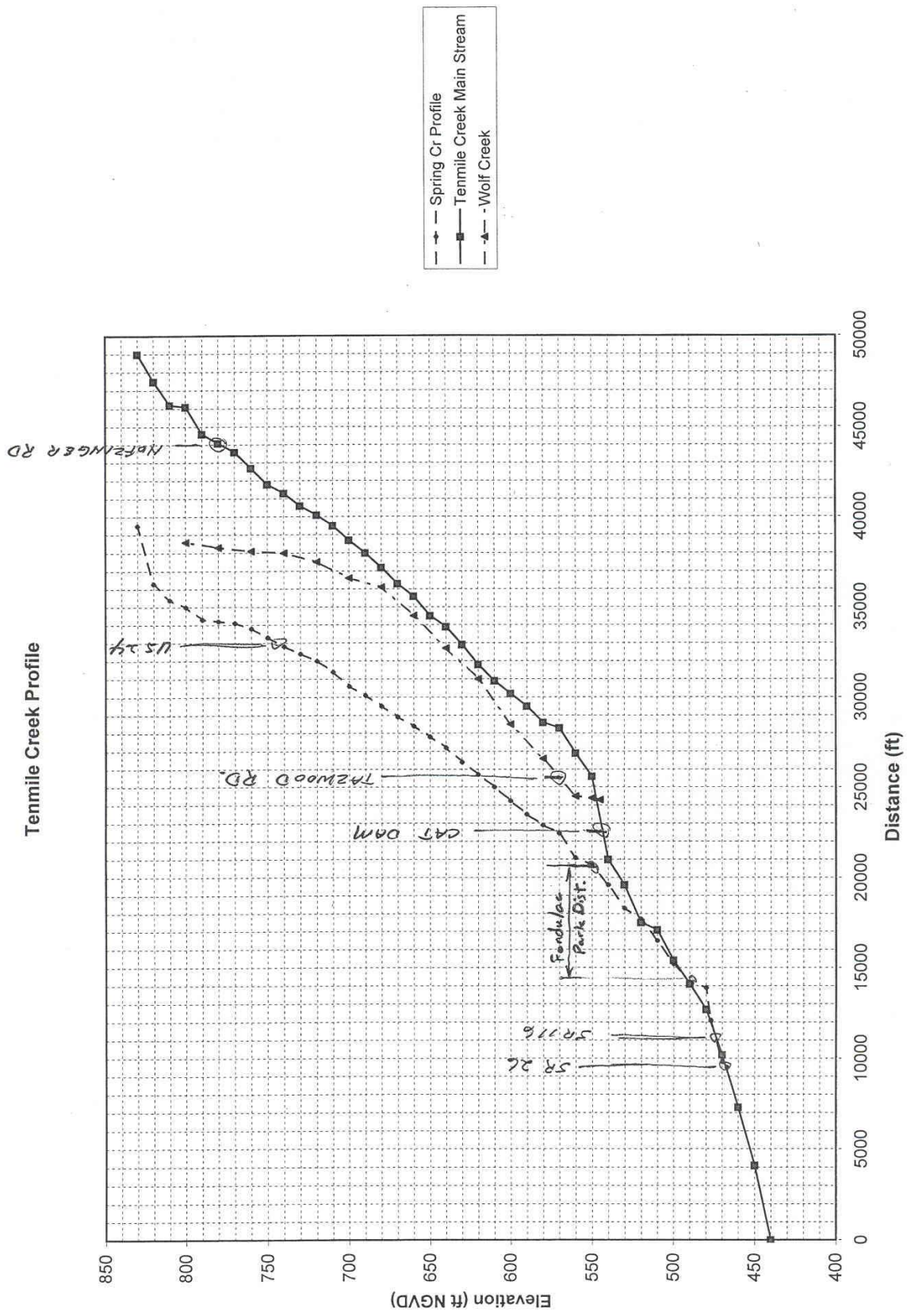


Figure 1. Profile of Tenmile Creek and tributaries

11/25/2002

MACTEC, Inc.

Land Use

In 2003 the Illinois Department of Natural Resources released digital land cover information for the years 1999-2000. Using Geographic Information System technologies, the various land use classifications and their corresponding acreages can be determined. Woodlands dominate the landscape of the Tenmile Creek Watershed creating a particular need for forest management. Urbanization is scattered throughout the woodlands and agriculture is concentrated on the eastern boundary. Table 14 lists the area of land in each land use classification seen on Map 17.

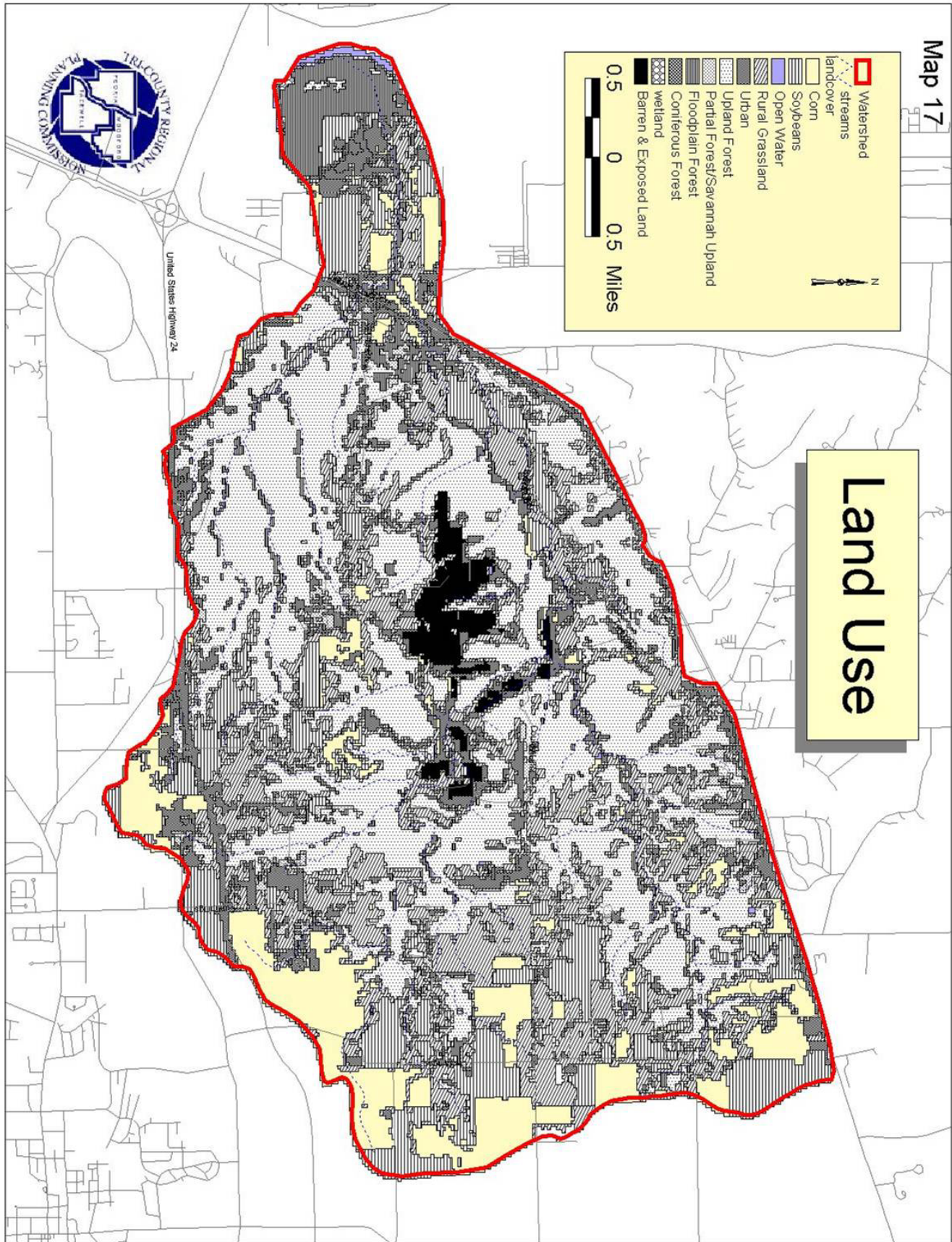
Table 14

Land Use Classifications in the Tenmile Creek Watershed

Land Use	Area (acres)	Percent of total watershed
Row crop	2,698	24
Open Water	20	0
Rural Grassland	2,350	21
Urban	992	9
Forest	4,805	43
Wetland	24	1
Barren/Exposed	228	2
Total	11,117	100



Map 17



Land Use (continued)

Agriculture: Agriculture and its related industries play a major role in the Woodford and Tazewell County economy. With 1832 farms on 628,052 acres, agriculture is the dominant land use within these two counties. The total number of farms has decreased from 1987 to 1997 by 20%, however total agricultural acreage has only decreased 4%. This disproportional fall in agricultural acreage is due to the 64% increase in the number of farms >1,000 acres. Tables 15 and 16 contain some basic information about Woodford and Tazewell County agriculture, respectively.

1997 CENSUS OF AGRICULTURE
Woodford County,
Illinois

Table 15

1997	1982	1987	
923	973	1103	Farms (number)
299763	295844	298266	Land in farms (acres)
325	304	270	Land in farms - average size of farm (acres)
192	(N)	(N)	Land in farms - median size of farm (acres)
953959	606187	454171	Estimated market value of land and buildings@1: average per farm (dollars)
2728	2045	1741	Estimated market value of land and buildings@1: average per acre (dollars)
99323	70910	50246	Estimated market value of all machinery/equipment@1: aver per farm (dollars)
64	84	84	Farms by size: 1 to 9 acres
144	131	159	Farms by size: 10 to 49 acres
240	278	326	Farms by size: 50 to 179 acres
270	286	350	Farms by size: 180 to 499 acres
153	150	151	Farms by size: 500 to 999 acres
52	44	33	Farms by size: 1,000 acres or more
865	891	1021	Total cropland (farms)
275256	272684	271532	Total cropland (acres)
829	868	999	Total cropland, harvested cropland (farms)
265489	254411	221368	Total cropland, harvested cropland (acres)
14	14	9	Irrigated land (farms)
319	(D)	371	Irrigated land (acres)
107254	98004	79515	Market value of agricultural products sold (\$1,000)
116202	100724	72090	Market value of agricultural products sold, average per farm (dollars)
84272	70005	50576	Market value of ag prod sold-crops,incl nursery and greenhouse crops (\$1,000)
22982	27999	28939	Market value of ag products sold - livestock, poultry, and their products (\$1,000)
259	281	343	Livestock and poultry: Cattle and calves inventory (farms)
8593	13114	14290	Livestock and poultry: Cattle and calves inventory (number)
200	199	247	Beef cows (farms)
3806	3875	4881	Beef cows (number)
9	34	24	Milk cows (farms)
197	950	885	Milk cows (number)
244	259	331	Cattle and calves sold (farms)



4231	9350	11399	Cattle and calves sold (number)
107	166	206	Hogs and pigs inventory (farms)
85413	97829	96217	Hogs and pigs inventory (number)
118	176	217	Hogs and pigs sold (farms)
148159	192070	178029	Hogs and pigs sold (number)
64	84	94	Sheep and lambs inventory (farms)
1753	3194	4130	Sheep and lambs inventory (number)
43	33	50	Layers and pullets 13 weeks old and older inventory (farms)
(D)	(D)	63648	Layers and pullets 13 weeks old and older inventory (number)
1	3	5	Broilers and other meat-type chickens sold (farms)
(D)	273	424	Broilers and other meat-type chickens sold (number)
692	731	879	Corn for grain or seed (farms)
133308	131748	112683	Corn for grain or seed (acres)
18062122	19119269	14208805	Corn for grain or seed (bushels)
18	20	25	Corn for silage or green chop (farms)
275	823	938	Corn for silage or green chop (acres)
4326	13615	11899	Corn for silage or green chop (tons, green)
76	71	110	Wheat for grain (farms)
1915	2448	1946	Wheat for grain (acres)
108106	100377	99674	Wheat for grain (bushels)
684	723	831	Soybeans for beans (farms)
126112	116191	98072	Soybeans for beans (acres)
5996452	5138433	4296291	Soybeans for beans (bushels)
245	289	318	Hay-alfalfa,other tame,small grain,wild,grass silage,green chop,etc (farms)
5666	6732	7644	Hay-alfalfa,other tame,small grain,wild,grass silage,green chop,etc (acres)
14878	20962	24644	Hay-alfal,oth tame,small grain,wild,grass silage,green chop,etc (tons,dry)
15	18	22	Vegetables harvested for sale (farms)
172	413	345	Vegetables harvested for sale (acres)

(D) Withheld to avoid disclosing data for individual farms.

(N) Not available.

*1997 Census of Agriculture

1997 CENSUS OF AGRICULTURE Tazewell County, Illinois

Table 16

1997	1992	1987	
909	1008	1182	Farms (number)
328289	336450	353326	Land in farms (acres)
361	334	299	Land in farms - average size of farm (acres)
176	(N)	(N)	Land in farms - median size of farm (acres)
1005963	702793	493099	Estimated market value of land and buildings@1: average per farm (dollars)
2824	2026	1640	Estimated market value of land and buildings@1: average per acre (dollars)
93761	70322	62789	Estimated market value of all machinery/equipment@1: aver per farm (dollars)
80	89	107	Farms by size: 1 to 9 acres



158	183	209	Farms by size: 10 to 49 acres
219	216	263	Farms by size: 50 to 179 acres
207	277	348	Farms by size: 180 to 499 acres
164	173	207	Farms by size: 500 to 999 acres
81	70	48	Farms by size: 1,000 acres or more
854	941	1076	Total cropland (farms)
305386	313429	323850	Total cropland (acres)
815	906	1040	Total cropland, harvested cropland (farms)
294395	290548	259498	Total cropland, harvested cropland (acres)
107	93	84	Irrigated land (farms)
30487	22625	16390	Irrigated land (acres)
123163	103401	90547	Market value of agricultural products sold (\$1,000)
135493	102581	76605	Market value of agricultural products sold, average per farm (dollars)
93631	79347	60532	Market value of ag prod sold-crops,incl nursery and greenhouse crops (\$1,000)
29532	24054	30015	Market value of ag products sold - livestock, poultry, and their products (\$1,000)
102	120	168	Farms by value of sales: Less than \$2,500
65	66	76	Farms by value of sales: \$2,500 to \$4,999
76	82	112	Farms by value of sales: \$5,000 to \$9,999
95	135	171	Farms by value of sales: \$10,000 to \$24,999
101	126	156	Farms by value of sales: \$25,000 to \$49,999
136	142	205	Farms by value of sales: \$50,000 to \$99,999
334	337	294	Farms by value of sales: \$100,000 or more
72123	62526	60956	Total farm production expenses@1 (\$1,000)
79343	62091	51526	Total farm production expenses@1, average per farm (dollars)
909	1007	1183	Net cash return from agricultural sales for the farm unit (see text)@1 (farms)
47223	38047	28427	Net cash return from agricultural sales for the farm unit (see text)@1 (\$1,000)
51950	37782	24029	Net cash return from ag sales for fm unit (see text)@1, average per farm (dollars)
523	642	755	Operators by principal occupation: Farming
386	366	427	Operators by principal occupation: Other
476	489	549	Operators by days worked off farm: Any
287	300	349	Operators by days worked off farm: 200 days or more
232	270	352	Livestock and poultry: Cattle and calves inventory (farms)
10186	9712	14218	Livestock and poultry: Cattle and calves inventory (number)
175	201	274	Beef cows (farms)
3373	4096	5001	Beef cows (number)
26	28	38	Milk cows (farms)
1070	854	1033	Milk cows (number)
220	252	336	Cattle and calves sold (farms)
5645	4760	8548	Cattle and calves sold (number)
102	146	200	Hogs and pigs inventory (farms)
111253	109534	121092	Hogs and pigs inventory (number)
109	159	209	Hogs and pigs sold (farms)
186840	188424	194687	Hogs and pigs sold (number)
27	65	63	Sheep and lambs inventory (farms)
679	1346	1847	Sheep and lambs inventory (number)
29	23	56	Layers and pullets 13 weeks old and older inventory (farms)
636	(D)	(D)	Layers and pullets 13 weeks old and older inventory (number)
3	1	4	Broilers and other meat-type chickens sold (farms)
175	(D)	640	Broilers and other meat-type chickens sold (number)
663	771	900	Corn for grain or seed (farms)



149125	153974	137203	Corn for grain or seed (acres)
19885880	23987451	18558097	Corn for grain or seed (bushels)
25	24	22	Corn for silage or green chop (farms)
894	641	647	Corn for silage or green chop (acres)
15001	10035	14921	Corn for silage or green chop (tons, green)
130	93	187	Wheat for grain (farms)
4485	2513	5507	Wheat for grain (acres)
234875	107951	282013	Wheat for grain (bushels)
653	736	835	Soybeans for beans (farms)
127670	121425	105867	Soybeans for beans (acres)
5834469	5513775	4412192	Soybeans for beans (bushels)
240	285	317	Hay-alfalfa, other tame, small grain, wild, grass silage, green chop, etc (farms)
6178	6306	7071	Hay-alfalfa, other tame, small grain, wild, grass silage, green chop, etc (acres)
19919	19776	20210	Hay-alfal, oth tame, small grain, wild, grass silage, green chop, etc (tons, dry)
69	70	45	Vegetables harvested for sale (farms)
6859	6655	3286	Vegetables harvested for sale (acres)

(D) Withheld to avoid disclosing data for individual farms.

(N) Not available.

*1997 Census of Agriculture

Landfills: Two landfills totaling 45 acres exist within Tenmile Creek Watershed. Both are privately owned and have been closed for almost thirty years. See table 17 for further detail.

Table 17

City	Owner	Operator	Size	Status	Permit	Permit Date	Close Date	Monitoring
Washington	Wyss, Bessie	Weaver, Glen	15	Closed final cover	Unperm. Exempt	Oct-66	May-76	No
Washington	Wenger, Joe	Blocker, Harold	30	Closed final cover	Permitted	Oct-71	Sep-77	No

Mining: There are no documented mining activities within Tenmile Creek Watershed.

Commercial: Commercial operations within Tazewell and Woodford Counties have been experiencing growth in sales and expansion overall. The table below contains the Pull Factor of Tazewell and Woodford County, the Village of Germantown Hills, and the City of Washington. The Pull Factor is a comparison of average, downstate, per capita expenditures compared to local per capita expenditures.

Pull Factors 2002

Table 18

Sector	Tazewell	Woodford	Germantown Hills	Washington
Total	126%	77%	39%	135%
General Merchandise	139	5	NA	194
Food	120	114	NA	174
Eating & Drinking	122	61	61	125



Apparel	33	4	NA	7
Furniture/Household	110	43	NA	75
Lumber	152	68	NA	67
Auto	153	136	NA	172
Other	99	50	48	113
Agriculture	136	86	21	53
Manufacturing	93	127	NA	256

(Rural Economic Technical Assistance Center, 2002)

Population: Table 18 contains the population of the municipalities with the watershed boundaries. Overall, the Tenmile Creek Watershed has undergone growth and expansion. Germantown Hills has undergone high immigration rates resulting in an expansion of the sewer and water treatment facilities in 1997 to accommodate the increased demand for public facilities. Growth is also anticipated to occur along the US 24 bypass north of the Village of Washington in Tazewell County. Infrastructure is currently being upgraded to facilitate this commercial and residential development.

Table 19

Area	Population (2002)
Tazewell Co.	128,485
Fondulac Twp.	13,138
Washington Twp.	19,427
Washington	10,841
Woodford Co.	35,469
Worth Twp.	7,285
Germantown Hills	2,111
Springbay Twp.	2,552

*Population Estimates Program, Population Division, U.S. Census Bureau

Air Quality

In the Tri-County region, state and local environmental agencies collect air quality data with sensitive equipment capable of detecting common air pollutants such as Carbon monoxide (CO), Sulfur dioxide (SO₂), ozone (O₃), Particulate Matter <10um (PM 10), and lead (Pb). The data is then analyzed to determine if the air quality meets the National Ambient Air Quality Standards set by the EPA. Table 20 contains the standards of five main air pollutants. Air quality data for Illinois counties is available on EPA's web page via AIRDATA database. All data retrieved from EPA's database indicated that the Tri-County region air quality meets the National Ambient Air Quality Standards.



Table 21 ranks Peoria and Tazewell Counties amongst the other 26 counties studied by the EPA for the Annual Air Quality Report of 2001. Table 22 contains the analyzed data collected by the EPA. Please see the description of the columns below.

Table 20
National Ambient Air Quality Standards

Pollutant	Standard Value
Carbon Monoxide	
1-hour average	35ppm
Nitrogen Dioxide*	
annual arithmetic mean	0.053ppm
Lead	
quarterly average	1.5 ug/m ³
Particulate (PM 10)	
24-hour average	150 um/m ³
Sulfur Dioxide	
24-hour average	0.14 ppm

Table 21
Peoria and Tazewell Ratings
amongst 26 IL counties monitored
(1 is the highest level of pollutants)

Pollutant	Peoria	Tazewell
CO 1-hr	1	16
CO 8-hr	2	16
NO mean	18	16
SO2 24-hr	6	1
SO2 mean	8	4
O3 1-hr	17	25
PM 24-hr	6	15
PM mean	7	15
PB mean	4	15



Table 22



U.S. Environmental Protection Agency

AirData

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EPA Home > Air & Radiation > AirData > Reports and Maps > Select Geography > Select Report/Map > Monitor Summary Report Criteria > Monitor Summary Report

Monitor Summary Report

Illinois Air Quality Summary (2001)

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26 Rows

Row #	CO(ppm)		NO2 (ppm)		SO2(ppm)		O3 (ppm)		PM10 (ug/m3)		PB (ug/m3)		Population	County	State	EP Reg
	2nd Max 1-hr	2nd Max 8-hr	Annual Mean	2nd Max 24-hr	Annual Mean	2nd Max 1-hr	2nd Max 24-hr	Annual Mean	Quarterly Mean							
1	5.1	3.2		0.029	0.005	0.084	47	19.7	0.01	182,827	Peoria Co	IL	05			
2	4.3	3.7	0.032	0.033	0.005	0.111	124	38.4	0.06	5,105,067	Cook Co	IL	05			
3	3.8	2.4				0.086				252,913	Winnebago Co	IL	05			
4	3.6	2.5	0.019	0.047	0.006	0.101	52	28.8	0.07	262,852	St Clair Co	IL	05			
5	3.1	1.4		0.028	0.003	0.095				178,386	Sangamon Co	IL	05			
6				0.023	0.003	0.088				66,090	Adams Co	IL	05			
7						0.080				173,025	Champaign Co	IL	05			
8						0.090				31,704	Effingham Co	IL	05			
9							39	20.7		61,067	Jackson Co	IL	05			
10						0.087				317,471	Kane Co	IL	05			
11			0.006			0.105				516,418	Lake Co	IL	05			
12				0.009	0.002	0.098	39	19.4	0.01	47,679	Macoupin Co	IL	05			
13						0.098				183,241	Mc Henry Co	IL	05			
14			0.007	0.020	0.005	0.098	56	22.2		357,313	Will Co	IL	05			
15				0.042	0.007					13,111	Wabash Co	IL	05			
16				0.077	0.006					123,692	Tazewell Co	IL	05			
17						0.083				148,723	Rock Island Co	IL	05			
18				0.008	0.002	0.092				34,583	Randolph Co	IL	05			
19						0.085				129,180	Mc Lean Co	IL	05			

<http://oaspub.epa.gov/pls/airsdata/adaqs.summary?geo=IL&cnty=&geoinfo=%3Fst%7EI...> 10/24/2002



20				0.041	0.007	0.116	141	48.0	2.26	249,238	Madison Co	IL	05
21				0.025	0.005	0.078				117,206	Macon Co	IL	05
22							107	22.1		106,913	La Salle Co	IL	05
23						0.102				20,539	Jersey Co	IL	05
24						0.080				8,499	Hamilton Co	IL	05
25						0.095				781,666	Du Page Co	IL	05

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Export this report to a text file

Create comma-delimited or tab-delimited values, compatible with PC spreadsheets and databases.

Comma Tab

Disclaimer: AirData reports are produced from a monthly extract of EPA's air pollution database, AIRS. Data for this report were extracted on January 04, 2002. They represent the best information available to EPA from state agencies on that date. However, some values may be absent due to incomplete reporting, and some values subsequently may be changed due to quality assurance activities. The AIRS database is updated daily by state and local organizations who own and submit the data. Please contact the pertinent [state agency](#) to report errors.

Readers are cautioned not to infer a qualitative ranking order of geographic areas based on AirData reports. Air pollution levels measured in the vicinity of a particular monitoring site may not be representative of the prevailing air quality of a county or urban area. Pollutants emitted from a particular source may have little impact on the immediate geographic area, and the amount of pollutants emitted does not indicate whether the source is complying with applicable regulations.

The following section, "What do the Report Columns Mean" was inserted directly from the EPA's webpage, <http://www.epa.gov/air/data/help/hmonsum.html?st~IL~Illinois#CO>

What Do the Report Columns Mean ?

EPA uses annual summary measures of air pollution to gauge compliance with air quality standards established by the Clean Air Act. The standards are framed in terms of different summary measures for each pollutant. This report lists standards-related air pollution annual summary values for all six criteria pollutants, for a county (or state or region). The values shown represent all monitoring sites in a county (or state or region) that reported data during the year.

Some air pollution values in the report are labeled "2nd max," which means the next-to-highest (second highest) value recorded for a geographic area. The report gives the second highest value when the applicable air quality standard allows one "exceedance" per year - one day when the measured pollutant concentration is higher than the value set in the standard. Thus the second highest value indicates whether the standard was exceeded during a year. This reporting convention allows you to see easily if a geographic area could be in jeopardy of failing to meet an air quality standard. (Exceedances are averaged over multiple years to determine attainment of the standards, so the results for a single year are not determinant.) Any pollutant concentration listed in the Monitor Summary report that is higher than the applicable air quality standard is an exceedance.



The units of measure of pollutant concentrations are:

- Parts per million by volume (ppm)
- Micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$)

Row #

Sequence number of report rows (lines). Sequence numbers are not associated with particular rows; they simply enumerate the rows of a report from first to last. Thus, choosing an alternate sort order for a report would change the sequence numbers associated with particular rows.

CO - Carbon Monoxide

Air Quality Standards

These levels may not be exceeded more than once per year:

- 1-hour average concentration -- 35 ppm
- 8-hour average concentration -- 9 ppm

2nd Max 1-Hour value

Second-highest 1-hour average concentration value (in ppm) for the year. This value should not exceed the 1-hour standard (35 ppm).

2nd Max 8-Hour value

Second-highest nonoverlapping 8-hour value (in ppm) for the year computed by AIRS software for each hour of the day as a moving average of eight 1-hour values. *Nonoverlapping* means that the 1st max and 2nd max do not include any of the same 1-hour values. This value should not exceed the 8-hour standard (9 ppm).

NO₂ - Nitrogen Dioxide

Air Quality Standard

Annual average concentration -- 0.053 ppm

Annual Mean

Arithmetic average of all 1-hour values for the year. This value should not exceed the annual standard (0.053 ppm).

SO₂ - Sulfur Dioxide

Air Quality Standards

- 24-hour average concentration -- 0.14 ppm
This level may not be exceeded on more than one day per year.
- Annual average concentration -- 0.03 ppm

2nd Max 24-Hour value



Second-highest 24-hour value (in ppm) for the year computed by AIRS software for each day as an average of 1-hour values. This value should not exceed the 24-hour standard (0.14 ppm).

Annual Mean 1-Hour value

Arithmetic average of all 1-hour values for the year. This value should not exceed the annual standard (0.03 ppm).

O3 - Ozone

Air Quality Standard

1-hour average concentration -- 0.12 ppm

This level may not be exceeded on more than one day per year, after compensating for missing data (estimated # of exceedences).

2nd Max 1-Hour value

The second highest "daily max values" -- take the highest 1-hour value of each day, pick the second highest of those values. This value should not exceed the 1-hour standard (0.12 ppm) in a year.

PM10 - Particulate Matter smaller than 10 micrometers

Air Quality Standards

- 24-hour average concentration -- 150 $\mu\text{g}/\text{m}^3$
This level may not be exceeded on more than one day per year, after compensating for missing data (estimated # of exceedences).
- Annual average concentration -- 50 $\mu\text{g}/\text{m}^3$
This level may not be exceeded after compensating for missing data (weighted arithmetic mean).

2nd Max 24-Hour value

The second highest 24-hour value (in $\mu\text{g}/\text{m}^3$) for the year. This value should not exceed the 24-hour standard (150 $\mu\text{g}/\text{m}^3$) in a year.

Annual Mean

Weighted arithmetic mean of 24-hour values for the year. The method of calculation compensates for scheduled sampling that did not occur. This value should not exceed the annual average standard (50 $\mu\text{g}/\text{m}^3$).

Pb - Lead

Air Quality Standard

Quarterly average concentration -- 1.5 $\mu\text{g}/\text{m}^3$

This level may not be exceeded in any quarter of a year.

Quarterly Mean

Highest of the quarterly mean values. Each quarterly mean is the arithmetic average of 24-hour values for a calendar quarter: January-March (1), April-June (2), July-September (3), and October-December (4). This value should not exceed the quarterly standard (1.5 $\mu\text{g}/\text{m}^3$).

Population



Population within the geographic entity represented by a row of the report -- a county, state, or EPA region. Populations are based on 1990 census data.

Fish/Aquatic Invertebrates

In the summer of 2003, the Illinois Department of Natural Resources conducted a fish resource survey of Tenmile Creek. Data was collected at the upper, middle, and lower sections of the watershed. The following is an excerpt from the report:

“Ten Mile Creek is unique among the streams that empty directly into the Illinois River. From its’ upper reaches, it flows for a distance of only 10 miles. It flows through some very urbanized areas in the upper part of the watershed, specifically the Germantown Hills area. Gradients are quite steep with the 10 mile length, dropping to the Illinois River flood plain. Because sand and gravel deposits occur to a great depth within the stream valley, creation of small or large wet impoundments to contain the bed load along its’ middle and lower reaches is not practical. The steep gradient of short length enables Ten Mile Creek to carry heavy amounts of sand, silt, gravel and rock during heavy rainfall and runoff events. The mouth of Ten Mile Creek forms the broad delta that separates upper and lower Peoria Lakes.

Upper Reach

The upper reaches of the watershed form a transition between row-crop fields and more steeply wooded ravines. With Ten Mile Creek, gully erosion in this upper reach is thought to contribute a significant load in the overall erosion concerns for this watershed. The stream appears to be down-cutting its bed through most of this reach. At the areas of down-cutting, stream bank sloughing and gully formation is taking place. Very steep bluffs, crowned with a monoculture of hard maple with very little understory aggravates the rate of run off and sloughing. Ridge top land use in this area is mostly urban in character with numerous small parcel land owners present in the upper watershed. Any attempt to correct the rate of erosion from this area will be tremendously complicated by the large numbers of owners in the watershed. A significant amount of home construction and resultant earth moving is taking place in the upper reaches. One possible solution to slow rate a flow in the upper reaches would be a program to construct a series of small ponds on ground owned by willing cooperators along Wolf Creek (tributary to Ten Mile Creek) and Ten Mile Creek proper. A possible negative influence on the fish population of this upper reach is the sewage treatment facility effluent for Germantown Hills.

Middle Reach

Downstream, in the middle reach, in-stream mining activity to remove sand and gravel at the Caterpillar Proving Grounds complex have a significant deleterious effect on aquatic habitats within the reach and further down stream. It is hoped that stream bank erosion



control techniques, placement of in-stream structures at nickpoints and providing areas of opportunity for the stream to drop some of its' bed load can be constructed within this reach.

Lower Reach

For the final 2 miles of stream,(the lower reach) a significant amount of human activity within the stream bed occurs. This includes, but is not limited to, ATV use in stream, deposition of trash and garbage and the illegal removal of substrate materials. The stream is aggrading its' bed and, at times of low flow, completely disappears within the stream bed substrate. Most of the small particle siltation carried by Ten Mile Creek finds its' way to the Illinois River in the area below the narrows and above the McClugage Bridge on the Tazewell County side of the River. This site was once a very large established mussel bed with Washboard and Three Ridge shells being very abundant. Mussel populations at this site are currently not abundant because of heavy silt loads.”

Table 23 lists the species and number of individual fish collected at each site as well as whether the fish are tolerant or intolerant to pollution. The diversity indexes calculated include: 1) The Shannon Weiner Index. This index measures species diversity. It takes into account the number of individuals within each species as well as the overall number of species. A high Index indicates greater species diversity and a healthier ecosystem. In comparison with other streams in the Peoria Lakes Basin, a value of 1.74 is fair-poor. 2) The ratio of tolerant to intolerant species. Species intolerant to contaminated waters are indicators of water quantity. In comparison with other streams in the Peoria Lakes Basin, Tenmile Creek has a high number of intolerant species constituting approximately 25% of the population.

Fish collected in Tenmile
Creek Watershed

Table 23

	Species	number	tolerance
upper	bigmouth shiner	34	
	stoneroller	1	
	southern redbelly dace	6	I
	creek chub	7	T
middle	bluegill	42	
	bluntnose minnow	12	T
	southern redbelly dace	17	I
	bigmouth shiner	28	
	red shiner	124	T
	emerald shiner	1	
	creek chub	28	T
	hornyhead chub	4	I
	sand shiner	6	
lower	black bullhead	1	
	blacknose dace	1	
	southern redbelly dace	18	I



largemouth bass	1	
hornyhead chub	1	I
bigmouth shiner	187	
bluntnose minnow	6	T
orangethroat darter	6	
fantail darter	4	
golden shiner	2	T
red shiner	4	T
creek chub	10	T
sand shiner	7	
stoneroller	5	
bluegill	8	
green sunfish	1	T
total	572	
Shannon Weiner (H')	1.74	
Tolerant:Intolerant	4:1	

In conjunction with the fish survey, the Illinois Chapter of the Nature Conservancy conducted an aquatic insect survey in the upper, middle, and lower portions of Tenmile Creek. The following is an excerpt from that report:

“Ten Mile Creek supported higher diversity of mayflies (4 genera) and caddisflies (5 genera) than either Partridge or Ackerman Creeks. This corresponds to higher EPT values and biotic index scores at all three sites in Ten Mile Creek relative to the other two sub-watersheds. Taxa richness (30 taxa) and diversity measures (2.14) for the combined sites were high, similar to those calculated for Partridge Creek (34 taxa, 2.59), and higher than those calculated for Ackerman Creek (22 taxa, 1.62).

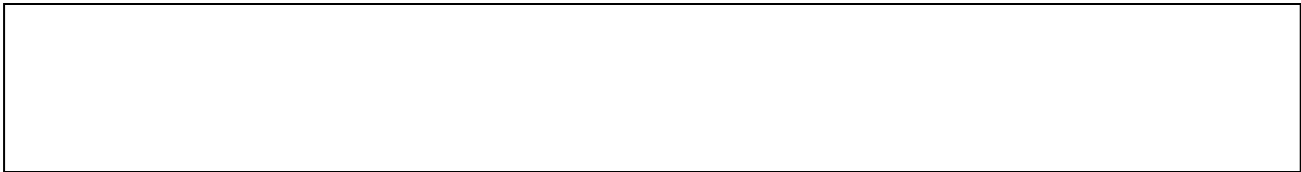
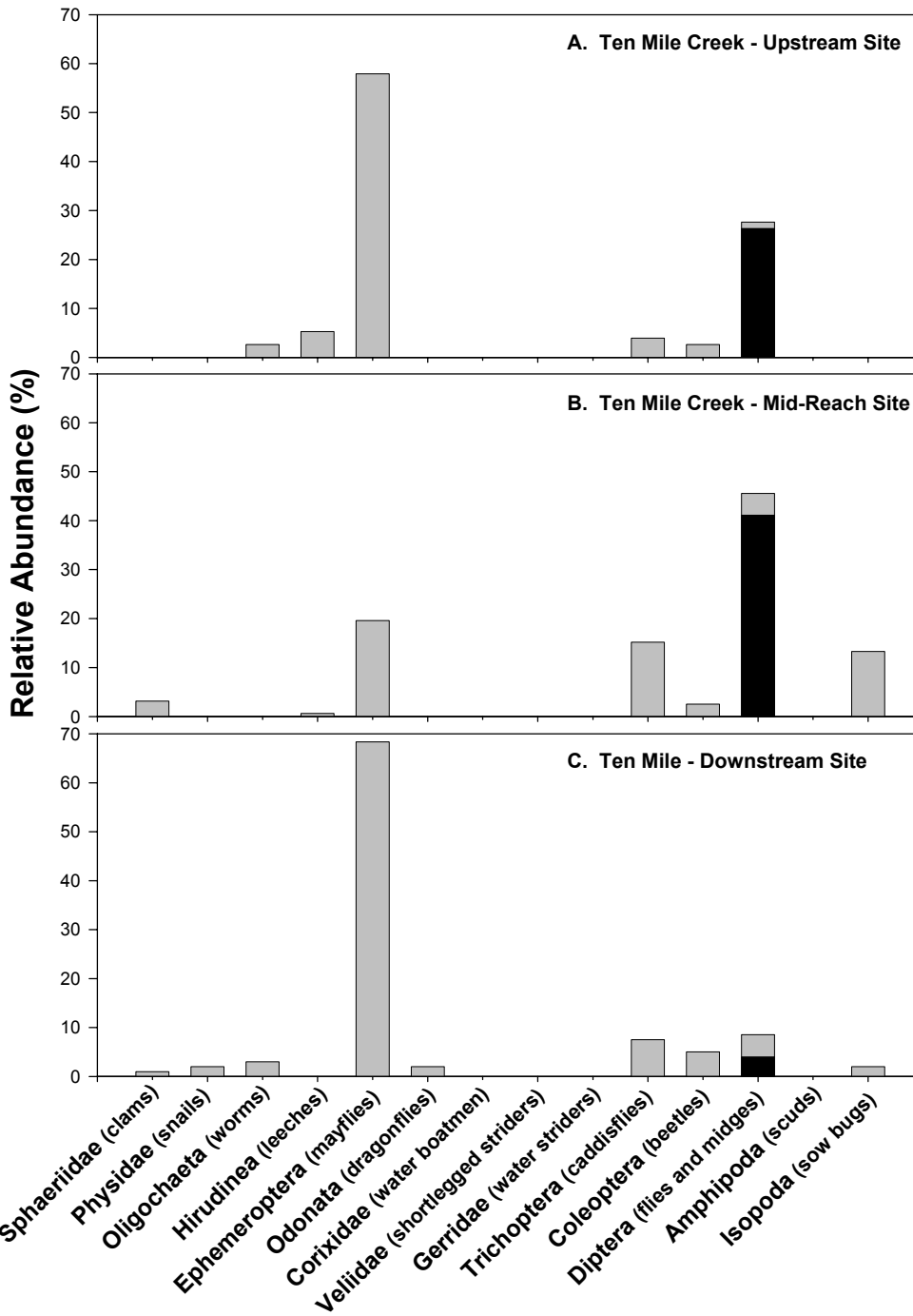
Low taxa richness at the upstream and mid-reach sites may be related to effects of urbanization, such as high pesticide runoff and extreme flooding during storm events, and of in-stream mining at the mid-reach site (see Fishery Resources Report submitted to Tri-County Regional Planning Commission by Wayne Herndon, IDNR Fisheries Biologist). Mayfly taxa (*Caenis* sp., *Baetis* sp.) at all three sites are characterized as tolerant to pollution and can persist in highly disturbed habitats (Miller and Golladay 1996). Increased taxa richness at the downstream site was primarily due to greater diversity of beetles and dipteran flies collected at this site. Baetid mayflies comprised nearly 70% of the total individuals collected at this site, and hydropsychids (primarily *Cheumatopsyche* sp.) dominated the caddisfly assemblage, indicating that water quality could be improved in this sub-watershed.

[Tenmile] appeared to be affected by urbanization, some level of organic pollution, and disturbance events (e.g., storm runoff, in-stream mining). Mayfly and caddisfly assemblages were dominated by families that are considered to be tolerant to organic pollution or low dissolved oxygen, indicating that water quality could be improved in this system (i.e., Hydropsychidae, Baetidae, Caenidae). Mayflies and caddisflies, [two species relatively intolerant to pollution], were commonly collected in Ten Mile Creek.



It should be noted that because samples were collected on just one date during 2003, results from this survey should be viewed as a snap-shot comparison of the invertebrate assemblages in these systems. Additional taxa (e.g., stoneflies) might be added to the taxa list by sampling early in the year, prior to spring emergence. This would provide a more robust description of the aquatic macroinvertebrate assemblages in these sub-watersheds.”





Wildlife

The deciduous forests, wetlands, prairies, and streams that comprise the natural habitats of Tazewell County and Tenmile Creek, are home to a variety of plants and animals. Table 24-26 represents fish, mammal, and mussel data collected by the Illinois State Natural History Survey from years 1947 to 1998. Map 18 depicts the pre-settlement vegetation of the Tenmile Creek Watershed. This information was digitized from 1800 scientist's field notes.

Table 24

Fish in 1997 sample of Ten-Mile Creek

<u>Scientific Name</u>	<u>Common Name</u>	
Moxostoma erythrurum	golden redbhorse	native
Moxostoma macrolepidotum	shorthead redbhorse	native
Ameiurus natalis	yellow bullhead	native
Noturus flavus	stonecat	native
Ambloplites rupestris	rock bass	native
Lepomis cyanellus	green sunfish	native
Lepomis macrochirus	bluegill	native and introduced
Micropterus dolomieu	smallmouth bass	native and introduced
Etheostoma flabellare	fantail darter	
Etheostoma nigrum	johnny darter	native
Luxilus chrysocephalus	striped shiner	native
Lythrurus umbratilis	redfin shiner	
Nocomis biguttatus	hornyhead chub	native
Notropis ludibundus	sand shiner	native
Phenacobius mirabilis	suckermouth minnow	native
Pimephales notatus	bluntnose minnow	native
Semotilus atromaculatus	creek chub	native
Catostomus commersoni	White Sucker	
Hypentelium nigricans	northern hog sucker	native
Moxostoma anisurum	silver redbhorse	
Campostoma anomalum	central stoneroller	native
Cyprinella lutrensis	red shiner	native
Cyprinella whipplei	steelcolor shiner	native
Cyprinus carpio	common carp	non-native

Table 25

Mammals in Tazewell County

<u>Scientific Name</u>	<u>Common Name</u>	
Blarina brevicauda	short-tailed shrew	1968
Peromyscus leucopus	white-footed mouse	1968
Microtus ochrogaster	prairie vole	1968



Geomys bursarius	plains pocket gopher	1950
Mustela vison	Mink	1961
Ondatra zibethicus	muskrat	1958
Lasiurus borealis	eastern red bat	1967

Table 26

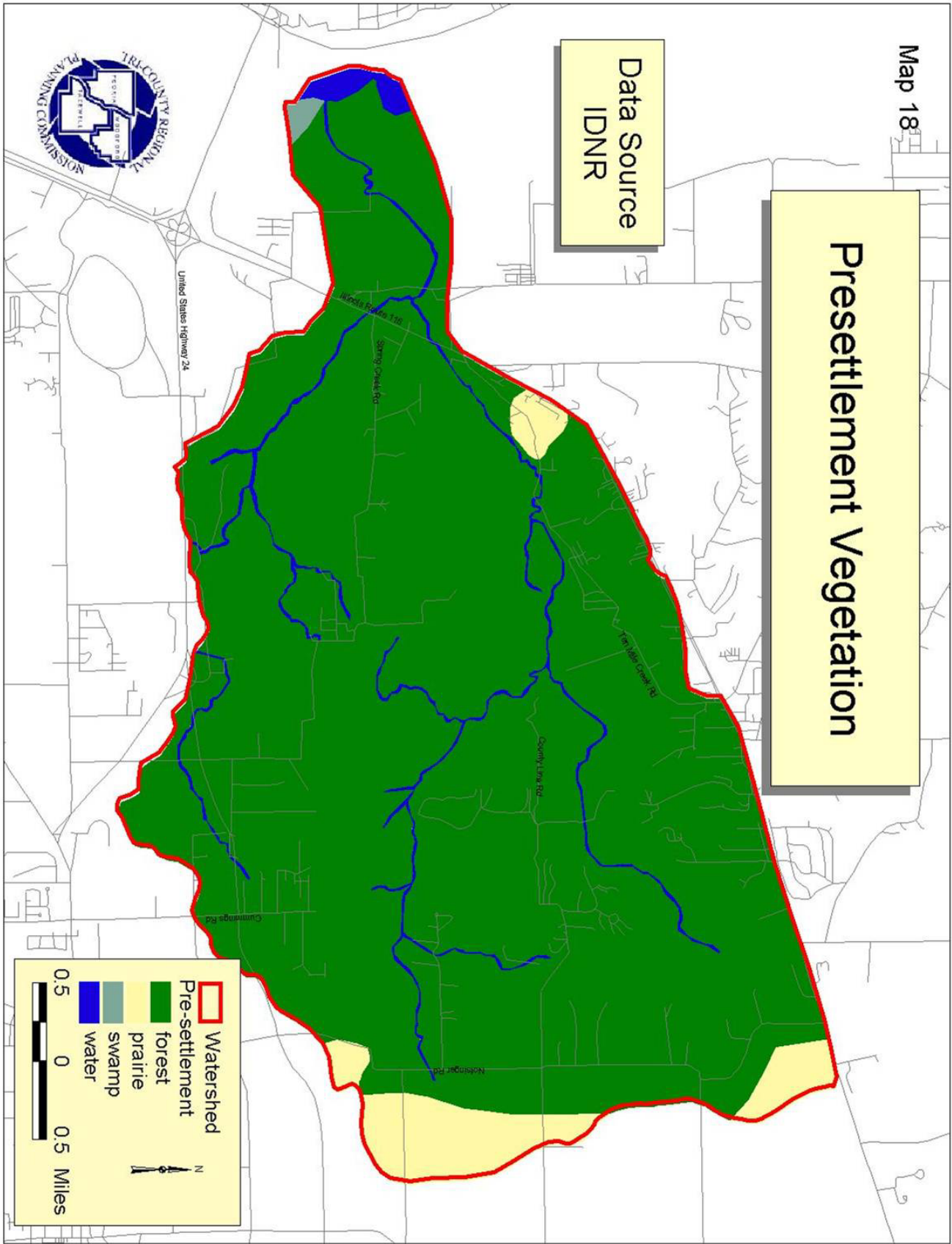
**Mussels of Tazewell
County**

<u>Genus species</u>	<u>Common name</u>
Alasmidonta marginata	Elktoe
<u>Anodontoides ferussacianus</u>	Cylindrical papershell
<u>Arcidens confragosus</u>	Rock-pocketbook
<u>Lasmigona complanata</u>	White heelsplitter
<u>Lasmigona compressa</u>	Creek heelsplitter
<u>Lasmigona costata</u>	Fluted-shell
<u>Pyganodon grandis</u>	Giant floater
<u>Strophitus undulatus</u>	Squawfoot
<u>Utterbackia imbecillis</u>	Paper pondshell
<u>Amblema plicata</u>	Threeridge
<u>Elliptio dilatata</u>	Spike
<u>Fusconaia flava</u>	Wabash pigtoe
<u>Megaloniaias nervosa</u>	Washboard
<u>Pleurobema sintoxia</u> <i>or Pleurobema sintoxia</i>	Round pigtoe
<u>Quadrula pustulosa</u>	Pimpleback
<u>Quadrula quadrula</u>	Mapleleaf
<u>Tritogonia verrucosa</u>	Pistolgrip
<u>Actinonaias ligamentina</u>	Mucket
<u>Lampsilis cardium</u>	Plain pocketbook
<u>Lampsilis siliquoidea</u>	Fatmucket
<u>Lampsilis teres</u>	Yellow sandshell
<u>Leptodea fragilis</u>	Fragile papershell
<u>Ligumia recta</u>	Black sandshell
<u>Potamilus alatus</u>	Pink heelsplitter
<u>Potamilus ohiensis</u>	Pink papershell
<u>Toxolasma parvus</u>	Lilliput
<u>Truncilla donaciformis</u>	Fawnsfoot
<u>Truncilla truncata</u>	Deertoe
<u>Venustaconcha ellipsiformis</u>	Ellipse
<u>Villosa iris</u>	Rainbow
<u>Dreissena polymorpha</u>	Zebra mussel
<u>Corbicula fluminea</u>	Asian clam



Presettlement Vegetation

Data Source
IDNR



Socio-economic

The economy of the watershed is lead by manufacturing, retail, and agricultural industries. The Peoria-Pekin Metropolitan Area suffered a severe economic downturn in the 1980's. This resulted in large numbers of manufacturing and retail jobs being lost. The 1990's had been one of growth, however much of that growth has been to make up the ground lost a decade ago. The AG sector is currently in the midst of a crisis brought on by high levels of production and low commodity prices. This has made volunteer incentive based programs for soil conservation more attractive than in past years. Table 27 contains some general facts about Tazewell County obtained from the 2000 Census of the Census Bureau. Figures 3 and 4 are the household income and population, respectively of Tazewell County in 1989 and Table 28 contains employment data for Tazewell and Woodford Counties as well as the Village of Washington.

Table 27

People QuickFacts	Tazewell County	Illinois
Population, 2000	128,485	12,419,293
Population, percent change, 1990 to 2000	3.90%	8.60%
Persons under 5 years old, percent, 2000	6.20%	7.10%
Persons under 18 years old, percent, 2000	24.40%	26.10%
Persons 65 years old and over, percent, 2000	14.90%	12.10%
White persons, percent, 2000 (a)	97.40%	73.50%
Black or African American persons, percent, 2000 (a)	0.90%	15.10%
American Indian and Alaska Native persons, percent, 2000 (a)	0.30%	0.20%
Asian persons, percent, 2000 (a)	0.50%	3.40%
Native Hawaiian and Other Pacific Islander, percent, 2000 (a)	Z	Z
Persons reporting some other race, percent, 2000 (a)	0.30%	5.80%
Persons reporting two or more races, percent, 2000	0.70%	1.90%
Female population, percent, 2000	50.80%	51.00%
Persons of Hispanic or Latino origin, percent, 2000 (b)	1.00%	12.30%
White persons, not of Hispanic/Latino origin, percent, 2000	96.70%	67.80%
High school graduates, persons 25 years and over, 1990	63,119	5,558,141
College graduates, persons 25 years and over, 1990	10,890	1,534,996
Housing units, 2000	52,973	4,885,615
Homeownership rate, 2000	76.10%	67.30%
Households, 2000	50,327	4,591,779
Persons per household, 2000	2.49	2.63
Households with persons under 18 years, percent, 2000	34.20%	36.20%
Median household money income, 1997 model-based estimate	\$42,860	\$41,179
Persons below poverty, percent, 1997 model-based estimate	8.40%	11.30%
Children below poverty, percent, 1997 model-based estimate	12.60%	17.50%
Business QuickFacts	Tazewell County	Illinois
Private nonfarm establishments with paid employees, 1998	2,783	304,533
Private nonfarm employment, 1998	41,640	5,221,782
Private nonfarm employment, percent change 1990-1998	12.10%	12.40%
Nonemployer establishments, 1997	6,125	637,794
Manufacturers shipments, 1997 (\$1000)	2,512,880	200,019,991



Retail sales, 1997 (\$1000)	1,275,240	108,002,177
Retail sales per capita, 1997	\$9,896	\$8,992
Minority-owned firms, 1992	NA	67,603
Women-owned firms, 1992	2,691	250,613
Housing units authorized by building permits, 1999	490	53,974
Federal funds and grants, 1999 (\$1000)	452,423	55,835,957
Local government employment - full-time equivalent, 1997	4,267	459,893

Geography QuickFacts	Tazewell County	Illinois
Land area, 2000 (square miles)	649	55,584
Persons per square mile, 2000	198	223.4
Metropolitan Area	Peoria-Pekin, IL MSA	

Z: Value greater than zero but less than half unit of measure shown
 NA: Not available

Tazewell County household income: 1989

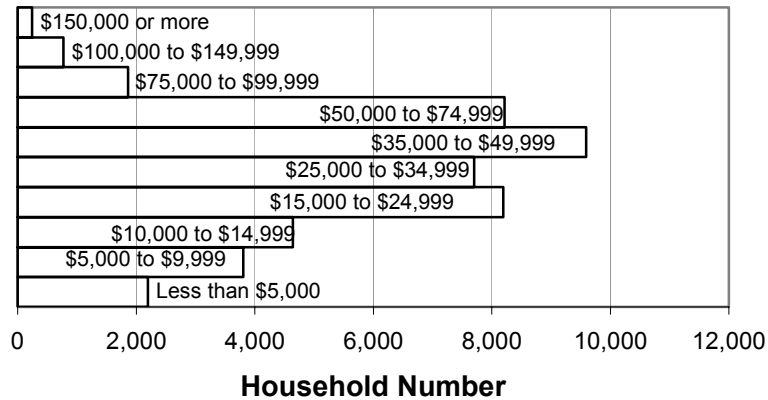


Figure 3



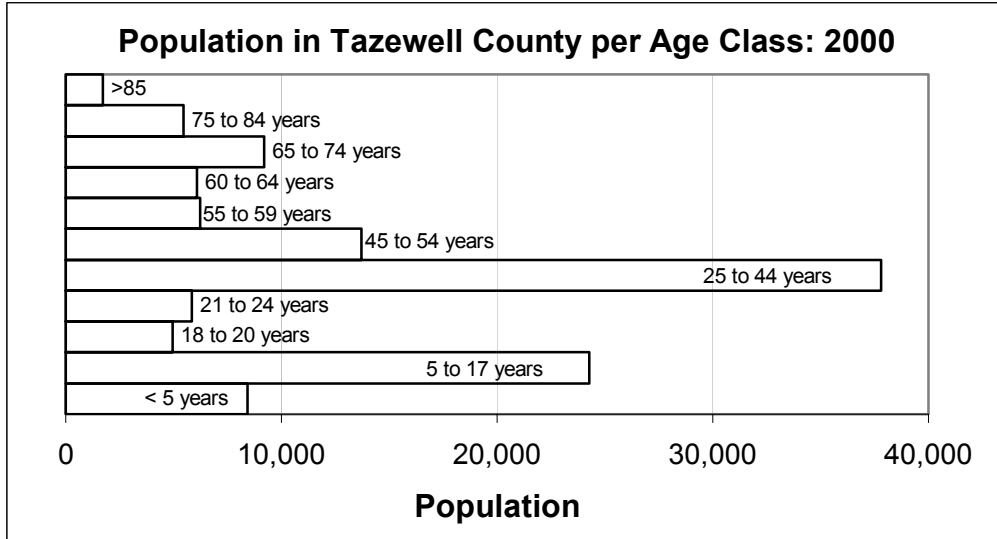


Figure 4

Table 28

Employment 1995*

Type	Tazewell Co	Woodford Co.	Washington
Total	34001	6404	3354
Manufacturing	5203	1419	334
Retail	9561	1462	1562
Finance, Insurance, & Real Estate	1733	224	135
Services	8159	1966	815
White Collar	22209	4276	2520
Blue Collar	11578	2213	990

Rural Economic Technical Assistance Cnet



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Appendix A
City of Peoria's Model Stream Buffer Ordinance

DRAFT

February 25, 2003

City of Peoria Planning and Growth Management

Based upon a Model Ordinance

Stream Buffer Ordinance

3-104 Definitions

Streams: Perennial and intermittent watercourses identified through site inspection and USGS maps. Perennial streams are those which are depicted on a USGS map with a solid blue line. Intermittent streams are those which are depicted on a USGS map with a dotted blue line.

Buffer: A vegetated area, including trees, shrubs and herbaceous vegetation, which exists or is established to protect a stream system or lake. Alteration of this natural area is strictly limited. A buffer for a stream system shall consist of a forested and/or vegetated strip of land extending along both sides of a stream, as of its location at the date of this ordinance, and its adjacent wetlands, floodplain, and slopes. The buffer width shall be adjusted to include contiguous, sensitive areas, such as steep slopes or erodible soils, where development or disturbance may adversely affect soil erosion, water quality, streams, wetlands, or other waterbodies. Adjustments shall be accomplished by evaluating the potential of a site to produce impacts that result in runoff, soil erosion, and sediment transport.

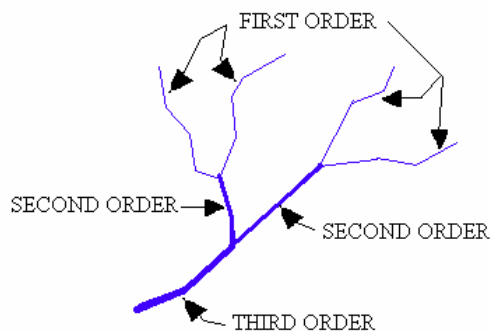
Wetland: Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

One Hundred Year Floodplain: The area of land adjacent to a stream or body of water that is subject to inundation during a storm event that has a recurrence interval of one hundred (100) years.

Stream Order: A classification system for streams based on stream hierarchy. The smaller the stream, the lower its numerical classification. For example, a first order stream does not have tributaries and normally originates from springs and/or seeps. At the confluence of two first order streams, a second order stream begins, and so on. (See Figure 1)

FIGURE 1

STREAM ORDER



5-208 *Stream Buffering*

A. *This ordinance shall apply to:*

1. All proposed development except for that development which meets waiver or variance criteria as outlined in Section 5-208 D of this regulation..
2. The regulation shall not apply to agricultural operations that are existing at the time of the passage of this ordinance or are determined to have no significant negative effects upon the water quality of the watercourse.
3. Except as provided above, this regulation shall apply to all parcels of land, structures and activities which are causing or contributing to:
 - a. Pollution, including non-point pollution, of the waters of the jurisdiction adopting this ordinance.
 - b. Erosion or sedimentation of stream channels
 - c. Degradation of aquatic or riparian habitat

B. *Buffer standards for streams, wetlands, and floodplains.*

The required minimum overall width for buffers shall be 200 feet. The minimum base width for each side of the stream (i.e., the base width measured from the channel centerline for First Order streams. For Second Order (and larger) streams, None 1 shall be measured from the top of the bank.) shall be a minimum of one hundred feet, with the requirement to expand the buffer depending on: 1) stream order; 2) percent slope; 3) 100-year floodplain; 4) wetlands or critical areas.

1. In third order and higher streams, add twenty-five feet to the base width.
2. Stream buffer width shall be modified if there are slopes, 15% or greater, which are within 200 feet of the stream and drain into the stream system. In those cases, the stream buffer minimum base width, for the side of the stream so effected, shall be adjusted as follows:

Percent Slope	Width of Buffer
15%-17%	add 10 feet
18%-20%	add 30 feet
21%-23%	add 50 feet
24%-25%	add 60 feet

3. Stream buffers shall be extended to encompass the entire 100-year floodplain.
4. When wetland or critical areas extend beyond the edge of the required buffer width, the buffer shall be adjusted so that the buffer consists of the extent of the wetland plus a 25-foot zone extending beyond the wetland edge.
5. The stream buffer shall be composed of three distinct zones, (see figure 2) with each zone having its own set of allowable uses and vegetative targets as specified in this ordinance.

a. Zone 1 “Streamside Zone” - The function of the streamside zone is to protect the physical and ecological integrity of the stream ecosystem.

- 1) The streamside zone will begin at the middle (channel centerline) of the perennial or intermittent watercourse and extend a minimum of 25 feet on each side of the stream.

- 2) Allowable uses within this zone are highly restricted to:

- i) flood control structures
- ii) utility rights of way and facilities that are generally perpendicular to the channel.
- iii) Biking and hiking paths
- iv) road crossings, where permitted shall be generally perpendicular to the channel and designed to meet IDNR criteria.
- v) existing utilities

- 3) The vegetative target for the streamside zone is undisturbed and/or reintroduced vegetation adapted to the region.

b. Zone 2 “Middle Zone” - The function of the middle zone is to protect key components of the stream and to provide distance between upland development and the streamside zone.

- 1) The middle zone will begin at the outer edge of the streamside zone and extend a minimum of 50-feet plus any additional buffer width for stream order, slopes, floodplains or wetlands.

- 2) Allowable uses within the middle zone are restricted to:

- i) All uses allowed in the Streamside Zone
- ii) Stormwater management facilities, with the approval of the (Local agency) responsible for stormwater).
- iii) Recreational uses as approved by (Planning Agency).

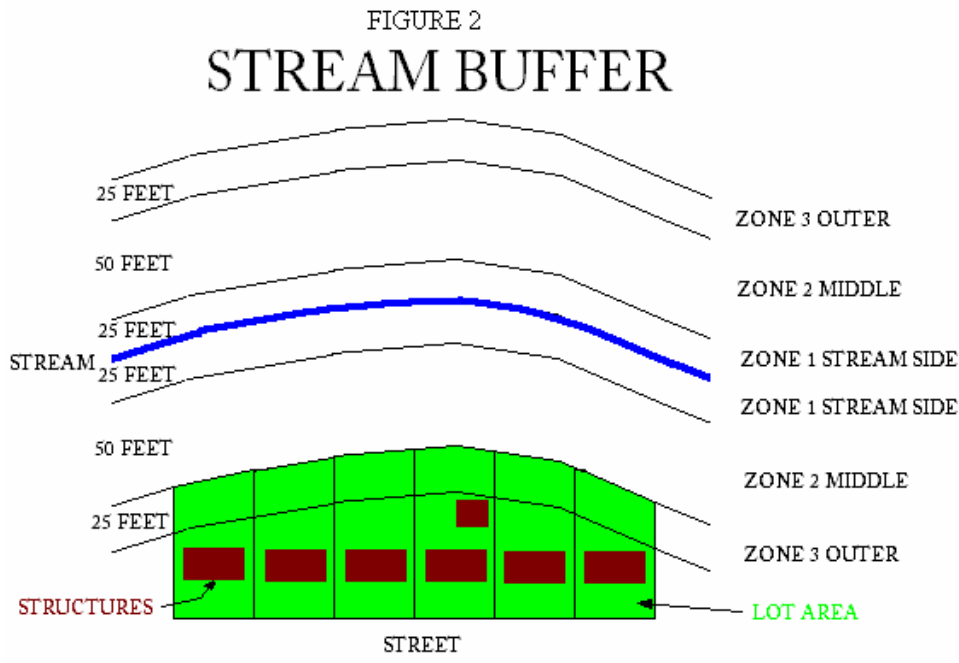
- iv) Limited tree and vegetation clearing with approval from (Planning Agency).
- v) Sanitary Sewers, constructed towards the the outside edge (greatest distance from the channel) of Zone 2 to the extent practicle.

3) The vegetative target for the middle zone is mature vegetation adapted to the region.

c. Zone 3 “Outer Zone” - The function of the outer zone is to prevent encroachment into the stream buffer and to filter runoff from residential and commercial development.

- 1) The outer zone will begin at the outward edge of the middle zone and provide a minimum width of 25 feet between Zone 2 and the nearest permanent structure.
- 2) Allowable uses within the Outer Zone are restricted to those uses allowed in the Streamside and Middle Zones.
- 3) The vegetative target for the outer zone may vary. The planting of vegetation adopted to the region is encouraged but must consist of green and growing material.

6. In all zones there shall be no septic systems, permanent structures or impervious cover, with the exception of paths and other structures otherwise permitted by this ordinance.



C. Buffer Management and Maintenance

1. The stream buffer, including wetlands and floodplains, shall be managed to enhance and maximize the unique value of these resources. Management includes specific limitations on alteration of the natural conditions of these resources. The following practices and activities are restricted within Zones 1 and 2 of the stream buffer, except with approval by (Planning Agency):

- a. Clearing of existing vegetation.
- b. Soil disturbance by grading, stripping, or other practices.
- c. Filling or dumping.
- d. Drainage by ditching, underdrains, or other systems
- e. Use, storage, or application of pesticides, except for the spot spraying of noxious weeds or non-native species consistent with recommendations of (Planning Agency)
- f. Storage or operation of motorized vehicles, except for maintenance and emergency use approved by (Forestry, Planning Agency)

2. The following structures, practices, and activities are permitted in the stream buffer, with specific design or maintenance features, subject to the review of (Planning Agency):

- a. Roads, bridges, paths, and utilities:
 - i) The minimum number of road crossings should be used within each subdivision.

3. All plats and plans prepared for recording and all right-of-way plats under City jurisdiction shall provide the following:

- a. Show the extent of any stream buffer on the subject property by metes and bounds
- b. Label the stream buffer
- c. Provide a note to reference any stream buffer stating: "There shall be no clearing, grading, construction or disturbance of vegetation except as permitted by the City of Peoria."
- d. Provide a note to reference any protective covenants governing all stream buffers areas stating: "Any stream buffer shown hereon is subject

to protective covenants which may be found in the land records and which restrict disturbance and use of these areas."

4. In order to ensure long-term maintenance and inspection access, those areas within Zone 1 and 2 shall be dedicated as a permanent drainage and conservation easement and depicted on all plats of survey and development plans. Such dedications shall contain the following protective development covenant and deed restriction:

All stream buffer areas shall be maintained through a declaration of protective covenant, which is required to be submitted for approval by (Planning Agency). The covenant shall be recorded at the Peoria County of Deeds and shall run with the land and continue in perpetuity.

5. All lease agreements must contain a notation regarding the presence and location of protective covenants for stream buffer areas and which shall contain information on the management and maintenance requirements for the stream buffer for the new property owner.

6. An offer of dedication of a stream buffer area to the agency shall not be interpreted to mean that this automatically conveys to the general public the right of access to this area.

7. The City shall periodically inspect the stream buffer for evidence of sediment deposition, erosion, or concentrated flow channels and cause the responsible entity to take corrective actions to ensure the integrity and functions of the stream buffer.

8. Stream buffer areas may be allowed to grow into their vegetative target state naturally, but methods to enhance the succession may be required when deemed necessary by the City to ensure the preservation and propagation of the buffer area. Buffer areas may also be enhanced through reforestation or other growth techniques as a form of mitigation for achieving buffer preservation requirements.

D. Waivers/Variances

1. This ordinance shall apply to all proposed development except for that development which prior to the effective date of this ordinance:

- a. Is covered by a valid, unexpired preliminary or final plat
- b. Is covered by a valid, unexpired building permit
- c. Has been granted a waiver in accordance with current development regulations.

2. The City may grant a variance for the following:

- a. Those projects or activities where it can be demonstrated that strict compliance with the ordinance would result in practical difficulty or financial hardship
 - b. Those projects or activities serving a public need where no feasible alternative is available.
3. Waivers for development may also be granted in two additional forms, if deemed appropriate by the City:
 - a. The buffer width may be relaxed and the buffer permitted to become narrower at some points as long as the average width of the buffer meets or exceeds the minimum requirement. This averaging of the buffer may be used as long as the streamside zone (Zone I) is not disturbed by the narrowing, and no new structures are built within the one hundred (100) year floodplain.
4. The applicant shall submit a written request for a variance to the director of the agency. The application shall include specific reasons justifying the variance and any other information necessary to evaluate the proposed variance request. The agency may require an alternatives analysis that clearly demonstrates that no other feasible alternatives exist and that minimal impact will occur as a result of the project or development.
5. In granting a request for a variance, the City may require site design, landscape planting, fencing, the placement of signs, and the establishment of water quality best management practices in order to reduce adverse impacts on water quality, streams, wetlands, and floodplains.

E. Buffer Plan

1. The buffer plan shall be submitted in conjunction with the required grading plan for any development, and the stream buffer shall be clearly delineated on the preliminary and final plats or plans and construction plans.

F. Boundary Markers

1. Permanent boundary markers, in the form of signage approved by the City of Peoria shall be installed prior to final approval of the required clearing and grading plan. Signs shall be placed at the edge of the Middle Zone.

G. Alternative Compliance

1. Petitioners may choose to follow the setback system as described above or to submit a buffer plan under the alternative compliance provisions of this sections. The alternative compliance provisions are intended to give the petitioner the flexibility needed to respond to unique site issues and client needs and still meet the intent of this ordinance.

2. No Appeal of Administrators Review. If the petitioner chooses to submit a buffer plan through the alternative compliance provisions there will be no appeal of the Administrator's review. Denial by the Administrator will require that the petitioner amend the plan through the alternative compliance process or submit a plan through the standard setback system process.
3. Basis for Review. Buffer plans submitted through the alternative compliance process shall fully achieve the performance standards as described in

Appendix B
Tri-County Unified Model
Stormwater Ordinance

Created by the Peoria Lakes Tributaries Watershed
Stormwater Technical Advisory Committee

**FINAL DRAFT
TRI-COUNTY, ILLINOIS
UNIFIED
STORMWATER ORDINANCE**

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SECTION ONE GENERAL PROVISIONS

Section One, Article I. – Authority, Purpose, Abbreviations & Definitions

A. Authority

These Regulations provide for the regulation of matters relative to the management of storm water within the jurisdiction and its extraterritorial jurisdiction. Its provisions include, but are not limited to, regulating drainage installations and improvements, requiring the preservation and enhancement of certain natural environmental features, requiring the installation of drainage improvements in developments, regulating uses, maintenance, and activities in floodplains and flood hazard areas, requiring permits, payment of fees and assurances of completion, and providing for inspections and control of work. The requirements, standards and specifications herein provided are in addition to any other applicable legal requirements.

B. Purposes

1. To maintain and improve the quality of water impacted by the storm drainage system within the jurisdiction.
2. To promote and protect the public health, safety and general welfare of the citizens from the hazards of flooding.
3. To create a set of fair and consistent standards that will facilitate desirable and sustainable development in the Tri-County area.
4. To protect the natural resources of Peoria, Tazewell and Woodford Counties and the Illinois River at Peoria Lakes.
5. To preserve property values by protecting new and existing buildings and improvements to buildings from damage due to stormwater flow.
6. To assure that new developments and redevelopments do not increase flood or drainage hazards to others, or create unstable conditions susceptible to erosion.
7. To preserve the natural characteristics of stream corridors in order to moderate flood and storm water impacts and to protect water quality.
8. To prevent the discharge of contaminated storm water runoff and illicit discharges from industrial, commercial, residential, and construction sites into the storm drainage system within the jurisdiction of _____.
9. To promote public awareness of the hazards involved in the improper discharge of trash, yard waste, lawn chemicals, pet waste, wastewater, oil, petroleum products, cleaning

products, paint products, hazardous waste, sediment and other pollutants into the natural and man-made storm drainage system.

10. To encourage recycling of used motor oil and safe disposal of other hazardous consumer products.
11. To facilitate compliance with state and federal standards and permits by owners of construction sites within the jurisdiction.
12. To enable the jurisdiction to comply with all current federal and state laws and regulations applicable to the National Pollutant Discharge Elimination System (NPDES) permitting requirements for storm water discharges and prepare for future requirements (e.g., monitoring Total Maximum Daily Loads).

C. Abbreviations

The following abbreviations when used in this Ordinance shall have the designated meanings:

BMP	–	Best Management Practices
CFR	–	Code of Federal Regulations
FEMA	–	Federal Emergency Management Agency
HHW	–	Household Hazardous Waste
IDPH	–	Illinois Department of Public Health
IEPA	–	Illinois Environmental Protection Agency
MS4	–	Municipal Separate Storm Sewer System
NPDES	–	National Pollutant Discharge Elimination System
NRCS	–	Natural Resources Conservation Service (formerly SCS)
SCS	-	Soil Conservation Service (now NRCS)
SWCD	–	Soil and Water Conservation District
SWP3	–	Storm Water Pollution Prevention Plan
USACE	-	US Army Corps of Engineers
USDA	–	U.S. Department of Agriculture
USEPA	–	U.S. Environmental Protection Agency

D. Definitions

Unless a provision explicitly states otherwise, the following terms and phrases as used in this Ordinance, shall have the meanings hereinafter designated.

1. Adverse Impacts are any negative impact on plant, soil, air or water resources affecting quality and quantity and their beneficial uses including recreation, aesthetics and aquatic habitat.
2. Agricultural Practices are normal farming, silviculture and ranching activities such as gardening, plowing, seeding, cultivating, harvesting for the production of food, fiber, forest products, nursery stock and livestock. Maintenance of agricultural drain tiles, irrigation and drainage ditches, farm roads and other access areas for farm vehicles and equipment use are also included. These practices shall not include grading, filling or draining floodprone areas with greater than 100 acres of tributary area or a regulatory wetland.

3. Applicant is any person, firm, or governmental agency who executes the necessary forms to procure official approval of a development or permit to carry out construction of a new development or re-development from the jurisdiction of _____.
4. Appropriate Official is the Zoning Administrator or delegated agent.
5. Base Flood Elevation is the elevation delineating the level of flooding resulting from the 100-year frequency flood event, which has a one percent (1%) probability of being equaled or exceeded in any given year..
6. Best Management Practices (BMPs) here refers to management practices and methods to control pollutants in stormwater. BMPs are of two types: “source controls” (nonstructural) and “treatment controls” (structural.) Source controls are practices that prevent pollution by reducing potential pollutants at their source, before they come into contact with stormwater. Treatment controls partially remove pollutants from stormwater. The selection, application and maintenance of BMPs must be sufficient to prevent or reduce the likelihood of pollutants entering the storm drainage system. Specific BMPs may be imposed by the jurisdiction and are discussed further in Section 3.
7. Building Official is the officer or other designated authority charged with the administration and enforcement of the International Building Code for the jurisdiction of _____
8. Building Permit is a permit issued by the jurisdiction of _____, for the construction, erection or alteration of a structure or building and the related ground and surface preparation prior to and after completion of construction, erection or alteration of a structure or building.
9. Bypass Flows is Stormwater runoff from upstream properties tributary to a property's drainage system but not under its control.
10. Certify or Certification means formally attesting that the specific inspections and tests were performed, and that such inspections and tests comply with the applicable requirements of this Ordinance.
11. Channel is any defined river, stream, creek, brook, natural or artificial depression, ponded area, on-stream lake or impoundment, abandoned mine, flowage, slough, ditch, conduit, culvert, gully, ravine, wash, or natural or manmade drainageway, that has a definite bed and bank or shoreline, in or into which surface or groundwater flows, either perennially or intermittently.
12. Channel Modification is the alteration of a channel by changing the physical dimensions or materials of its bed or banks. Channel modification includes damming, riprapping (or other armoring), filling, widening, deepening, straightening, relocating, lining, and significant removal of bottom or woody rooted vegetation.
13. Clearing is any activity, which removes the natural vegetative ground cover.

14. Commercial means pertaining to any business, trade, industry, or other activity engaged in for profit.
15. Compensatory Storage is an artificially excavated, hydraulically equivalent volume of storage within the floodplain used to balance the loss of natural flood storage capacity when fill or structures are placed within the floodplain.
16. Conduit is any channel, pipe, sewer or culvert used for the conveyance or movement of water, whether open or closed.
17. Construction Site means any location where clearing, grading, excavation, filling, or other construction activity occurs.
18. Contaminated means containing harmful quantities of pollutants.
19. Contractor means any person or firm performing or managing construction work at a construction site, including any construction manager, general contractor or subcontractor. Also includes, but is not limited to, earthwork, paving, building, plumbing, mechanical, electrical or landscaping contractors, and material suppliers delivering materials to the site.
20. County is the County of _____, Illinois.
21. Dam is defined by the Illinois Department of Natural Resources Office of Water Resources.
22. Detention Basin is a facility constructed or modified to provide for the temporary storage of stormwater runoff and the controlled release of this runoff at a prescribed rate during and after a flood or storm.
23. Detention Time is the amount of time stormwater is held within a detention basin after a design storm elevation is reached.
24. Development is any manmade change to real estate or property, including:
 - a. The division or subdivision of any duly recorded parcel of property.
 - b. Construction, reconstruction or placement of a building or any addition to a building valued at more than one thousand dollars (\$1000).
 - c. Installation of a manufactured home on a site, preparing a site for a manufactured home, or installing a travel trailer on a site for more than 180 days per year.
 - d. Construction of roads, bridges, or similar projects.
 - e. Redevelopment of a site.
 - f. Filling, dredging, grading, clearing, excavating, paving drilling, mining or other non-agricultural disturbance of a ground surface.
 - g. Storage of materials or deposit of solid or liquid waste.
 - h. Any other activity that might alter the magnitude, frequency, direction, or velocity of stormwater flows from a property.

25. Discharge means any addition or release of any pollutant, stormwater or any other substance whatsoever into storm drainage system.
26. Discharger means any person who causes, allows, permits, or is otherwise responsible for, a discharge, including, without limitation, any owner of a construction site or industrial facility.
27. Domestic Sewage means untreated sewage originating primarily from kitchen, bathroom and laundry sources, including waste from food preparation, dishwashing, garbage grinding, toilets, baths, showers and sinks.
28. Drainage Plan is a plan, including engineering drawings and supporting calculations, which describes the existing stormwater drainage system and environmental features, including grading, as well as proposed alterations or changes to the drainage system and environment of a property. The jurisdiction may require that a Drainage Plan include upstream and downstream (offsite) drainage features, if it is found that the development would be impacted by these offsite features.
29. Dry Basin is a detention basin designed to drain after temporary storage of stormwater flows and to normally be dry between runoff events.
30. Earthwork means the disturbance of soils on a site associated with clearing, grading, or excavation activities.
31. Erosion is the general process whereby soil or earth is moved by rainfall, flowing water, wind or wave action.
32. Event is a short duration hydrologic occurrence, such as a period of rainfall or elevated streamflow, that is brief in duration allowing certain hydrologic components, such as evaporation and arrival times of rainfall, to be neglected. A storm event is normally limited to ten days or less.
33. Excavation is any act by which organic matter, earth, sand, gravel, rock or any other similar material, is cut into, dug, quarried, uncovered, removed, displaced, re-located or bulldozed and shall include the conditions resulting from such actions.
34. Existing Grade is the vertical location of the existing ground surface prior to excavation or filling.
35. Facility means any building, structure, installation, process, or activity from which there is or may be a discharge of a pollutant.
36. Fertilizer means a substance or compound that contains an essential plant nutrient element in a form available to plants and is used primarily for its essential plant nutrient element

content in promoting or stimulating growth of a plant or improving the quality of a crop, or a mixture of two or more fertilizers.

37. Fill is any act by which earth, sand, gravel, rock, or any other material, is deposited, placed, replaced, pushed, dumped, pulled, transported or moved by man to a new location and shall include the conditions resulting therefrom.
38. Final Grade is the vertical location of the ground surface after grading work is completed in accordance with the plans.
39. Fire Protection Water means any water, and any substances or materials contained therein, used by any person to control or extinguish a fire, or to inspect or test fire equipment.
40. Garbage means putrescible animal and vegetable waste materials from the handling, preparation, cooking, or consumption of food, including waste materials from markets, storage facilities, and the handling and sale of produce and other food products.
41. Grading is the excavation or fill or any combination thereof and shall include the conditions resulting from any excavation or fill.
42. Groundwater means any water residing below the surface of the ground or percolating into or out of the ground.
43. Harmful Quantity means the amount of any substance that the appropriate official determines will cause an adverse impact to storm drainage system or will contribute to the failure of the jurisdiction to meet the water quality based requirements of the NPDES permit for discharges from the regulated MS4.
44. Hazardous Substance means any substance listed in Table 302.4 of 40 CFR Part 302.
45. Hazardous Waste means any substance identified or listed as a hazardous waste by the EPA pursuant to 40 CFR Part 261.
46. Household Hazardous Waste (HHW) means any material generated in a household (including single and multiple residences) that would be classified as hazardous pursuant to the Illinois EPA.
47. Hydrograph is a graph or tabulation showing for a given location on a stream or conduit, the flow rate with respect to time.
48. Hydrograph Method This method estimates runoff volume and runoff hydrographs for the points of interest by generating hydrographs for individual subareas, combining them, and routing them through channels, floodplains, and reservoir structures. Factors such as rainfall depth and temporal distribution, rainfall abstractions, time of concentration, land use characteristics, storage volumes and travel time are included.

49. Illegal Discharge See illicit discharge below.
50. Illicit Connection means any drain or conveyance, whether on the surface or subsurface, which allows an illicit discharge to enter the storm drainage system.
51. Illicit Discharge means any discharge to the storm drainage system that is prohibited under this Ordinance.
52. Impervious Surface is that area of property that is covered by materials other than soil and vegetation and that has no intended capacity to absorb stormwater, such as parking lots, roadways, driveways, sidewalks, patios, tennis courts, roofs and other structures.
53. Industrial Waste (or commercial waste) means any wastes produced as a by-product of any industrial, institutional or commercial process or operation, other than domestic sewage.
54. Infiltration is the passage or movement of water into the soil.
55. Jurisdiction means the jurisdiction of _____.
56. Lot is an individual platted parcel in an approved subdivision.
57. Major Drainage System is that portion of a drainage system needed to store and convey flows beyond the capacity of the minor drainage system. Major Drainage System components include, but are not limited to, detention ponds, dams, roadway culverts, bridges, medium or large open channels, large (trunk) storm sewers and natural overland paths. Major Drainage System components are to be designed to safely convey the 100-year recurrence interval storm event.
58. Mechanical Fluid means any fluid used in the operation and maintenance of machinery, vehicles and any other equipment, including lubricants, antifreeze, petroleum products, oil and fuel.
59. Minor Drainage System is that portion of a drainage system designed for the convenience of the public. It consists of street gutters, storm sewers, small open channels, and swales and, where manmade, is to be designed to safely convey the 10-year recurrence interval storm discharge.
60. Mitigation is when the prescribed controls are not sufficient and additional measures are required to offset the development, including those measures necessary to minimize the negative effects which stormwater drainage and development activities might have on the public health, safety and welfare. Examples of mitigation include, but are not limited to compensatory storage, soil erosion and sediment control, channel restoration and wetlands.
61. Mobile Commercial Cosmetic Cleaning (or mobile washing) means power washing, steam cleaning, and any other method of mobile cosmetic cleaning, of vehicles and/or exterior surfaces, engaged in for commercial purposes or related to a commercial activity.

62. Municipal Separate Storm Sewer System (MS4) means the system of conveyances, including roads, streets, curbs, gutters, ditches, inlets, drains, catch basins, pipes, tunnels, culverts, channels, detention basins and ponds owned and operated by the jurisdiction and designed or used for collecting or conveying stormwater, and not used for collecting or conveying sanitary sewage.
63. Natural are conditions existing prior to agricultural development resulting from physical, chemical, and biological processes without intervention by man.
64. Natural Drainage consists of channels formed in the existing surface topography of the earth prior or after changes made by unnatural causes.
65. NPDES means the National Pollutant Discharge Elimination System.
66. NPDES Permit means a permit issued by the IEPA that authorizes the discharge of pollutants to Waters of the United States, whether the permit is applicable to an individual, group, or general area-wide basis.
67. Notice of Violation means a written notice detailing any violations of this Ordinance and any action expected of the violators.
68. Oil means any kind of oil in any form, including, but not limited to: petroleum, fuel oil, crude oil, synthetic oil, motor oil, cooking oil, grease, sludge, oil refuse, and oil mixed with waste.
69. One Hundred-Year Event is a rainfall, runoff, or flood event having a one percent (1%) probability of being equaled or exceeded in any given year.
70. One Year Event is a rainfall, runoff, or flood event being met or exceeded on the average in any given year.
71. Owner means the person who owns a facility, part of a facility, or land.
72. Parcel is a contiguous lot or tract of land under one ownership. A lot or tract of land is land intended as a unit for the purpose of development or transfer of ownership.
73. Peak Flow is the maximum rate of stormwater flow, for a given storm event, at a given point in a channel or conduit.
74. Permittee is any person to whom a building permit or a grading and drainage permit is issued.
75. Person means any individual, partnership, co-partnership, firm, company, corporation, association, joint stock company, trust, estate, governmental entity, or any other legal

entity; or their legal representatives, agents, or assigns, including all federal, state, and local governmental entities.

76. Pesticide means a substance or mixture of substances intended to prevent, destroy, repel, or migrate any pest.
77. Pet Waste (or Animal Waste) means excrement and other waste from domestic animals.
78. Petroleum Product means a product that is obtained from distilling and processing crude oil and that is capable of being used as a fuel or lubricant in a motor vehicle or aircraft, including motor oil, motor gasoline, gasohol, other alcohol blended fuels, aviation gasoline, kerosene, distillate fuel oil, and #1 and #2 diesel.
79. Pollutant means any substance attributable to water pollution, including but not limited to rubbish, garbage, solid waste, litter, debris, yard waste, pesticides, herbicides, fertilizers, pet waste, animal waste, domestic sewage, industrial waste, sanitary sewage, wastewater, septic tank waste, mechanical fluid, oil, motor oil, used oil, grease, petroleum products, antifreeze, surfactants, solvents, detergents, cleaning agents, paint, heavy metals, toxins, household hazardous waste, small quantity generator waste, hazardous substances, hazardous waste, soil and sediment.
80. Pollution means the alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water that renders the water harmful, detrimental, or injurious to humans, animal life, plant life, property, or public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.
81. Positive Drainage is provision for overland paths for all areas of a property including depressional areas that may also be drained by storm sewer.
82. Potable Water means water that has been treated to drinking water standards and is safe for human consumption.
83. Private Drainage System means all privately or publicly owned ground, surfaces, structures or systems, excluding the regulated MS4, that contribute to or convey stormwater, including but not limited to, roofs, gutters, downspouts, lawns, driveways, pavement, roads, streets, curbs, gutters, ditches, inlets, drains, catch basins, pipes, tunnels, culverts, channels, detention basins, ponds, draws, swales, streams and any ground surface.
84. Public Improvement Plans means engineering drawings subject to approval by the jurisdiction Engineer for the construction of public improvements.
85. Qualified Person means a person who possesses the required certification, license, or appropriate competence, skills, and ability as demonstrated by sufficient education, training, and/or experience to perform a specific activity in a timely and complete manner consistent with the regulatory requirements and generally accepted industry standards for such activity.

86. Release means to dump, spill, leak, pump, pour, emit, empty, inject, leach, dispose or otherwise introduce into the storm drainage system.
87. Retention Basin is a facility constructed or modified to provide for the storage of stormwater runoff without overland discharge. Retention Basins do not have a positive outlet and therefore discharge only by means of infiltration and evaporation.
88. Rubbish means non-putrescible solid waste, excluding ashes, that consist of: (A) combustible waste materials, including paper, rags, cartons, wood, excelsior, furniture, rubber, plastics, yard trimmings, leaves, and similar materials; and (B) noncombustible waste materials, including glass, crockery, tin cans, aluminum cans, metal furniture, and similar materials that do not burn at ordinary incinerator temperatures (1600 to 1800 degrees Fahrenheit).
89. Sanitary Sewage means the domestic sewage and/or industrial waste that is discharged into the jurisdiction sanitary sewer system and passes through the sanitary sewer system to the jurisdiction sewage treatment plant for treatment.
90. Sanitary Sewer means the system of pipes, conduits, and other conveyances which carry industrial waste and domestic sewage from residential dwellings, commercial buildings, industrial and manufacturing facilities, and institutions, whether treated or untreated, to the jurisdiction sewage treatment plant (and to which stormwater, surface water, and groundwater are not intentionally admitted).
91. Sediment means soil (or mud) that has been disturbed or eroded and transported by water, wind, gravity, or tracked by equipment tires.
92. Sedimentation is the process that deposits soils, debris, and other materials either on other ground surfaces or in bodies of water or stormwater drainage systems.
93. Septic Tank Waste means any domestic sewage from holding tanks such as vessels, chemical toilets, campers, trailers, septic tanks and aerated tanks.
94. Shall means mandatory; may means discretionary.
95. Site means the land or water area where any facility or activity is physically located or conducted, including adjacent land used in connection with the facility or activity.
96. Slope Disturbance Line is the line which delineates relatively level building areas from areas where slopes exceed 7 percent (7%) and where special precautions must be taken.
97. Small Quantity Generator Waste means any hazardous waste generated by a small quantity generator as defined by the IEPA.

98. Solid Waste means any garbage, rubbish, refuse and other discarded material, including solid, liquid, semisolid, or contained gaseous material, resulting from industrial, municipal, commercial, construction, mining or agricultural operations, and residential, community and institutional activities.
99. State means the State of Illinois.
100. Storm Drainage System means all surfaces, structures and systems that contribute to or convey stormwater, including private drainage systems, the MS4, surface water, groundwater, Waters of the State and Waters of the United States.
101. Storm Sewer is a closed conduit for conveying collected stormwater.
102. Stormwater means runoff resulting from precipitation and snowmelt.
103. Storm Water Pollution Prevention Plan (SWP3) means a document that describes the Best Management Practices to be implemented at a site, to prevent or reduce the discharge of pollutants.
104. Stream is any river, creek, brook, branch, flowage, ravine, or natural or man-made drainageway which has a definite bed and banks or shoreline, in or into which surface or groundwater flows, either perennially or intermittently.
105. Stripping is any activity which removes the vegetative surface cover including tree removal, by spraying or clearing, and storage or removal of top soil.
106. Subdivision Development includes activities associated with the platting of any parcel of land into two or more lots and includes all construction activity taking place thereon.
107. Surface Water means water bodies and any water temporarily residing on the surface of the ground, including wetlands, lakes, reservoirs, rivers, ponds, streams, puddles, channelized flow and runoff.
108. Ten-Year Event is a runoff, rainfall, or flood event having a ten percent (10%) probability of being equaled or exceeded in any given year.
109. Time of Concentration is the elapsed time for stormwater to flow from the most hydraulically remote point in a drainage basin to a particular point of interest in that watershed.
110. Tributary Watershed is all of the land surface area that contributes runoff to a given point.
111. Two-Year Event is a runoff, rainfall, or flood event having a fifty percent (50%) probability of being equaled or exceeded in any given year.
112. Uncontaminated means not containing harmful quantities of pollutants.

113. Urban runoff pollutants are contaminants found in urban runoff which have been shown to adversely affect uses in receiving waterbodies. Pollutants of concern include sediment, heavy metals, petroleum-based organic compounds, nutrients, oxygen-demanding organics (BOD), pesticides, salt, and pathogens.
114. Used Oil (or Used Motor Oil) means any oil that as a result of use, storage, or handling, has become unsuitable for its original purpose because of impurities or the loss of original properties.
115. Utility Agency means private utility companies, jurisdiction departments or contractors working for private utility companies or jurisdiction departments, engaged in the construction or maintenance of utility distribution lines and services, including water, sanitary sewer, storm sewer, electric, gas, telephone, television and communication services.
116. Vacant land is land on which there are no structures or only structures that are secondary to the use or maintenance of the land itself.
117. Wastewater means any water or other liquid, other than uncontaminated stormwater, discharged from a facility.
118. Water of the State (or water) means any groundwater, percolating or otherwise, lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, inside the territorial limits of the State, and all other bodies of surface water, natural or artificial, navigable or non-navigable, and including the beds and banks of all water courses and bodies of surface water, that are wholly or partially inside or bordering the State or inside the jurisdiction of the State.
119. Water Quality Standard means the designation of a body or segment of surface water in the State for desirable uses and the narrative and numerical criteria deemed by State or Federal regulatory standards to be necessary to protect those uses.
120. Water Quality Volume means the volume necessary to collect 100 percent of the runoff generated from a specified event. This volume shall be detained for a period not less than 24 hours, as measured from the time the pond water surface elevation reaches its 1-Year high water level for detention or 2 Year high water level for certain best management practices.
121. Waters of the United States means all waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and the flow of the tide; all interstate waters, including interstate wetlands; all other waters the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce; all impoundments of waters otherwise defined as waters of the United States under this definition; all tributaries of waters identified in this definition; all wetlands adjacent to waters identified in this definition; and any waters within the federal definition of “Waters of the United States” at 40 CFR Section

122.2; but not including any waste treatment systems, treatment ponds, or lagoons designed to meet the requirements of the Federal Clean Water Act.

122. Watershed is all land area drained by, or contributing water to, the same channel, lake, marsh, stormwater facility, groundwater or depressional area.
123. Wet Bottom Basin is a detention basin designed to maintain a permanent pool of water after the temporary storage of stormwater runoff.
124. Wetland Basin is a detention basin designed with all or a portion of its bottom area as a wetland.
125. Wetlands are defined by regulation as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands generally include swamps, marshes, bogs, and similar areas. For general, but not inclusive locations of potential wetlands refer to the most recent mapping prepared jointly by the U.S. Department of Interior, Fish and Wildlife Service and the Illinois Department of Natural Resources, Office of Resource Conservation; National Wetlands Inventory Mapping, and the NRCS "Swampbuster" Wetland Inventory maps. The applicant may be required to provide an on-site delineation, following currently accepted methodology, completed by a qualified wetland delineator to determine boundaries and the presence of regulated wetlands.
126. Yard Waste means leaves, grass clippings, tree limbs, brush, soil, rocks or debris that result from landscaping, gardening, yard maintenance or land clearing operations.

Section One, Article II – Prohibited Actions

A. Surface Water

Surface water shall be allowed to travel its pre-regulation course unless changes are allowed by means of a Grading and Drainage Permit or grading and drainage plans approved by the appropriate official. It shall be unlawful for any person to force surface water off that person’s property and onto a neighboring property or to prevent surface water which would have entered that person’s property prior to site development or redevelopment, from doing so without approval granted by a Grading and Drainage Permit.

B. Easements

No buildings or permanent structures, including impervious surfaces, may be placed wholly or in part within an easement that has been granted for access to drainage facilities of any type, including agricultural drainage conduit, without the written approval of the appropriate official; provided, however, streets, sidewalks and driveways may be allowed to cross easements by the shortest possible route, provided that other requirements are met.

C. Obstruction of Watercourse

It shall be unlawful for any person to cause or maintain any obstruction within a watercourse or drainage facility of any type, except as may be specifically authorized by this Ordinance.

D. Discharge

No person shall release or cause to be released into the storm drainage system any discharge that is not composed entirely of uncontaminated stormwater, except as allowed in listed exemptions of this Ordinance.

E. Exempted Discharges

The following discharges are exempt from the regulations in this Ordinance:

1. Water line and fire hydrant flushing.
2. Landscape and lawn watering.
3. Rising ground waters.
4. Uncontaminated ground water exfiltration, infiltration, or seepage.
5. Uncontaminated pumped ground water.
6. Discharges from potable water sources (dechlorinated or de minimus discharge only).
7. Uncontaminated foundation drains.
8. Air conditioning condensate.
9. Irrigation water (except for wastewater irrigation).

10. Springs and seeps.
11. Water from crawl space pumps.
12. Footing drains.
13. Water from individual car washing on properties residential zoned.
14. Routine external building wash-down which does not use detergents.
15. Flows from riparian habitats and wetlands.
16. De-chlorinated pH neutral swimming pool discharges.
17. Residual street wash water.
18. Discharges or flows from fire fighting activities.
19. De-chlorinated water reservoir discharges.
20. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed).

F. Pollutant Discharge

Notwithstanding the listed exemptions of this section, any discharge shall be prohibited by this Ordinance if the discharge in question has been determined by the appropriate authority to be a source of pollutants to the storm drainage system.

The construction, use, maintenance or continued existence of illicit connections to the storm drainage system is prohibited. This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.

G. Line Connect

No person shall connect a line conveying sanitary sewage, domestic sewage or industrial waste, to the storm drainage system, or allow such a connection to continue.

H. Interference

No person shall interfere with Best Management Practices (BMPs) implemented pursuant to this Ordinance.

Section One, Article III. – Requirements For Certain Discharges

A. Private Drainage System Maintenance

The owner of any private drainage system shall maintain the system in accordance with applicable permits to prevent or reduce the discharge of pollutants. This maintenance shall include, but is not limited to, sediment removal, bank erosion repairs, maintenance of vegetative cover, and removal of debris from pipes and structures.

B. Minimization of Irrigation Runoff

Irrigation systems shall be managed to reduce the discharge of water from a site.

C. Cleaning of Paved Surfaces Required

The owner of any paved parking lot, street or drive shall clean the pavement as required to prevent the buildup and discharge of pollutants. The visible buildup of mechanical fluid, waste materials, sediment or debris is a violation of this Ordinance. Paved surfaces shall be cleaned by dry sweeping, wet vacuum sweeping, collection and treatment of wash water or other methods in compliance with this Ordinance. This section does not apply to pollutants discharged from construction activities, which are otherwise specified.

D. Mobile Commercial Cosmetic Cleaning Operations

Mobile commercial cosmetic cleaning operations shall not discharge to the storm drainage system in violation of this Ordinance.

E. Maintenance of Equipment

Any leak or spill related to equipment maintenance in an outdoor, uncovered area shall be contained to prevent the potential release of pollutants. Vehicles, machinery and equipment must be maintained to reduce leaking fluids.

F. Materials Storage

In addition to other requirements of this Ordinance, materials shall be stored to prevent the potential release of pollutants. The uncovered, outdoor storage of unsealed containers of hazardous substances is prohibited.

G. Pet Waste

Pet waste shall be disposed of as solid waste or sanitary sewage in a timely manner, to prevent discharge to the storm drainage system.

H. Pesticides, Herbicides and Fertilizers

Pesticides, herbicides and fertilizers shall be applied in accordance with manufacturer recommendations and applicable laws. Excessive application shall be avoided.

I. Prohibition on Use of Pesticides and Fungicides Banned from Manufacture

Use of any pesticide, herbicide or fungicide, the manufacture of which has been either voluntarily discontinued or prohibited by the U.S. or Illinois Environmental Protection Agency, or any Federal, State or jurisdiction regulation is prohibited.

J. Open Drainage Channel Maintenance

Every person owning or occupying property through which an open drainage channel passes shall keep and maintain that part of the drainage channel within the property free of trash, debris, excessive vegetation and other obstacles that would pollute, contaminate, or retard the flow of water through the drainage channel. In addition, the owner or occupant shall maintain existing privately owned structures adjacent to a drainage channel, so that such structures will not become a hazard to the use, function, or physical integrity of the drainage channel. Physical modifications to the drainage channel, other than those necessary to remove debris and other obstacles, are prohibited without a Grading and Drainage Permit.

K. Release Reporting and Cleanup

Any person responsible for a known or suspected release of materials which are resulting in or may result in illegal discharges to the storm drainage system shall take all necessary steps to ensure the discovery, containment, abatement and cleanup of such release. In the event of such a release of a hazardous material, said person shall comply with all state, federal, and local laws requiring reporting, cleanup, containment, and any other appropriate remedial action in response to the release. In the event of such a release of non-hazardous materials, said person shall notify the appropriate official no later than the close of the next business day.

L. Authorization to Adopt and Impose Best Management Practices

The jurisdiction may adopt and impose requirements identifying Best Management Practices (BMPs) for any activity, operation, or facility, which may cause a discharge of pollutants to the storm drainage system. Where specific BMPs are required, every person undertaking such activity or operation, or owning or operating such facility shall implement and maintain these BMPs at their own expense.

Section One, Article IV. – Inspections and Plan Modifications

A. Inspections

The jurisdiction shall make inspections as required and shall notify the Grading and Drainage Permit holder in the event that the work fails to comply with the requirements of this Ordinance. The notification of any deficiencies in the work or violations of this Ordinance shall be posted at the site and mailed to the owner of the site by ordinary mail.

The owner of the site shall notify the appropriate official:

1. Two (2) working days prior to the start of any land disturbing activities,
2. Upon completion of installation of sediment and runoff control measures (including perimeter controls and diversions), prior to proceeding with any other earth disturbance or grading;
3. After stripping and clearing;
4. After rough grading;
5. After seeding and landscaping deadlines;
6. After final stabilization and landscaping and prior to removal of temporary sediment controls.

B. Special Precautions

If at any stage of the grading of any development site the jurisdiction determines by inspection that the nature of the site is such that further work authorized by an existing permit is likely to imperil any property, public way, stream, lake, wetland, or drainage structure, the jurisdiction shall require, as a condition of allowing the work to be done, that such reasonable special precautions to be taken as is considered advisable to avoid the likelihood of such peril. "Special precautions" may include, but shall not be limited to, a more level exposed slope, construction of additional drainage facilities, berms, terracing, compaction, or cribbing, installation of plant materials for erosion control, and recommendations of Certified Professional in Erosion and Sediment Control (CPESC) or registered Professional Engineer which may be made requirements for further work.

Where it appears that storm damage may result because the grading on any development site is not complete, work shall be stopped and the Grading and Drainage Permit holder required to install temporary structures or take such other measures as may be required to protect adjoining property or the public safety. On large developments or where unusual site conditions prevail, the appropriate official shall specify the starting and completion times of required activity or may require that the operations be conducted in specific stages so as to ensure completion of protective measures or devices prior to the advent of seasonal rains.

C. Amendment of Plans

Any significant amendments to grading plans or stormwater pollution prevention plans shall be submitted to the appropriate official of the jurisdiction and shall be processed and approved or disapproved in the same manner as the original plans. Any significant field modifications made without prior approval shall be a direct violation of this Ordinance.

Section One, Article VI. – Maintenance of Drainage Facilities

The jurisdiction will maintain those drainage facilities that are on public land and have been dedicated and accepted for maintenance or stipulated by agreement for maintenance by the jurisdiction. All other drainage facilities, when located on other than public property, shall be the responsibility of the owner of the property on which they exist or the owner of the drainage facility, regardless of whether or not dedicated easements exist over said facilities.

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and appropriate quality assurance procedures.

Abandonment and alteration, either structural or operational, of all facilities and systems shall occur only following application and issuance of a permit.

Operation and maintenance checklists in Appendix C shall be used to determine maintenance needs.

Section One, Article VII. – Enforcement

A. Procedures for Receipt and Consideration of Information by the Public

The jurisdiction shall establish and publicize procedures for receipt and consideration of information regarding non-compliance of provisions in this Ordinance.

B. Right of Entry and Sampling

1. Whenever the appropriate official has cause to believe that there exists, or potentially exists, in or upon any premises any condition which constitutes a violation of this Ordinance, the appropriate official shall have the right to enter the premises at any reasonable time to determine if the discharger is complying with all requirements of this article. In the event that the owner or occupant refuses entry after a request to enter has been made, the jurisdiction is hereby empowered to seek assistance from a court of competent jurisdiction in obtaining such entry.
2. The appropriate official shall have the right to set up on the property of any discharger to the storm drainage system such devices that are necessary to conduct sampling of discharges.

C. Notice of Violation

Whenever an authorized enforcement person determines that a person has violated or failed to meet a requirement of this Ordinance, the enforcement person will order compliance by written Notice of Violation to the responsible person. Posting the written notice on the property will constitute written notice. Whenever possible, a courtesy copy of the Notice of Violation will be mailed by ordinary mail to the address of the property owner according to the records Tax Collector of (jurisdiction) .

The Notice of Violation shall include:

1. The name of the responsible person or property owner.
2. The date and location of the violation.
3. A description of the violation.
4. Actions that must be taken by the responsible person to remedy the violation.
5. The deadline within which the required actions must be completed.
6. Enforcement actions that may be taken by the jurisdiction.
7. Notice date.
8. Any person receiving a Notice of Violation may file a written appeal the Notice to the appropriate official within fifteen (15) days of the Notice date. The appropriate official will

affirm, modify or rescind the Notice in writing, within 15 days of the date of the appeal. If the recipient of a Notice of Violation is dissatisfied with the outcome of the appeal to the appropriate official, the appeal process outlined in Section One, Article 9, of this Ordinance will be followed.

D. Action without Prior Notice

Any person who violates or fails to meet a requirement of this Ordinance will be subject, without prior notice, to one or more of the enforcement actions identified in this Ordinance when attempts to contact the person have failed and the enforcement actions are necessary to stop an actual or threatened discharge which presents or may present imminent danger to the environment or to the health or welfare of persons or to the storm drainage system.

E. Enforcement Actions

Any person who fails to comply with or appeal a Notice of Violation, or fails to comply with an appeal decision of the appropriate authority, will be subject to one or more of the following enforcement actions:

1. Stop Work Order. The appropriate official may issue a stop work order to the owner and contractors on a construction site, by posting the order at the construction site and distributing the order to all jurisdiction departments whose decisions may affect any activity at the site. Unless express written exception is made, the stop work order shall prohibit any further construction activity at the site and shall bar any further inspection or approval necessary to commence or continue construction or to assume occupancy at the site. A Notice of Violation shall accompany the stop work order, and shall define the compliance requirements.
2. Abatement of an Illicit Connection. The appropriate official may order jurisdiction representatives to terminate an illicit connection. Any expense related to such abatement by jurisdiction representatives shall be fully reimbursed by the property owner.
3. Abatement of a Violation on Private Property. When a property owner is not available, not able or not willing to correct a violation, the appropriate official may order jurisdiction representatives to enter private property to take any and all measures necessary to abate the violation. It shall be unlawful for any person, owner, agent or person in possession of any premises to refuse to allow jurisdiction representatives to enter upon the premises for these purposes. Any expense related to such abatement by jurisdiction representatives shall be fully reimbursed by the property owner.
4. Recovery of Costs. Within thirty (30) days after abatement by jurisdiction representatives, the appropriate official shall notify the property owner of the costs of abatement, including administrative costs, and the deadline for payment. The property owner may appeal the recovery costs as outlined in Section One, Article 9 of this Ordinance.
5. Termination of Utility Services. After lawful notice to the customer and property owner concerning the proposed disconnection, the appropriate official shall have the authority to order the disconnection of jurisdiction water, sanitary sewer and/or sanitation services, upon a finding by the appropriate official that the disconnection of utility services will

remove a violation of this Ordinance that poses a public health hazard or environmental hazard.

6. Criminal Prosecution. Any person who violates or continues to violate a prohibition or requirement of this Ordinance shall be liable to criminal prosecution to the fullest extent of the law, and shall be subject to criminal penalties.

F. Criminal Penalties

Any person violating this Ordinance shall, upon an adjudication of guilt or a plea of no contest, be fined a minimum of \$250.00 to a maximum of \$1,500.00. Each separate day on which a violation is committed or continues shall constitute a separate offense.

G. Other Legal Action

Notwithstanding any other remedies or procedures available to the jurisdiction, if any person violates this Ordinance, the jurisdiction Attorney may commence an action for appropriate legal and equitable relief including damages and court costs. The jurisdiction Attorney may seek a preliminary or permanent injunction or both which restrains or compels the activities on the part of the discharger.

H. Abrogation and Greater Restrictions

This Ordinance is not intended to repeal, abrogate or impair any existing easements, covenants, or deed restrictions. Where this Ordinance and other ordinance, easements, covenants, or deed restrictions conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

I. Separability

The provisions and sections of this Ordinance shall be deemed separable and the invalidity of any portion of this Ordinance shall not affect the validity of the remainder.

Section One, Article VIII. – Implementation

This Ordinance is effective upon passage with the following exceptions:

A. Subdivision Improvements

The requirements for obtaining a Grading and Drainage Permit are waived for a period of three (3) years after passage of this Ordinance if the preliminary plat of a subdivision was approved by the appropriate authority prior to the passage of this Ordinance. All other requirements of the Ordinance shall remain in effect.

B. Non-Subdivision Improvements Requiring a Building Permit

The requirements for obtaining a Grading and Drainage Permit for non-subdivision related improvements requiring a building are waived for the duration of the building permit if the building permit was issued prior to the passage of this Ordinance. All other requirements of the Ordinance shall remain in effect.

C. Improvements that Previously Did Not Require a Permit

The requirements for obtaining a Grading and Drainage Permit for construction that did not require a permit prior to passage of this Ordinance are waived for a period of one (1) year if the construction commenced prior to the passage of this Ordinance. All other requirements of the Ordinance shall remain in effect.

Section One, Article IX. – Variances and Appeals

The appropriate entity, after a public hearing and after concurrence by the regional oversight board, if one exists, may: 1) Determine and vary the requirements and regulations of this Ordinance in harmony with their general purpose and intent, where the appropriate entity make written findings of fact in accordance with the standards herein after prescribed and further, find that there are practical difficulties or particular hardships in the way of carrying out the strict letter of requirements and regulations of this Ordinance and 2) Uphold, modify or overrule the decision of the appropriate official.

A written application for a variance from the requirements of this Ordinance or an appeal of a decision by an appropriate official shall be filed within thirty (30) days of the time that the applicant became aware of the need for the variance or the decision of the appropriate official. The application shall fully state the grounds of the request and the facts relied upon by the applicant. Each application shall be filed with the appropriate official. The appropriate officials will review and transmit recommendations to the appropriate entity, which shall review such recommendations prior to granting or denying the variance.

A. Variances

The appropriate entity shall not vary the requirements and regulations of this Ordinance unless evidence is presented that proves that:

1. The land in question is of such shape or size or is affected by such physical conditions or is subject to such title limitations or record, that it is impossible or impractical for the applicant to comply with all of the requirements of this Ordinance and
2. The granting of the variance will not be detrimental to the public welfare, environment or injurious to other property in the vicinity of the subject property and
3. Post construction site peak runoff rate control for sites discharging directly to the Illinois River are unnecessary because: (1) no adverse flooding impacts would potentially be created by increased peak runoff rates along the conveyance between the project site and the River and (2) increased peak runoff rates will not potentially contribute to adverse ecological impacts, including water quality degradation by either artificial or natural mechanisms or by stream erosion. This exemption does not relieve the property owner from constructing and maintaining a sediment trapping BMP following Illinois Urban Manual criteria during construction and a permanent detention facility meeting requirements in this Ordinance.

The appropriate entity shall hold a public hearing on each application for variance within thirty (30) days after the application for a variance is received by the appropriate official. Within thirty (30) days after the public hearing, the appropriate entity shall approve the variance with the conditions it deems necessary, disapprove the variance or take other such action as appropriate.

B. Appeals

The appropriate entity shall consider each application for modification to the decision of an appropriate official at a public meeting within thirty (30) days after the appeal application is received by the appropriate official. Within thirty (30) days after the public meeting, the appropriate entity shall uphold, modify or overrule the decision of the appropriate official.

SECTION TWO CONSTRUCTION SITE RUNOFF CONTROL

Section Two, Article I. – General Requirements for All Construction Sites

A. Responsible Entity

The owner of a site with construction activity meeting the requirements of a Grading and Drainage Permit shall be responsible for compliance with the requirements of this Ordinance.

B. Waste Disposal

Solid waste, industrial waste, yard waste and any other pollutants or waste on any construction site shall be controlled through the use of BMPs. Waste or recycling containers shall be provided and maintained by the owner or contractor on construction sites where there is the potential for release of waste. Uncontained waste that may blow, wash or otherwise be released from the site is prohibited.

C. Ready-Mixed Concrete

Ready-mixed concrete, or any materials resulting from the cleaning of vehicles or equipment containing or used in transporting or applying ready-mixed concrete, shall be contained on construction sites for proper disposal. Release of these materials to any elements of the storm drainage system is prohibited.

D. Soil Erosion and Sediment Control

Appropriate BMPs such as silt fences, diversions, sediment traps, or other appropriate sediment or runoff control measures shall be implemented to prevent the release of sediment from construction sites prior to the commencement of grading activities. Disturbed areas shall be minimized, disturbed soil shall be protected and stabilized and construction entrances shall be managed to prevent sediment tracking onto adjacent roadways. Excessive sediment tracked onto public streets shall be removed immediately. Disturbed areas shall be stabilized with approved vegetative measures within fourteen (14) calendar days following the end of active disturbance or redisturbance. All temporary soil erosion and sediment control BMPs shall remain in place, and be fully maintained, until the establishment of permanent vegetation throughout the construction site at which time they shall be removed within thirty (30) days. Consideration shall be given to environmentally sensitive areas based on slope, soil type, vegetation and proximity to a water body.

E. Continued Compliance

Upon completion of permitted construction activity on any site, the property owner and subsequent property owners will be responsible for continued compliance with the requirements of this Ordinance, in the course of maintenance, reconstruction or any other construction activity on the site.

F. Rights Reserved

The jurisdiction of _____ reserves the right to require any non-agricultural construction development activity, regardless of disturbed area or type of activity, to

comply with this Ordinance if it is determined to be the cause of or a contributor to an existing or potential erosion, sediment, or stormwater impact.

Section Two, Article II. – Grading and Drainage Permit Requirements

A. Permit Exceptions

Except as exempted below, no person shall commence construction prior to obtaining the appropriate Grading and Drainage Permit as defined below. The Appropriate Official will issue Grading and Drainage Permits.

In order to preclude inappropriate phasing of developments to circumvent the intent of this Ordinance, when a proposed development activity will occur on a lot or parcel of land that has contiguous lots or parcels of lands owned by the same property owner, then the criteria as defined in this section will be applied to the total land area compiled from aggregate ownership parcels.

A Grading and Drainage Permit shall not be required for the following:

1. Any construction activity below the minimum thresholds for a Class 1 Grading and Drainage Permit.
2. The agricultural use of land, including the implementation of conservation measures included in a farm conservation plan approved by the Natural Resources Conservation Service, and including the construction of agricultural structures.

B. Class 1 Grading and Drainage Permit

Any construction that meets one of the following thresholds shall require a Class 1 grading and Drainage Permit:

1. Any construction that will include the addition of an impervious surface area (i.e., streets, roof, patio or parking area or any combination thereof) greater than 500 square feet and less than 10,000 square feet requires a Class 1 Grading and Drainage Permit.
2. Any land disturbing activity (i.e., clearing, grading, stripping, excavation, fill, or any combination thereof) that will affect an area greater than or equal to 5,000 square feet and less than one acre (43,560 square feet)
3. Any land disturbing activity that will exceed 100 cubic yards, but does not otherwise require a Class 2 Grading and Drainage Permit.
4. Any land disturbing activity on the sloping side of the slope disturbance line, but does not otherwise require a Class 2 Grading and Drainage Permit.
5. Construction of one or more single-family dwellings that is/are constructed as part of a subdivision development with an approved Storm Water Pollution Prevention Plan.

The issuance of a Grading and Drainage Permit shall constitute an authorization to do only that work which is described on the approved site plan. A Class 1 Grading and Drainage Permit shall be valid for one (1) year after the date of issuance.

C. Class 1 Grading and Drainage Permit Application Forms

A completed application form for Class 1 Grading and Drainage Permit shall include:

1. Name(s), address(es) and telephone numbers of the owner and developer of the site, the contractor(s) and of any consulting firm retained by the applicant identifying the principal contractor.
2. Certification that all construction covered by the Grading and Drainage Permit will be undertaken in compliance with Section Two, Article I (General requirements for All Construction Sites) of this Ordinance.
3. A site plan created with the use of “Erosion Control for Small Projects” worksheet available from (to be determined) or other suitable methods acceptable to the Appropriate Authority showing the amount of impervious area being created and BMPs to be implemented. For Class 1 Permits, stormwater detention calculations shall be provided with the site plan.
4. An application fee as set forth in Section Five of this Ordinance.

D. Class 2 Grading and Drainage Permit

Any construction that meets one of the following thresholds shall require a Class 2 Grading and Drainage Permit:

1. Any construction that will include the addition of an impervious surface area (i.e., streets, roof, patio or parking area or any combination thereof) greater than 10,000 square feet.
2. Any land disturbing activity (i.e., clearing, grading, stripping, excavation, fill, or any combination thereof) that will affect an area greater than one acre (43,560 square feet).
3. A completed application form shall include:
 - a. Name(s), address(es) and telephone numbers of the owner and developer of the site, the contractor(s) and of any consulting firm retained by the applicant identifying the principal contractor.
 - b. Certification that any land clearing, construction, or development involving the movement of earth shall be in accordance with the plans approved upon issuance of the permit.
 - c. An application fee as set forth in Section Five of this Ordinance.

- d. A faithful performance bond or bonds, letter of credit, or other improvement security satisfactory to the jurisdiction Attorney in an amount deemed sufficient by the appropriate official of the jurisdiction to cover all costs of improvements, landscaping, maintenance of improvements and landscaping, and soil erosion and sediment control measures for such period as specified by the jurisdiction and engineering and inspection costs to cover the cost of failure or repair of improvements installed on the site on a form acceptable to the jurisdiction. (See sample in Appendix A). Upon satisfactory completion of the improvements, the documented security would be void.

- e. The following information shall be submitted for both existing and proposed property conditions for all applicable developments: a topographic survey of the property at two-foot (2) contours (or one-foot contours for relatively flat areas where additional detail will be required to review drainage designs) unless otherwise specified or approved by the appropriate jurisdiction official keyed to a consistent vertical datum specified by the jurisdiction; and an existing drainage and proposed drainage plan for the property and one hundred (100) feet surrounding the property at a scale of not more than one hundred (100) feet to one (1) inch, and including the following (unless otherwise specified by the appropriate jurisdiction official):
 - i. Property boundary, dimensions, and approximate acreage
 - ii. Building setback lines
 - iii. All existing and proposed structures and sizes
 - iv. Square feet of existing and proposed impervious surface
 - v. All existing, or proposed easements
 - vi. All existing, abandoned, or proposed water or monitoring well head locations
 - vii. All existing, abandoned, or proposed watermains
 - viii. All sanitary or combined sewer lines and septic systems
 - ix. The banks and centerline of streams and channels
 - x. Shoreline of lakes, ponds, and detention basins with normal water level elevation
 - xi. Farm drains and tiles
 - xii. Location, size and slope of stormwater conduits and drainage swales;
 - xiii. Detention facilities showing inlet and outlet locations and details

- xiv. Roads, streets and associated stormwater inlets including finished grades
 - xv. Base flood elevation, flood fringe, and regulatory floodway
 - xvi. A vicinity map showing the relationship of the site to its general surroundings at a scale of not greater than two thousand (2,000) feet to one (1) inch (1:24,000)
 - xvii. Title, scale, north arrow, legend, seal of Licensed Professional Engineer, date, and name of person preparing plans
 - xviii. Subwatershed boundaries within the property
 - xix. Offsite areas draining to property, including entire offsite drainage boundary(ies)
 - xx. Soil classifications
 - xxi. Depressional storage areas
- f. The following certifications and design statements shall be provided:
- i. Basis of design for the final drainage system components
 - ii. A statement giving any applicable engineering assumptions and calculations
 - iii. A statement by the design engineer of the drainage system's provision for conveying storm flows exceeding the 100-year magnitude
 - iv. Design calculations and other submittals as required by this Ordinance, including flow rates and velocities at critical points in the drainage system
 - v. A statement of certification of all drainage plans, calculations, and supporting data by a Professional Engineer Licensed in the state of Illinois
- g. A depiction of environmental features of the property and immediate vicinity including the following:
- i. The limits of designated regulatory and non-regulatory wetland areas
 - ii. The location of trees greater than eight (8) inches in diameter, taken at 4.5 ft dbh in areas to be disturbed
 - iii. Any designated natural areas or prime farmland
 - iv. Any proposed environmental mitigation features

- v. Location and dimensions of a stream buffer area (if required by local jurisdiction)
- vi. Base flood elevation, flood fringe, and regulatory floodplains
- vii. Abandoned mines
- h. Any and all local, state or federal maps marked to reflect any proposed change in the floodway delineation, base flood, or 100-year frequency flood elevation will change due to the proposed project.
- i. Conditional approval by FEMA or other regulatory agencies of the proposed changes in the floodway map that have been made if the floodway delineation, base flood, or 100-year frequency flood elevation will change due to the proposed project.
- j. Engineering calculations and data supporting all proposed plans. Hydrologic analysis shall be completed in accordance with Section Three, Article II (Hydrologic Design Criteria) of this Ordinance. Detention system design shall be completed in accordance with Section Three, Article III (Detention System Design Criteria) of this Ordinance.
- k. If the project involves channel modification, the following information shall be submitted:
 - i. A discussion of the purpose and need for the proposed work
 - ii. Discussion of the practicability of using alternative locations or methods to accomplish the purpose of the proposed work
 - iii. Analysis of the impacts of the proposed project, considering cumulative effects on the physical and biological conditions of the body of water affected
 - iv. Hydraulic analysis of the channel modifications, including pre- and post-project base flood elevations
 - v. Additional information as required by this Ordinance
- 4. Storm Water Pollution Prevention Plan (SWP3) prepared in accordance with Section 4 of this Ordinance.

E. Submittal, Review, and Approval

If a Building Permit is also required for the development, the Grading and Drainage Permit application shall be submitted to the appropriate department at the time application is made for a Building Permit. Departments of the jurisdiction shall coordinate their activities to prevent additional, unnecessary delays.

- 1. Each application for an approved Grading and Drainage Permit shall be reviewed and acted upon according to the following procedures. The jurisdiction shall:

- a. Provide a written evaluation to the applicant regarding the adequacy and effectiveness of the proposal to address the provisions of this Ordinance. The jurisdiction may retain the services of an independent professional to perform this evaluation. The jurisdiction may assess a fee for this evaluation service as set forth in Section Five of this Ordinance.
 - b. Verify the applicant has filed a Notice of Intent (NOI) with the IEPA for construction site activity and has submitted appropriate permit fees.
 - c. Attend a pre-construction meeting with the applicant or designated agent to review implementation of Grading and Drainage Permit.
 - d. Conduct onsite inspections during the active construction phases of and development projects to determine whether site development is in compliance with the approved grading and drainage plans, and determine adjustments needed to the approved plans. After construction has been completed, determine whether permanent site stabilization has been achieved and identify operation and maintenance needs.
 - e. Prepare correspondence as needed regarding the effectiveness (or corrective measures needed) or adequacy of soil erosion and sediment control measures.
 - f. Provide land developers, consultants, and contractors general guidelines and information concerning the design criteria, installation and maintenance procedures and other information regarding best management practices recommended under the provisions of this Ordinance.
 - g. After review of the application and required submissions if it is found to be in conformance with the provisions of this Ordinance.
 - i. Approve the Grading and Drainage Permit
 - ii. Approve the Grading and Drainage Permit subject to such reasonable conditions as may be necessary to secure substantially the objectives of this Ordinance, and issue the approval subject to these conditions
 - iii. Disapprove the Grading and Drainage Permit, indicating the deficiencies and the procedure for submitting a revised application and/or submission
2. No approval for a Grading and Drainage Permit shall be issued for an intended development site unless one or more of the following have been obtained as applicable:
- a. Land use regulations that apply to the development has been approved by the jurisdiction where applicable.
 - b. Such permit is accompanied by or combined with a valid building permit issued by the jurisdiction building official.

- c. The proposed earth moving is coordinated with any overall development program previously approved by the jurisdiction for the area in which the site is situated.
 - d. All relevant federal, state, and local permits.
 - e. Applicant is successful in the appeals process.
3. Failure of the appropriate official to act on an original or revised application within sixty (60) days of receipt shall authorize the applicant to proceed in accordance with the plans as filed and in compliance with the regulations contained herein, unless such time is extended by agreement between the appropriate official and the applicant. Pending preparation and approval of a revised plan, development activities may be allowed to proceed in accordance with conditions established by the appropriate official.

F. Other Agency Permits and Reviews

1. The appropriate official shall not issue a Grading and Drainage Permit unless all required federal, state and local permits and reviews have been obtained by the applicant and copies thereof reviewed by the appropriate official. The acquisition of these permits shall be the sole responsibility of the applicant. The granting of a Grading and Drainage Permit under these regulations shall in no way affect the owner's responsibility to obtain the approval required by any other statute, ordinance or code, or to meet the requirements of other jurisdiction ordinances and regulations, including but not limited to:
- a) Building or other relevant permits of (jurisdiction);
 - b) Permits in accordance with Sections 401 and 404 of the Clean Water Act; 33 U.S.C. Section 1251, including any joint permit application requirements (e.g., Floodway Construction Permit form IDNR-OWR);
 - c) Permits in accordance with Section 106 of the National Historic Preservation Act;
 - d) Permits required under Section 10 of the Rivers and Harbors Act;
 - e) Permits required by the Illinois Department of Natural Resources, Office of Water Resources in accordance with the Rivers, Lakes and Streams Act, 615 ILCS 5/18, 23, 23(a) and 29(a), and consistent with any applicable regulations including those found at 17 Ill. Adm. Code Parts 3700, 3702, and 3704;
 - f) A Natural Resources Information (NRI) report prepared by the _____ County SWCD under Section 22.02a of the Soil and Water Conservation Districts Act, 70 ILCS Par. 405/1 et.seq.;
 - g) Any reviews required by the Farmland Preservation Act, 505 ILCS 75/6;
 - h) Any reviews required by the Illinois Groundwater Protection Act, 415 ILCS;
 - i) Any permits that may be required by the Illinois Environmental Protection Act, 415 ILCS 5/12 et.seq. including any permits under National Pollutant Discharge Elimination System (NPDES) Permit and 401 Water Quality Certification through the Illinois Environmental Protection Agency, Division of Water Pollution Control, 415 ILCS 5/12 (f);
 - j) Any reviews required by the Threatened and Endangered Species Act, 16 USC 1531 et.seq.;
 - k) Any reviews required by the Illinois Endangered Species Protection Act, 520 ILCS 10/11;
 - l) Conditional Letter of Map Revision, 44 CFR 60; and

- m) Approval/permit from local Flood Insurance Program community.
2. Any work involving the construction, modification or removal of a dam as defined herein, per 92 Ill. Adm. Code 702 (Rules for Construction of Dams), shall require an IDNR/OWR Dam Safety Permit or a letter stating that a permit is not required, prior to permit being issued by the jurisdiction.
 3. Any development involving work in waters of the United States, including wetlands and streams as identified and regulated by the U.S. Army Corps of Engineers, shall require permits or sign-offs from the Corps prior to the issuance of a jurisdiction permit.
 4. Confirmation of compliance or exemption from all applicable entities requiring the above permits or reviews shall be provided by the applicant to the jurisdiction.

G. Permit Limitations

1. The issuance of a Grading and Drainage Permit shall constitute an authorization to do only that work which is described or illustrated on the application for the permit or on the plans and specifications approved by the jurisdiction.
2. The issuance of a permit or the approval of drawings and specifications shall not be construed to be a permit for, nor an approval of, any violation of or deviation from the provision of these Regulations or any other ordinance, law, rule, or regulation.
3. The issuance of a permit, based upon drawings and specifications, shall not prevent the jurisdiction from thereafter requiring the correction of errors in said drawings and specifications or from stopping unlawful construction operations being carried on thereunder.
4. The Grading and Drainage Permit shall be valid until the completion date noted in the permit. The appropriate officials may grant an extension if relevant design and construction standards have not changed and if in the appropriate official's opinion, the work approved under the permit does not unduly adversely affect the health, safety and general welfare of the public. Otherwise, a new permit shall be acquired before work is started or continued. The appropriate official may require modification of the soil erosion and sediment control plan to prevent any increase in erosion or off-site sediment runoff resulting from any extension.

H. Revocation of Permits

1. The appropriate official may revoke a permit:
 - a. Where there has been any false or inaccurate statement or misrepresentation as to a material fact in the application or plans on which the permit was based.
 - b. When work is performed contrary to the provisions of the application or plans on which the permit is based.

2. When a permit is revoked, the appropriate official shall inform the permittee, in writing, of the specific steps the permittee must take in order to have the permit reissued.
3. It shall be unlawful to continue any work authorized by a permit after revocation of that permit until that permit is reissued or until a new permit is issued.
4. In cases where the permittee wishes to appeal the decision of the appropriate official, the appeal process outlined in Section One, Article IX will be followed. An appeal shall stay all proceedings in furtherance of the action appealed from unless the appropriate official certifies to the appropriate authority, after the notice of the appeal has been filed with him, that by reason of facts stated in the certificate a stay would, in his opinion, cause imminent peril to life or property.

I. Retention of Plans

Plans, specifications, and reports for all site developments shall be retained as required by Illinois Statute by the appropriate official.

SECTION THREE POST CONSTRUCTION RUNOFF CONTROL

Section Three, Article I. – Best Management Practices Hierarchy

Use of BMPs identified by this Ordinance, or the use of any other BMPs submitted for approval by the permittee as a substitute, will be a requirement of this Ordinance in obtaining approval for Subdivisions, Building Permits, and Grading and Drainage Permits. This list of definitions is not exclusive and Developers are encouraged to submit alternative BMPs for approval by the jurisdiction Engineer.

It should be noted that many of the BMPs listed in this section require regular maintenance in order to function adequately throughout their design life. Design provisions shall be made to minimize long-term maintenance requirements. In some situations, specific BMPs may be rejected if projected maintenance requirements cannot be met by either the property owner or the jurisdiction.

In the preparation of site design and drainage plans for a development, the applicant shall evaluate and implement, where practicable, site design features that minimize the increase in runoff volumes and rates from the site. The applicant's drainage plan submittal shall include site design features that are consistent with the following hierarchy:

A. Preserving Regulatory Floodplains, Flood Prone and Wetland Areas

1. Buffer Zones. An area along a shoreline, wetland, or stream where development is restricted or prohibited. The primary function of aquatic buffers is to physically protect and separate a stream, lake, or wetland from future disturbance or encroachment. The three types of buffers are water pollution hazard setbacks, vegetated buffers, and engineered buffers.
2. Conservation Easements. Voluntary agreements that allow an individual or group to set aside private property to limit the type or amount of development on their property. The conservation easement can cover all or a portion of a property and can either be permanent or last for a specified time. The easement is typically described in terms of the resource it is designed to protect (e.g., agricultural, forest, historic, or open space easements) and explains and mandates the restrictions on the uses of the particular property.

B. Minimizing Impervious Surfaces on the Property

1. Open Space Design, Conservation Development. A better site design technique that concentrates dwelling units in a compact area in one portion of the development site in exchange for providing open space and natural areas elsewhere on the site. The minimum lot sizes, setbacks and frontage distances for the residential zone are relaxed in order to create the open space.

2. Narrower Streets. In many residential settings, streets can be as narrow as twenty-two (22) to twenty-six feet (26) wide without sacrificing emergency access, on-street parking or vehicular and pedestrian safety. Even narrower access streets or shared driveways can be used when only a handful of homes need to be served. Use of narrower streets will only be allowed on public streets by requesting a variance from the jurisdiction's subdivision ordinance.
3. Eliminating Curbs and Gutters. Elimination of curbs and gutters involves the use of grass swales and ditches as an alternative to convey stormwater runoff, thereby providing natural stormwater filtration and pollution reduction. Eliminating curbs and gutters from public streets will only be allowed by requesting a variance from the jurisdiction's subdivision ordinance.
4. Alternative Turnarounds. Alternative turnarounds are designs for end-of-street vehicle turnaround that replace cul-de-sacs and reduce the amount of impervious cover created in residential neighborhoods. Numerous alternatives create less impervious cover than the traditional forty (40) foot cul-de-sac. These alternatives include reducing cul-de-sacs to a thirty (30) foot radius and creating hammerheads, loop roads, and pervious (grassed) islands in the cul-de-sac center by requesting a variance from the jurisdiction's subdivision ordinance.
5. Alternative Pavers. Alternative pavers are permeable surfaces that can replace asphalt and concrete and can be used for driveways, parking lots, and walkways. Commercially available pavers are used which contain void spaces for grass or clean, washed stone or gravel. Gravel, cobble, or mulch parking lots are prohibited.

C. Storm Water Wetlands, Grassed Swales and Vegetated Filter Strips

1. Storm Water Wetlands. Storm water wetlands (a.k.a. constructed wetlands) are structural practices similar to wet detention ponds that incorporate wetland plants into the design. Storm water wetlands are designed specifically for the purpose of treating storm water runoff and providing enhanced aquatic habitat. A distinction should be made between using a constructed wetland for storm water management and diverting storm water into a natural (existing) wetland. The latter practice is not recommended because altering the hydrology of the existing wetland with additional storm water can degrade the resource and result in plant die-off and the destruction of wildlife habitat. Furthermore, the latter practice may be prohibited by state (IDNR) or federal (USACE) regulations.
2. Grassed Swales. The term swale (a.k.a. grassed channel, dry swale, wet swale, bio-filter) refers to a series of vegetated, open channel management practices designed specifically to treat and attenuate storm water runoff for a specified water quality volume. As storm water runoff flows through these channels, it is treated through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils.

3. Vegetated Filter Strips. Vegetated surfaces that are designed to treat sheet flow from adjacent surfaces. Filter strips function by slowing runoff velocities and filtering out sediment and other pollutants.

D. Infiltrating Runoff On-Site

1. Sand and Organic Filters. Sand filters are usually two-chambered stormwater devices; the first is a settling chamber, and the second is a filter bed filled with sand or another filtering media. As storm water flows into the first chamber, large particles settle out, and then finer particles and other pollutants are removed as storm water flows through the filtering medium. There are several modifications of the basic sand filter design, including the surface sand filter, underground sand filter, perimeter sand filter, organic media filter, and Multi-Chamber Treatment Train.
2. Infiltration Trenches. An infiltration trench is a rock-filled trench with no outlet that receives storm water runoff. Storm water runoff passes through some combination of pretreatment measures, such as a swale and detention basin, and into the trench. There, runoff is stored in the void space between the stones and infiltrates through the bottom and into the soil matrix.
3. Infiltration Basins. A shallow impoundment that is designed to infiltrate storm water into the ground water. Infiltration Basins should only be used on small drainage areas (less than ten (10) acres), and where soils are highly permeable.
4. Porous Pavements. Porous pavement is a permeable pavement surface with an underlying stone reservoir to temporarily store surface runoff before it infiltrates into the subsoil. This porous surface replaces traditional pavement, allowing parking lot storm water to infiltrate directly and receive water quality treatment. There are a few porous pavement options, including porous asphalt, pervious concrete, and grass pavers.
5. Bioretention. Bioretention areas are landscaping features adapted to provide on-site treatment of storm water runoff. They are commonly located in parking lot islands or within small pockets of residential land uses. Surface runoff is directed into shallow, landscaped depressions. These depressions are designed to incorporate many of the pollutant removal mechanisms that operate in forested ecosystems. During storms, runoff ponds above the mulch and soil in the system. Runoff from larger storms is generally diverted past the facility to the storm drain system. The remaining runoff filters through the mulch and prepared soil mix. Typically, the filtered runoff is collected in a perforated underdrain and returned to the storm drain system.

E. Providing Stormwater Retention Structures

1. On-Lot Treatment. A series of practices that are designed to collect runoff from individual residential or small commercial lots. The primary purpose of most on-lot practices is to manage rooftop runoff and, to a lesser extent, driveway and sidewalk runoff. Although there are a wide variety of on-lot treatment options, they can all be classified into one of three categories: 1) practices that collect and infiltrate rooftop runoff; 2) practices that

divert runoff or soil moisture to a pervious area; and 3) practices that store runoff for later use.

2. Retention Basins. Retention basins are designed to collect and hold stormwater runoff, with no outlet pipes or structures. They are not necessarily infiltration basins, and are best designed to rely mostly on evaporation and groundwater infiltration. Retention basins are only feasible when special circumstances of land and soil type are available.

F. Providing Wet Bottom or Wetland Detention Structures

Defined and controlled under the subsection of this Ordinance titled Detention System Design Criteria.

G. Providing Dry Detention Structures

Defined and controlled under the subsection of this Ordinance titled Detention System Design Criteria. Detention basins shall be designed to remove floatables from stormwater runoff by providing trash grates or special outlet structures that separate floatables.

H. Constructing Storm Sewers

1. Manufactured Products for Storm Water Inlets. A variety of products for storm water inlets known as swirl separators, or hydrodynamic structures. Swirl separators are modifications of the traditional oil-grit separator and include an internal component that creates a swirling motion as storm water flows through a cylindrical chamber. The concept behind these designs is that sediments settle out as storm water moves in this swirling path. Additional compartments or chambers are sometimes present to trap oil and other floatables. There are several different types of proprietary separators, each of which incorporates slightly different design variations, such as off-line application.
2. Catch Basin Inserts. Catch basin efficiency can be improved using commercially available inserts, which can be designed to remove oil and grease, trash, debris, and sediment. Some inserts are designed to drop directly into existing catch basins, while others may require being installed as part of the construction of the basin.
3. In-Line Storage Structures. In-line storage refers to a number of practices designed to use the storage within the storm drainage system to detain flows. Storage is achieved by placing large-volume devices in the storm drainage system to restrict the rate of flow. Devices can slow the rate of flow by storing runoff volume, as in the case of a dam or weir, or through the use of vortex valves, devices that reduce flow rates by creating a helical flow path in the structure.

I. Water Quality and Multiple Uses

The storm drainage system shall be designed to minimize adverse surface and groundwater quality impacts off-site and on the property itself. Detention basins shall incorporate design features to capture stormwater runoff pollutants. In particular, designers shall utilize wet bottom and wetland detention basin designs and all stormwater runoff from the development shall be routed through the basin (i.e. flows shall not be bypassed). Detention of stormwater shall be promoted throughout the property's drainage system to reduce the peak rate of

stormwater runoff and to reduce the quantity of runoff pollutants. The storm drainage system should incorporate multiple uses where practicable. Uses considered compatible with stormwater management include open space, aesthetics, aquatic habitat, recreation (boating, fishing, trails, playing fields), wetlands and water quality mitigation.

Section Three, Article II. – Hydrologic Design Criteria

A. Referenced Standards

Design standards for hydrologic design shall comply with these regulations and with the applicable provisions of the IDOT Drainage and Design Manuals. Where this Ordinance imposes greater restrictions than those imposed by the IDOT Drainage and Design Manuals or those required by other provisions of law or ordinance, the provisions of this Ordinance shall prevail.

B. Release Rates

The drainage system for new developments or redevelopments meeting the requirements of a Class 2 Grading and Drainage Permit shall be designed to control the peak rate of discharge from the total property under development for the one- (1-) year¹, ten- (10-) year, and one hundred- (100-) year, storm events. The allowable release rates for the three design storms are as follows:

<u>Event frequency</u>	<u>Maximum release rate (cfs/acre)</u>
1-year	Varies ²
10-year	0.08
100-year	0.30

¹ Properties discharging directly to the Illinois River are not required to limit 10-year and 100-year post-development peak flow rates as shown above. However, these properties are required to provide 24-hour detention for the 1-year storm to provide water quality protection.

² The 1-year release rate shall be set to provide 24 hour detention time. A sample detention calculation may be found in Appendix D.

If it is determined that the downstream (receiving) storm drainage system cannot safely convey the allowable release rate(s), the release rate(s) shall be lowered such that the receiving system can safely handle the detention pond discharge. The applicant shall provide documentation that downstream capacity is adequate and erosion prevention measures will be installed.

C. Drainage System Design and Evaluation

The following criteria should be used in evaluating and designing the drainage system. The design will provide capacity to pass the ten (10) year peak flow in the minor drainage system and an overland flow path (major drainage system) for flows in excess of the design capacity. Whenever practicable, the stormwater systems shall not result in cross connections between different storm sewer systems unless no other alternative exists.

D. Design Methodologies

Choose an applicable hydrologic design method according to the IDOT Drainage Manual, Figure 4-001, with the following modifications and clarifications. Major and minor conveyance systems for areas up to ten (10) acres, may be designed using the Rational Formula. The Rational Formula may also be used in sizing the minor drainage system for larger sites up to one hundred (100) acres. Runoff hydrograph methods as described in this

Ordinance must be used for major drainage system design for all systems with greater than ten (10) acres of drainage area and for the design of all detention basins.

E. Positive Drainage

All developments must be provided an overland flow path that will pass the one hundred (100) year flow (assuming the minor drainage system is functioning) within designated drainage easements or the public right-of-way with a freeboard of at least one (1) foot. Overland flow paths shall be provided drainage easements unless the flow is contained in the public right-of-way.

F. Methods for Generating Runoff Hydrographs

Runoff hydrographs shall be developed incorporating the following assumptions of rainfall amounts and antecedent moisture.

1. Rainfall. Unless a continuous simulation approach to drainage system hydrology is used, all design rainfall events shall be based on the NRCS Type II rainfall distributions with a 24-hour rainfall duration.
2. Antecedent Moisture. Computations of runoff hydrographs, which do not rely on a continuous accounting of antecedent moisture conditions, shall use Antecedent Moisture Condition II (AMC II).
3. Rainfall Recurrence Interval. The design rainfall recurrence interval shall be set by the design application as follows:

Detention	100 year
Emergency Overflow Routing	100 year
Bridges	100 year
Roadway Underpasses*	50 year
Swales, Ditches, and Culverts*	25 year
Storm Sewers	10 year

* Local, IDNR, or IDOT culvert design criteria may govern in special situations.

G. Culvert, Road and Driveway Crossings

Sizing of culvert crossings shall consider entrance and exit losses as well as tailwater conditions on the culvert. Furthermore, exit velocity calculations shall also be required for all culvert crossings and erosion protection shall be provided where exit velocities exceed 4 fps.

H. Vegetated Filter Strips and Swales

To effectively filter stormwater pollutants and promote infiltration of runoff, sites should be designed to maximize the use of vegetated filter strips and swales. These BMPs shall be designed to follow criteria in the Illinois Urban Manual. Whenever practicable, runoff from impervious surfaces should be directed onto filter strips and swales comprised of native grasses and forbs before being routed to a storm sewer or detention basin.

I. Maintenance Considerations

The stormwater drainage system shall be designed to minimize and facilitate maintenance. Use of native vegetation is strongly encouraged to reduce maintenance, increase wildlife habitat, and to provide other benefits. Wet basins shall be provided with alternate outflows, which can be used to completely drain the pool for sediment removal. Pumping may be considered if drainage by gravity is not feasible. Pre-sedimentation basins shall be included, where feasible, for localizing sediment deposition and removal. Site access for heavy equipment shall be provided.

Long-term maintenance also shall include the routine removal of excessive trash and debris and the removal of obstructions from the basin outlet structure. Periodic removal of accumulated sediment (e.g., from swales, forebays, and settling basins) also shall be done to maintain the function and aesthetics of stormwater facilities. At a minimum, sediment shall be removed from forebays and sediment basins whenever one foot or more of sediment has accumulated in the basin bottom. Naturally landscaped areas of detention and drainage facilities shall be maintained via controlled burning every one to three years, as needed to control invasive weeds. Where controlled burning is not feasible, mowing shall be performed as needed. Mowing should be performed on naturally landscaped areas not suitable for burning on an annual basis and on all turfed areas on a regular basis to maintain grass height below 6 inches.

A maintenance plan for the ongoing maintenance of all stormwater management system components including wetlands is required prior to plan approval. The plan shall include:

1. Maintenance tasks.
2. The party responsible for performing the maintenance tasks.
3. A description of all permanent public or private access maintenance easements and overland flow paths, and compensatory storage areas.
4. A description of dedicated sources of funding for the required maintenance.

J. Provisions for Agricultural Drainage

The applicant shall submit a subsurface drainage inventory for Class 2 Grading and Drainage Permits. The inventory shall locate existing farm and storm drainage tiles by means of slit trenching and other appropriate methods performed by a qualified subsurface drainage consultant. All existing drain tile lines damaged during the investigation shall be repaired.

1. The applicant shall provide a topographical map of the development site showing:
 - a) Location of each slit trench identified to correspond with the tile investigation report with the tile field staked and surveyed at approximately 50 foot intervals
 - b) Location of each drain tile with a flow direction arrow, tile size and any connection to adjoining properties

- c) A summary of the tile investigation report showing trench identification number, tile size, material and quality, percentage of the tile filled with water, percentage of restrictions caused by silting, depth of ground cover, and working status.
 - d) Name, address and phone number of person or firm conducting tile location investigation.
2. Information collected during the drainage investigation shall be used to design and develop a stormwater management system that is appropriate for the development and connecting tile lines on adjoining properties.
 3. Existing easements for any agricultural drainage systems located underneath areas that will be developed shall be preserved. If no such easement exists, an easement shall be dedicated for access and maintenance as provided for in this Ordinance.
 4. All agricultural drainage systems that serve upstream areas outside of the development and that are located underneath areas that will be developed shall be replaced with non-perforated conduit to prevent root blockage, provided, however, that the existing drainage district system may remain in place with the approval of the appropriate entity.
 5. Agricultural drainage systems that, due to development, will be located underneath streets, driveways, and other paved areas as allowed by this Ordinance, shall be replaced with conduits meeting the jurisdiction's standard specifications, as needed to prevent the collapse of the agricultural drainage conduit.
 6. Agricultural drainage systems may be relocated within the development area upon the approval of the appropriate official of the jurisdiction. Such relocation shall maintain sufficient slope and capacity to prevent sedimentation and to prevent an increase in scouring or structural damage to the conduit. Such relocation shall only be with the consent and approval of the appropriate entity responsible for the system. If the system is not under the authority of a drainage district, the appropriate official of the jurisdiction shall consider the interests of those landowners who are served by the system.
 7. Field tile systems disturbed during the process of development shall be reconnected by those responsible for their disturbance unless the approved drainage plan includes provisions for these.
 8. Where tiles are being connected to stormwater facilities or at points of ingress or egress from the development sites, observation structures or similar maintenance and inspection access structures shall be installed.
 9. The development design shall utilize, when permission is granted from the adjoining downstream property owner and where the existing system has adequate capacity and structural integrity, outflow locations that have an existing tile leaving the development site. A subsurface connection to the tile shall be constructed as the primary low flow outlet. A secondary surface outlet shall be designed for outflows exceeding the tile capacity and as a backup system if the downstream tile ceases to function.

10. Surface outflows onto adjoining properties not into a defined channel shall be designed to release as sheet flow using level spreader trenches or alternative designs as approved by the Appropriate Official.

K. Channel Modifications

Channel modification is acceptable if the purpose is to restore natural conditions and improve water quality. If the proposed development activity involves a channel modification, it must be demonstrated that:

1. Water quality and other natural functions would be significantly improved by the modification or the impacts are offset by the replacement of an equivalent degree of natural resource values.
2. The activity has been planned and designed and will be constructed in a way which will minimize its adverse impacts on the natural conditions of the stream or body of water affected.
3. Channel modifications will NOT result in an increase in the base flood elevation or flow velocities. If necessary, hydraulic calculations shall be provided which detail the pre- and post-development 100-year high water elevations and flow velocities.

Section Three, Article III. – Detention System Design Criteria

Developments initiating implementation after the adoption of this Ordinance will use the temporary detention of stormwater runoff from the site to meet release rates as required in this Ordinance and shall follow the following criteria. Implementation is defined by this jurisdiction in Section One, Article VIII of this Ordinance.

A. Referenced Standards

Design standards for detention basin design and construction shall comply with the provisions of the following, unless otherwise stated by this Ordinance.

1. IDOT Standard Specifications, latest edition
2. IDOT Drainage Manual, latest edition
3. Clean Water Act (discharges regulated by the United States EPA through NPDES permits)
4. Jurisdiction of _____ Standard Details and Specifications
5. The Subdivision and Zoning Ordinances
6. 17 Illinois Administrative Code 3702(Rules for Construction of Dams)
7. NRCS/IEPA Illinois Urban Manual

B. Detention Storage Requirements

The design storage to be provided in the detention basin shall be based on the need to restrict the runoff from the 1-year, 10-year and 100-year events to the allowable release rates while providing a minimum of one (1) vertical foot of freeboard for the 100-year event. All detention basin storage shall be computed using Hydrograph Methods utilizing reservoir routing (also called modified puls or level pool) or equivalent method as described by this Ordinance.

C. Waiver of Requirements

1. The requirement for stormwater detention and release rate does not apply when:
 - a. The development is in accord with the approved site plan and is on a lot in a new subdivision for which detention is otherwise provided.
 - b. The development is on a lot or parcel in a subdivision for which detention was provided and approved prior to the effective date of these Regulations.
2. The requirement for stormwater detention and release rate shall be waived by the appropriate jurisdiction official when he/she determines it is in the best interest of the jurisdiction to require fee in lieu of detention as described in Section Three, Article III, R.

D. Ownership

Detention basins are owned and maintained by the property owner (often a Homeowner's Association) unless otherwise described by this Ordinance or indicated by the appropriate jurisdiction official. Property developers shall contact the appropriate jurisdiction official to inquire about the ownership and maintenance responsibility of existing regional detention basins which may affect the development.

E. Maintenance and Repair Responsibilities

1. Detention basins and associated inflow and outflow systems are maintained by the property owner absent any specific legal agreement to the contrary.
2. Maintenance agreements may be required at the option of the appropriate jurisdiction official to define parties responsible for the maintenance of commercial detention basins.
3. The detention basin owner shall be responsible for the following items:
 - a. An annual report on the detention basin condition, using the checklist provided in Appendix C, shall be submitted to the appropriate jurisdiction official.
 - b. At five (5) year intervals, the basin shall be inspected by a professional engineer registered in the State of Illinois. A report of this inspection shall be submitted to the appropriate jurisdiction official within sixty (60) days of the inspection. The inspection shall include an evaluation of the items in the checklist included in Appendix C. An annual report is not required the year the five-year report is due.
 - c. Detention basin owners shall notify subsequent owners of their maintenance responsibilities and transfer basin maintenance records to the party with active maintenance responsibility.
 - d. These requirements shall be effective for all detention basins existing in the jurisdiction of _____ on the date of adoption of this Ordinance as well as detention basins constructed after the effective date.

F. General Basin Design Requirements

1. Erosion Control. Temporary and permanent erosion control shall be required for all detention basins in accordance with this Ordinance.
2. Verification and Final Approval.
 - a. Erosion protection shall be inspected throughout the project duration.
 - b. Detention basin storage volume shall be verified to the satisfaction of the appropriate jurisdiction official through as-built surveys or other means.

- c. Inflow, outflow and emergency overflow elevations and configurations shall be verified through as-built surveys.
 - d. Final vegetative cover and permanent erosion control shall be inspected for completeness of cover.
 - e. The basin will receive final approval upon fulfillment of b, c, and d above, and the anniversary date of maintenance and repair reporting will be recorded as such.
 - f. All basins must receive final approval within ninety (90) days of the substantial completion as determined by the appropriate jurisdiction official of ANY of the following:
 - i. The first phase (as shown on approved plans) of construction of public utilities and roadways in any approved Subdivision project. Detention structures for the ultimate development area must be constructed during the first phase of the project, and approved at its completion. The detention structures must then be maintained and repaired in conformance with this Ordinance, during future construction phases.
 - ii. Parking areas, floor slabs and/or other impervious areas (as shown on approved plans, and not including sidewalks) for work on an individual lot requiring an individual permit under this Ordinance. Phased construction will be treated as in the above case.
 - iii. Mass earthwork or rough grading, if no other phased construction is scheduled to be started within one hundred eighty (180) days.
 - g. Failure to receive final approval as required will be considered a violation of this Ordinance.
3. Infiltration Practices. To effectively reduce runoff volumes, infiltration practices including basins, trenches, and porous pavement should be used when practical and shall follow criteria in the Illinois Urban Manual and other relevant permitting. An appropriate sediment control device shall be provided to remove coarse sediment from stormwater flows before they reach infiltration basins or trenches. Stormwater shall not be allowed to stand more than seventy-two (72) hours over eighty (80) percent of the dry basin's bottom area for the maximum design event. The bottom of infiltration basins or trenches shall be a minimum of three (3) feet above the seasonally high groundwater and bedrock level if practicable. Engineering calculations demonstrating infiltration rates shall be included with the application.
4. Side Slopes. The side slopes of all detention basins at one hundred (100) year, 24 hour capacity should be as level as practicable to prevent accidental falls into the basin and for stability and ease of maintenance. Side slopes of detention basins and open channels shall not be steeper than three (3) to one (1) (horizontal to vertical) – certain types of basins have different requirements as defined by this Ordinance. Detention basin side slopes above

normal pool shall be designed with permanent erosion protection consisting of grass, non-grass vegetation, or other permanent finish. At least six (6) inches of topsoil must be provided on side slopes in shoreline planting zones and above normal pool elevation whenever non-structural, permanent erosion control is not being used. Permanent erosion protection shall be aesthetically suitable to the development or existing surrounding land use.

5. Overflow Structures. All stormwater detention basins shall be provided with an overflow structure capable of safely passing excess flows at a stage at least one foot below the lowest foundation grade in the vicinity of the detention basin. The design flow rate of the overflow structure shall be equivalent to the one hundred (100) year peak inflow rate. Weirs, dams and specialized outflows shall be designed by a Professional Engineer registered in the State of Illinois.
6. Detention Basin Outlet Design.
 - a. Backwater on the outlet structure from the downstream drainage system shall be addressed when designing the outlet. The downstream boundary condition shall be summarized, including all assumptions and calculations used to determine the boundary condition.
 - b. Minimum Detention Outlet Size. Single pipe outlets shall have a minimum inside diameter of 12 inches. If design release rates require a smaller outlet, a design that minimizes clogging shall be used. Minimum outlet restrictor size shall be four (4) inches in diameter provided there is adequate downstream capacity. Smaller restrictors may be considered if adequate protection is provided to prevent clogging at the outlet. Detention volume and corresponding high water level required for a development shall be determined by using the appropriate release rates specified in Section Three, Article II B.
7. Other Design Requirements.
 - a. “Bubble up” outlets are prohibited.
 - b. Pumped outlets and other active control structures are discouraged and must be pre-approved on a case-by-case basis by the appropriate jurisdiction official.
 - c. Temporary erosion techniques shall be used as required to ensure a full stand of cover vegetation in minimum time.
8. Location Requirements.
 - a. In subdivisions, detention basins and their one hundred (100) year design high water shall be contained within platted lots dedicated for drainage purposes. In redevelopments, detention basins and their one hundred (100) year design high water shall be contained within a drainage easement.

- b. Detention basin lots shall have a minimum of twenty (20) feet of frontage on a right-of-way for the purpose of providing unrestricted access for maintenance. Exceptions may be made for infill development.
 - c. A twenty (20) feet minimum setback shall be required from all property lines to the normal pool elevation which is considered to be the elevation of the water level at the permanent depth of the wet basin pool rather than the temporary depth during drainage events.
 - d. Detention basins shall be provided with a minimum of one (1) foot of vertical freeboard above the one hundred (100) year peak design water elevation.
 - e. There shall be at least two (2) feet of freeboard between the one hundred (100) year design water elevation and all boundaries of the parcel or easement containing the basin.
9. Accommodating Flows from Upstream Tributary Areas. Stormwater runoff from areas tributary to the property shall be considered in the design of the property's drainage system. Flows from upstream areas that are not to be detained should be routed around the basin being provided for the site being developed.
10. Upstream Areas NOT Meeting Ordinance Requirements. When there are areas not meeting the storage and release rates of this Ordinance, tributary to the applicant's property, the following steps shall be followed:
- a. The applicant shall compute the storage volume needed for his/her property using the release rates and procedures described in this Ordinance.
 - b. Areas tributary to the applicant's property, not meeting the storage and release rate requirements of this Ordinance, shall be identified.
 - c. Using the areas determined above plus the applicant's property area, total storage and release rates needed for the combined properties shall be computed using the release rates and procedures described in this Ordinance. If tributary areas are not developed, a reasonable fully developed land cover, based on local zoning, shall be used for the purposes of computing storage.
 - d. Once the necessary combined storage is computed the jurisdiction may choose to pay for over-sizing the applicant's detention basin to accommodate the regional flows. The applicant's responsibility will be limited to the storage for his property as computed above. If regional storage is selected by the jurisdiction, the jurisdiction will work with the applicant to implement the requirements of this Ordinance. If regional storage is rejected by the jurisdiction, the applicant shall bypass all tributary area flows around the applicant's basin whenever practicable as determined by appropriate jurisdiction official. If the applicant must route upstream flows through his/her basin

and the upstream areas exceed one-square mile in size, the applicant must meet the provisions On-Stream Detention in this Ordinance and applicable IDNR requirements.

11. Upstream Areas Meeting Ordinance Requirements. When there are areas which meet the storage and release rate requirements of this Ordinance, tributary to the applicant's property, the upstream flows shall be bypassed around the applicant's detention basin if this is the only practicable alternative as determined by appropriate jurisdiction official. Storage needed for the applicant's property shall be computed as described in this Ordinance. However, if the jurisdiction decides to route tributary area flows through an applicant's basin, the final design stormwater releases shall be based on the combined total of the applicant's property plus tributary areas. It must be shown that at no time will the runoff rate from the applicant's property exceed the allowable release rate for his/her property alone.
12. Early Completion of Detention Facilities. Where detention or retention are to be used as part of the drainage system for a property, they shall be constructed as the first element of the initial earthwork program. Any eroded sediment captured in these facilities shall be removed by the applicant on a regular basis and before project completion in order to maintain the design volume of the facilities.

G. Wet Bottom Detention Basin Design

Wet bottom detention basins shall be designed to remove stormwater pollutants, to be safe, to be aesthetically pleasing, and as much as feasible to be available for recreational use.

1. Wet Bottom Basin Depths. Wet bottom basins shall be at least three feet deep, excluding near-shore zones and safety ledges. If fish habitat is to be provided they shall be at least ten (10) feet deep over twenty-five (25%) percent of the bottom area to prevent winterkill.
2. Wet Bottom Basin Shoreline Slopes. The side slopes of wet bottom basins shall not be steeper than ten to one (10 to 1) horizontal to vertical from one foot above the normal pool stage to at least one foot below the normal pool stage. Slopes below a depth of 8 feet are permitted to be two to one, In accordance with IDOT Standard Specifications Section 204.

Appropriate soil conditions shall be provided in this shoreline zone. First, compaction of both subsoil and topsoil shall be minimized (i.e., to less than 275 psi). Where subsoil compaction cannot be avoided, it should be disked to a depth of 6-8 inches with a chisel plow before spreading topsoil. Second, a suitable uncompacted topsoil, at a minimum thickness of one foot shall be spread to provide a suitable growing medium for aquatic plants. Coarse soils with minimal clay content and a high organic content are recommended.

Upper slopes of detention basins (higher than one foot above normal stage and including the upstream side of the embankment) should be no steeper than 4:1. Flatter slopes (i.e., 5:1) are preferred to enhance plant establishment and to facilitate long-term maintenance.

3. Permanent Pool Volume. The minimum permanent pool volume in a wet bottom basin at normal depth shall be equal to the runoff volume from its watershed for the two (2) year, twenty-four (24) hour event.
4. Wet Bottom Basin Inlet and Outlet Orientation. The distance between detention inlets and outlets shall be maximized. Inlets and outlets shall be at opposite ends of the basin providing that the orientation does not create undue hardship based on topography or other natural constraints. Designers are encouraged to use baffles or berms in the basin bottom to prevent short-circuiting. There shall be no low flow bypass between the inlet and outlet.
5. Safety Ledge. All wet detention basins shall have a level safety ledge at least four feet in width two and one-half to three (2.5 to 3) feet below the normal water depth.
6. Shoreline Vegetation: Water tolerant native vegetation shall be used to landscape the shorelines of wet detention facilities. The selected plants and planting methods shall conform to the soils, hydrology, and water quality conditions present in such facilities, with plants being tolerant of highly variable hydrologic conditions and degraded water quality (e.g., high turbidity and salinity content). Plant selection should conform to the guidance in the *Native Plant Guide for Stream and Stormwater Facilities in Northeastern Illinois* (NRCS et al, 1997) which is hereby adopted by reference.

Native vegetation is recommended, but not required, for side slopes (higher than one foot above normal stage) of all detention facilities.

7. Dewatering. An outlet structure shall be provided to allow dewatering of the pond for maintenance. Gravity dewatering is strongly preferred.
8. Soil Permeability. Wet bottom basin design shall include an evaluation of soil permeability. A basin liner shall be included in the design if needed to ensure water retention to normal pool elevation.

H. Wetland Detention Basin Design

In addition to the other requirements of this Ordinance, wetland basins shall be designed to remove stormwater pollutants, to be safe, to be aesthetically pleasing and as much as feasible to be available for multiple uses.

1. Wetland Basin Grading. The side slopes of wetland basins (from one foot above the normal pool stage to at least one foot below the normal pool stage) and the basin bottom shall not be steeper than 10 to 1 (horizontal to vertical). Steeper slopes are permitted in settling basins and open water zones near the basin outlet.

Appropriate soil conditions shall be provided in this shoreline zone. First, compaction of both subsoil and topsoil shall be minimized (i.e., to less than 275 psi). Where subsoil compaction cannot be avoided, it should be disked to a depth of 6-8 inches with a chisel plow before spreading topsoil. Second, a suitable uncompacted topsoil, at a minimum thickness of one foot shall be spread to provide a suitable growing medium for aquatic

plants. Coarse soils with minimal clay content and a high organic content are recommended.

Upper slopes of detention basins (higher than one foot above normal stage) should be no steeper than 4:1. Flatter slopes (i.e., 5:1) are preferred to enhance plant establishment and to facilitate long-term maintenance.

2. Wetland Vegetation: Water tolerant native vegetation shall be used to landscape the shorelines and bottoms (non-open water areas) of wetland detention facilities. The selected plants and planting methods shall conform to the soils, hydrology, and water quality conditions present in such facilities, with plants being tolerant of highly variable hydrologic conditions and degraded water quality (e.g., high turbidity and salinity content). Plant selection should conform to the guidance in the *Native Plant Guide for Stream and Stormwater Facilities in Northeastern Illinois* (NRCS et al, 1997) which is hereby adopted by reference.

Native vegetation is recommended, but not required, for side slopes (higher than one foot above normal stage) of all detention facilities.

I. Dry Detention Basin Design

In addition to the other requirements of this Ordinance, dry basins shall be designed to remove stormwater pollutants, to be safe, to be aesthetically pleasing and as much as feasible to be available for multiple uses.

1. Dry Basin Drainage. Dry basins shall be designed so that eighty percent (80%) of their bottom area shall have standing water no longer than seventy-two (72) hours for any runoff event less than the one hundred (100) year event. Grading plans shall clearly distinguish the wet portion of the basin bottom. Underdrains directed to the outlet may be used to accomplish this requirement.
2. Minimum Bottom Slope. Dry bottom basins shall have two percent (2%) minimum bottom slopes or underdrain systems as approved by the jurisdiction Engineer.
3. Velocity Dissipation. Velocity dissipation measures shall be incorporated into dry basin designs to minimize erosion at inlets and outlets and to minimize resuspension of pollutants.
4. Dry Basin Inlet and Outlet Orientation. Dry basin inlet and outlet orientation shall be the same as for wet bottom basins.
5. Temporary Sediment Trap. A sediment trap shall be constructed at each major inlet to a dry basin during construction. The temporary sediment trap shall be designed in accordance with criteria in the Illinois Urban Manual.

J. Detention in Flood Plains is Prohibited

The placement of detention basins within the 100-year floodplain is prohibited. In the case where there is no regulatory (FEMA) floodplain, and the receiving stream has a drainage area

greater than or equal to one (1) square mile, a 100-year floodplain delineation shall be performed by a Professional Engineer registered in the state of Illinois. This delineation shall be used to determine the areas where detention is prohibited.

K. Detention on Prime Farmland

The placement of detention basins shall avoid the utilization of prime farmland. All detention basin construction shall examine potential impacts to adjacent agricultural land and shall address measures that will be implemented to eliminate such impacts and comply with other relevant permitting.

L. On-Stream Detention

On-stream detention basins are discouraged but will be considered if they provide regional public benefits and if they meet the other provisions of this Ordinance with respect to water quality and control of the one (1) year, 10-year, and one-hundred (100) year, twenty-four (24) hour events from the property. IDNR criteria must also be met for on-stream detention basins. Further criteria are presented in this Ordinance. If on-stream detention is used in watersheds larger than one square mile, the applicant will use hydrologic and hydraulic modeling to demonstrate that the design will not increase the flood levels for any properties upstream or downstream of the property.

Impoundment of the stream as part of on-stream detention SHALL:

1. Require the implementation of an effective non-point source management program throughout the upstream watershed which shall include as a minimum:
 - a. Best Management Practices (BMPs) for runoff reduction consistent with the hierarchy for Minimization of Runoff Volumes and Rates as defined in this Ordinance; and
 - b. Two year, 24 hour detention/sedimentation basins for all development consistent with the definition of Temporary Sediment Trap.
 - c. A program to control nonpoint sources at the source for prior developments constructed without appropriate stormwater BMPs.
2. Include a design for appropriate bank stabilization measures, based on flow velocity calculations, and a pre-sedimentation basin.
3. Comply with other relevant permitting and/or ordinances.

Impoundment of the stream as part of on-stream detention SHALL NOT:

1. Prevent the migration of indigenous fish species, which require access to upstream areas as part of their life cycle, such as for spawning.
2. Cause or contribute to the degradation of water quality or stream aquatic habitat.
3. Involve any stream channelization or the filling of wetlands.
4. Occur downstream of a wastewater discharge.

5. Contribute to the duration or flood frequency of any adjacent land.

M. Protection of Wetlands, Rivers, Streams, Lakes, Ponds, and Depressional Storage Areas

Wetlands, rivers, streams, lakes and ponds shall be protected from damaging modifications and adverse changes in runoff quality and quantity associated with land developments. In addition to the other requirements of this Ordinance, the following requirements shall be met for all developments whose drainage flows into wetlands, rivers, lakes or ponds:

1. Detention in Wetlands, Rivers, Streams, Lakes or Ponds. Existing wetlands, rivers, lakes, or ponds shall not be modified for the purposes of stormwater detention unless it is demonstrated that the proposed modifications will maintain or improve its habitat and ability to perform beneficial functions and shall comply with other relevant permitting. Existing storage and release rate characteristics of wetlands, rivers, lakes, ponds, or other depressional storage areas shall be maintained and the volume of detention storage provided to meet the requirements of this section shall be in addition to this existing storage.
2. Sediment Control. The existing wetlands, rivers, lakes or ponds shall be protected during construction and as further regulated in Section Three, Article IV of this Ordinance.
3. Alteration of Drainage Patterns. Site drainage patterns shall not be altered to substantially decrease or increase the existing area tributary to wetlands, rivers, lakes or ponds. Drainage patterns shall not be altered by development to direct runoff offsite to other than natural drainage outlets existing prior to development.
4. Detention/Sedimentation. All runoff from the development shall be routed through a preliminary detention/sedimentation basin designed to capture the two (2) year, twenty-four (24) hour event and hold it for at least twenty-four (24) hours, before being discharged to the wetland, river, lake or pond. This basin shall be constructed before property grading begins and shall be maintained throughout the construction process. In addition, the BMP hierarchy defined in Section Three, Article I, D. should be followed to minimize runoff volumes and rates being discharged to the wetland, river, stream, lake or pond, and as further regulated in Article II and Article IV of this Section.
5. Vegetated Buffer Strip. A buffer strip of at least twenty-five (25) feet in width, vegetated with native plant species, shall be maintained or restored around the periphery of a wetland, river, stream, lake or pond.

N. Street Detention

If streets are to be used as part of the minor or major drainage system, ponding depths shall follow the criteria below:

1. Principal and Minor Arterials

- a. Flow from a ten (10) year storm shall not inundate the center twenty (20) feet of the pavement.
 - b. Flow from a fifty (50) year storm shall be carried without damage to any building.
2. Collector Streets
 - a. Flow from a ten (10) year storm shall not inundate the center ten (10) feet of the pavement.
 - b. Flow from a fifty (50) year storm shall be carried without damage to any building.
3. Local Streets
 - a. Flow from a ten (10) year storm shall not top the curb.
 - b. Flow from a fifty (50) year storm shall be carried without damage to any building.

O. Parking Lot Detention

The maximum stormwater ponding depth in any parking area shall not exceed six (6) inches for more than four (4) hours. Parking layout shall be designed such that handicap parking spaces are outside the design flood limits of the parking lot.

P. Rooftop Detention

Rooftop storage of excess stormwater shall be designed and constructed to meet with the jurisdiction building code.

Q. Fee in Lieu of Detention

1. For the purpose of satisfying the requirements for stormwater detention or compensatory storage for a development or redevelopment on a property for which detention or compensatory storage was not previously provided, a fee in lieu of detention or compensatory storage may be assessed against the development prior to the issuance of a permit. Fees shall be calculated to establish the property's fair share of costs to provide detention or compensatory storage for the watershed or drainage basin in which the property exists. The cost figures used for detention shall be actual costs for detention or compensatory storage being provided by contract or estimated costs for planned detention or compensatory storage facilities approved by the appropriate jurisdiction official. All revenues received through such fees shall be used for no purpose other than defraying public costs associated with providing detention or compensatory storage facilities.
2. The jurisdiction also may require a fee for each acre/foot of detention needed in lieu of the applicant building a basin on site, provided the property will discharge stormwater into existing or proposed detention facilities with added capacity for the additional runoff.

R. Cooperative Detention

The jurisdiction will consider joint detention facilities developed through cooperative efforts that comply with all requirements of this Ordinance.

SECTION FOUR STORMWATER POLLUTION PREVENTION PLAN (SWP3)

A. General

1. The area disturbed shall be assumed to include the entire property area unless the applicable plans specifically exclude certain areas from disturbance.
2. The owner bears the responsibility for implementation of the SWP3 and notification of all contractors and utility agencies on the site.
3. SWP3's must be provided for all phases of development, including sanitary sewer construction, storm drainage system construction, waterline, street and sidewalk construction, general grading and the construction of individual homes. The Class 2 Grading and Drainage Permit holder will not be required to provide an SWP3 for the activities of utility agencies.
4. The jurisdiction of _____ will use the Illinois Department of Transportation (IDOT) system of compliance that is outlined in the Bureau of Design and Environment (BDE) design manual.
5. The subsequent owners of individual lots in a subdivision with an approved SWP3 bears the responsibility for continued implementation of the approved SWP3's for all construction activity within or related to the individual lot, excluding construction managed by utility agencies.

B. Requirements for Utility Construction

1. Utility companies shall be responsible for compliance with the requirements of this Ordinance.
2. Utility companies shall develop and implement Best Management Practices (BMPs) to prevent the discharge of pollutants on any site of utility construction within the jurisdiction. Disturbed areas shall be minimized, disturbed soil shall be managed and construction site entrances shall be managed to prevent sediment tracking. Sediment tracked onto public streets shall be removed immediately by the utility agency.
3. Prior to entering a construction site, utility agencies shall obtain a copy of any SWP3's for the project from the owner. Any disturbance to BMPs resulting from utility construction shall be repaired immediately by the utility company in compliance with the SWP3.

C. Required Documentation

A Class 2 Grading and Drainage Permit requires the execution and record maintenance of the following forms and reports (see also the Erosion Control Plan Action Matrix, NPDES Action Matrix - IDOT). The most current version of the standard forms from the Illinois Department

of Transportation and the Illinois Environmental Protection Agency (IEPA) shall be used. The approved project erosion control documents shall be kept on file at the construction site or at a nearby field office and must be made available to the general public upon request.

1. A Storm Water Pollution Prevention Plan (SWP3) using the IDOT SWP3 Template (form BDE 2342), except that the Illinois Urban Manual, latest amended, shall be referenced in lieu of IDOT Standard Specifications for Road and Bridge Construction.
2. A Contractor Certification Statement (CCS) prepared prior to the start of construction by the contractor responsible for erosion control using the IDOT CCS Template (form BDE 2342a). The Grading and Drainage Permit holder shall provide the contractor responsible for erosion control with a copy of the IEPA NPDES statewide permit ILR10.
3. A Notice of Intent (NOI) shall be filed at least 30 days prior to the start of construction and shall be prepared by the Grading and Drainage Permit holder (the original sent by certified mail to the IEPA with transmittal copy to the appropriate jurisdiction official, and a copy kept in the project erosion control file). Use the IDOT NOI Template (Found in Forms Section of the IDOT Construction Manual WPC 623).
4. A NPDES / Erosion Control Inspection Report (ECIR) shall be prepared by the Grading and Drainage Permit holder on a weekly basis and after any 1/2-inch rainfall (to be kept in project erosion control file). Use current IDOT ECIR template (BC 2259).
5. An Incidence of Non-Compliance (ION) and corrective action shall be filed by the Grading and Drainage Permit holder within five (5) working days of the incident (the original sent by certified mail to the IEPA with transmittal copy to the appropriate jurisdiction official and a copy kept in the project erosion control file). Use current IDOT ION Template (Found in Forms Section of the IDOT Construction Manual WPC 624).
6. A Notice of Termination (NOT) shall be filed upon final stabilization of erosion (minimum 70% viable vegetative growth) by the Grading and Drainage Permit holder (the original sent by certified mail to the IEPA with transmittal copy to the appropriate jurisdiction official and a copy kept in the project erosion-control file). Use current IDOT NOT Template V (found in Forms Section of the IDOT Construction Manual WPC 621).

D. Applicability and Guidelines

1. It is the responsibility of the Grading and Drainage Permit holder to prepare and maintain documentation to meet the NPDES permit requirements for private grading and construction projects.
2. The appropriate jurisdiction official shall be given immediate access to all required project NPDES documents.
3. All notices sent to the IEPA shall be copied to the appropriate jurisdiction official.

E. Referenced Standards

Design standards for soil erosion and sediment control shall comply with the most current provisions of the USEPA regulations, IEPA regulations, IDOT Erosion Control/NPDES guidelines and the latest amended “Illinois Urban Manual”, prepared by the United States Department of Agriculture, Natural Resources Conservation Service, unless otherwise stated by this Ordinance.

The preparation of stormwater pollution prevention plans shall follow the requirements of this Ordinance and the procedures outlined in the latest edition of the “Illinois Procedures and Standards for Urban Soil Erosion and Sediment Control” (commonly known as the “Greenbook”), which is hereby incorporated into this Ordinance by reference.

Practice standards and specifications for measures outlined in the stormwater pollution prevention plan shall follow the requirements of this Ordinance and be as least as protective as criteria in the latest edition of the “Illinois Urban Manual: A Technical Manual Designed for Urban Ecosystem and Enhancement”, which is hereby incorporated into this Ordinance by reference.

In instances where BMPs are not included in the Illinois Urban Manual, design criteria found in IDOT standard specifications or other reference manuals may be used with the approval of the jurisdiction.

F. General Erosion and Sediment Control Design Features

The following principles shall apply to all construction undertaken under the authorization of a Class 2 Grading and Drainage Permit.

1. New development or redevelopment shall be designed to create the least potential for erosion. The disturbance of slopes greater than seven percent (7%) should be avoided wherever possible. Natural contours should be followed as closely as possible.
2. Natural vegetation shall be retained and protected wherever possible. Areas immediately adjacent to natural watercourses, lakes, ponds, and wetlands are to be left undisturbed wherever possible. Temporary crossings of watercourses, when permitted, must include appropriate stabilization measures.
3. Special precautions shall be taken to prevent damages resultant from any necessary development activity within or adjacent to any stream, lake, pond or wetland. Preventive measures shall reflect the sensitivity of these areas to erosion and sedimentation.
4. The smallest practical area of land should be exposed for the shortest practical time during development.
5. Sediment basins or traps, filter barriers, diversions, and any other appropriate sediment or runoff control measures shall be installed prior to site clearing and grading and maintained to remove sediment from run-off waters from land undergoing development.

6. In the design of erosion control facilities and practices, aesthetics and the requirements of continuing maintenance must be considered.
7. Provisions shall be made to accommodate the increased run-off caused by changed soil and surface conditions during and after development. Drainageways should be designed so that their final gradients and the resultant velocities and rates of discharge will not create additional erosion on-site or downstream.
8. Permanent vegetation and structures shall be installed and functional as soon as practical during development. Disturbed areas shall be stabilized with approved permanent measures within seven (7) calendar days following the end of active disturbance or redisturbance consistent with the following criteria:
 - a) Appropriate permanent stabilization measures shall include seeding, mulching, sodding, with non-vegetative measures as a last resort.
 - b) Areas having slopes greater than twelve percent (12%) shall be stabilized with sod, mat, or blanket in combination with seeding or equivalent.
9. Those areas being converted from agricultural purposes to other land uses shall be vegetated with an appropriate protective cover prior to development.
10. All waste generated as a result of site development activity shall be properly disposed of and shall be prevented from being carried off the site by either wind or water.
11. All construction sites shall provide measures to prevent sediment from being tracked onto public or private roadways.
12. All temporary soil erosion and sediment control practices shall be maintained to function as intended until the contributing drainage area has been permanently stabilized at which time they shall be removed within thirty (30) days after final site stabilization.

G. Materials and Construction Notes

Materials and construction notes for BMPs shall be at least as protective as criteria in the Illinois Urban Manual. In instances where BMPs are not included in the Illinois Urban Manual, criteria found in IDOT standard specifications or other reference manuals may be used with approval of the jurisdiction.

H. Testing and Inspection

Use the Residents Weekly NPDES / Erosion Control Inspection Report BC 2259 from the Illinois DOT Construction Manual.

I. Soil Grading and Drainage Plan Requirements

A soil grading and drainage plan, including a narrative shall be submitted showing all measures necessary to meet the objectives of this Ordinance throughout all phases of construction. The development of a soil grading and drainage plan shall follow the requirements of this Ordinance and the procedures in the latest edition of the "Illinois Urban Manual" which is hereby incorporated into this Ordinance by reference. The jurisdiction may waive specific requirements for the content of submissions upon finding

that the information submitted is sufficient to show that the work will comply with the objectives and principles of this Ordinance. Permanent soil erosion and sediment control features needed at the completion of any development site shall be included in the submittal.

The submitted soil grading and drainage plan shall include:

1. Mapping and Descriptions. The existing and proposed erosion and sediment control features of the property and immediate vicinity including:
 - a. Items as required for the Grading and Drainage Plan Submittal.
 - b. Location of the slope disturbance line.
 - c. Location and description of the soil erosion and sediment control measures to be employed during construction.
 - d. For any structures proposed to be located on the slope side of the slope disturbance line, the map shall include the limits of disturbance including: tree removal, soil erosion and sediment control measures during construction, details of method(s) proposed for providing slope stability, permanent stormwater control measures, and permanent erosion and sediment control measures all being certified by a registered Professional Engineer or a "Certified Professional Erosion Control Specialist."
 - e. The predominant soil types on the site, their location, and their limitations for the proposed use as defined by the U.S.D.A. Natural Resources Conservation Service (NRCS).
 - f. Location and description, including standard details, of all sediment control measures and specifics of sediment basins and traps, including outlet details.
 - g. Location and description (specification) of all soil stabilization and erosion control measures, including seeding mixtures and rates, types of sod, method of seedbed preparation (type and extent of tillage, weed control, planting equipment, etc.), expected seeding dates, type, method and rate of lime and fertilizer application (soil fertility testing required), kind and quantity of mulching for both temporary and permanent vegetative control measures, and types of non-vegetative stabilization measures.
 - h. Location and description of all runoff control measures, including diversions, waterways, and outlets.
2. Larger sites, at the discretion of the appropriate jurisdiction official, and those requiring a Stormwater Pollution Prevention Plan (SWP3), may also require the following:

- a. Location and description of methods to prevent tracking of sediment off-site including construction entrance details, as appropriate.
- b. Description of dust and traffic control measures.
- c. Provisions for maintenance of control measures, including type and frequency of maintenance, easements, and estimates of the cost of maintenance.
- d. Identification (name, address, and telephone) of the person(s) or entity which will have legal responsibility for maintenance of soil erosion and sediment control structures and measures during development and after development is completed.

J. Site Development Requirements

On-site sediment control measures, as specified by the following criteria, shall be constructed as specified in the referenced handbooks, and functional prior to initiating clearing, grading, stripping, excavating or fill activities on the site.

1. For new developments or re-developments of more than one (1) acre but less than five (5) acres, a sediment trap or equivalent control measure shall be constructed at the downslope point of the disturbed area.
2. For new developments or re-developments of greater than five (5) acres, a sediment basin or equivalent control measure shall be constructed at the down slope point of the disturbed area.
3. Sediment basin and sediment trap designs shall provide for both "dry" detention and "wet" detention sediment storage. The detention storage shall be composed of equal volumes of "wet" detention storage and "dry" detention storage and each shall be sized as regulated in this Ordinance. The release rate of the basin shall be that rate as regulated in this Ordinance. The elevation of the outlet structure shall be placed such that it only drains the dry detention storage.
4. The sediment storage shall be sized to store the estimated sediment load generated from the site over the duration of the construction period with a minimum storage equivalent to the volume or sediment generated in one year. For construction periods exceeding one year, the 1-year sediment load and a sediment removal schedule may be substituted.
5. To the extent possible or as otherwise regulated in this Ordinance all desirable trees eight (8) inches in diameter (measured at 4.5 ft. dbh) and larger shall be protected for their present and future value for erosion protection and other environmental benefits. Trees that have been selected for preservation shall be protected following criteria in the Illinois Urban Manual prior to the beginning of any clearing, grading, stripping, excavation, or filling of the site. A "No" construction zone shall be established and marked at the perimeter of the dripline of each tree which is to be preserved.
6. Stormwater conveyance channels, including ditches, swales, and diversions, and the outlets of all channels and pipes shall be designed and constructed as regulated in this Ordinance.

All constructed or modified channels shall be stabilized within forty-eight (48) hours, consistent with the following standards and as required in the referenced handbooks:

- a. For grades up to four percent (4%), seeding in combination with mulch, erosion blanket, or an equivalent control measure shall be applied. Sod or erosion blanket or mat shall be applied to the bottom of the channel.
 - b. For grades of four to eight percent (4-8%), sod or an equivalent control measure shall be applied in the channel.
 - c. For grades greater than eight percent (8%), rock, riprap, or an equivalent control measure shall be applied over filter fabric or other type of soil protection, or the grade shall be effectively reduced using drop structures.
7. Land disturbance activities in stream channels shall be avoided, where possible, or as regulated this Ordinance. If disturbance activities are unavoidable, the following requirements shall be met.
- a. Construction vehicles shall be kept out of the stream channel to the maximum extent practicable. Where construction crossings are necessary, temporary crossings shall be constructed of non-erosive material, such as riprap or gravel.
 - b. The time and area of disturbance of stream channels shall be kept to a minimum. The stream channel, including bed and banks, shall be stabilized within 48 hours after channel disturbance is completed, interrupted, or stopped.
 - c. Whenever channel relocation is necessary, the new channel shall be constructed under dry conditions and fully stabilized before flow is diverted, incorporating meanders, pool and riffle sequence, and riparian planting.
8. Storm sewer inlets and culverts shall be protected by sediment traps or filter barriers meeting accepted design standards and specifications.
9. Soil storage piles containing more than ten (10) cubic yards of material shall not be located with a downslope drainage length of less than fifty (50) feet to a roadway, drainage channel, or abandoned mine. Filter barriers, including straw bales, filter fence, or equivalent, shall be installed immediately surrounding the perimeter of the pile.
10. If dewatering devices are used, discharge locations shall be protected from erosion. All pumped discharges shall be routed through appropriately designed sediment traps or basins, or equivalent and shall not be deposited into an abandoned mine.
11. Each site shall have graveled (or equivalent) entrance roads, access drives, and parking areas of sufficient length and width to prevent sediment from being tracked onto public or private roadways. Any sediment reaching a public or private road shall be removed by

shoveling or street cleaning (not flushing) before the end of each workday and transported to a controlled sediment disposal area.

SECTION 5 FEES

APPENDIX A

**SAMPLE
LETTER OF CREDIT**

_____ (name of bank) _____

_____ (City bank's located) _____, _____ (State) _____

Irrevocable Credit No. _____

Date: _____, 20____

City/County of _____, Illinois
_____, Illinois

All drafts must be marked:
"Drawn under Credit No. _____,
dated _____, 20____

Gentlemen:

We hereby open an Irrevocable Letter of Credit in the amount of _____
_____ (\$ _____) in your favor for
the account of _____
(Developer), the developer of _____ (name of project) _____,
proposed in the City/County of _____, Illinois, or within
its territorial jurisdiction, for the benefit of the City/County of _____.
Said money hereunder shall be available by your drafts at sight drawn on us drawn in the name
of the City/County of _____, Illinois. All drafts so drawn
must be marked "Drawn under _____ (name of bank) _____, Credit No. _____
dated _____, 20____."

Drafts must be accompanied by a signed statement by the appropriate official of the
City/County of _____, Illinois, that the request is for the installation or
construction of improvements required pursuant to the plans, specifications, and cost estimates
dated _____, 20____, and approved by the City/County of _____,
Illinois, and on file with the appropriate official. Further, all requests for disbursements under
this Letter of Credit made prior to (must be 2 years after filing) _____, 20____, shall be
submitted by developer and accompanied by a certified estimate of units and value of work
completed with contractor's sworn statement and waiver of mechanics' liens, all approved by the
Developer's engineer and the appropriate official of the City/County of _____,
Illinois. It is understood as to all disbursements that the appropriate official shall approve partial
drawings only as long as there remains a sufficient balance to the Credit to cover his then current
estimate of costs for the required improvements which at that time remain to be completed but in
no case shall his approval exceed ninety percent (90%) of the value of work completed.

In the event that all of the work for the improvements is not completed to the satisfaction
of the City/County on or before (1 day short of 2 years after filing) _____, 20____, the funds
remaining under this Letter of Credit shall be available to the City/County of _____,
Illinois upon presentation of their draft at sight drawn on us in the name of the City/County of
_____, Illinois. This draft so drawn must be marked "Drawn under
_____ (name of bank) _____, Credit No. _____,

dated _____, 20__." Further, such draft shall be accompanied by a signed statement by the appropriate official of the City/County of _____, Illinois as follows: "I, _____ (name) _____, appropriate official for the City/County of _____, Illinois, do hereby certify that work on required improvements for the project named _____ has not been completed to the satisfaction of the City/County of _____ on or before (one day short of two years after filing), 20_____.

This Credit shall expire on (2 years after filing) _____, 20__; provided, however, the undersigned shall notify the appropriate official by certified mail, return receipt requested, at least 90 days prior to expiration date that this Letter of Credit is about to expire and provided, however, in no event shall this Credit expire except upon prior written notice, it being expressly agreed by the undersigned that the above expiration date shall be extended as shall be required to comply with this notice provision.

The undersigned further agrees that this Credit shall remain in full force and effect and pertain to any and all amendments or modifications which may be made from time to time to the specifications, and agreements for the project, without notice from the City/County of the amendments or modifications.

All acts, requirements and other preconditions for the issuance of this Irrevocable Letter of Credit have been completed.

We hereby engage with the drawers, endorsers, and bona fide holders of drafts, drawn under and in compliance with the terms of this Credit, that same shall be honored upon presentation to the drawer. This Credit must accompany any draft which exhausts the Credit and must be surrendered concurrently with the presentation of such draft.

We hereby undertake and engage that all demands made in conformity with this Credit will be honored upon presentation. If, within ten (10) days of the date any demand made in conformity with this Credit is presented, we fail to honor same, we agree to pay all attorneys' fees, court costs, and other expenses incurred by the City/County of _____ in enforcing the terms of this Credit.

Dated: _____, 20__.

(name of bank)

By _____
(title)

Attest:

(title)

**SAMPLE
PERFORMANCE BOND**

KNOW ALL MEN BY THESE PRESENTS, that _____, as
PRINCIPAL, _____, as SURETY, and _____,
as ADDITIONAL SURETY, are held and firmly bound unto the City/County of _____
_____, Illinois, as OBLIGEE, in the sum of _____
_____ (\$ _____) lawful money of the United States,
for the payment whereof to the Obligee, the Principal and the Surety, and Additional Surety bind
themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally,
firmly to these presents:

SIGNED, SEALED AND DATED, THIS _____ day of _____, 20 _____.

WHEREAS, application was made to the Obligee for approval of a project entitled
" _____", located in the City/County of
_____, Illinois, filed with the appropriate official of the
City/County of _____, Illinois, on _____, 20 _____, said
project may be approved upon certain conditions, one of which is that a performance bond in the
amount of _____ (\$ _____),
to be filed with the City/County Clerk to guarantee certain improvements in said project.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the
above named Principal shall within two (2) years from the date hereof will and truly make and
perform the required improvements and construction of public improvements in and adjacent to
said project in accordance with the specifications of the City/County of _____
appropriate department and the Stormwater Regulations of the City/County of _____
_____, then this obligation to be void; otherwise to remain in full force and effect.

It is hereby understood and agreed that in the event that any required improvements have
not been installed as provided aforesaid within the term of this Performance Bond, the
Governing Body may thereupon declare this bond to be in default and collect the sum remaining
payable thereunder and upon receipt of the proceeds thereof, the City/County of _____
_____ shall install such improvements as are covered by this bond and
commensurate with the extent of development that has taken place in said project but not
exceeding the amount of such proceeds.

_____ Principal

By: _____ Principal

_____ Surety

By: _____
Attorney in Fact

Additional Surety

Approved as to Form: _____

By: _____

APPENDIX B

Covenant To Be Included In Subdivision Covenants

Stormwater Detention Basin

A stormwater detention basin has been constructed within the subdivision, in accordance with the requirements of the municipal stormwater ordinance, and is so designated as "Detention Basin" on subdivision plat. The detention basin shall provide for the temporary detention of stormwater runoff from the subdivision to meet release rates as required by the municipality.

The real estate upon which the detention basin is located, designated as Outlot A on the Plat, shall be deeded from the Developer to the Homeowner's Association upon the sale of 75% of the lots within the Subdivision.

The Developer as owner, and subsequent to the conveyance of title, the Homeowners Association as owner, shall be responsible for the following:

- a. An annual report on the detention basin condition, using the checklist, designated below, shall be submitted to the appropriate jurisdiction official.
- b. At five (5) year intervals, the basin shall be inspected by a professional engineer registered in the State of Illinois. A report of this inspection shall be submitted to the appropriate jurisdiction official within sixty (60) days of the inspection. The inspection shall include an evaluation of the checklist items in the checklist below. An annual report is not required the year the five year report is due.
- c. The Developer, as owner, shall notify the Homeowners Association of its maintenance responsibilities and transfer basin maintenance records to the Homeowners Association.

Each owner of an improved lot within the Subdivision shall be assessed by the Homeowners Association for the cost of maintaining the Detention Basin and for the cost of complying with the requirements of these covenants and the requirements of the municipality. The Declaration regarding the establishment of a Homeowners Association and the procedures for the assessment and collection of dues for the cost of maintaining the detention basin shall be filed and recorded by the Developer as a separate document.

DECLARATION OF RESTRICTIVE AND PROTECTIVE COVENANTS AND
CONDITIONS REGARDING THE ESTABLISHMENT OF A HOMEOWNERS
ASSOCIATION FOR THE STORMWATER DETENTION BASIN SYSTEM AS LOCATED
WITHIN _____

Dated _____

Filed _____

To

The Public

This Declaration, made on the date hereinafter set forth by _____

_____, hereinafter referred to as "Declarant".

WITNESSETH:

Whereas, Declarant is the owner of certain property in the City of _____,
_____ County, Illinois, which is more particularly described as :

NOW, THEREFORE, Declarant hereby declares that all of the properties described above shall be held, sold and conveyed subject to the following easements, restrictions, covenants and conditions, all of which are for the purpose of enhancing and protecting the value, desirability and attractiveness of the real property, and for the purpose of complying with stormwater retention requirements of the City of _____. These covenants, restrictions and conditions shall run with the real property and shall be binding on all parties having or acquiring any right, title or interest in the described property or any part thereof, and shall inure to the benefit of each owner thereof.

ARTICLE I.

DEFINITIONS

1. "Association" shall mean and refer to Homeowners Association of _____, Inc., an Illinois nonprofit corporation, its successors and assigns.

2. "Properties" shall mean and refer to that certain real property hereinbefore described, more particularly described as: Lots _____ through _____ of _____, City of _____, Illinois, and such additions thereto as may hereafter be brought within the jurisdiction of the Association.

3. "Lot" shall mean and refer to any plot of land shown upon any recorded subdivision map or plat of the properties.

4. "Member" shall mean and refer to every person or entity who hold membership in the association.

5. "Owner" shall mean and refer to the record owner, whether one or more persons or entities, of a fee simple title to any lot which is a part of the Properties, including contract sellers, but excluding those having such interest merely as security for the performance of an obligation.

6. "Declarant" shall mean and refer to _____, to successors and assigns, if such successors or assigns should acquire more than one undeveloped lot from the Declarant for the purpose of Development.

7. "Developer" shall mean the same as "Declarant".

ARTICLE II

MEMBERSHIP AND VOTING RIGHTS

Every person or entity who is a record owner of a fee or undivided fee interest in any Lot which is subject by covenants of record to assessment by the Association, including contract Sellers, shall be a member of the Association. The foregoing is not intended to include persons or entities who hold an interest merely as security for the performance of an obligation. No owner shall have more than one membership. Membership shall be appurtenant to and may not be separated from ownership of any lot which is subject to assessment by the Association. Ownership of such lot shall be the sole qualification for membership.

ARTICLE III

ESCROW FUND FOR MAINTENANCE

The primary source of funds for maintenance of the master stormwater detention system shall be an escrow fund. Declarant shall establish the Escrow Fund at some local banking institution at such time as the first lot in The Properties is transferred to an owner other than the Declarant. The Association shall have the power to expend the escrow fund for maintenance authorized in accordance with the provisions of Article V.

ARTICLE IV

COVENANT FOR MAINTENANCE ASSESSMENT

1. Creation of the lien and Personal Obligation of Assessments. The Declarant, for each improved Lot owned within the Properties, hereby covenants, and each Owner of any Lot by acceptance of a Deed therefor, whether or not it shall be so expressed in such Deed, is deemed to covenant and agree to pay to the Association: (1) annual assessments or charges, such assessments to be established and collected from time to time as hereinafter provided. The term "improved Lot" shall mean any Lot having a building erected thereon and ready for occupancy as approved by the City of _____, Illinois. The annual assessments, together with interest, shall be a charge on the land and shall be a continuing lien upon the property against which each such assessment is made. Each assessment together with interest, costs and reasonable attorney's fees for collection, shall also be the personal obligation of the person or entity who was the owner of such property at the time the assessment fell due. The personal obligation for delinquent assessments shall not pass to his successors in title unless expressly assumed by them.

2. Purpose of Assessments. The assessments levied by the Association shall be used exclusively to maintain the stormwater detention basin system, as provided for under the Restrictive and Protective Covenants of _____. The Board of Directors of the Association shall establish a budget by January 1st of each year and shall levy

an assessment upon each improved Lot without the Subdivision by February 1st of each year, payable by the 1st day of May.

3. Notice and Quorum for Any Action Authorized Under Section 3. Written notice of any meeting called for the purpose of establishing the budget and making the assessment shall be sent to all members not less than 15 days nor more than 30 days in advance of the meeting. At the first such meeting called, the presence of Members or of proxies entitled to cast 50% of all votes of each class of membership shall constitute a quorum. If the required quorum is not present, another meeting may be called subject to the same notice requirement, and the required quorum at the subsequent meeting shall be one-half of the

required quorum at the preceding meeting. No such subsequent meeting shall be held more than 60 days following the preceding meeting.

4. Uniform Rate of Assessment. Annual assessments must be fixed at a uniform rate for all improved Lots and shall be collected on an annual installment basis, except as hereinafter provided.

5. Date of Commencement of Annual Assessments; Due Dates. The annual assessments provided for herein shall commence as to all improved Lots on the first day of the month following the conveyance of any such improved Lot. The first annual assessment shall be adjusted according to the number of months remaining in the calendar year. The Board of Directors of the Association shall fix the amount of the annual assessment against each lot at least 30 days in advance of each annual assessment period. Written notice of the annual assessment shall be sent to every Owner subject thereto. The annual assessment shall be paid in one annual payment, and the due dates and delinquency dates shall be uniformly established by the Board of Directors of the Association. The Association shall, upon demand, and for a reasonable charge, furnish a certificate signed by an officer of the Association setting forth whether the assessments on a specified Lot are current or delinquent. Such certificate shall be conclusive evidence of payment of any assessment therein stated to have been paid.

6. Effect of Non-payment of Assessments: Remedies of the Association. Any annual payment not paid within 30 days after the due date shall bear interest from the date of delinquency at the rate of 10% per annum. The Association may bring any action at law against the Owner personally obligated to pay the same, or foreclose the lien against the property by an action in equity. In any such action, interest, costs and reasonable attorneys fees shall be added to the amount of the delinquent assessment and collected as part of said judgment. In the event of such foreclosure, if the Association waives any and all rights to a deficiency judgment against the Owner, the period for redemption as provided by the statutes of the State of Illinois shall be reduced to six months from the date of foreclosure sale. Any lot ultimately acquired by the Association through Judges Deed after such a foreclosure shall be sold by the Association within a reasonable time either at public or private sale, and any surplus remaining after the payment of assessments, interest, costs and attorney's fees shall be paid over to the former Owner of said Lot. No Owner may waiver or otherwise escape liability for the assessments provided for herein by non-use of the Detention Basin or by abandonment of his Lot.

7. Subordination of the Lien to Mortgages. The lien of the assessments provided for herein shall be subordinate to the lien of any first mortgage placed upon any Lot. Sale or transfer of any Lot shall not affect the assessment lien. However, the sale or transfer of any lot pursuant to Mortgage foreclosure or any assessments as to payments which became due prior to such sale or transfer, provided that such sale or transfer shall not extinguish the personal obligation of the prior Owner or his heirs, successors or assigns, for payment of such assessment. No sale or transfer shall relieve such Lot from liability for any assessments thereafter becoming due or from the lien thereof.

ARTICLE V

GENERAL PROVISIONS

1. Enforcement. The Association, or any Owner shall have the right to enforce by any proceeding at law or in equity all restrictions, conditions, covenants or reservations now or hereafter imposed by the provisions of this Declaration. The Association shall have the sole right to enforce, by proceedings at law or in equity, the liens and charges now or hereafter imposed by the provisions of this Declaration. Failure by the Association or by any Owner to enforce any covenant or restriction herein contained shall in no event be deemed a waiver of the right to do so thereafter.

2. Severability. Invalidation of any one of these covenants or restrictions by judgment or Court Order shall in no wise affect any other provisions which shall remain in full force and effect.

3. Duration. The covenants and restrictions of this Declaration shall run with and bind the land, for a term of 21 years from the date this Declaration is recorded, after which time they shall be automatically extended for successive periods of 10 years each.

4. Amendment. This Declaration may be amended during the first 21 years period by an instrument signed by not less than 75% of the Lot owners and thereafter by an instrument signed by not less than 65% of the Lot Owners, provided, however, that no such amendment shall be valid or effective until it has been, and a certified copy of said resolution, and a certified copy of the amendment adopted by the Lot Owners, having both been recorded in the office of the Recorder of _____, Illinois.

By: _____
OWNER AND DECLARANT

By: _____
OWNER AND DECLARANT

APPENDIX C

APPENDIX D

Detention Pond Design Example Tri-County Unified Stormwater Ordinance

This design example is intended to provide the design engineer with general guidance for the proper steps in designing a detention pond to meet the requirements in this Ordinance.

40-acre commercial property

Site description:

Existing 40-acre parcel is 1,320 feet by 1,320 feet and has an average land slope ranging from 1% to 2%. The proposed development will consist of several office buildings and a small shopping complex, parking, and roadways. The developer wishes to build a single detention pond to serve the entire site.

Additional site information:

- The site currently drains to an open channel located at the corner of the property along an existing public roadway.
- The open channel has a small drainage area and no associated floodplain.
- No stormwater runoff enters the parcel from other properties.

Suggested Detention Pond Design Analysis Methodology:

- 1) Determine the approximate 100-year storage volume first. This will provide the design engineer with the information necessary to estimate the detention pond footprint and depth.
- 2) Upon establishing the detention pond geometry, develop a stage/storage table for the pond.
- 3) Calculate the 1-year runoff volume and the 1-year peak storage elevation.
- 4) Determine the type/size/elevation of the restriction device necessary to discharge the 1-year storage volume over a 24-hour period.
- 5) Calculate the required 10-year storage volume and 10-year peak storage elevation.
- 6) Determine the type/size/elevation of the restriction device necessary to discharge the 10-year storm at a rate of 0.12 cfs/acre.
- 7) Determine the type/size/elevation of the restriction device necessary to discharge the 100-year storm at a rate of 0.30 cfs/acre.
- 8) Detail the outlet structure.
- 9) Prepare an emergency overflow design.
- 10) Demonstrate adequate freeboard.
- 11) Review downstream hydraulic limitations.
- 12) Review detention pond discharge pipe flow velocity.

Step 1: Calculate Preliminary 100-Year Volume Required

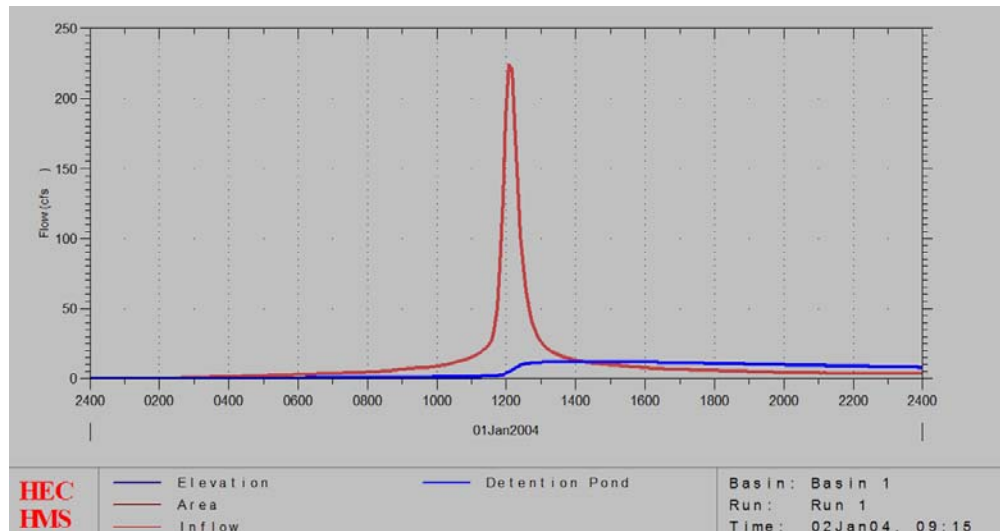
Calculate the volume necessary to detain the 100-year storm event:

Allowable discharge, $Q_a = 0.30 \text{ cfs/acre} \times 40 \text{ acres} = 12 \text{ cfs}$

The Runoff Hydrograph Method must be used, as the site is greater than 10 acres. Using HEC-HMS (public domain hydrologic modeling software), the following variables are used (other software packages, such as PondPack, XP-SWMM, HEC-1, TR-20, and other approved programs, may be used for this analysis):

Time of concentration (T_c): 25 minutes (calculated using TR-55 methodology)
Curve Number (CN): 92 (typical for commercial developments)
100-year 24-hour rainfall depth: 7.4 inches (City of Peoria, Bulletin 70)
Rainfall distribution: NRCS Type II, 24-hour

Using the preliminary site plan and HEC-HMS, an approximate 100-year detention volume is determined at **642,500 cubic feet** (14.75 acre-feet). The following hydrograph demonstrates the detention pond adequately detains flow to the *12 cfs allowable discharge rate*.



Note: Upon finalizing the detention pond outlet design, the detention pond routing calculations will need to be modified (fine-tuned) to reflect the final design contours and outlet structure configuration.

Step 2: Stage/Storage Table

The stage/storage table provides a summary of the contour areas for the proposed detention pond and confirms that the appropriate detention volume is being provided for the proposed site. *The stage/storage table may need to be updated (fine-tuned) after the completion of the detention pond design.*

Provide contour elevations at a 1-foot contour interval. *Elevation 650 represents either the bottom (outlet) of a dry detention basin or the permanent (normal) water level of a wet detention basin.*

Contour Elevation (NGVD)	Contour Area (square feet)	Average Contour Area (square feet)	Depth (ft)	Incremental Volume (cubic feet)	Cumulative Volume (cubic feet)
650	95,000				
		97,100	1	97,100	97,100
651	99,200				
		101,425	1	101,425	198,525
652	103,650				
		105,575	1	105,575	304,100
653	107,500				
		109,950	1	109,950	414,050
654	112,400				
		114,575	1	114,575	528,625
655	116,750				
		118,925	1	118,925	647,550
656	121,100				

Volume required: 642,500 cubic feet

Volume provided: 647,550 cubic feet

Note: Freeboard will be required above the 100-year high water level (see Step 10).

Step 3: 1-Year Storage Volume/Elevation

Calculate the volume necessary to detain the 1-year storm event:

Using the same HEC-HMS hydrologic model, the total runoff volume from the 1-year, 24-hour duration event (2.5-inch rainfall depth, Bulletin 70) is **245,000 cubic feet**. Interpolating between the stage/storage table volumes, this translates to a 1-year high water level of 652.44.

Step 4: 1-Year Hydraulic Restrictor

The 1-year runoff volume must be detained for a 24-hour period. Assuming an orifice will be used to detain the 1-year storm, use the orifice equation to determine the appropriate orifice area:

$$Q = c * a (64.4 * h)^{1/2}$$

c = orifice coefficient
 a = orifice area (square feet)
 h = head above center of orifice (feet)

Solving for Q: Discharge 245,000 cubic feet during a 24-hour period
 $Q_{1yr} = 245,000 \text{ cubic feet per day} / 86,400 \text{ seconds per day}$
 $Q_{1yr} = 2.84 \text{ cfs}$

To solve for area (a), assume an average head (h) of two-thirds (2/3) the 1-year high water level:

$$h_{1yr} = 642.44 - 640.00 = 2.44 \text{ feet}$$
$$\text{Average head} = 2.44 * 0.67 = 1.64 \text{ feet}$$

Using the orifice equation, solve for area (a):

$$a = Q / c(64.4 * h)^{1/2} \quad (\text{assume orifice coefficient} = 0.62)$$

$$a = 2.84 / 0.62(64.4 * 1.64)^{1/2}$$

$$a = 0.45 \text{ square feet}$$

1-year orifice: 9-inch diameter

Recalculate orifice area by adjusting average head. Head should be recalculated to the *center of the orifice*. As the orifice has been calculated at 9 inches (0.75 feet), reduce the average head by 0.38 feet.

$$a = 2.84 / 0.62(64.4 * 1.26)^{1/2}$$

$$a = 0.50 \text{ square feet}$$

1-year orifice: 9.5-inch diameter (bottom of orifice at elevation 650.00)

Step 5: 10-Year Storage Volume/Elevation

Calculate the volume necessary to detain the 10-year, 24-hour duration storm event and restrict the peak discharge to 0.12 cfs per acre. The allowable 10-year discharge would be calculated as follows:

$$Q_{10\text{-year allowable}} = 40 \text{ acres} * 0.12 \text{ cfs/acre} = 4.8 \text{ cfs}$$

Using the same HEC-HMS hydrologic model, approximately **375,000 cubic feet** of detention would be required to detain the 10-year storm (4.6 inch rainfall depth, Bulletin 70). Interpolating between the stage/storage table volumes, this translates to a 10-year high water level of 653.68. The 1-year orifice (9.5-inch diameter), will limit the 10-year discharge rate to 4.5 cfs.

Step 6: 10-Year Storage Restrictor

The 1-year orifice can be used as the 10-year storm restrictor, as the 10-year peak storage results in a peak discharge rate of 4.5 cfs (less than the allowable discharge rate of 4.8 cfs).

Step 7: 100-Year Storage Restrictor

The 100-year allowable flow rate, 12 cfs, will be controlled by an orifice plate at the upstream end of the detention pond discharge pipe. Flows exceeding the 10-year event will spill into a manhole and through a detention pond discharge pipe. The configuration of the detention pond discharge structure is illustrated under *Step 8*:

The size of the orifice is calculated below:

Using the orifice equation, solve for area (a):

$$a = Q / c(64.4 * h)^{1/2} \quad (\text{assume orifice coefficient} = 0.62)$$

$$a = 12 / 0.62(64.4*5.5)^{1/2} \quad (\text{adjust head to account for } \sim 12\text{-inch orifice})$$

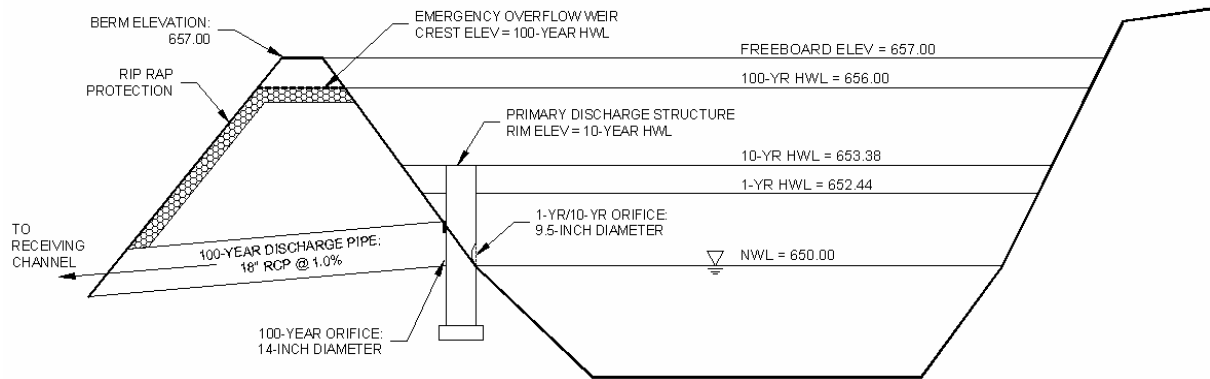
$$a = 1.03 \text{ square feet} \quad (\text{equivalent to } 14\text{-inch diameter})$$

Use an 18-inch discharge pipe with a 14-inch diameter orifice plate.

Note: Downstream boundary conditions (i.e. floodplain, undersized receiving storm sewer, etc.) may impact the detention pond outlet hydraulics. All above calculations assume that the detention pond will discharge freely with no downstream restrictions. The design engineer must certify the hydraulic capacity of the receiving storm sewer/channel and incorporate any adverse tailwater effects in the detention pond discharge calculations (see Step 11).

Step 8: Detail the Outlet Structure

Now that the detention pond discharge structure has been designed, provide a detail of the outlet structure and the design storm high water levels.



DETENTION POND DISCHARGE STRUCTURE

Step 9: Emergency Overflow Design

The emergency overflow device must be capable of conveying discharge from the 100-year fully-developed discharge rate. The HEC-HMS model indicates that the developed 40-acre parcel will discharge at a rate of 224 cfs (NRCS Type II 24-hour rainfall). The most practical way of providing an emergency overflow device for this flow rate is to construct a depression in the detention pond berm (overflow weir).

The emergency overflow weir will have a crest elevation of 656.00 (100-year high water level) and will be wide enough to pass 224 cfs (or other peak discharge rate as calculated by the design engineer). The entire weir will be lined with riprap on a geotextile fabric base. The riprap will extend to the toe of the slope on the outside bank of the detention pond.

Step 10: Freeboard Determination

The 100-year high water level is calculated at 656.00. The minimum berm elevation for the detention pond, other than the emergency spillway, is 657.00, thereby providing one foot of freeboard.

Step 11: Downstream Hydraulic Limitations

The receiving channel is a grassed, trapezoidal channel. The receiving channel collects runoff only from the 40-acre development and is adequately sized to convey the 100-year design discharge rate (12 cfs) and the emergency overflow rate (224 cfs). The discharge structure hydraulics are not impacted by the water levels in the receiving channel.

Step 12: Exit Velocity of Detention Pond Discharge Device

The velocity in the proposed 18-inch discharge pipe is approximately 7 feet per second (fps). This velocity is highly erosive to vegetated channels. Riprap will be placed at the downstream end of the discharge pipe as is appropriate to dissipate the energy of the detention pond discharge. Riprap sizing calculations must be performed to justify riprap gradation and layout.

Appendix C
Conservation Funding List

Created by The Illinois Chapter of The Nature
Conservancy's Volunteer Stewardship Network

CONSERVATION FUNDING LIST

September 2003

Type of Funding Key

A Land Acquisition
H Habitat
E Education
P Planning

Federal Programs/Grants

Name and Description of Program/Grant	Contact Information	Type of Funding (see Key)	Deadlines (if available)
<u>Aquatic Ecosystem Restoration (Section 206)</u> Projects include funding assistance to carry out ecosystem restoration and enhancement that is in the public interest, will improve the environment, and is cost-effective.	<u>US Army Corps of Engineers</u> Phone: 312/353-6400; 309/794-5590; 314/331-8404 http://www.usace.army.mil	H	
<u>Project Modification for the Improvement of the Environment (Sect 1135)</u> Federal funds and technical assistance for planning, engineering, construction, and administration.	<u>U.S. Army Corps of Engineers</u> Phone: 312/353-6400; 309/794-5590; 314/331-8404 http://www.usace.army.mil	H/P	
<u>Clean Water Action Plan</u> The purpose of this program is to provide funding support to eligible organizations or entities who are interested in forming regional watershed roundtables in each of the CWAP regions.	<u>US EPA</u> Phone: 800/490-9198 http://cleanwater.gov/	P	
<u>Environmental Education Grant</u> Eligible project include environmental education activities such as a curricula design or dissemination, designing or demonstrating educational field methods, training educator, or fostering international cooperation.	<u>US EPA</u> Phone: 312/353-3209 http://www.epa.gov/ogd	E	February 14, 2003
<u>Environmental Justice Small Grants</u> Projects include those that use community-based approaches for environmental protection.	<u>US EPA</u> Phone: 312/353-1440 or 800/962-6215 http://www.epa.gov/seahome/resources	E/P	
<u>Smart Growth Funding – US EPA</u> This federal EPA web site, developed in fall 2001,	<u>US EPA</u> http://www.epa.gov/smartgrowth/funding.htm		

<p>has links to dozens of federal and private funding programs to which organizations can apply. The programs are organized under the following categories:</p> <ul style="list-style-type: none"> * General Smart Growth Assistance * Brownfield Redevelopment & Economic Dvpt. * Open Space and Farmland Preservation * Water Quality * Smart Growth & Rural/Native American Comm. * Increasing Transportation Options * Private Foundations 			
<p><u>Sustainable Development Challenge Grant Program</u> Purpose is to provide place-based approaches to urban sprawl and slow the loss of open space.</p>	<p>U.S. EPA Phone: 312/886-4856</p>	P	Need to call for deadlines
<p><u>Great Lakes National Program - US EPA</u> Funds available for habitat protection/restoration, invasive species, strategic or emerging issues.</p>	<p><u>Great Lakes National Program Office</u> Phone: 312/886-6942 http://pss_support@glmpo.net</p>	H	
<p><u>Challenge Grant Program</u> Funds endangered species habitat restoration, streambank stabilization, wetland restoration, & watershed planning.</p>	<p>U.S. Fish & Wildlife Service Phone: 847/381-2253 x216 http://www.fws.gov or http://grants.fws.gov/ Christie_Deloria@fws.gov</p>	H/P	June to August
<p><u>Northeastern Illinois Wetlands Conservation Account</u> This program includes funding restoration, enhancement, appreciation, and stewardship of wetlands.</p>	<p>U.S. Fish & Wildlife Service Phone: 847/381-2253 x216 http://grants.fws.gov/ Christie_Deloria@fws.org</p>	H	Varies
<p><u>USFWS Private Stewardship Grants Program</u> Grants for on-the-ground conservation on private lands that benefit federally listed, proposed, candidate or at-risk species.</p>	<p>U.S. Fish & Wildlife Service Phone: 612/713-5343</p>	H	January 15, 2003
<p><u>Partners for Fish & Wildlife</u></p>	<p>U.S. Fish & Wildlife Service</p>	H	Need to call for

Eligible projects include restoration or enhancement of wildlife habitat, especially wetlands; does not fund land acquisition or salaries.	Phone: 847/381-2253 x216 http://grants.fws.gov/ Christie_Deloria@fws.gov		deadlines
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State Programs/Grants

Name and Description of Program/Grant	Contact Information	Type of Funding (see Key)	Deadlines (if available)
<u>C2000 - Ecosystem Program</u> Provide funding to Ecosystem Partnerships for projects that preserve and enhance the region's resources, while addressing local economic and recreation concerns.	Illinois DNR Phone: 217/782-7940 http://dnr.state.il.us/c2000/manage/partner.htm	A/H/E/P	February
<u>Endangered Species Act Section 6 Grant Program</u> Funding support to agencies responsible for administration and management of areas established conservation of federally listed endangered and/or threatened species.	Illinois DNR Phone: 217/785-8774 http://gkruse@dnrmail.state.il.us	H	September
<u>Natural Areas Acquisition Fund (NAAF)</u> Funds available for the acquisition, preservation, and stewardship of natural areas, including habitats for endangered and threatened species and other areas with unique natural heritage qualities.	Illinois DNR Phone: 217/782-2602 http://www.dnr.state.il.us/finast.htm	H	
<u>Open Lands Trust</u> Provides matching funds for acquisition of open land from willing sellers for public conservation, open space, and natural resource-related recreation purposes.	Illinois DNR Phone: 217/782-7481 http://dnr.state.il.us/ocd/ocdframe.htm	A	
<u>Open Space Land Acquisition & Development Grant (OSLAD)</u> Provides matching funds for acquisition of open space and in some cases restoration and management.	Illinois DNR Phone: 217/782-6501 http://dnr.state.il.us/ocd/ocdframe.htm	A/H	July

<p><u>Project Wild Grants (Schoolyard Habitat Action Grants)</u> Projects available for funding include enhancement of wildlife habitat, with emphasis on youth involvement and education.</p>	<p>Illinois DNR Phone: 217/524-4126 http://dnr.state.il.us/lands/education/CLASSRM/grant</p>	<p>E</p>	<p>Mid-October</p>
<p><u>Project Wild School Site Grants:</u> Eligible projects include enhancement of wildlife habitat, with emphasis on youth involvement and education. Projects must involve WILD educator or facilitator.</p>	<p>Illinois DNR Phone: 217/782-1434 http://dnr.state.il.us/finast.htm</p>	<p>E</p>	<p>Mid-September</p>
<p><u>Incentives for Conservation</u> Urban land that is environmentally sensitive may qualify for significant property tax reductions.</p>	<p>Illinois DNR Phone: 217/785-8774 http://www.dnr.state.il.us/finast.htm</p>		
<p><u>Illinois Trails Grant Program</u> Eligible projects include acquiring or construction non-motorized bicycle and snowmobile paths and facilities.</p>	<p>Illinois DNR Phone: 217/782-7481 http://dnr.state.il.us/ocdframe.htm</p>	<p>A</p>	<p>March & May</p>
<p><u>Illinois Nature Preserves Commission (NAA Stewardship Funds for Mgmt)</u> Funds for restoration and management of dedicated Nature Preserves.</p>	<p>Illinois IDNR/INPC Phone: 217/785-8686 http://www.dnr.state.il.us/finast.htm</p>	<p>H</p>	
<p><u>Illinois Wildlife Preservation Fund (Small Project Program)</u> Eligible projects include those that deal with management, site inventories or on-going education programs.</p>	<p>Illinois DNR Phone: 217/785-8774 http://dnr.state.il.us/finast.htm</p>	<p>H/P/E</p>	<p>April</p>
<p><u>Special Grant Funds for Wildlife Conservation</u> Provides grants through the Habitat, Furbearer, Pheasant, and Waterfowl Programs to protect, acquire, enhance, or manage wildlife habitat and to</p>	<p>Illinois DNR Phone: 217/782-2602 specialfunds@dnrmail.state.il.us/finast.htm</p>	<p>A/H/E</p>	<p>March for Furbearer</p>

support a limited research and education programs.			
<u>Urban & Community Forestry Grant Program</u> Purpose is to create or enhance local forestry program in communities with local forestry ordinances.	<u>Illinois DNR</u> Phone: 217/782-2361 http://www.dnr.state.il.us/finast.htm A listing of previously funded projects can be viewed at: http://www.treelink.org/nucfac/ .	H/P	Varies
<u>Small Projects Fund</u> Assistance for smaller communities for alleviating drainage and/or flood problems.	<u>Illinois DNR (Office Water Resources)</u> Phone: 217/782-4637	A/H/P	Varies
<u>Hazard Mitigation Assistance Program</u> Acquisition of uninsured structures & underlying real property for open space uses.	<u>Illinois Emergency Mgmt. Agency</u> Phone: 217/782-8719	A	
<u>Environmental Education Grant</u> Projects for designing, demonstrating environmental education practices, methods, techniques, or assessing environmental conditions/problems.	<u>Illinois EPA (Watershed Mgmt. Sect.)</u> Phone: 217/782-3362 http://www.epa.state.il.us	E	
<u>Illinois Clean Lakes Program</u> Financial assistance for landowners' interest in long-term, lake management that results in improved water quality.	<u>Illinois EPA (Watershed Mgmt. Sect.)</u> Phone: 217/782-3362 http://www.epa.state.il.us/water/financial-assistance/index.html	P/E	
<u>Lake Education Assistance Program (C2000)</u> Educational initiative for lake/lake watershed related educational activities.	<u>Illinois EPA (Watershed Mgmt. Sect.)</u> Phone: 217/782-3362 http://www.epa.state.il.us/water/financial-assistance	E	
<u>Non-point Source Mgmt. Program (Section 319 Grant)</u> Eligible projects include funding to control or eliminate non-point pollution sources.	<u>Illinois EPA</u> Phone: 217/782-3362 http://www.epa.state.il.us/water/financial-assistance	H/P/E	
<u>Priority Lake & Watershed Implementation Program</u>	<u>Illinois EPA (Watershed Mgmt. Sect.)</u>	H/P/E	

Eligible projects include funding to implement protection or restoration practices that improve water quality prioritized publicly-owned lakes.	Phone: 217/782-3362 http://www.epa.state.il.us/water/financial-assistance		
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County Programs/Grants

Name and Description of Program/Grant	Contact Information	Type of Funding (see Key)	Deadlines (if available)
<u>McHenry Co. Conservation Foundation - Natural Resources & Conservation</u> Funds for land acquisition, restoration, and management of high-quality open space and natural areas, conservation education, and research.	<u>McHenry Co. Conservation Foundation</u> Phone: 815/479-0103	A/H/P/E	May September
<u>North Branch Watershed Project</u> Funding for projects within the North Branch watershed in Lake and Cook Counties. Types of projects include water quality improvement and nonpoint source pollution reduction, reduction of flood damages, natural resources conservation and restoration efforts, and inclusion of education component and/or recreational benefits within the scope of an in-the-ground project.	<u>In Lake County:</u> Sean Wiedel Lake County Stormwater Management Commission Phone: 847/918-7893 Fax: 847/918-9826 e-mail: swiedel@co.lake.il.us <u>In Cook County:</u> John Quail Friends of the Chicago River Phone: 312/939-0490 ext. 20 Email: jquail@chicagoriver.org	H/E	June 2, 2003 December 1, 2003
<u>Habitat Restoration Program for the Fox & Kishwaukee River Watersheds</u> Provide cost-share and technical assistance for the protection, restoration, and enhancement of aquatic resources with secondary benefits to wildlife habitat to landowners in priority areas of the Fox and Kishwaukee River watersheds.	<u>Local Soil & Water Conservation District Offices</u> Boone County - Phone: 815/544-2677 DeKalb County - Phone: 815/756-3237 Kane-DuPage County - Phone: 630/584-7961 Lake County - Phone: 847/223-1056 McHenry County - Phone: 815/338-0099 North Cook County - Phone: 847/468-0071	H	
<u>Conservation 2000 - Steambank Stabilization</u> Eligible projects include vegetative streambank stabilization practices.	<u>Local Soil & Water Conservation District Offices</u> (see listing for Soil & Water Conservation Districts), consult local phone book, or U.S. Dept. Ag. in	H	

	Springfield, IL Phone: 217/492-4180 or 217/398-5267		
<u>SWCD and NRCS Programs for Croplands</u> Tax Incentive Program for Filter Strips Conservation Practices Program Conservation Reserve Program Conservation Reserve Enhancement Program Environmental Quality Incentive Program Forestry Incentive Program Stewardship Incentive Program Wetland Reserve Program Wildlife Habitat Incentive Program	<u>Local Soil & Water Conservation District Offices</u> (see listing for Soil & Water Conservation Districts), consult local phone book, or U.S. Dept. Ag. in Springfield, IL Phone: 217/492-4180 or 217/398-5267	H	
<u>Urban Resources Partnership - Technical Assistance & Grants Program</u> This program will fund projects in the Chicago & East St. Louis metro areas that restore or enhance natural ecosystems through local community-based partnerships.	<u>Urban Resources Partnership</u> Phone: 312/353-2473	H/P/E	

Private/Other Programs/Grants

Name and Description of Program/Grant	Contact Information	Type of Funding (see Key)	Deadlines (if available)
<u>American Greenways Awards Program</u> This program funds greenway and trail projects.	<u>The Conservation Fund - Greenways Coordinator</u> Phone: 703/525-6300 http://www.conservationfund.org	A	
<u>AmeriCorps*NCCC Projects</u> Proposals for team-based, community service projects focusing on areas of education, environment, human needs, and public safety are considered for funding.	<u>AmeriCorps NCCC</u> Phone: 303/844-7412	E	
<u>Captain Planet Foundation</u> Eligible projects include environmental activities for	<u>Captain Planet Foundation</u> Phone: 800/KID-POWER	B	September

children such as urban gardens, water testing, and habitat restoration.	http://www.captainplanetfdn.org		
<u>Chicago Wilderness</u> Eligible projects include community-based partnerships that conserve natural areas, provide for habitat restoration, promote appreciation and understanding of biological diversity.	<u>Chicago Wilderness</u> Phone: 312/346-8166 x30	H/P/E	September
<u>Community Tree Planting & Partnership Enhancement Monetary Grant Program</u> Eligible projects include community tree plantings with seedlings and grants to organizations in urban areas.	<u>National Land Tree Trust</u> Phone: 202/628-8733	H/P	
<u>The Conservation Foundation</u> Protect environmental concerns and preservation of open space, improving rivers and watersheds, and promoting conservation education.	<u>The Conservation Foundation</u> Phone: 630/428-4500 http://www.conservationfoun.org	A/H/P/E	February
<u>Gaylord & Dorothy Donnelley Foundation</u> This foundation is interested in funding conservation projects in the Chicago area.	<u>Judith Stockdale</u> 35 East Wacker Drive, Suite 2600 Chicago, IL 60601	A/H/P/E	Need to call for deadlines
<u>The Eastman Kodak American Greenways Awards</u> This partnership involving Kodak, the Conservation Fund, and the National Geographic Society, provides small grants to stimulate the planning and design of greenways in communities throughout America. The American Greenways program is designed to develop new action-oriented greenway projects; assist grassroots greenway organizations; leverage additional money for conservation and greenway development; and recognize and encourage greenway proponents and organizations.	Applications are available and may be submitted online at Conservation International's Web site. Request For Proposal (RFP) Link: http://www.conservationfund.org/?article=2106 For additional RFPs in Environment, visit: http://fdncenter.org/pnd/rfp/cat_environment.jhtml	H/E/P	
<u>Exxon-Mobile Education Foundation</u> Emphasis is on conservation and education.	<u>Exxon-Mobile</u> Phone: 972/444-1104	E	

<u>Field Foundation of Illinois</u> The focus of these grants is on conservation and education.	<u>Field Foundation of Illinois</u> Phone: 312/831-0910	H/P/E	Mid-January Mid-March Mid-September
<u>Five-Star Restoration Challenge Grant Program</u> Provides funding to support community-based wetland and riparian restoration projects that build diverse partnerships and foster local natural resource stewardship.	<u>Fish & Wildlife Foundation</u> Phone: 202/260-8076 and 202/942-4225 http://www.nfwf.org/programs.htm	H	March
<u>Grand Victoria Foundation</u> This program will fund projects in restoration, pollution prevention, BMP implementation, environmental education, etc.	<u>Grand Victoria Foundation</u> Phone: (847) 289-8575	A/H/P/E	May November
<u>Great Lakes Land Trust Matching Grants Program</u> A majority of the grants are intended to increase land trust organizational capacity. Funding is provided to promote innovative conservation projects and to encourage land trusts partnerships that expand the scope and constituencies of the organizations involved.	<u>Great Lakes Land Trust</u> Phone: 202/638-4725 http://mdanskin@lta.org	P	October
<u>Home Depot Grants</u> Environmental grants are available on an ongoing basis to support the work of nonprofit organizations in four focus areas: Environment, Affordable Housing, At-Risk Youth, and Disaster Preparedness and Response. Environmental proposals should focus specifically on: Forestry and Ecology, Green Building Design, Clean-up and Recycling, and Lead Poisoning Prevention. Applications are accepted throughout the year, and application forms are available online. Applications can be mailed to local Home Depot District Managers or to The Home Depot's Community Affairs department in Atlanta, as indicated on the application form. The review process requires 6 - 8 weeks.	<u>The Home Depot</u> http://www.homedepot.com/ {click on "Environment" at the bottom of the home page, then "Outreach and Grants"}	H/E	

<p><u>Illinois Clean Energy Community Foundation</u> The Foundation provides financial support for programs and projects that benefit the public by preserving and enhancing natural areas and wildlife habitats in Illinois communities. Specially the foundation will provide funding for the acquisition of high-value natural areas and wildlife habitat; planning efforts leading to acquisition of important natural areas; restoration of important natural areas; and building capacity of nonprofit organizations that acquire and manage natural areas, with annual operating budgets of up to \$100,000. (Capacity-building grants are limited to no more than \$40,000 over two years.)</p>	<p><u>Illinois Clean Energy Community Foundation</u> Phone: 312/ 372-5191 http://www.illinoiscleanenergy.org/</p>	<p>A/H/P</p>	<p>January 15, 2003 July 15, 2003</p>
<p><u>Illinois Conservation Foundation</u> This program will provide funding assistance for the preservation and enhancement of natural resources in the state.</p>	<p><u>Illinois Conservation Foundation</u> Phone: 312/814-7237 http://www.ilcf.org</p>	<p>A/H/P/E</p>	<p>February 7, 2003</p>
<p><u>Illinois Native Plant Society (INPS) Research Fund</u> This fund was developed to promote the conservation of Illinois native plants and communities through science research. Eligible research projects may include studies on native plants (including those that are threatened or endangered) such as life history, reproductive biology, demography, genetics, site inventories, community ecology, etc. as well as threats to native plants and communities such as invasive species and their control. Funding requests should not exceed \$1,000, the maximum grant allowed.</p>	<p><u>Illinois Native Plant Society</u> Research Fund Grant Program Forest Glen Preserve 20301 E. 900 North Road Westville, IL 61883 http://www.inhs.usuc.edu/inps</p>	<p>H</p>	
<p><u>Lake Michigan Federation</u> The Great Lakes Aquatic Habitat Network and Fund (GLAHNF) offers grants of up to \$3,500 twice per year for community-based aquatic habitat protection efforts in the Lake Michigan basin. Types of projects that would be considered for funding include, but are not limited to: land use and</p>	<p><u>Lake Michigan Federation</u> Joel Brammeier jbrammeier@lakemichigan.org 312-939-0838x4 A grant application is available online at http://www.qlhabitat.org/grants.html</p>	<p>A/H/P/E</p>	<p>September 30, 2003</p>

<p>watershed advocacy and planning; watchdogging of regulation implementation, reduction of polluted runoff, rehabilitation of ponds, lagoons, shorelines, and other wetland areas for fish and migratory bird habitat, and non-partisan voter education and citizen involvement initiatives. Also, this is the first year of a two-year wetlands theme for GLAHNF, so a portion of the available funds will be dedicated specifically to wetland projects.</p> <p>Key project criteria for all GLAHNF funding: grants are for smaller organizations, with budgets of about \$250,000 or less; projects should be action and advocacy based (education alone will not likely be eligible); funds cannot be used for construction and/or planting costs, but can be used for other aspects of restoration efforts; projects should be in the Lake Michigan drainage basin, or a case must be made that the project will provide benefits to habitats/species inside the basin.</p>			
<p><u>McGraw Foundation</u> The foundations primary areas of interest are the fields of higher education, science, medical research, health, civic and cultural organizations, social services, and the environment.</p>	<p><u>McGraw Foundation</u> Phone: 847/291-9810 http://maxmcgraw@worldnet.att.net</p>	H/P/E	February
<p><u>Motorola Foundation</u> Eligible projects include environmental efforts.</p>	<p><u>Motorola</u> http://www.mot.com/motorola http://www.motorola.com/sponsorships/envionment</p>	P/E	
<p><u>National Tree Trust</u> Eligible organizations will include qualified 501(c)3 nonprofits that have been in existence for two years, and are either an urban and community forestry organization or a conservation-focused organization working on urban and community forest projects.</p>	<p><u>National Tree Trust</u> 800-846-8733 http://www.nationaltreetrust.org/index.cfm?cid=70000</p>	H/E	The 2004 grant application will become available in the fall of 2003.
<p><u>National Fish & Wildlife Challenge Grant</u> Funding for wetland habitat restoration and wetland</p>	<p><u>National Fish & Wildlife Foundation</u> Phone: 202/857-0166</p>	H	

protection	http://www.nfwf.org		
<p><u>The National 4-H Council</u> The National 4-H Council offers grants at the community, county, and state level for young people and adults to take action on issues critical to their lives, their families, and their communities. Grant recipients are expected to take the lead in the design of the project, the proposal writing process, implementation, and evaluation of funded projects.</p> <p>The National 4-H Council's Community Tree Planting Grant Program will provide community action grants in the amounts of \$200 to \$1,000 to stimulate community tree planting and/or reforestation projects across the United States. Grants will be awarded to communities in support of ongoing community tree planting and/or reforestation projects or to stimulate new and creative youth-led projects. Applicants must secure matching funds or in-kind contributions from other sources equal to the amount requested from the 4-H grant program.</p>	<p><u>The National 4-H Council</u> For complete guidelines and an application form, see the National 4-H Council Web site.</p> <p>Contact: 2002 Deft Community Tree Planting Grant National 4-H Council 7100 Connecticut Avenue Chevy Chase, MD 20815</p> <p>Request For Proposal Link: http://www.fourhcouncil.edu/programs/category.asp?scatid=11&catid=1&subid=6</p>	H/E	
<p><u>National Wildlife Federation Species Recovery Fund</u> For on the ground projects that protect certain target species. Species on their list are relevant to Illinois/Midwest: bald eagles, eastern/western prairie fringed orchid, karner blue butterfly, imperiled neotropical migratory songbirds, and endangered butterflies of North America, etc. Funding to grassroots organizations is preferred.</p>	<p>Grant guidelines are available at: http://www.newmansown.com/5b1_grants.html</p>	E	
<p><u>Newman's Own Grants</u> Grants are awarded annually to organizations that focus on children and youth, health, education, the elderly, the environment, the arts, literacy, substance abuse education, and programs for the needy. U.S.-based 501(c)(3) organizations, schools, hospitals, and other public-benefit institutions are eligible to apply.</p>	<p><u>National Wildlife Federation</u> http://www.nwf.org/wildalive/SRF/srfhome.html Contact YinLan Zhang Phone: 202/797-6892 or Email zhang@nwf.org</p>	H	

<p><u>North American Wetlands Conservation Council - Small Grant Program</u> Eligible project include long-term acquisition, restoration, and/or enhancement of natural wetlands. Requires 1:1 match, maximum grant if \$50,000.</p>	<p>Application guidelines available at: http://www.neg.pge.com/grantProgram.html</p>	E	December
<p><u>P&E National Energy Group</u> Environmental Education Grants ranging from \$5,000 to \$10,000 will be awarded for innovative programs that encourage and support educating young people about the environment. Those eligible to apply for grants include K-12 schools, non-profit organizations engaged in educational projects related to earth science, conservation and the environment, and teacher training programs with hands-on student activities that focus on earth science and environmental education projects.</p>	<p><u>N. American Wetlands Council</u> Phone: 703/358-1784 http://northamerican.fws.gov</p>	A/H	
<p><u>Prairie Biotic Research, Inc. Small Grant Program</u> The purpose of this non-profit organization is to foster basic biotic research in prairies. They are especially interested in supporting independent researchers -- individuals lacking institutional support -- but anyone may apply. The research can include working with native and/or reconstructed prairie.</p>	<p><u>Prairie Biotic Research, Inc. Small Grant Program</u> PO Box 5424 Madison, WI 53705 http://prairiebioticresearch@hotmail.com</p>	H/P	
<p><u>River Network's Watershed Assistance Grants Program</u> Eligible projects include community-based partnerships that conserve or restore watersheds.</p>	<p><u>River Network</u> Phone: 503/241-3506 http://www.rivernetwork.org</p>	P/E	
<p><u>Toyota Tapestry Grants for Teachers</u> Provides funding support to K-12 science teachers for innovative projects that enhance science education in the school and/or school district.</p>	<p><u>Toyota</u> Phone: 800/807-9852 http://www.nsta.org/programs/toyota.htm</p>	E	January
<p><u>Wetland Restoration Fund</u></p>	<p><u>Openlands (NE Illinois Only)</u></p>	H	

<p>Eligible projects include wetlands and other aquatic ecosystems restorations, projects must be in the six-county Chicago metropolitan area and have either a conservation easement or be owned by a government agency.</p>	<p>Phone: 312/427-4256 x241</p>		
<p><u>Wildlife Links</u> Projects which include management and education for conservation on golf courses are eligible.</p>	<p><u>National Fish & Wildlife Foundation</u> Phone: 202/857-0166 http://www.nfwf.org</p>	<p>E</p>	<p>Varies</p>
<p><u>Thorn Creek Audubon Society Small Grants Program</u> Any individual or organization is eligible and all are invited to apply. The grant program is for a \$500 matching grant for projects that exemplify the mission of the Thorn Creek Audubon Society. The project must focus on one or more of the following areas: Education, Habitat Restoration, Preservation, Avian or Plant Ecology, Demonstration Area, Management. The funded project must also have an outreach component.</p>	<p><u>Thorn Creek Audubon Society Grants Program</u> Thorn Creek Audubon Society PO Box 895 Park Forest, IL 60466 http://www.thorncreekaudubon.org</p>	<p>H/E</p>	<p>Varies</p>
<p><u>Illinois Buffer Partnership Grant</u> Funding available through Trees Forever for streamside buffer plantings of trees, grasses, and shrubs, planting around livestock facilities, streambank stabilization and constructed wetlands in Illinois.</p>	<p>Trees Forever Toll free: 800-369-1269 www.treesforever.org</p>	<p>H/E</p>	<p>Call for deadline</p>

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The document was prepared by the Funding Resource Working Group of the Volunteer Stewardship Network (VSN) Steering Committee for the VSN. The VSN is coordinated by The Nature Conservancy, Illinois Chapter and the Illinois Natural Preserves Commission. People and organizations using this document are strongly encouraged to directly contact the agencies/organizations providing the grants to get more information on the purpose of the grant, who or what type of organizations should apply, establish whether there are any geological limitations for a grant, and to determine when it is most appropriate to apply for a grant.

**This is a “living” document of funding resources that is updated on a continual basis.
For additions, corrections, and suggestions, please contact:**

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