WILL COUNTY COMPREHENSIVE STORMWATER MANAGEMENT PLAN

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EXECUTIVE SUMMARY

INTRODUCTION

In July 1996, parts of Will County as well as many areas of the region, experienced record flooding as a result of unprecedented rainfall. In Aurora, near the northwest corner of the County, almost 17 inches of rain fell in less than 24 hours.

This event, combined with an increasing frequency of drainage complaints from around the county in recent years, focused attention on the stormwater management needs of Will County and crystalized the notion that stormwater and flooding do not follow political boundaries and must be managed on a more regional or watershed basis. To provide for a more coordinated and comprehensive approach to stormwater and floodplain management, the Will County Stormwater Management Planning Committee began preparation of this plan for a countywide stormwater management program. The stormwater committee is composed of nine municipal and nine county representatives.

The County was divided into four watershed planning units as shown in Figure 1. The character of these watershed varies both in terms of the demographics and the physical conditions. The Des Plaines River, Calumet River, and DuPage River Watersheds have significant urban and suburban components. However, each of these watersheds still have approximately half their land area in agricultural production. Conversely, the Kankakee River Watershed is primarily rural and has over 75% of its land area in agricultural production.

GOALS

The goals for the Will County Stormwater Program are as follows:

1. Consolidate and coordinate existing stormwater management programs and activities into an effective, unified countywide structure.

2. Prevent increases in stormwater-related problems associated with development, re-development and other watershed activities.

3. Remediate existing problems related to improper management of stormwater runoff and encroachment into floodprone areas.

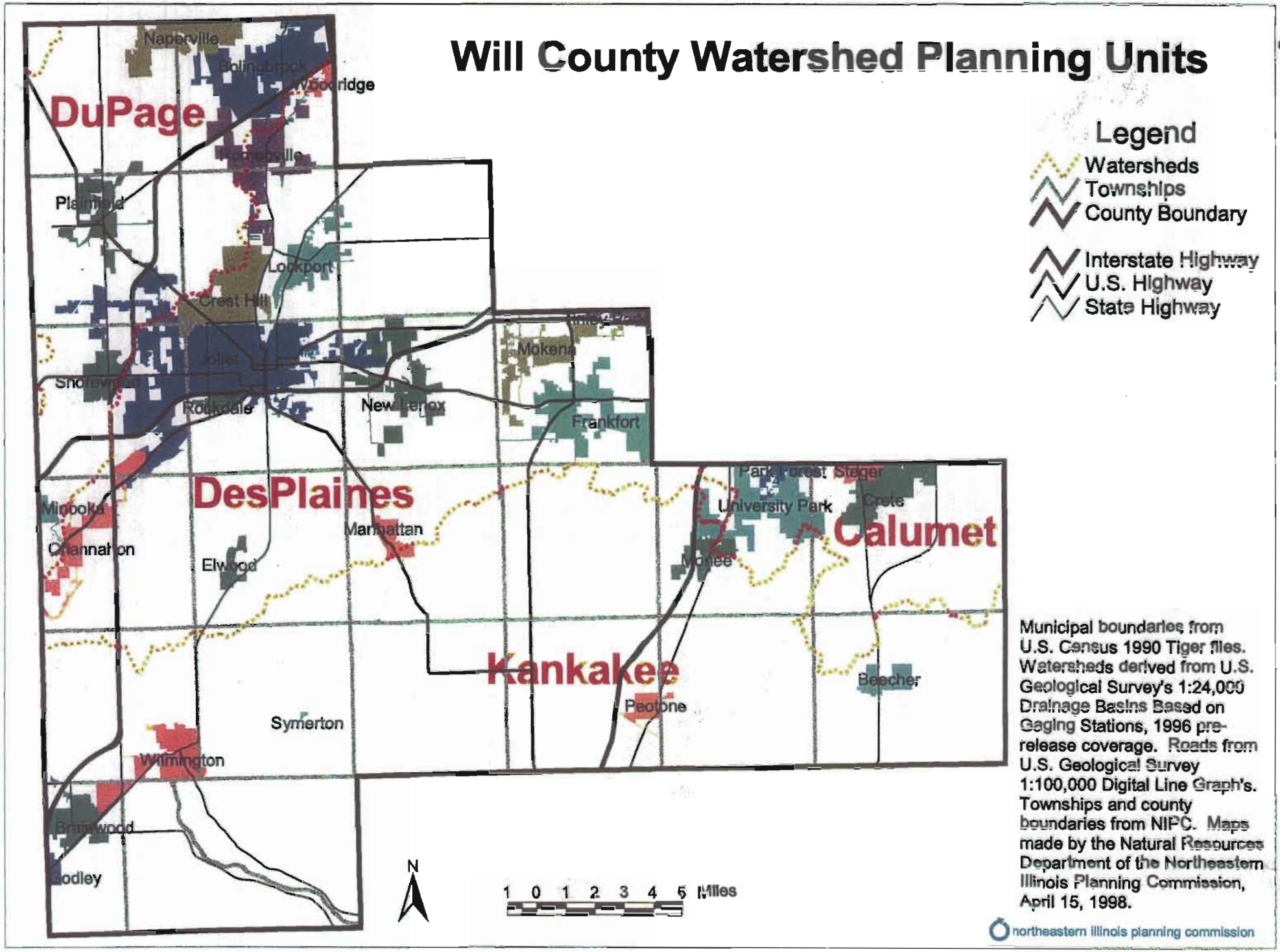
4. Ensure maintenance, management, and sustainable operation of natural and manmade stormwater drainage and storage features.

FINDINGS

To identify the extent of existing problems and identify the most important stormwater-related issues, a questionnaire was distributed to each of the municipalities and townships. The results

Figure 1

Will County Watershed Planning Units



Municipal boundaries from U.S. Census 1990 Tiger files. Watersheds derived from U.S. Geological Survey's 1:24,000 Drainage Basins Based on Gaging Stations, 1996 pre-release coverage. Roads from U.S. Geological Survey 1:100,000 Digital Line Graph's. Townships and county boundaries from NIPC. Maps made by the Natural Resources Department of the Northeastern Illinois Planning Commission, April 15, 1998.

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of this survey were combined with evaluations of several state and federal agency inventories. The findings are highlighted below.

Stormwater Impacts: Stormwater impacts include flood damages, streambank erosion or siltation, and surface water quality problems. Most all of the information collected on flood damages and streambank erosion problems came from the surveys. Most of the water quality information came from the Illinois Environmental Protection Agency (IEPA)

Although there were considerable flood damages associated with the July 1996 flood event, that event represented a very extreme condition that is unlikely to repeat itself. The July 1996 event aside, damage from flooding was not reported to be a widespread problem. Most of the chronic flood problems were reported along the DuPage River and in one area along the Des Plaines River. A number of local drainage- related problems were also reported and the most significant concentrations were located in the most urbanized townships.

The quality of Will County streams is highly varied. Based on data from the IEPA, Will County has some of the highest quality streams and at the same time some of the lowest quality streams in the region. Based on biological conditions, a number of the streams in the Kankakee River watershed are in excellent condition and are considered unique aquatic resources. A couple of the streams in the Des Plaines and Calumet River watersheds do not support their intended uses and are considered limited aquatic resources.

Like most areas of the region and the nation, there is a very strong relationship in Will County between the level of watershed urbanization and the degree of flooding problems and stream degradation.

Public Education/Involvement/Issues: This topic considers public information programs that exist in their community, the level of public awareness of stormwater issues, and the most pressing stormwater issues within the communities.

There is currently no countywide public information program to educate te public on stormwater issues. However, a number of the communities have performed public involvement activities and reported that the public recognizes stormwater management as a significant issue. The local public involvement activities were generally associated with site or event specific issues. A few of the communities have formalized systems for addressing resident complaints.

Planning, Maintenance, and Funding: Each community was asked to describe stormwater planning efforts and projects that have occurred within their community. They were also asked to describe maintenance procedures and mechanisms as well as the method of funding these planning and maintenance activities. In addition to the questionnaires, reports on past stormwater and watershed planning efforts were reviewed.

Flood control studies have been prepared for a number of creeks by state and federal agencies. One of these studies resulted in a flood control reservoir on Hickory Creek. In many cases, projects with flood control benefits that exceeded estimated construction costs could not be identified. Floodplain

mapping was produced for a number of the other studies. A number of the municipalities have prepared local drainage studies to address flooding and drainage issues within their communities.

In many communities, maintenance of stormwater drainage and detention facilities is the responsibility of the municipality while in other communities, homeowners associations have that responsibility. Although a number of municipalities and townships inspect and maintain stream channels, lack of stream maintenance was cited as continuing problem. This is particular true in the unincorporated areas of the county.

Most municipalities use general revenues to fund maintenance, planning, and capital projects. However, a few reported using motor fuel tax revenues.

Coordination: Each of the municipalities, townships, and drainage districts were asked to describe coordination efforts.

Prior to formation of the Will County Stormwater Management Planning Committee, few of the municipalities were coordinating with their neighbors to address stormwater drainage or maintenance issues. However, most municipalities expressed a need for more regional coordination of stormwater programs and standards.

There also appears to be no significant coordination between the municipalities or townships and the drainage districts. None of the drainage districts responded to the questionnaire.

Very recently, a Will County resource planning committee has formed to provide better coordination between various entities concerned with drainage issues. Those groups that are participating include representatives from county and federal agencies as well as several drainage districts.

Regulations and Standards: This topic addresses four categories of local development regulations: floodplain management; stormwater drainage and detention; soil erosion and sediment control; and stream and wetland protection.

Over the last ten to twenty years, communities have begun to require greater levels of stormwater management to prevent flooding problems. More recently, stormwater management standards have been adopted, in some areas of the county, to address water quality issues as well.

While the state and federal governments have regulations protecting certain elements of wetlands and portions of the floodplain, these standards are not sufficient to prevent increases in flooding problems as the county develops. Neither the state or federal regulations fully protect wetland and floodplain storage to prevent increases in flood flows when these features are modified. Also, no state or federal programs require stormwater management to prevent increases in flood flow rates or volumes as part of new development.

While it may be impossible to fully mitigate all of the flooding and water quality impacts of development, a number of communities in Will County have ordinances that should minimize those impacts. However, because standards contained within the local ordinances vary between communities, the level of protection varies throughout the county and within watersheds. Because

drainage patterns do not follow municipal boundaries, communities that choose to provide a lower level of protection may be impacting their downstream neighbors as much as themselves.

RECOMMENDATIONS

Based on the goals and objectives for this plan and the findings described above, a number of programmatic, regulatory, maintenance, and watershed planning recommendations are presented in this plan. In particular, the plan recommends a more coordinated, unified approach to stormwater management. The County level is the logical level at which this coordination should take place because: 1) the County is large enough to encompass large portions of major watersheds and entire subwatersheds and 2) the state legislature has provided the County with the authority to perform countywide stormwater management planning. Although, it is logical for stormwater management to be coordinated at the county level, the municipalities already have the resources to perform many stormwater management activities. Thus, this plan recommends that those activities continue at the local level but that they be coordinated countywide. The plan recommendations are summarized below.

Countywide Stormwater Ordinance: Because Will County is projected to be the fastest growing county in the northeastern Illinois region (the population is expected to more than double between 1990 and 2020), the plan recommends that a countywide stormwater ordinance be developed and enforced to minimize any increases in stormwater-related problems. Development of the ordinance and its enforcement mechanism should be the first recommendations to be implemented.

> **Ordinance Standards:** The ordinance standards recommended in this plan are intended to prevent increases in flood damages, maintain eligibility in the National Flood Insurance Program, and meet minimum Illinois EPA nonpoint source pollution control recommendations. There are four basic components to the recommended standards. They are 1) floodplain management to prevent building in floodprone areas and loss of floodplain flow and storage capacity; 2) stormwater drainage and detention to minimize increased discharge of runoff volumes and rates and stormwater pollutants associated with development; 3) soil erosion and sediment control to minimize soil loss and associated downstream impacts including loss of flood storage and conveyance capacity; and 4) stream and wetland protection to prevent loss of the stormwater benefits of wetlands including floodwater storage and pollutant filtering.
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> **Ordinance Enforcement:** Based on the recommendations of this plan, each municipality will have the option of seeking certification for enforcement of an ordinance within its jurisdiction or deferring to the county for permit review and enforcement. To receive certification, a municipality must adopt an ordinance at least as stringent as the countywide ordinance and demonstrate that it has adequate personnel to review and enforce the ordinance. The personnel may either be in-house staff or consultants. The municipality may collect permit application fees to cover its costs. Certain floodplain and wetland permits should continue to be reviewed by the appropriate state and federal agencies and the municipalities and the County should enforce the standards not addressed by these agencies.

Public Education: To help residents understand the relationship between public and private activities on the landscape and downstream flooding problems, a countywide public education campaign should be implemented. Property owners adjacent to streams and other waterbodies should be targeted to prevent debris accumulations and associated flooding and drainage problems that can result from dumping of landscape waste. Public education should be an ongoing activity of the countywide stormwater program and should be implemented early to increase awareness of the program and its benefits.

Maintenance: Stormwater infrastructure must be maintained to operate properly. Mechanisms to ensure maintenance of existing and new stormwater infrastructure should be implemented. A number of potential mechanisms are identified in the plan. These mechanisms should be incorporated into the countywide stormwater ordinance.

Accumulation of natural and manmade debris in stream channels can exacerbate flooding and streambank erosion. Guidance for maintaining streams and mechanisms to facilitate maintenance should be implemented.

Planning: Both countywide and watershed planning are necessary to coordinate activities between agencies, to prevent increases in stormwater-related problems, and to develop cost-effective solutions to existing problems.

Countywide planning activities such as floodplain and wetland mapping, collection or hydrologic data, and coordination with other county planning activities should be performed in support of the regulatory program and watershed planning.

In later phases of implementing this plan, individual watershed plans should be prepared to address existing flooding problems. It is important that the countywide stormwater ordinance be developed and enforced prior to addressing existing flooding problems to prevent creation of new problems at the same time that existing problems are being addressed.

FUNDING

It is envisioned that the cost of enforcing the ordinance will be funded by permit application fees. A number of mechanisms for funding countywide coordination, maintenance, and planning activities are identified in the plan.

CHAPTER 1

AUTHORITY, PURPOSE, GOALS, AND OBJECTIVES

1.1 INTRODUCTION

In July 1996, portions of Will County experienced record flooding as a result of unprecedented rainfalls centered around the northwest corner of the County. Nationally, the 16.91 inches of rain recorded at the National Weather Service cooperator site in the City of Aurora was the second highest rainfall in history outside of hurricane zones. This event resulted in record high flood stages in most of the Creeks and Rivers in the northwest portion of the County and it was reported that over 400 homes experienced first floor flooding.

While substantial flooding is not unexpected under such extreme rainfall conditions, the event served to focus attention on the massive damage that flooding can cause and the need for coordinated, comprehensive floodplain and stormwater management.

To address flooding and other stormwater related issues, the Will County Board passed a resolution in 1993 creating the Will County Stormwater Management Planning Committee. Shortly after the July 1996 flood event, the Committee acquired professional assistance to prepare a plan for a countywide stormwater management program.

1.2 BACKGROUND

Will County is located on the south-western edge of the northeastern Illinois region. The County is approximately 849 square miles in area and had a 1990 population of 357,302 for an overall population density of 421 people per square mile. Like the other outlying counties of the region, Will County is experiencing rapid growth. Between 1980 and 1990, Will County's population increased by a modest 10%. However, between 1990 and 1997, the population has already grown over 24% to 444,469 people. By 2020, the County population is projected to grow to between 723,000 and 806,000 - an increase of over 100% relative to the 1990 population (Northeastern Illinois Planning Commission, 1994). This is the highest growth rate projected for any county in the northeastern Illinois region.

The incorporated areas of the County consist of 24 villages and cities that are predominately in Will County. These cities and villages range in population from 110 to 76,836 (1990 population). The areas of highest population are in the northwest portion of the county. The population density generally decreases to the south.

The County has two principal river basins: the Des Plaines River Basin to the north and west and the Kankakee River Basin to the south and east. Several large tributaries to the Des Plaines River also flow through the County, including the DuPage River and the Chicago Sanitary and Ship Canal. The Des Plaines River flows through the western portion of the County and its watershed covers virtually all of Cook and DuPage Counties and nearly half of Lake County. It has headwater areas in both Wisconsin and Indiana. The drainage area of the Des Plaines River basin within Will County is

478 square miles. The Kankakee River basin area within Will County is 368 square miles. Although the Kankakee River flows through the southwest corner of the county, the majority of the Kankakee River basin in Will County is headwater area composed of numerous smaller streams that drain through Kankakee County before joining the Kankakee River. The Kankakee River and the Des Plaines River join to form the Illinois River just outside Will County. For planning purposes, the two basins have been divided into four main watershed planning units as described in Chapter 3.

Overbank flood damages occur along the DuPage River and the Des Plaines River, as well as along some of the tributaries to the Des Plaines River. Damages are generally concentrated in a few isolated areas and does not currently appear to be a widespread problem. In many areas of the county, local drainage related flooding problems are greater than overbank flooding problems.

The tributaries to the Kankakee River are relatively high quality streams with virtually all of them fully supporting their designated uses. Three of the tributaries are considered "unique aquatic resource" due to the high quality fish communities within them. Conversely, Will County also has streams that are quite degraded due to wastewater discharges, urban runoff, and habitat degradation due to channelization and streambank erosion. Two streams are not supporting any of their designated uses.

There are relatively few lakes in Will County and there is very little data on the lakes that do exist. Of the five lakes evaluated by the Illinois Environmental Protection Agency, three are reported to be fully supporting their designated uses overall. The other two lakes are only partially supporting their designated uses with impairments due to suspended sediments and excessive aquatic weed growth.

1.3 WILL COUNTY STORMWATER MANAGEMENT PLANNING COMMITTEE

In recognition that there is a link between continued urbanization and increased levels of flooding, the Will County Board created the Will County Stormwater Management Planning Committee (WCSMPC). As required by state legislation, the WCSMPC is represented by one municipal representative and one County Board representative from each of the nine County board districts. The WCSMPC is made up of elected officials, individuals representing agricultural interests, and professionals in the field of stormwater management. The WCSMPC prepared this plan for a countywide stormwater program. The intent of the plan is to develop a program to fulfill the goals and objectives presented in Section 1.6

1.4 AUTHORITY

The five collar counties in northeastern Illinois (DuPage, Kane, Lake, McHenry and Will Counties) have been granted special powers to manage stormwater and floodplains. The purpose and authority for these powers is outlined in Public Acts 85-905 and 85-1266 (55 ILCS 5/5-1062). The legislation prescribes that a stormwater management planning committee shall be established by County Board resolution, with its membership consisting of equal number of County Board and municipal representatives, and such other members as may be determined by the County and municipal members.

Purpose

As stated in the statutes, the purpose of the legislation was to allow management and mitigation of the effects of urbanization on stormwater drainage. The purpose shall be achieved by**:**

- consolidating the existing stormwater management framework into a united, countywide structure;
- setting minimum standards for floodplain and stormwater management; and
- preparing a countywide plan for the management of stormwater runoff, including the management of natural and manmade drainageways. Such countywide plan may include watershed plans;

Authority

Upon adoption of a countywide stormwater plan by ordinance, the County has authority to:

- establish subcommittees of the stormwater management planning committee to serve particular watersheds that have similar stormwater management needs;
- retain engineering, legal, and financial advisors and inspection personnel;
- prescribe by ordinance reasonable rules and regulations for floodplain management and for governing the location, width, course, and release rate of all stormwater runoff channels, streams, and basins in the County in accordance with the adopted stormwater management plan;
- enforce adopted stormwater and floodplain management rules and regulations in municipalities, unless the municipality adopts and enforces a stormwater management ordinance that is consistent with and at least as stringent as the County plan and ordinance;
- adopt a schedule of fees as necessary to mitigate the effects of increased stormwater runoff (fee-in-lieu of detention);
- levy up to 0.20% annual tax to implement the countywide plan including the design, planning, construction, operation, and maintenance of stormwater facilities;
- issue general obligation bonds for implementing the countywide stormwater plan and watershed plans;
- petition the circuit court to dissolve any and all drainage districts; and
- enter upon lands, with 10 day notice, for the purpose of inspecting stormwater facilities or to remove any obstruction to an affected watercourse.

Plan Adoption

The Statutes specify that during preparation and adoption of the countywide stormwater management plan and watershed plans, the stormwater management planning committee shall:

- coordinate the planning process with each adjoining county (Cook, DuPage, Kane, Kendall, and Kankakee Counties in Illinois and Lake County in Indiana)to ensure that recommended stormwater projects will have no significant negative impact on the flood levels or flows in inter-county watersheds;

- submit the countywide plan and watershed plans to the Office of Water Resources of the Illinois Department of Natural Resources and to the Northeastern Illinois Planning Commission for review and recommendations; and
- hold at least one public hearing in the County seat and publish a hearing notice at least 15 days in advance of the hearing date.

A municipality having a stormwater management plan adopted by ordinance may oppose the County plan and submit specific proposals for amendments to the County plan. If the proposed amendments are not included in the County plan, approval of the County plan shall require a two-thirds vote of the County Board.

1.5 ORGANIZATION OF THE PLAN

The enabling legislation does not specify the content of the County stormwater plans; rather it allows the individual counties to tailor the plan to fit their own needs. Will County has chosen to prepare this stormwater plan for development of a countywide stormwater program but not proceed with detailed watershed planning and project design at this time. Instead, the stormwater program will be implemented in phases as outlined in chapter 6 of this plan.

This **first chapter** outlines the authority and purpose for preparation of this stormwater plan as well as the goals and objectives for the plan and resulting stormwater program.

The **second chapter** defines a stormwater management framework with four functional categories and then describes the role that local, regional, state, and federal agencies play in each of the four categories.

The **third chapter** is a brief assessment of the physical stormwater conditions and problems in Will County based on review of existing reports and a questionnaire distributed to each of the municipalities and townships.

The **fourth chapter** is an assessment of the current status of the programmatic and administrative aspects of stormwater management in Will County based on a questionnaire distributed to each of the municipalities and townships.

The **fifth chapter** presents recommendations for a countywide stormwater management program. The **sixth chapter** presents a strategy for implementing the recommendations of the plan. As part of the implementation strategy, priority levels or phases are identified and the recommendations are categorized by priority level.

1.6 VISION, GOALS, AND OBJECTIVES

In addition to goals and objectives, it is often beneficial to have a vision statement. While the goals and objectives provide specifics regarding desired accomplishments or conditions, a vision statement provides an overall view of what the WCSMPC hopes to achieve.

Vision Statement

Will County should be a place where the residents are free from flood damages.

Will County should be a place where the municipalities, townships, and the County work cooperatively to remedy existing stormwater problems and prevent creation of new problems. Stormwater and flood waters should be managed on a watershed basis to ensure the best possible solutions and to prevent negative impacts to downstream neighbors.

Will County should be a place of well-informed residents that understand the causes of flooding and have an appreciation for the value of the natural resources of the County and region. These residents and their elected officials are willing to work to protect, preserve and enhance those resources.

Will County should be a place where development activities harmonize with the natural resources of the County to enhance the quality of life of its residents.

Goals and Objectives

Goals and objectives follow naturally from the vision. The goals and objectives for the Will County Stormwater Program are detailed below. The goals and objectives were adopted by the WCSMPC and are intended to lay the foundation on which the remainder of this plan as well as subsequent watershed plans are built. The goals and objectives guide development of the organizational framework as well as the standards which will be used to implement the countywide stormwater management plan.

The intent is to outline not only the goals of this plan but the goals of a long range, sustained stormwater management effort through a coordinated countywide program.

The following goals and objectives were developed by a sub-committee of the WCSMPC and approved by the full committee.

Goal 1

Consolidate and coordinate existing stormwater management programs and activities into an effective, unified countywide structure.

Objectives

Existing stormwater programs and activities should be incorporated into a countywide framework to ensure consistency and should be coordinated with local, regional, state, and federal agencies to the extent practicable.

Financial, public participation, and technical mechanisms should be established. These mechanisms should include comprehensive watershed planning, policies, and a countywide database, to address

watershed-specific conditions and preserve resources, to the extent practicable, for the benefit of public health, safety, and welfare.

Promote "Best Management Practices" throughout the County. Training and public information programs should be implemented by, working with developers, private citizens, local jurisdictions, and other agencies and organizations.

Goal 2

Prevent increases in stormwater-related problems associated with development, re-development and other watershed activities.

Objectives

Through implementation of a stormwater management plan, minimize increases in runoff volumes and rates caused by development so that the impact of changing land uses does not increase the risk of flooding. Upstream and downstream areas and on-site overland flow routes should be considered during development of site grading, stormwater drainage, and stormwater management plans. Individual drainage policies and standards may be needed on a watershed-specific basis.

Encourage the use of natural storage features such as floodplains and wetlands as a supplement to man made storage areas. If such areas are to be disturbed, compliance with all governing federal, state, and local agencies is required.

Goal 3

Remediate existing problems related to improper management of stormwater runoff and encroachment into floodprone areas.

Objectives

When possible, eliminate existing stormwater related damage to property and adverse effects to the health, safety, and welfare of the residents of Will County. Benefits and costs should be considered during evaluation. Considerations should include flood reduction, environmental impact, open space, and recreational benefits. Remedial activities should be addressed from a watershed perspective considering the influences of both existing and future watershed conditions and the effects on upstream and downstream areas.

Consider restoring severely degraded streams, lakes, and wetlands to enhance their natural storage capacity, water quality, habitat, and recreational functions.

Educate Will County residents and property owners on the benefits of proper stormwater management. Encourage participation among individual parties to floodproof structures, eliminate or reduce the number of floodprone structures, and employ Best Management Practices.

Goal 4

Ensure maintenance, management, and sustainable operation of natural and manmade stormwater drainage and storage features.

Objectives

Stormwater facilities must be properly maintained and managed in order to function effectively. Therefore, routine inspections should be made and preventive maintenance performed to ensure that facilities function as designed.

At a minimum, a responsible party should be designated to provide long-term management and maintenance of stormwater facilities. Documentation should be kept indicating inspection dates and maintenance performed.

Because flooding and water quality issues extend beyond individual property lines, it is the general interest of Will County to educate land owners, residents, and public entities on the importance of properly managing stormwater facilities and natural drainage areas. In doing so, the County's stream, lakes, and wetlands will not be adversely impacted and in many cases water quality can be improved.

CHAPTER 2

DESCRIPTION OF EXISTING STORMWATER MANAGEMENT FRAMEWORK

The purpose of this chapter is to describe the current stormwater management framework in Will County and the role of the various local, regional, state, and federal agencies and organizations within that framework. In addition to describing conventional stormwater management responsibilities (e.g., stormwater drainage and detention), descriptions are also provided for related topics such as water quality and aquatic habitat management. Prior to the description, a functional framework is defined which provides the basis for the subsequent discussion as well as the assessments and recommendations in later chapters.

2.1 FUNCTIONAL FRAMEWORK

When discussing the stormwater-related activities of the various local, state, and federal agencies and organizations and assessing their role in meeting the goals and objectives of the Will County Stormwater Management Committee, it is useful to differentiate between several categories of activities, or functions, performed by the various groups. This allows specific tasks to be organized and the function of the various agencies to be defined in a consistent manner. For the purposes of this plan, the following functional categories will be used.

- Administration and Management
- Regulation
- Planning
- Maintenance

1. Administration and Management

This functional element represents various administrative and management activities that are part of a stormwater management program. It includes establishment of priorities, program plan development, budgeting, identification of funding sources, and management of technical staff. In addition to these basic program management activities, technical assistance, public information, maintenance of a stormwater database, and disaster assistance activities will be placed in this functional category.

2. Regulation

The regulatory element includes administration of a permit program consisting typically of permit review, inspection and enforcement and providing guidance in meeting ordinance standards. It also includes coordination with other regulatory entities such as local municipalities, the Illinois Department of Natural Resources - Office of Water Resources (IDNR-OWR), the Federal Emergency Management Agency (FEMA), the U.S. Army Corps of Engineers (USACE) and the Illinois Environmental Protection Agency.

3. Planning

Perhaps the most important planning activity of a countywide stormwater management program is watershed-based planning. Watershed planning focuses on the specifics of the individual watersheds. Comprehensive watershed planning has two basic purposes. One is to identify strategies and provide the tools to prevent increased flooding and degradation of watershed resources. The second is to develop recommendations to remediate existing flooding and other water resource problems and to prepare a strategy to implement the recommendations. Further recommendations regarding the components of a comprehensive watershed plan are provided in Chapter five and Appendix B.

Planning is also important for those activities that are not specific to a particular watershed, including coordination with other planning programs such as transportation, land use, zoning, and open space as well as coordinating with other counties.

Capital improvement planning is also included under this element. While not all watershed plans will lead to capital improvements, watershed planning is often performed prior to, or as part of, making significant stormwater related capital improvements.

4. Maintenance

Maintenance involves those activities necessary to ensure maintenance and management of both man-made stormwater facilities and natural streams, lakes, and wetlands to ensure that they function as designed and provide the full range of hydrologic and water quality functions.

Stormwater management facility maintenance includes such tasks as cleaning debris from detention ponds, stream channels, catch basins and storm sewers. It also includes inspection and regular upkeep and repair of facilities to maintain system performance. Maintenance and management of the natural drainage system typically includes inspection and removal of debris from streams, and addressing streambank erosion. More intensive maintenance and management activities focus on stream corridor vegetative management and restoration as well as excessive streambed erosion and deposition.

2.2 AGENCY ACTIVITIES AND RESOURCES

Each of the agencies and organizations below are discussed in terms of the activities performed and the resources they can provide within each of the four functional categories defined above. Many of the agencies perform no activities or have no role in one or more of the categories. However, for completeness, all four categories are included in the discussion of each of the agencies. Instead of evaluating the various groups, this section merely describes their current activities specific to Will County. An evaluation of the current functional framework in meeting the goals and objectives for the Will County stormwater program is provided in Chapter 4.

2.2.1 Local

MUNICIPALITIES, TOWNSHIPS, AND COUNTY: The municipalities and the Will County Land Use Department play the primary role and the townships a more minor role in stormwater management in Will County.

Administration and Management: Municipalities and the County have primary responsibility for stormwater management and administration within their jurisdiction and essentially operate independently of neighboring jurisdictions. However, numerous other agencies and organizations provide support for certain elements of administration and management functions (particularly training and public education).

Regulation: Virtually all municipalities have adopted some form of stormwater regulations. Municipalities also have authority to enforce soil erosion and sediment control standards and protect wetlands. However, they are not required to do so by state or federal regulations. To participate in the National Flood Insurance Program communities must regulate development in floodplains. The County performs the same functions as the municipalities for the unincorporated areas.

In some cases, township boards and/or highway commissioners provide input on new developments being considered by municipalities or the County. By objecting to a map amendment or special use permit in unincorporated Will County, a township can force a super-majority vote by the County Board to approve the development.

Planning: Although assistance from state and federal agencies may be requested, virtually all stormwater planning activities that occur within a municipality or County are performed by or for that local government. However, project planning assistance on larger waterways (e.g., Des Plaines River) is often provided by state (e.g., Illinois Department of Natural Resources) and Federal (e.g., US Army Corps of Engineers) agencies. Capital improvements to address local drainage problems are generally made by municipalities. Occasionally, the State (IDNR) can provide assistance with smaller drainage projects as well.

Township boards have authority to prepare land use plans. Municipal and County plans in conflict with township plans require a super-majority vote to be approved. Townships also have authority, by referendum, to create and implement open space acquisition plans.

Maintenance: Maintenance of stormwater infrastructure within municipal boundaries is usually the responsibility of the municipalities. Outside the municipalities, the townships (highway department) and the County generally maintain culverts and ditches within the rights of way of township and County roads.

PARK DISTRICTS: Park districts are significant property owners in Will County and throughout the northeastern Illinois region. Historically, park districts have been concerned with providing active recreational facilities such as ball diamonds and soccer fields. More recently, some park

districts in the region have been getting involved in owning and managing natural areas for passive recreational uses.

Administration and Management: Park districts do not typically play a role in the administration and management of stormwater programs. However, some districts are involved in environmental education programs which educate the public on the many values of stream corridors, wetlands, and other natural areas.

Regulation: Park districts are not involved in regulatory activities. However, park districts take ownership of detention basins and other stormwater features in some areas of the northeastern Illinois region.

Planning: Park districts are typically not involved in stormwater or watershed planning activities. However, park districts are potential land holders of significant floodplains or depressional storage areas identified for preservation during watershed planning.

Maintenance: Under agreement with municipalities or homeowners associations, park districts are occasionally responsible for maintenance of detention facilities. Typically the maintenance is limited to mowing and other landscape maintenance activities.

PROPERTY AND HOMEOWNER ASSOCIATIONS: Homeowners associations are becoming increasingly responsible for stormwater management within their subdivisions as municipalities now require detention for most developments and view homeowners association management of these facilities as a way to minimize municipal involvement.

Administration and Management: Homeowners associations are not responsible for administration of stormwater programs.

Regulation: Homeowners associations have no regulatory authority and fall under the authority of the governing municipality or the county. However, covenants may occasionally be placed on individual lots by the developer. Covenants may include requirements to maintain drainage paths, roadside swales, or native vegetation within and adjacent to detention basins, wetlands, and streams that may lie on individual lots.

Planning: Homeowners associations are rarely involved in planning activities and fall under the planning jurisdiction of the municipalities or the county. However, within the northeastern Illinois region, there have been cases where homeowners associations have taken it upon themselves (generally with assistance from state and federal resource agencies) to prepare plans for protection/remediation of a particular resource (typically a lake).

Maintenance: Homeowners associations are often responsible for maintenance of specific components of the stormwater system, generally detention basins. However, homeowners associations are sometimes also given responsibility for maintaining streams and other drainageways that traverse their property. The amount of maintenance responsibility given to

homeowners associations varies between municipalities and policy on this issue is still evolving in many communities.

WILL-SOUTH COOK SOIL AND WATER CONSERVATION DISTRICT (SWCD): The territory of this Soil and Water Conservation District (SWCD) covers Will County and southern Cook County, with the exception of some cities and villages. The SWCD is governed by a board of directors elected from the land owners and occupiers within the district.

Administrative and Management: The SWCD provides technical assistance to rural and urban customers. Statewide, SWCDs have limited ability to tax through referendum to fund their activities. However, the Will-South Cook SWCD is not doing so. The SWCDs are funded through grants from the counties, the Illinois Department of Agriculture, and internal programs.

Regulation: The SWCDs have no regulatory authority but assist with several Natural Resources Conservation Service (NRCS) programs. In some areas of the region, SWCDs have entered into agreements with municipalities for development and enforcement of adequate construction site soil erosion and sediment control ordinances. Also, some SWCD's (including Will-South Cook)and NRCS have entered into three-way agreements with the US Army Corps of Engineers to review soil erosion and sediment control plans and conduct site inspections in conjunction with the Section 404 wetland permitting process.

Planning: The Will-South Cook SWCD has been participating in WCSMPC meetings. In other areas of the region the SWCDs have been assisting local watershed planning groups in preparing watershed management plans.

Maintenance: The SWCDs do not have any maintenance responsibilities but do provide technical assistance and historical drainage data to urban and rural customers regarding maintenance of drainage systems.

FOREST PRESERVE DISTRICT OF WILL COUNTY (FPD): The FPD is responsible for acquisition and management of open space in Will County with a particular focus on natural areas. The Will County Board also serves as the board of commissioners who govern the FPD.

Administration and Management: The FPD is not involved with administration or management of stormwater programs.

Regulation: The FPD has no regulatory authority and does not participate in municipal or County regulatory activities. However, the District could potentially take ownership of significant natural resource area donations or easements that may occur as part of the development process, facilitating protection of these areas.

Planning: The FPD is primarily involved in regional open space and natural, cultural, scenic, and recreational resource preservation planning. However, some forest preserve districts (including Will County) are participating in watershed planning activities. The FPD of Will

County is currently participating in development of a watershed management plan for Spring Creek. Also, it may be possible to coordinate the District's open space program with acquisition of regionally significant stormwater storage areas such as wetlands and floodplains. Also, the District can be a significant technical resource related to identifying and protecting watershed natural resources as part of preparing comprehensive watershed plans.

Maintenance: The FPD maintains streams, lakes, and wetlands within their properties and may be a significant technical resource for appropriate and effective maintenance and restoration practices.

WILL COUNTY HIGHWAY DEPARTMENT AND TOWNSHIP HIGHWAY COMMISSIONERS: The Will County highway department and the township highway commissioners are responsible for construction, expansion, and maintenance of County and township roads, respectively.

Administration and Management: The County and township highway departments are not involved with administration or management of stormwater programs, other than their own drainage needs.

Regulation: The County and township highway departments have no direct authority to regulate stormwater or floodplain activities. However, they do regulate access to their rights-of-way through traffic access permits. Any time there is an encroachment onto highway right-of-way such as grading changes, driveway construction, or curb cuts, the highway departments can review drainage plans to ensure that there is no diversion of runoff onto the right-of-way and that there is no increase in flow rate to the highway drainage system.

Planning: Although the highway departments participates in transportation related planning activities (however, the primary County transportation planning role is with the County Land Use Department), their role in stormwater or watershed planning is limited to highway drainage infrastructure to handle runoff draining from and onto their right-of-ways.

Maintenance: The highway departments are responsible for maintenance of all County highway drainage systems.

WILL COUNTY EMERGENCY MANAGEMENT AGENCY (WCEMA): WCEMA is the local emergency management agency. Although flood emergencies is a significant component or their responsibilities, WCEMA is responsible for managing all hazards.

Administration and Management: WCEMA plays no direct role in the administration and management of local stormwater programs. However, WCEMA is the primary local agency responsible for responding to emergency situations, including floods. Also, during presidential disaster declarations, WCEMA is part of an Interagency Mitigation Advisory

Group (IMAG) that is formed to guide mitigation activities and allocate state and federal disaster assistance funds.

Regulation: WCEMA has no regulatory authority and is not involved in regulatory issues.

Planning: WCEMA is not involved with stormwater management planning activities.

Maintenance: WCEMA is not involved in maintenance activities.

WILL COUNTY STORMWATER MANAGEMENT PLANNING COMMITTEE (WCSMPC): The WCSMPC is an intergovernmental entity with representation from both municipalities and the county. The WCSMPC is an advisory body to the County Board and is responsible for directing the implementation of this plan and its revision, if necessary. This plan establishes the recommended role of the WCSMPC.

Administration and Management: The WCSMPC is composed of half municipal and half County Board representation. The WCSMPC has authority to establish its own committees and to retain engineering, legal, and financial advisors and inspection personnel, yet it is planned that County staff will provide these services for the committee. The committee is required by state statutes to meet, at a minimum, quarterly.

The recommendations section of this document (Chapter 5) identifies WCSMPC's long term role related to administration and management.

Regulation: The WCSMPC is an advisory body to the County Board and it is envisioned that the WCSMPC will be instrumental in developing a draft countywide ordinance for the County Board and in advising the County Board on issues related to stormwater management in Will County. The committee's recommendations require due consideration and any regulatory enactments in contravention to the committee's recommendations requires a super majority vote of the County Board.

Planning: This is a primary role for the WCSMPC, that is the preparation of this plan, planning and drafting of a countywide stormwater ordinance, and developing implementation plans for this countywide plan.

Maintenance: Adoption of this Stormwater Management Plan provides authority for the County to develop a mechanism to ensure maintenance of stormwater facilities and the natural drainage system. (See the recommendations in Chapter 5.)

WILL COUNTY: The County Board of the County of Will has the ultimate authority to adopt this Stormwater Management Plan. Upon adoption of the plan, it is the County Board that is charged with implementing and enforcing a countywide stormwater ordinance. It is envisioned that the WCSMPC will provide the necessary advice and prepare a draft countywide ordinance for consideration and adoption by the County Board. This approach will ensure that any countywide

stormwater ordinance has been fully considered by the municipalities, at a minimum, through their representatives on the WCSMPC.

Administration and Management: The County Board may prescribe, by ordinance, reasonable rules and regulations for floodplain management and for governing the location, width, course, and release rate of all stormwater runoff channels, streams, and basins in the County in accordance with the adopted plan. The County has authority to levee taxes to fund implementation of the plan and a subsequent countywide stormwater ordinance, including the ability to tax up to a maximum of 0.20% of assessed valuation to fund their activities. However, in order to exercise that authority, either other County programs would have to be reduced or a referendum would be required due to the current legislative tax cap. It is envisioned that County staff would be provided to administer the plan and countywide ordinance with the advice and oversight of the WCSMPC.

Regulation: The County Board is granted authority to adopt this stormwater plan and to prepare a countywide ordinance establishing minimum standards for stormwater management. By County Board adoption of the ordinance, the County has the authority to enforce the ordinance countywide.

Planning: It is envisioned that County staff will provide technical assistance to the WCSMPC for planning activities. These activities may include preparation and implementation of watershed plans, educational programs, maintenance plans for stormwater facilities and natural drainage systems, and others.

Maintenance: State legislation provides the County, or its agents, authority to enter onto private land to perform stream and stormwater maintenance activities. Adoption of the Stormwater Plan provides authority for the County to develop a mechanism to ensure maintenance of stormwater facilities and the natural drainage system. (See the recommendations in Chapter 5).

DRAINAGE DISTRICTS: Drainage districts are entities organized by landowners, under authority provided by Illinois statutes to construct, maintain, or repair drains, levees or to engage in other drainage or levee work for agricultural, sanitary, or mining purposes. The primary function of drainage districts is to drain the land to improve agricultural productivity. Maintaining adequate drainage in appropriate areas is important to urban and agricultural development.

Administration and Management: The drainage districts are each administered by three elected directors. These directors monitor the condition of the district's drainage, develop work plans, levy assessments, and budget resources for their district. The formation and activities of drainage districts are described in greater detail in Section 2.3.2

Regulation: Drainage districts have certain authorities to require that land owners maintain drainage through their properties. The commissioners for a district may perform all activities provided in the Illinois Drainage Code (70 ILCS 605/1-1 et seq.).

Planning (Capital Improvements): Drainage districts have historically been responsible for draining the land to improve agricultural productivity. Although most of the many miles of field tile in the County were installed by individual property owners, the regional drain tile system conveying runoff from the private systems was installed by the drainage districts. Many of the channelized streams and drainageways in the County are also the result of drainage district activities. Drainage districts retain authority to perform their statutory activities.

Maintenance: The active drainage districts are involved in inspection of the drainage system, efforts to keep surface ditches clear of obstructions, maintaining stable channels, and repair of damaged subsurface drains.

PRIVATE AND CORPORATE CITIZENS: Although citizens of Will County may not be specifically responsible for stormwater management activities, they play a very important role in terms of electing officials that support their positions concerning flooding and environmental issues and in terms of their day-to-day activities that affect storm runoff and water quality.

Administration and Management: Citizens are not responsible for administration and management of stormwater programs. However, they should be the recipients of public information activities. Citizens need to be aware that the actions on their property affect flooding and water quality downstream.

Regulation: Citizens are not responsible for enforcing stormwater regulations.

Planning: As watershed stakeholders, citizens should be encouraged to participate in watershed planning activities to ensure that their concerns are addressed. The watershed planning process is also an excellent opportunity to educate citizens regarding the range and complexity of stormwater and related issues.

Maintenance: Land owners adjacent to streams, lakes, and wetlands are often responsible for maintenance and management of the waterway within their property. Non-riparian land owners are responsible for maintenance of their property including the drainage system. Proper vegetative management can have a significant impact on the quality of stormwater runoff. Proper maintenance of the drainage system can have a significant impact on the number and severity of local drainage problems. In Will County (particularly in unincorporated areas), individual lot owners are often responsible for detention basins or wetlands (or portions thereof) that have been incorporated into their lot as part of the platting process. In these cases, the owner of the lot or lots on which the feature resides is responsible for maintenance rather than the homeowners association.

DEVELOPERS AND DEVELOPMENT CONSULTANTS: These individuals have significant influence over the form and function of the landscape in developing areas.

Administration and Management: Developers and their consultants are not responsible for administration and management of stormwater programs. However, they should be the

recipients of information and technical education programs to improve their understanding of the goals and objectives of the stormwater committee and the tools necessary to comply with stormwater regulations of the communities and the county.

Regulation: Developers are not responsible for enforcing stormwater regulations. However, to the extent that they are the regulated community, they may have some involvement in development of countywide stormwater regulations that may be part of the countywide stormwater program.

Planning: As watershed stakeholders, developers should be encouraged to participate in watershed planning activities to ensure that their concerns are addressed.

Maintenance: In most cases developers will only be responsible for maintenance activities during the period of development.

2.2.2 Regional

NORTHEASTERN ILLINOIS PLANNING COMMISSION (NIPC): NIPC is the regional planning agency for the six county Chicago metropolitan area. The Commission is involved in research, planning, technical plan and policy development and review, and local government technical support. The state stormwater statutes specify that County stormwater plans shall be submitted to NIPC for review and recommendations.

Administration and Management: NIPC plays no direct role in the administration and management of stormwater activities in Will County. However, NIPC provides assistance to local governments to carry out these activities including technical assistance and training opportunities.

NIPC co-sponsors training opportunities including courses and workshops on design and implementation of stormwater best management practices, soil erosion and sediment control, wetland management, and hydrologic computer modeling.

Although NIPC is not a direct source of funding to local governments, NIPC can assist local governments in applying for state and federal grants. In some cases NIPC administers grants to local governments for the state or federal funding agency.

Regulation: NIPC is an advisory agency and has no direct authority to implement its plans or enforce its policies. However, NIPC has developed model ordinances that reflect its policies, including Model Stormwater Drainage and Detention Ordinance (NIPC, 1990), Model Soil Erosion and Sediment Control Ordinance (NIPC, 1991), Model Floodplain Ordinance (IDNR/NIPC, 1996), and a Model Stream and Wetland Protection Ordinance (NIPC, 1988). NIPC encourages municipalities and counties interested in providing protection in these areas to adopt some or all of these ordinances. NIPC provides technical assistance to local governments and developers in interpreting and meeting the standards of the model ordinances.

NIPC, with the backing of the Illinois Environmental Protection Agency, recommends adoption of nonpoint source pollution prevention standards as a condition of approval of amendments to wastewater treatment facility planning areas.

Planning: NIPC has historically performed watershed planning, in particular, the Areawide Water Quality Management Plan that was developed for all of the major watersheds in northeastern Illinois under Section 208 of the Clean Water Act. Currently, NIPC does not initiate development of watershed plans. However, NIPC often assists local governments in development of their watershed plans.

Maintenance: NIPC is not involved in stormwater infrastructure maintenance. However, with the assistance of state and federal grants, NIPC has worked with local governments in performing and demonstrating stream and shoreline maintenance and stabilization activities.

2.2.3 State

There are two state agencies most directly involved with stormwater management: The Illinois Department of Natural Resources (IDNR) and the Illinois Environmental Protection Agency (IEPA). The IDNR is composed of several, previously separate state agencies. Those former agencies concerned with stormwater related issues were the Illinois Department of Transportation-Division of Water Resources (IDOT-DWR), Illinois Department of Conservation (IDOC), and the Illinois Department of Energy and Natural Resources. The IDNR was officially created July 1, 1995 and the stormwater-related operational offices under IDNR are identified and discussed below. In addition to IEPA and IDNR, the Illinois Emergency Management Agency and the Illinois Department of Transportation are involved with floodplain management, drainage, and disaster relief issues.

ILLINOIS DEPARTMENT OF NATURAL RESOURCES-OFFICE OF WATER RESOURCES (IDNR-OWR): IDNR-OWR (formerly IDOT-DWR) is the regulatory agency for floodplain construction in Illinois. OWR is also the state's flood control and flood mitigation agency. The state stormwater statutes specify that County stormwater plans shall be submitted to IDNR-OWR for review and recommendations.

Administration and Management: OWR plays no direct role in the administration and management of stormwater activities in Will County. However, OWR sometimes co-sponsors training opportunities.

Regulation: As stated previously, OWR is the state regulatory agency for floodplain construction in Illinois. In accordance with Rivers, Lakes and Streams Act, 615 ILCS 5/5 through 29a (1994 State Bar Edition), IDNR/OWR regulates all public water construction activities and all construction activities in the floodways of streams draining 1 square mile (640 acres) or more in urban areas and 10 square miles (6,400 acres) or more in rural areas. The purposes of IDNR/OWR's regulations are to protect the public's interests and uses in the state's public bodies of water and to prevent increased flood damages. The state will

delegate certain aspects of their program to municipalities and counties that have ordinances containing the minimum state standards. OWR has delegated this authority to Will County as well as most of the municipalities in Will County. OWR, along with NIPC, developed a model floodplain management ordinance for those communities wishing to participate in the National Flood Insurance Program (NFIP) and wishing state permit review authority for activities in the floodplain. OWR provides advice and technical assistance to local permit review officials.

OWR also regulates dam construction. For larger dams and where the risk to life and property is high (Class I, Class II, and certain Class III dams), OWR reviews and issues permits. Certain Class III dams may be non-jurisdictional and may not require detailed review by OWR.

Planning/Capital Improvements: At the request of local governments, OWR will perform flood control studies to identify alternatives and determine financial feasibility to address overbank flooding problems. Historically, plans developed by OWR have focused on structural flood control measures. For eligible flood control projects, where the benefits exceed the costs, OWR can fund 100% of project analysis, design, and construction. For projects where the benefits do not exceed the costs, OWR can fund capital improvements up to an amount equal to the benefits. OWR generally performs the analysis leading to flood control projects in-house. However, they may also fund projects recommended in local plans and meeting certain criteria.

OWR also has a small projects program that municipalities occasionally use to address local drainage problems and can fund flood related improvements up to $75,000. A less rigorous quantification of benefits is allowed under this program.

OWR has occasionally had flood mitigation funds available for flood proofing and buyouts of flood prone structures. OWR also provides assistance in flood mitigation planning and has funded preparation of local flood hazard mitigation plans which are required to receive flood mitigation funds (See Illinois Emergency Management Agency).

Many of the stream gages in Illinois maintained by the US Geological Survey, are jointly funded by OWR. Also, OWR has a few gages that they have installed and maintain themselves.

Maintenance: OWR provides limited technical and financial assistance on stream and channel maintenance on a case-by-case basis as resources are available.

ILLINOIS DEPARTMENT OF NATURAL RESOURCES - OFFICE OF REALTY AND ENVIRONMENTAL PLANNING (IDNR-OREP) OREP is responsible for natural resource and outdoor recreation planning.

Administration and Management: OREP has no responsibility for administration and management of stormwater related programs in Will County.

Regulation: The Division of Natural Resource Review and Coordination, under OREP, is responsible for administering Endangered Species Conservation Program. The Illinois Endangered Species Protection Act and the Illinois Natural Areas Preservation Act mandate that every local municipality complete a consultation process prior to performing, funding, or authorizing land, air, or water disturbing activities, including new development. If there are any endangered species or State Natural Area Inventory sites being impacted or likely to be affected by the activity, the Division issues a biological opinion stating whether there is potential for biological impact and provides guidance on measures that can be taken to minimize any potential impacts. OREP must review both public and private projects.

Also under the Division of Natural Resource Review and Coordination, is the permit Review program. Through this program, the Division reviews all Corps of Engineers and all OWR permits under the provisions of the Fish and Wildlife Coordination Act. The Interagency Wetlands Policy Act is also administered by the Division. Compliance with this Act is needed only when state funds are involved.

Planning: The Division of Planning, under OREP, carries out a variety of outdoor recreation and natural resource planning, program development and management, and policy formulation activities, including greenways corridor planning. The Division helped fund preparation of the "Northeastern Illinois Regional Greenways Plan", its 1997 update, and the "Northeastern Illinois Regional Water Trails Plan."

The IDNR's Ecosystems Program is a program established in OREP in 1994 under Governor Edgar's Conservation 2000 initiative. The program is a voluntary program to provide financial and technical support to groups of individuals, both public and private, which seek to maintain and enhance ecological and economic conditions in key watersheds. Under the ecosystem program, partnerships are assembled to protect and enhance "resource rich" areas of the state. The partnerships are composed of local governments, land owners, and other stakeholders. After approval of a partnership by the State, the partnership is eligible to apply for grants to implement projects within their ecosystem. Four eligible project types have been identified under the program; 1) habitat protection agreements where conservation easements or other strategies are used to protect specific habitat sites; 2) habitat improvement projects where specific habitat sites are improved using various restoration techniques; 3) research projects to improve understanding of ecosystem processes or strategies for protecting and enhancing ecosystems; and 4) education projects to inform the public of the values of ecosystems and improve stewardship for ecosystems. The Prairie Parklands Ecosystem Partnership (including the Midewin National Tallgrass Prairie) has been designated and covers a large part of Will County. In addition, the extreme northeastern corner of the Kankakee and Iroquois River Ecosystem Partnership enters Will County (southeastern corner of Will County).

The Critical Trends Assessment Program (CTAP) was a precursor to the Conservation 2000 initiative. There are a number of components under CTAP including environmental education resources, citizen environmental monitoring programs (e.g. the river watch

network), and statewide land cover mapping, as well as assessment of critical trends. CTAP was essentially developed to monitor ecological and environmental trends in Illinois as well as provide scientific support for the Ecosystems Program. This project has identified resource rich areas of the state, developed land cover mapping from satellite images and assembled other natural resource data that could be useful in preparing watershed plans.

Maintenance: OREP is not involved with maintenance activities.

ILLINOIS DEPARTMENT OF NATURAL RESOURCES-OFFICE OF RESOURCE CONSERVATION (IDNR-ORC): ORC is responsible for the preservation and enhancement of the natural resources in Illinois and manages the state parks. ORC works with a variety of public and private agencies involved in the protection of natural resources in Illinois.

Administration and Management: ORC has no responsibility for administration and management of stormwater related programs in Will County.

Regulation: Section 404 permit applications for significant wetland disturbances are reviewed by ORC through IDNR's Permit Review Program under the Division of Natural Resource Review and Coordination.

Planning: Under the Division of Fisheries, ORC performs fish surveys as part of their basin survey and biannual sampling programs. Each of the Will County river basins (DuPage River, Des Plaines River, and Kankakee River watersheds) are sampled on a five year cycle under the basin surveys. Both the mainstem and tributaries are sampled. Under the biannual program, the DuPage River, Des Plaines River, and Kankakee River mainstems (not the tributaries) are sampled once every two years. The Division of Fisheries also provides technical assistance to the Ecosystem Partnerships.

Maintenance: Maintenance activities of ORC are limited to their own properties on which they generally perform stream management activities.

ILLINOIS DEPARTMENT OF NATURAL RESOURCES - OFFICE OF CAPITAL DEVELOPMENT (IDNR-OCD): OCD is responsible for administration of IDNR grants.

Administration and Management: OCD has no responsibility for administration and management of stormwater-related programs in Will County.

Regulation: OCD has no regulatory authority.

Planning: OCD administers state and federal open space programs. The state's program is entitled Open Space Lands Acquisition and Development (OSLAD) and the corresponding federal program is entitled Land and Water Conservation Fund (LWCF but also known as LAWCON). These programs provide funding for open space acquisition and development on a 50% reimbursement basis. It may be possible to use these funds to assist in the purchase and enhancement of significant wetland, depressional storage, and floodplain areas that are

important to the management of stormwater in Will County. OCD works closely with the Division of Planning under OREP in reviewing and selecting open space grants.

Maintenance: OCD is not involved with maintenance activities.

ILLINOIS DEPARTMENT OF NATURAL RESOURCES-OFFICE OF SCIENTIFIC RESEARCH AND ANALYSIS (IDNR-OSRA): OSRA (formerly IDENR) conducts research, provides information, and formulates policy related to Illinois' natural resources.

Administration and Management: OSRA plays is not involved in administration and management of stormwater-related programs in Will County.

Regulation: OSRA has no regulatory authority.

Planning: The OSRA can provide research and technical assistance for projects involving natural resources. The Water Survey, a division of OSRA, conducts hydrologic studies and provides design rainfall data for the state of Illinois. The Natural History Survey, also a division of OSRA, is currently developing new techniques for studying soil erosion and helping to identify Illinois streams which are biologically significant. The Natural History Survey can also perform assessments of flora and fauna of natural areas.
Maintenance: OSRA is not involved with maintenance activities.

ILLINOIS EMERGENCY MANAGEMENT AGENCY (IEMA): IEMA is the state emergency management agency. Although flood emergencies and floodplain management is a significant component or their responsibilities, IEMA is responsible for managing all hazards.

Administration and Management: IEMA plays no direct role in the administration and management of local stormwater programs. However, during presidential disaster declarations, IEMA is part of an Interagency Mitigation Advisory Group (IMAG) that is formed to guide mitigation activities and allocate state and federal disaster assistance funds.

Regulation: IEMA has no regulatory authority and is not involved in regulatory issues.

Planning: There are two stormwater and floodplain management-related federal grant programs administered by IEMA. The first program is the Hazard Mitigation Grant Program (HMGP) which is initiated by a presidential disaster declaration. This program provides funding after a disaster has been declared and can be used to acquire, relocate, or elevate structures substantially damaged by floods. However, IEMA's first priority is acquisition. A certified hazard mitigation plan is required to be eligible for these funds. However, in the past, IEMA has allowed an abbreviated plan to be prepared and submitted as part of the application for HMGP funds.

The second program is the Flood Mitigation Assistance Program (FMAP). This program is relatively new and the available funds have been relatively small. The purpose of the program is to provide pre-flood grants to prepare and implement locally prepared hazard

mitigation plans. An approved flood hazard mitigation plan is required to be eligible for project implementation funds. The plan can be prepared using local funds or with financial assistance under FMAP. Acquisition, flood proofing, and other FMAP funded activities may occur on insured properties (federal flood insurance) only. Communities must be in the National Flood Insurance Program (NFIP) to be eligible for FMAP grants. Planning and design required to implement specific mitigation projects are likely to be fundable activities under this program.

Both HMGP and FMAP grants provide 75% funding with a 25% (non-federal) match of cash or in-kind services required. Hazard mitigation plans are certified through the IEMA regional coordinator (Region III for County) and approved at the state level.

Maintenance: IEMA is not involved in maintenance activities.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY (IEPA): IEPA is the agency responsible for water quality issues including regulation and management of both point and nonpoint sources of pollution.

Administration and Management: IEPA is not directly involved in administration or management of stormwater programs in Will County except to the extent that they may provide grants to fund certain administrative and management activities.

IEPA (with USEPA funds) has partially funded preparation of a course curriculum to educate designers and permit reviewers in the application of stormwater BMPs on urban development sites. IEPA (also with USEPA funds) has partially funded, as part of other projects, preparation of public education materials such as guidance to riparian land owners.

IEPA provided funding to NRCS to prepare the "Illinois Urban Manual - A Technical Manual Designed for Urban Ecosystem Protection and Enhancement" (USDA, 1995) which provides guidance in designing soil erosion and sediment control as well as stormwater best management practices for new development.

Regulation: IEPA is the state regulatory agency for water quality and issues National Pollutant Discharge Elimination System (NPDES) permits in the State of Illinois under Section 402p of the Clean Water Act. In 1992, NPDES was expanded to address stormwater discharges, including construction activities of five or more acres. USEPA is currently considering rules that would address construction activities disturbing more than one acre. Under the construction activities program, the developer is required to prepare a "Stormwater Pollution Prevention Plan" addressing construction site runoff as well as post construction runoff and file a "Notice of Intent". The Illinois Urban Manual is intended to guide preparation of the pollution prevention plans. There presently is little state review of prevention plans or inspection and enforcement to ensure compliance with the prepared plans. This program is administered entirely at the state level with no local government

involvement required. However, the permit does reference compliance with local government ordinances, in addition to the state requirements.

Certain industries (based on SIC code) also must file for a permit for stormwater discharges, regardless of the time at which the property was developed. The requirements for some industrial discharges are considerably greater than for construction activities. The requirements may include water quality monitoring of selected storm events to characterize the runoff from the site and development of detailed pollution prevention plans that are reviewed by IEPA. Follow-up water quality monitoring may be required after installation of the measures in the pollution prevention plan.

Finally, municipalities with populations over 100,000 are required to file for a permit for stormwater discharges. As with the industrial stormwater discharge permits, the municipal stormwater permits require monitoring of stormwater runoff and development of pollution prevention plans for discharges that exceed state water quality standards.

The USEPA published proposed rules for Phase II of the NPDES program in the January 9, 1998 Federal Register. Under the proposed rules all census designated □urban areas□ will be required to comply under Phase II. In Will County, nearly 19% of the land area is designated as urban including virtually all the municipalities in the Des Plaines River (except Channahon, Elwood, Mokena, and Manhattan), DuPage River (except Minooka), and Calumet River watersheds.

Although the Corps of Engineers is the agency responsible for issuing wetland permits, IEPA makes determinations regarding water quality impacts of wetland disturbances and issues water quality certification under Section 401 of the Clean Water Act.

Planning: IEPA collects water quality and biological data on streams and lakes throughout the state, including Will County. The data is reported in their biannual "Illinois Water Quality Report" (305b report). This document reports the level to which waterbodies are supporting their designated uses (i.e., swimming, aquatic life, etc.). For lakes, the data is also reported in an annual Lake Water Quality Assessment Report. Finally, IEPA maintains the Illinois Water Quality Management Plan which includes recommendations for stormwater, soil erosion and sediment control, and stream and wetland BMPs.

USEPA provides grants for water quality-related planning, implementation, and demonstration projects under Section 319(h) and 104(b)(3) of the Clean Water Act. These programs are administered by IEPA and provide funds for local governments to implement projects or prepare plans.

Section 319 is the state nonpoint source program and it provides grants annually for implementation of nonpoint source control plans and demonstration projects which can include best management practices for urban runoff as well as instream activities to reduce erosion and sedimentation that can lead to degradation of water quality. On the preventative

side, activities such as ordinance implementation and preparation of workshops on stormwater best management practices have been funded under Section 319.

Funding under Section 104(b)(3) is sporadic and is the only one of these programs that provides funding for watershed planning. Funding under 104(b)(3) has been used to develop watershed management plans in several watersheds in Lake County, Illinois. These plans recommended both remedial and preventative actions to address water quality and use impairments of Flint and Mutton Creeks and their lakes and wetlands.

The Illinois Clean Lakes Program provides annual grants for Phase I lake diagnostics and alternative evaluation and Phase II implementation. The focus of the program is on lake remediation projects where there is a realistic opportunity for restoration and on protection projects for high quality lakes. IEPA encourages a watershed approach in addressing lake remediation and protection needs.

Most of the IEPA grants require a local cost share (generally 40%). The cost share can either be in the form of hard dollars or in-kind services.
Maintenance: IEPA is not directly involved in maintenance activities. However, grants have been awarded to local governments to assist in stream maintenance activities that address water quality concerns, including streambank erosion. These grants have partially funded removal of debris from streams, removal of non-native undesirable riparian vegetation, and installation of erosion control measures.

ILLINOIS POLLUTION CONTROL BOARD (IPCB): The Illinois Environmental Protection Act was enacted in 1970 to establish a comprehensive statewide program to restore, protect, and enhance the quality of the environment in Illinois. The IPCB was formed to implement the act and provided authority to adopt environmental standards and regulations for the State.

Administration and Management: IPCB is not involved in the administration or management of stormwater programs in Will County

Regulation: IPCB establishes the state regulations enforced by IEPA.

Planning: IPCB is not involved in stormwater or watershed planning activities.

Maintenance: IPCB is not involved with maintenance activities.

ILLINOIS DEPARTMENT OF TRANSPORTATION (IDOT): Although IDOT's primary responsibility is building and maintaining the state highway system, IDOT is involved in drainage issues related to stream crossings and drainage of its roadways.

Administration and Management: IDOT is not involved in the administration or management of stormwater programs in Will County, other than its own drainage needs.

Regulation: IDOT has no direct authority to regulate stormwater or floodplain activities. However, they do regulate access to their rights-of-way through a traffic access permit. Any time there is an encroachment onto highway right-of-way such as grading changes, driveway construction, or curb cuts, IDOT reviews drainage plans to ensure that there is no diversion of runoff onto the right-of-way and that there is no increase in flow rate to the highway drainage system.

IDOT is regulated by IDNR-OWR whenever there is a crossing of a regulatory floodway. IDOT is allowed no more than 0.1 foot of created head at the crossing. New bridge and culvert structures over streams, but not in regulatory floodways, are sized to allow a created head no greater than 0.5 feet and 1.0 feet for the 100-year frequency discharge in urban areas and rural areas, respectively.

The waterway openings of IDOT bridges and culverts are designed based on the 50-year flood. The bridges are sized to have a minimum clearance of 2 feet between the 50-year stage and the low beam of the bridge structure. In addition, highway pavement located within the floodplain must be at least 3 feet above the 50-year flood stage.
IDOT is not required to meet local permit requirements in terms of detention or other stormwater standards. However, IDOT has worked with county stormwater committees and local government councils to try to meet local standards that IDOT deems feasible.

Planning: IDOT is not involved in stormwater or watershed planning activities.

Maintenance: IDOT is responsible for maintaining the drainage system within their right-of-way, including at bridges and culverts.

2.2.4 Federal

U.S. ARMY CORPS OF ENGINEERS (USACE): The U.S. Army Corps of Engineers is responsible for the management of navigable rivers, lakes and shorelines. The Corps constructs large flood control projects on regional river systems. The Corps is also responsible for regulating activities which involve the dredging and filling of the waters of the United States, including wetlands.

Administration and Management: The Corps of Engineers is not involved in administration and management of stormwater programs in Will County.

Regulation: Section 404 of the Clean Water Act prohibits the discharge of dredged or fill material into waters of the United States without a permit from the U.S. Army Corps of Engineers. As defined by the Clean Water Act, waters of the U.S. include all waters and wetlands that could be important for interstate commerce purposes. The Corps of Engineers also derives authority from Section 10 of the Rivers and Harbors Act of 1899. This act prohibits the alteration or obstruction of any navigable waterway of the United States without the Authorization of the Corps of Engineers. The act makes it unlawful to excavate, fill, or in any way modify or alter the channel of a navigable waterway without authorization.

Wetlands with surface water elevations below the ordinary high-water elevation of a connected navigable waterway are also regulated under Section 10. Under this act navigable waterways are those waters that are presently used, have been used in the past, or may be susceptible to use to transport interstate or foreign commerce.

Historically, dredge and fill have been the only activities in wetlands regulated by the Corps of Engineers. More recently, the Corps of Engineers is paying closer attention to other wetland disturbances such as drainage and excavation. Still other wetland disturbances, such as vegetation removal and impoundment, remain unregulated unless part of a dredge and fill activity. Also, the Corps is primarily interested in the flora and fauna of wetlands and does not specifically protect the stormwater storage volume of wetlands. Recently, the Corps reduced the minimum protected wetland size to 1/3 acre. Related to the Section 404 permit, water quality certification must be obtained from the State of Illinois as described under the Illinois EPA. The 404 permit and 401 water quality certification are addressed by a joint application to the Corps of Engineers. Like the NPDES program, no local government involvement is required in the Corps permitting process.

Planning/Capital Improvements: The Corps of Engineers has funding available for flood control projects. After a reconnaissance level study has shown that a project is likely to be cost effective (i.e. benefits exceed costs), the Corps will proceed with project analysis which must be funded locally by 50% matching funds. For approved projects, the Corps funds 75% of design and construction costs with the remaining 25% to be funded locally. Projects are generally limited to structural flood control measures. However, the Corps has also provided design services for floodproofing of residences as part of an overall flood control project. Corps studies are generally performed with in-house staff. However, local government assistance with those studies can be applied to the local cost share.

Maintenance: The Corps of Engineers has maintenance responsibilities for certain navigable waterways (e.g., the Sanitary and Ship Canal) and their own flood control facilities.

FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA): FEMA administers the National Flood Insurance Program (NFIP). FEMA also provides disaster assistance during floods as well as other disasters. The Federal Insurance Administration, a part of FEMA, produces floodplain maps which are used for both insurance and regulatory purposes.

Administration and Management: FEMA is the lead agency related to disaster assistance in terms of federal funding and technical assistance for relief and recovery programs. FEMA has also participated in and sponsored training programs on the National Flood Insurance Program and flood hazard mitigation activities.

Regulation: FEMA has minimum floodplain standards that must be enforced by local governments to maintain eligibility in the NFIP. Participation in the NFIP allows residents of the community to purchase flood insurance and makes the communities eligible for federal emergency relief funds if a presidential disaster declaration has been issued. Flood insurance is required for insurable structures located in the floodplain if the owner applies

for a federal grant or loan, or federally insured or subsidized loans (e.g. mortgage). In support of the local regulatory programs, floodplain mapping was produced for all communities participating in the program. Most of these maps for Will County were produced in the early 1980s. However, a number of studies were updated in the early 1990s. Also in support of the NFIP, IDNR-OWR and NIPC prepared a model floodplain ordinance for communities to adopt. Adoption and enforcement of the model will satisfy FEMA's requirements to maintain eligibility in the program.

Planning: FEMA has several flood hazard mitigation funding programs that are administered by the Illinois Emergency Management Agency (IEMA). These programs are described further under the description of IEMA. Funding may also be available from FEMA to update floodplain maps.

Maintenance: FEMA is not involved in maintenance activities.

U.S. DEPARTMENT OF AGRICULTURE- NATURAL RESOURCES CONSERVATION SERVICE (NRCS): NRCS (formerly the Soil Conservation Service) is primarily concerned with the wise use of soil, water and other related natural resources.

Administration and Management: NRCS works through and provides technical assistance to local soil and water conservation districts to assist the agricultural community. NRCS also co-sponsors training opportunities including courses and workshops in design and implementation of stormwater best management practices, soil erosion and sediment control, wetland management, and hydrologic computer modeling to support the urban community.

Regulation: NRCS utilizes a voluntary, rather than a regulatory, approach to implement its conservation program authorities. In agricultural areas, producers who want to participate in USDA programs and receive benefits must implement conservation requirements. NRCS has developed conservation practice standards and specifications that may be utilized in regulatory programs.

Planning: Under the Watershed Protection and Flood Protection Act (Public Law 93-566, as amended) NRCS has planned, designed, and constructed flood control facilities to address overbank flooding in the Chicago metropolitan region. Also under this program, NRCS has performed floodplain management studies and updated floodplain mapping for local governments.

In recent years, the NRCS has initiated an urban conservation program because of the need for urban erosion, sediment and flood control assistance. Under this program, NRCS provides (or will provide) technical assistance (and possibly financial assistance) in urban natural resource planning and restoration. To staff these activities, the NRCS has opened the Chicago Metro Urban and Community Assistance Office in Naperville, Illinois.

NRCS is currently assisting local governments in preparing management plans for various watersheds around the region, including Spring Creek in Will County.

Maintenance: NRCS has no maintenance responsibilities but does provide technical assistance to land owners and public works officials regarding the maintenance of streams and stormwater management facilities in both agricultural and urban areas.

U.S. GEOLOGICAL SURVEY-WATER RESOURCES DIVISION (USGS-WRD): USGS-WRD is responsible for providing the hydrologic information necessary to achieve the best use and management of the nation's water resources.

Administration and Management: Although USGS has no involvement in administration and management, USGS has co-sponsored training courses in hydrologic modeling in northeastern Illinois.

Regulation: The USGS has no regulatory authority and is not involved in regulatory activities in Will County.

Planning: Through a cooperative program, the USGS-WRD (Illinois District) maintains a stream gaging network and publishes an annual report containing daily streamflow data and water quality information for selected sites around the state. The USGS also has funding for site specific hydrologic and water quality data collection and analysis. Some mapping efforts may also be fundable through USGS. USGS funds 50% of project in-house labor and expenses. On a 50% cost basis, the USGS-WRD can provide technical assistance in developing watershed models and other hydrologic and water quality related assistance.

Maintenance: USGS is not involved in maintenance activities.

U.S. ENVIRONMENTAL PROTECTION AGENCY: Protecting the nation's waters from pollution is one of the many concerns of the USEPA. The Clean Water Act enables the USEPA to regulate water quality on a national level.

Administration and Management: USEPA is not involved in local administration or management of stormwater programs.

Regulation: NPDES authority ultimately rests with the USEPA. However, that authority has been delegated to the IEPA in Illinois (see IEPA for more discussion on NPDES). Although not directly involved in the permitting process, the USEPA works with the U.S. Army Corps of Engineers to establish wetlands policy and has veto authority over Section 404 permits. USEPA has enforcement authority for a number of sections of the Clean Water Act.

Planning: USEPA provides grants for water quality related planning and demonstration projects under Section 319(h) and 104(b)(3) of the Clean Water Act as discussed under IEPA. USEPA also holds national conferences on such topics as urban runoff management, watershed nonpoint source pollution monitoring, ecological restoration, and others.

Maintenance: USEPA plays no direct role in maintenance activities. However, USEPA is the ultimate source of grant funds to assist in performing maintenance/restoration activities as discussed under IEPA.

U.S. FISH AND WILDLIFE SERVICE: The U.S. Fish and Wildlife Service (USFWS) is responsible for protection of aquatic and wildlife habitats and is actively involved in water quality and wetland preservation. USFWS also works with numerous agencies, such as IDNR-ORC, on a variety of wetland protection projects.

Administration and Management: USFWS is not involved in administration and management of stormwater activities in Will County.

Regulation: Section 404 permit applications (see US Army Corps of Engineers) for wetland disturbances on sites which contain federally endangered or threatened plant or wildlife species are reviewed by the USFWS for impacts to fish and wildlife resources.

Planning: The USFWS can provide technical review and support for the planning and design of wetland protection and restoration. USFWS has a field office in Barrington, Illinois specializing in urban wetland issues.

Maintenance: USFWS may be able to provide technical assistance to land owners performing stream and wetland maintenance and management activities which would enhance their wildlife habitat functions.

NATIONAL PARK SERVICE (NPS): The NPS is charged with preservation of the nation's natural, cultural, and recreational resources through acquisition and technical assistance. The NPS carries out their mission through acquisition, development, and maintenance of the nations parks and by providing technical assistance to state and local governments as well as private organizations.

Administration and Management: NPS is not involved with administration and management of stormwater activities in Will County.

Regulation: NPS has no regulatory authority.

Planning: The Rivers, Trails, and Conservation Assistance (RTCA) Program provides technical assistance in support of local river conservation projects. NPS staff will work with local governments and private groups on river corridor projects to help them achieve multiple benefits including floodwater retention, wetland protection, habitat restoration, water quality improvements, and recreational opportunities. NPS staff can assist with citizen involvement activities, facilitate local discussion and decision making, and assist in development and implementation of plans.

Maintenance: The NPS is not involved in maintenance activities in Will County.

2.3. LEGAL AND REGULATORY BACKGROUND

The following discussions on legal and regulatory rights and authorities related to agricultural and urban drainage and stormwater management were excerpted and paraphrased from *Model Stormwater Drainage and Detention Ordinance* (NIPC, 1990) and *Illinois Drainage Law* (Uchtmann and Rolf, 1991)

2.3.1 Illinois Drainage Law

Civil Law Rule: Essentially all states adhere to one of three types of drainage law: the common enemy rule, the civil law rule (also known as the natural flow or natural drainage rule), and the reasonable use rule.

The common enemy rule states that a landowner has an unlimited privilege to deal with surface water on his land as he pleases, regardless of the harm his actions may cause other landowners. By the same token, the adjoining property owners can "fight back" and repel waters coming on to their properties however they may choose. Most states which continue to adhere to this rule have modified it so that a landowner can obstruct surface waters only to the extent that the obstruction is incidental to ordinary use of the land and is not installed maliciously or negligently.

The civil law rule, in its original form, holds that a landowner cannot interfere with the natural flow of surface waters. Owners of lower-lying land (in legal terminology the "servient estate") were burdened by an "easement" which required them to accept all surface waters naturally flowing from higher land (in legal terminology "dominant estate"). On the other hand, the dominant estate owner could do nothing which increased the flow of waters to servient estates. Because this prohibition impeded agricultural development, the Illinois Court, In Peck versus Herrington (109 Ill. 611 (1884)) and in a series of later cases, declared and gradually defined a "good husbandry exception" to the civil law rule.

The good husbandry exception allowed the owner of the dominant estate to construct drains on his land, in order to promote appropriate agricultural practices, even though such drains increased the flow of water onto the servient estate. Whether the drains consisted of surface ditches or underground tile drains made no difference (Lambert versus Alcorn, 144, Ill. 313, 33 N.E. 53 (1893)). Even under the good husbandry exception, however, the dominant estate owner could not divert the natural course of drainage; that is, he could not cast waters onto lower land which otherwise would have naturally flowed in another direction nor could he discharge runoff at a location different from the natural drainage outlet (Dayton versus Drainage Commission, 128 Ill. 271, 21 N.E. 198 (1889)). The amount of water which could be drained on to lower land, was limited only by the carrying capacity of the stream into which the surface waters were eventually discharged (People versus Peeler, 290 Ill. 451 (1919)). Illinois adheres to the Civil Law rule as modified and clarified by the cases cited above as well as subsequent cases.

The reasonable use rule, unlike either the common enemy or civil law doctrines, is based on tort law rather than property law. Thus, the guiding concept of this rule is "fair play" rather than "who owns what." The essence of the reasonable use rule is that a person may drain his property only in a

manner which is not unreasonably injurious to the interests of other landowners. To determine reasonableness, the courts of jurisdictions subscribing to this rule apply a "balancing test"; they attempt to devise a fair and equitable solution to the specific facts and circumstances of a particular case. The upshot is that the reasonable use rule is unquestionably the most flexible of the three approaches, and arguably the most adaptable to changing contemporary conditions.

Key Elements of Illinois Drainage Law: The following are the key elements of Illinois Drainage law.

1) A landowner may collect surface water, discharge it, and hasten its flow downstream. Under the good husbandry exception, landowners can hasten drainage of their land (and therefore increase flow rates) provided the water is not diverted from another basin and the water enters the servient estate where it would have in a state of nature. The water can be carried by artificial ditches and tile lines and the owners of the lower land cannot object to the increased flow. Although not explicitly stated, this appears to allow concentration of flow in addition to increasing flow.

2) A landowner may drain surface waters into watercourses. Owners of higher ground can drain their land within a natural basin into a natural watercourse even if such drainage does damage to lower ground. Furthermore, owners of a streambank have the right to improve it so long as the improvements do not impair drainage.

3) A landowner has no right to obstruct the flow of surface water from upstream property. The owner of lower land has no right to build any artificial structure that will interfere with the drainage of higher land. However, the owner of higher land cannot compel the owner of lower land to remove natural obstructions that may accumulate and impair drainage. On the other hand, in some circumstances, the owner of the higher land has the right to enter the servient estate to make reasonable repairs and clear the watercourse.

4) Easements of drainage or obstruction. When landowners are harmed by other owners and fail to enforce their rights, the harmful practices themselves become rights or *easements*. The easement is acquired by *prescriptive use*. The period of use required to obtain the easement by prescriptive use is 20 years in Illinois. These easements cannot be acquired against the public (e.g., a highway or school district).

5) A landowner may extend a tile drain across the land of others. Illinois Drainage Code provides that owners may extend their tile drain across the land of others when the extension is necessary to accomplish adequate drainage and when certain conditions imposed by law are met. Owners who install a drain must keep it in good repair so that it will not injure the property through which it passes. To meet this obligation, the tile owners may enter the lands where the drains are located at any time to affect the repair. The owner of the drain is liable for triple damages for willful harm to servient lands.

6) Urban landowners cannot increase drainage flows unreasonably. In 1974, in the landmark case of Templeton versus Huss (57 Ill. 2d 134, 311 N.E. 2d 141) the Illinois Supreme Court very substantially modified the civil law rule of drainage in Illinois. In this case, the defendants owned

the dominant estate, which they developed into a residential subdivision. The plaintiff owned the servient estate, a parcel of farmland. Recognizing that natural drainage could be substantially altered by urban development, the court held that the developer of the subdivision was liable for damages to the lower land if the houses and streets interfered so much with natural seepage that the amount and velocity of water running off the developers land was unreasonably increased.

Although the court's reasoning could easily be applied to controversies over agricultural drainage, the criteria of good husbandry still appears to be applicable. Courts have not expressly indicated that Templeton v. Huss altered the good husbandry exception. It could be inferred that, in effect, natural drainage law applies to rural lands and reasonable use law applies to urban lands.

2.3.2 Illinois Laws on Drainage Districts

Natural drainage law did not adequately meet the drainage needs of landowners in many parts of the state. To meet the needs of these landowners, the legislature in 1879 passed the Levee Act and the Farm Drainage Act and in 1956 passed the Illinois Drainage Code (70 ILCS 605/1-1 et Seq.). The Levee Act and Farm Drainage Act allowed for drainage districts based on a system of assessments and permitted districts to include only lands that benefited. The Illinois Drainage Code allows for drainage districts to be formed to construct, maintain, or repair natural or artificial drains or levees. They may also engage in other drainage or levee work for agricultural, sanitary, or mining purposes.

Landowners within the district pay assessments. However, the assessments on land cannot exceed the benefits that the land will receive. Benefits are defined as the value of the proposed drainage works to a particular property and the benefits are not limited to agricultural benefits.

Drainage districts are public corporations charged with specific governmental functions and, if necessary, may acquire rights in land by eminent domain.

Formation of Districts: "A drainage district may be organized upon petition signed by 20% of adult owners owning more than one-fourth of the land in the proposed district; or by more than one-fourth of the adult owners owning a major portion of the land." (Illinois Compiled Statutes, Chapter 70, Sec 605/3-3). The petition must include a description of the proposed work and a statement of the necessity of the work, as well as numerous other items. Provision is made for giving notice and holding a court hearing on the petition to allow challenges to the necessity of all or part of the proposed work.

An alternative method of formation is by referendum in the proposed district. The petition for referendum requires signature by at least 10% of the adults who own at least 20% of the land in the proposed district.

A petition for district formation may not include land already in another district. However, *outlet districts* may be formed provided they benefit two or more drainage districts as well as land not already in a drainage district.

If the court approves the petition for district formation, three temporary commissioners are appointed. Two commissioners constitute a quorum. The specific duties of the temporary commissioners are to evaluate the feasibility, costs, and benefits of the proposed work. A report of the findings must be filed with the court. If the benefits of the proposed work exceed the costs, the court may find that the district should be organized.

Powers and Duties of the Commissioners: The commissioners for a district may do and perform all acts and things, whether express or implied, that may be reasonable required in order to accomplish the purposes of the Illinois Drainage Code. In performing any of the duties and in exercising any of the powers provided in the Illinois Drainage Code, the commissioners are required to used all practicable means and measures, including consideration of alternative methods of providing the necessary drainage, to protect such environmental values as trees and fish and wildlife habitat, and to avoid erosion and pollution of the land, water, or air. (70 ILCS 605/4-15.1) Some of the more important powers and duties of the drainage district commissioners include the following.

- To file a list of active commissioners with the clerk of the circuit court and to file a map showing all boundaries and locations of all drainage improvements with the clerk of both the circuit court and the county;
- To go upon land, employ necessary assistance, and adopt a plan or system of drainage;
- To obtain the necessary lands and right-of-way by agreement or, if necessary, by eminent domain;
- To let contracts for surveying, laying, constructing, repairing, altering, enlarging, cleaning, protecting, and maintaining of any drain, ditch, levee, or other works;
- To widen, straighten, deepen, or enlarge any ditch or watercourse, and to remove driftwood and rubbish whether the ditch is in, outside, or below the district;
- To cause railroad companies to construct, rebuild, or enlarge bridges or culverts when necessary; (Since the legislature enacted the Farm Drainage Act prior to the invention of the automobile, it is not clear if this right would also apply to highway authorities.)
- To make annual or more frequent reports as required by the court, including an annual financial report; and
- To abandon works no longer useful to the district.

Before a farmer and a drainage district decide to make drainage improvements, they should consider the effects these improvements will have on a farmer's participation in USDA programs. Specifically, farmers must comply with the wetland provisions of the Food Security Act of 1985, as amended by the Food, Agriculture, Conservation, and Trade Act of 1990, to be eligible for USDA program benefits.

2.3.3. Statutory Authority

Municipal Authority: Authorization for municipalities to enact ordinances to better manage stormwater runoff and avoid undue flooding cannot be found in any one section of the Municipal Code (65 ILCS), but must be "pieced together" from a number of sections. The totality of authority granted municipalities, though, is clearly sufficient to permit enactment of effective stormwater control measures. Moreover, in light of Section 5/1-2-1 of the Municipal Code (□The corporate authorities of each municipality may pass all ordinances and make all rules and regulations proper or necessary to carry into effect the powers granted to municipalities, with such fines or penalties as may be deemed proper□), the fact that the authority is scattered would not pose any serious impediment to passage of □free-standing ordinances□ as opposed to a series of amendments to the local zoning, subdivision, and building ordinances.

Municipalities in DuPage, Kane, Lake, McHenry, and Will counties are bound by stormwater management regulations which may be adopted by county boards as part of the programs authorized by 55 ILCS 5/5-1062.

County Authority: Counties, like municipalities, have various powers which, when viewed together, appear sufficient to adequately control stormwater runoff.

CHAPTER 3

ASSESSMENT OF STORMWATER CONDITIONS AND PROBLEMS

The purpose of this chapter is to assess the current physical conditions of Will County watersheds. This Stormwater Plan is primarily concerned with development of an institutional framework. However, knowledge of current physical conditions and problems is needed both to assess the adequacy of existing stormwater programs and to prioritize activities once the framework is in place.

Part of the assessment presented in this chapter was based on review and analysis of existing databases and part was based on a survey. Surveys were sent out to each municipality and township as well as the County regarding the types and locations of stormwater problems. The findings presented in this chapter reflect review of the surveys returned by each of the entities, review of local stormwater studies, review of IEPA water quality data, and personal observation of the WCSMPC and those participating in preparation of this plan. Results of these assessments are presented for the following topics:

- Watershed Land Use and Floodplains (Section 3.1)
- Soils and Drainage (Section 3.2)
- Flooding (Section 3.3)
- Streambank Erosion (Section 3.4)
- Water Quality and Water Body Use Impairment (Section 3.5)

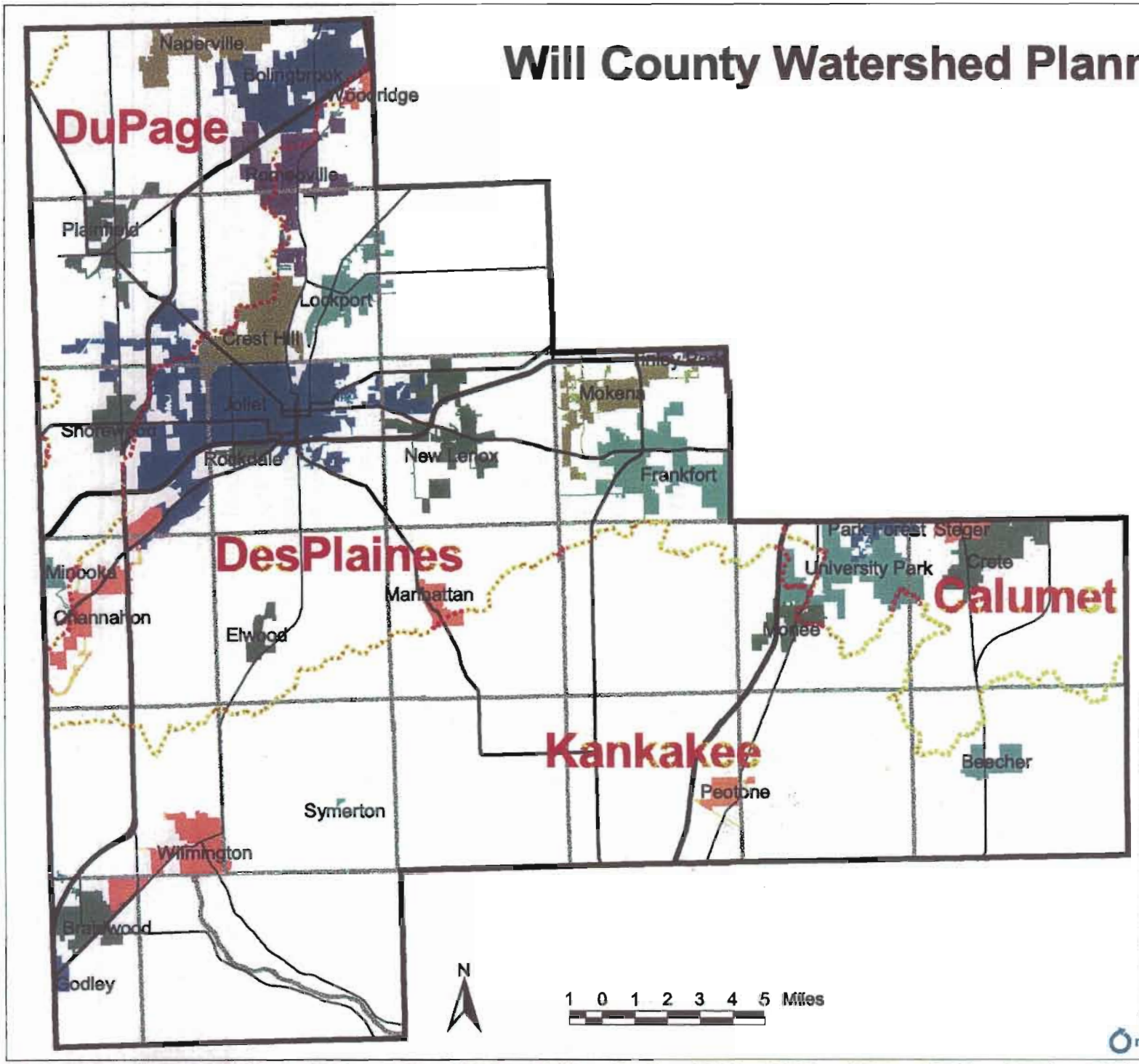
3.1 WATERSHED LAND USE AND FLOODPLAINS

This section provides background information which may be useful in understanding existing and potential future stormwater problems. For planning purposes, the County has been divided into four primary watersheds plus small areas on the western edge of the County that are in none of the four watersheds (Illinois River tributaries):

- DuPage River,
- Des Plaines River,
- Calumet River,
- Kankakee River, and
- Illinois River tributaries.

The four watersheds plus the Illinois River tributaries area are shown in Figure 3-1 along with township and municipal boundaries. The Illinois River tributaries area is not labeled since it includes only a very small portion of the County (0.3%). The statistics presented in this section are based on data contained within the Geographic Information System (GIS) database of NIPC. The data layers within the GIS and used for this project include a 1990 regional land use database (NIPC, 1994), digital streams data (USGS, 1986), digital flood insurance rate maps

Will County Watershed Planning Units



Legend

- Watersheds
- Townships
- County Boundary
- Interstate Highway
- U.S. Highway
- State Highway

Municipal boundaries from U.S. Census 1990 Tiger files. Watersheds derived from U.S. Geological Survey's 1:24,000 Drainage Basins Based on Gaging Stations, 1996 pre-release coverage. Roads from U.S. Geological Survey 1:100,000 Digital Line Graph's. Townships and county boundaries from NIPC. Maps made by the Natural Resources Department of the Northeastern Illinois Planning Commission, April 15, 1998.

northeastern illinois planning commission

Figure 3-1

(FEMA Q3 data, 1996), digital 1990 population data (NIPC, 1994), and watershed boundaries (USGS, 1996). The Q3 data was prepared from the community Flood Insurance Rate Map (FIRM) panels available through 1995 but prior to preparation of the countywide FIRM.

Through a digital overlay of the watershed boundaries on the land use and population layers, statistics on land use area and population were computed by watershed. Table 3-1 presents the population and land use areas in acres for each of the five watersheds. Table 3-2 presents the same information in terms of percentages (and population density).

Degree of Urbanization: Urban land uses include single and multi-family residential, commercial, industrial, institutional, and transportation. The greatest percentage of urban land uses occurs in the Des Plaines River watershed (32%) followed by the Calumet River (23%) and DuPage River (19%) watersheds in the northern part of the County. The Kankakee River watershed in the southern portion of the County has only 10% urban land uses. It is interesting to note that the DuPage River watershed has the highest population density yet the third highest percentage of land in residential land uses in particular and urban land uses in general.

By year 2020, the greatest numbers of households and people are projected to be added to the three watersheds that are already the most urbanized. However, in terms of percentage increases, the Kankakee watershed may experience the greatest growth rate. Also, if the airport being considered in the Peotone/Beecher area is constructed, the percentage of the Kankakee watershed in urban land uses will dramatically increase.

Degree of Agriculture: All of the watersheds have a substantial agricultural component with even the Des Plaines and Calumet River watersheds being nearly 50% agriculture. The Kankakee River watershed has the highest percentage of land (78%) in agricultural use. Overall, the County is 63% agricultural.

Wetlands: Wetlands are relatively uniformly spread throughout the County with the northern portion of the County (DuPage, Des Plaines, and Calumet) having the highest percentages and the Kankakee having the lowest percentage. Wetlands within the County are shown in Figures 3-2 through 3-5 for each of the four main watersheds. Watershed total wetland areas are included in Table 3-1. The wetlands are from the NIPC 1990 land use database which generally includes only wetlands over 2.5 acres in size. The wetlands database has not been field verified but is suitable for assessing the general distribution of wetlands throughout Will County. A more thorough inventory of wetlands, including wetlands smaller than 2.5 acres, would likely indicate a higher percentage of the land area covered by wetlands than the 2.93% shown in Table 3-2. For example, in McHenry County, the NIPC inventory shows 7.5% of the County being covered in wetlands while a recent, more thorough survey showed approximately 11% of the County being covered by wetlands.

For more definitive information regarding the presence and boundaries of wetlands in agricultural areas, the NRCS wetlands database should be consulted. The NRCS database is

Table 3-1: Will County 1990 Landuse Area and Population by Watershed

Landuse	Will County Landuse Area by Watershed (acres)					County (acres)
	DuPage	Des Plaines	Calumet	Kankakee	Ill. River Tribs	
Single Family Residential	10,185	32,038	6,551	10,743	19	59,536
Multi-Family Residential	106	460	136	46	0	748
Commercial	985	3,595	1,046	1,585	0	7,212
Industrial	2,457	8,428	377	1,394	0	12,656
Institutional	661	10,061	403	7,368	0	18,494
Transportation/Utility	1,386	4,211	462	1,824	5	7,889
Vacant	2,514	2,898	265	512	0	6,189
Agriculture	52,188	86,336	18,747	183,563	1,810	342,643
Forest, Grassland, and Open Space	6,260	25,835	9,530	18,024	1	59,650
Wetland	2,538	7,129	1,396	4,857	17	15,937
Water	2,692	3,631	197	5,892	0	12,412
Total	81,974	184,622	39,110	235,807	1,852	543,366
Population (people)	86,207	212,425	29,681	28,921	68	357,302

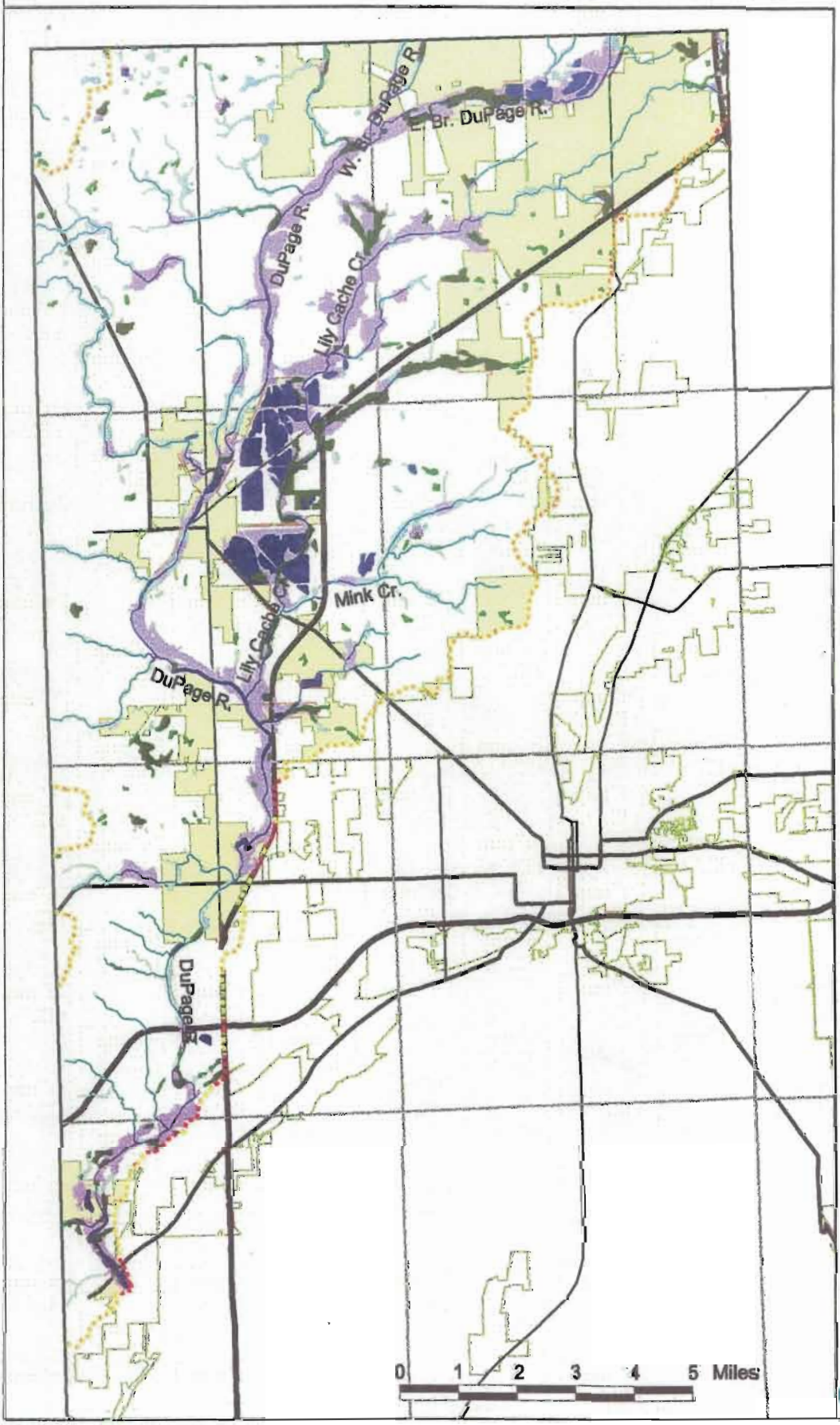
Table 3-2: Will County 1990 Landuse Percentage and Population Density by Watershed

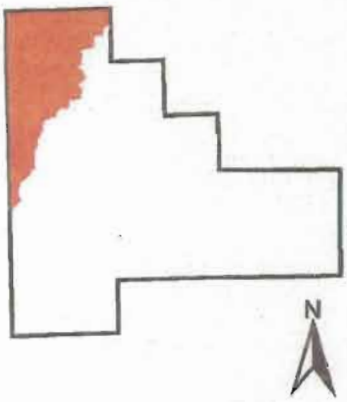
Landuse	Will County Landuse Area by Watershed (percent)					County
	DuPage	Des Plaines	Calumet	Kankakee	Ill. River Tribs	
Single Family Residential	12.42%	17.35%	16.75%	4.56%	1.02%	10.96%
Multi-Family Residential	0.13%	0.25%	0.35%	0.02%	0.00%	0.14%
Commercial	1.20%	1.95%	2.68%	0.67%	0.00%	1.33%
Industrial	3.00%	4.57%	0.96%	0.59%	0.02%	2.33%
Institutional	0.81%	5.45%	1.03%	3.12%	0.00%	3.40%
Transportation/Utility	1.69%	2.28%	1.18%	0.77%	0.28%	1.45%
Vacant	3.07%	1.57%	0.68%	0.22%	0.00%	1.14%
Agriculture	63.66%	46.76%	47.93%	77.84%	97.71%	63.06%
Forest, Grassland, and Open Space	7.64%	13.99%	24.37%	7.64%	0.06%	10.98%
Wetland	3.10%	3.86%	3.57%	2.06%	0.89%	2.93%
Water	3.28%	1.97%	0.50%	2.50%	0.00%	2.28%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Population (people/mi^2)	673	736	486	78	23	421

Source: Northeastern Illinois Planning Commission Regional GIS Database

Figure 3-2

Will County Wetlands and FEMA Floodplains
DuPage River Watershed





Legend

- Streams
- Watershed
- Wetlands
- Open Water
- Floodplains
- Interstate Highway
- U.S. Highway
- State Highway
- Incorporated Areas

Streams from U.S. Environmental Protection Agency RF3 Reach File. Wetlands from NIPC 1990 Landuse Inventory. Floodplains from Federal Emergency Management Agency 1996 Q3 Flood Data. Municipal boundaries from U.S. Census 1990 Tiger files. Watersheds derived from U.S. Geological Survey's 1:24,000 Drainage Basins Based on Gaging Stations, 1996 pre-release coverage. Roads from U.S. Geological Survey 1:100,000 Digital Line Graph's. Townships and county boundaries from NIPC. Maps made by the Natural Resources Department of the Northeastern Illinois Planning Commission, April 15, 1998.

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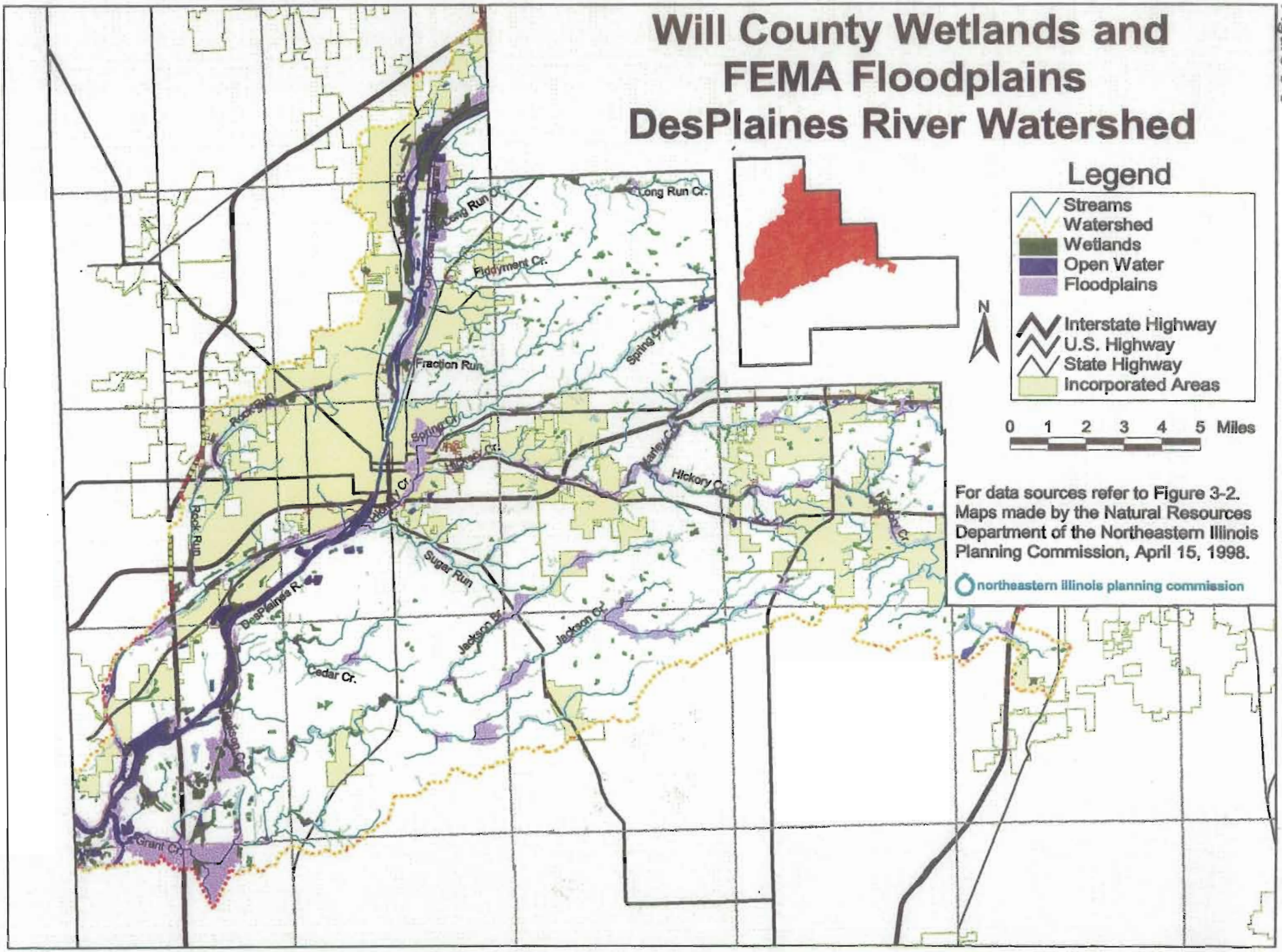
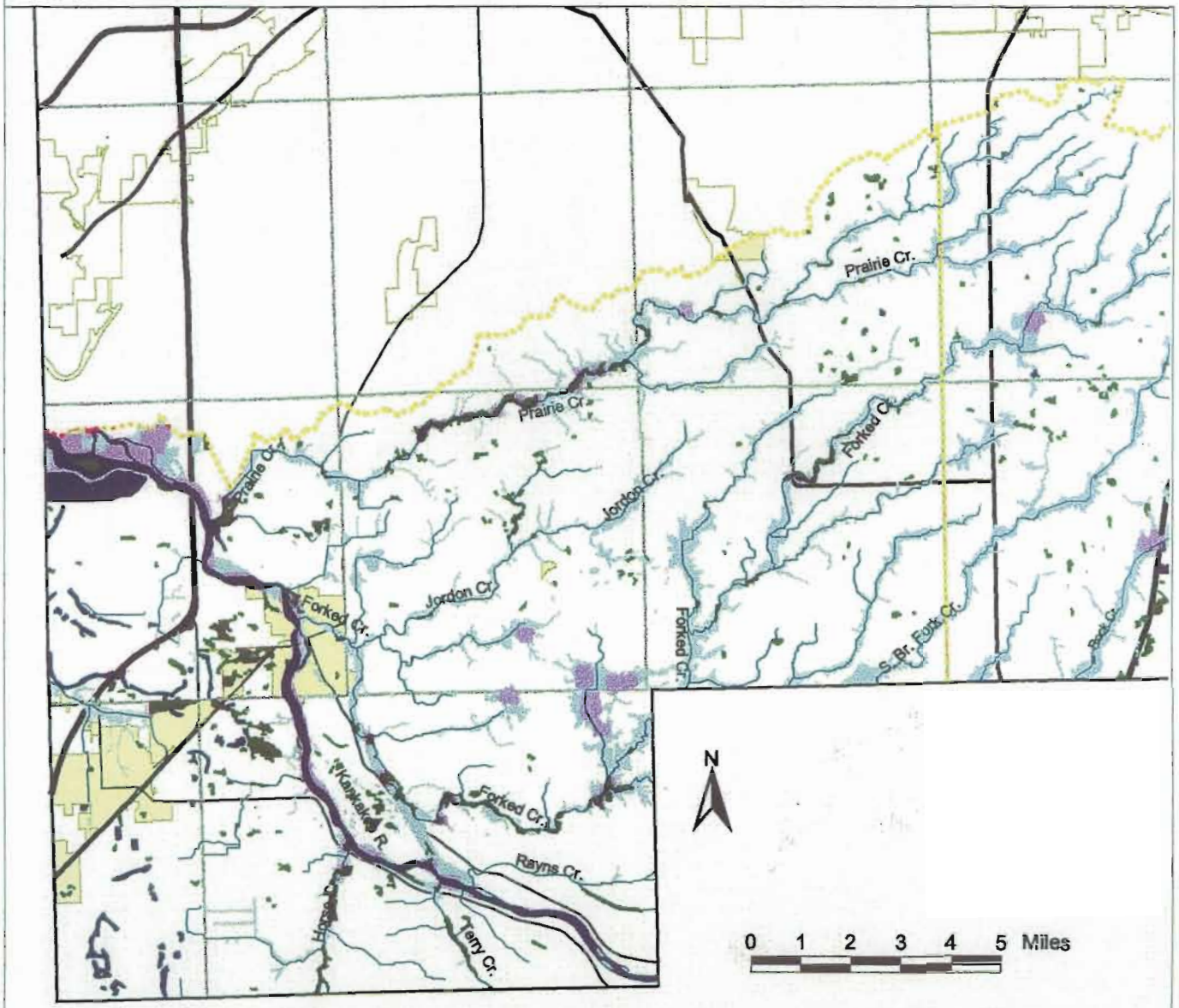
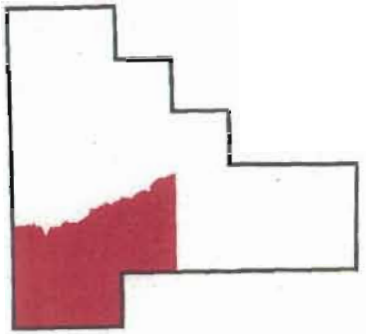

Will County Wetlands and
FEMA Floodplains
DesPlaines River Watershed
Legend
Streams
Watershed
Wetlands
Open Water
Floodplains
Interstate Highway
U.S. Highway
State Highway
Incorporated Areas
N
0 1 2 3 4 5 Miles
For data sources refer to Figure 3-2.
Maps made by the Natural Resources Department of the Northeastern Illinois Planning Commission, April 15, 1998.
northeastern illinois planning commission
Long Run Cr.
Fiddyment Cr.
Fraction Run
Spring Cr.
Rock Run
Hickory Cr.
Marley Cr.
Sugar Run
DesPlaines R.
Jackson Cr.
Cedar Cr.
Grant Cr.

Figure 3-3

Will County Wetlands and FEMA Floodplains
West Kankakee River Watershed





Legend

- Streams
- Watershed
- Wetlands
- Open Water
- Floodplains
- Interstate Highway
- U.S. Highway
- State Highway
- Incorporated Areas

For data sources refer to Figure 3-2.
Maps made by the Natural Resources Department of the Northeastern Illinois Planning Commission, April 15, 1998.

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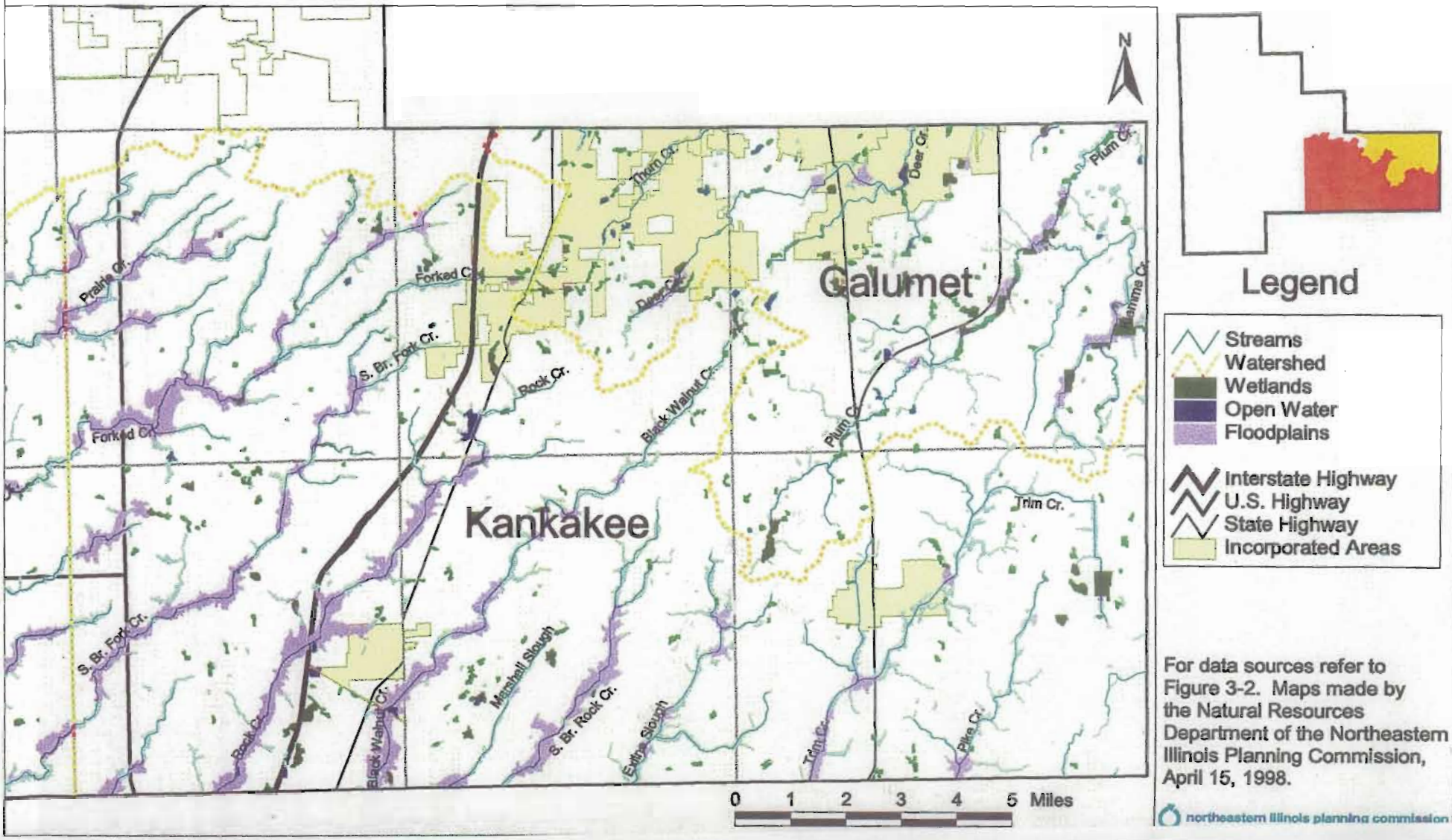
Figure 3-4

Will County Wetlands and FEMA Floodplains
East Kankakee River and Calumet River Watersheds



For data sources refer to Figure 3-2. Maps made by the Natural Resources Department of the Northeastern Illinois Planning Commission, April 15, 1998.

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Figure 3-5

available in digital format but does not include wetlands in urban areas. In addition to the NIPC wetlands, the National Wetland Inventory (NWI) may be consulted for the location and boundary of wetlands in urban areas. However due to the age of the NWI inventory (1980 and 1981), the inventory should be used with caution. For project purposes, all wetlands should be field verified.
Floodplains: For use in this analysis floodplains were derived from the FEMA Flood Insurance Rate Map (FIRM) panels (Q3 data). Floodplains within the County are shown in Figures 3-2 through 3-5 for each of the four main watersheds. These FIRM floodplains were digitally overlaid on the land use layer to determine the area of each land use within the floodplain, by watershed. It should be noted that the FIRM layer only includes mapped floodplain areas. Since only floodplains with greater than approximately one square mile of drainage area are mapped as regulatory floodplain, there is considerably more flood prone area than indicated by the FIRM maps. Also, the floodplains depicted by the FIRM maps may have expanded in some watersheds due to the increased level of urbanization in those watersheds since the late 1970s to early 1980s when many of the flood insurance studies were performed. The discussion of current floodplain regulations in Section 4.2 discusses the status of floodplain mapping further.

Floodplain area is presented in Tables 3-3, 3-4, and 3-5.

Table 3-3 shows the absolute area of each land use in the floodplain by watershed.
Table 3-4 shows the area of each land use in the floodplain as a percentage of the total area of that land use in the watershed.
Table 3-5 shows the area of each land use in the floodplain as a percentage of the total floodplain area in that watershed.

The tables show that mapped FEMA floodplains occupy from 6.7% to 14.9% of the total watershed area, depending on the watershed (excluding Illinois River Tributaries watershed). Mapped FEMA floodplain occupies 12.8% of Will County as a whole. Table 3-5 show that most of the floodplain is located in areas of agricultural, open space, vacant, wetland, and water land uses (86% of the total floodplain area). Of these non-urban uses in the floodplain, most is agricultural area. In fact, agricultural land use accounts for 48% of Will County's mapped floodplain area. This is important considering that agricultural areas are often converted to urban land uses.

Substantial urban uses are also located in the floodplain. It should be noted that when an urban land use is found to be in the floodplain, it does not necessarily mean that structures are located in the floodplain. Inhabited urban land uses account for 13% of the total floodplain area (the transportation land use accounts for 1% of the floodplain area) and 9.3% of Will County's inhabited urban land use area is in the floodplain.

In terms of acreage, most of the urban land use in the floodplain is single family residential (4,025 acres or 44% of the inhabited urban land use in the floodplain). However, in terms of the

Table 3-3: Will County 1990 Landuse Area within the Floodplain by Watershed

Landuse	Floodplain Landuse Area by Watershed (acres)					County
	DuPage	Des Plaines	Calumet	Kankakee	Ill. River Tribs	(acres)
Single Family Residential	762	1,914	331	1,019	0	4,025
Multi-Family Residential	8	20	0	1	0	29
Commercial	56	253	46	49	0	403
Industrial	602	1,199	31	69	0	1,901
Institutional	30	1,831	9	942	0	2,812
Transportation/Utility	131	515	22	105	0	774
Vacant	196	214	7	11	0	429
Agriculture	5,286	6,945	673	20,105	29	33,038
Forest, Grassland, and Open Space	1,492	5,447	961	3,108	0	11,009
Wetland	1,490	3,895	492	1,966	5	7,847
Water	2,174	3,050	65	1,801	0	7,089
Total	12,226	25,282	2,637	29,176	34	69,356

Table 3-4: Will County 1990 Landuse Area within the Floodplain as a Percentage of Total Landuse Area

Landuse	Landuse Percentage by Watershed (percent)					County
	DuPage	Des Plaines	Calumet	Kankakee	Ill. River Tribs	
Single Family Residential	7.48%	5.97%	5.05%	9.49%	0.00%	6.76%
Multi-Family Residential	7.66%	4.28%	0.10%	1.91%	0.00%	3.85%
Commercial	5.70%	7.02%	4.39%	3.08%	0.00%	5.59%
Industrial	24.49%	14.23%	8.25%	4.95%	0.00%	15.02%
Institutional	4.61%	18.19%	2.16%	12.79%	0.00%	15.20%
Transportation/Utility	9.47%	12.23%	4.74%	5.78%	0.00%	9.81%
Vacant	7.80%	7.40%	2.74%	2.14%	0.00%	6.93%
Agriculture	10.13%	8.04%	3.59%	10.95%	1.62%	9.64%
Forest, Grassland, and Open Space	23.83%	21.08%	10.09%	17.25%	0.00%	18.46%
Wetland	58.68%	54.64%	35.21%	40.47%	28.67%	49.24%
Water	80.73%	83.98%	33.28%	30.56%	0.00%	57.12%
All Landuses	14.91%	13.69%	6.74%	12.37%	1.84%	12.76%

Table 3-5: 1990 Landuse Area within the Floodplain as a Percentage of Total Floodplain Area

Landuse	Landuse Area by Watershed (percent)					County
	DuPage	Des Plaines	Calumet	Kankakee	Ill. River Tribs	
Single Family Residential	6.23%	7.57%	12.54%	3.49%	0.00%	5.80%
Multi-Family Residential	0.07%	0.08%	0.01%	0.00%	0.00%	0.04%
Commercial	0.46%	1.00%	1.74%	0.17%	0.00%	0.58%
Industrial	4.92%	4.74%	1.18%	0.24%	0.00%	2.74%
Institutional	0.25%	7.24%	0.33%	3.23%	0.00%	4.05%
Transportation/Utility	1.07%	2.04%	0.83%	0.36%	0.00%	1.12%
Vacant	1.60%	0.85%	0.28%	0.04%	0.00%	0.62%
Agriculture	43.23%	27.47%	25.52%	68.91%	86.08%	47.64%
Forest, Grassland, and Open Space	12.20%	21.55%	36.46%	10.65%	0.00%	15.87%
Wetland	12.18%	15.41%	18.64%	6.74%	13.92%	11.31%
Water	17.78%	12.06%	2.48%	6.17%	0.00%	10.22%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Northeastern Illinois Planning Commission Regional GIS Database

percentage of the land use in the floodplain, both the industrial and institutional land uses have 15% of their area in the floodplain, countywide (single family residential has 6.8% of its area in the floodplain). In the DuPage River watershed, nearly 25% of the industrial land use is in the floodplain. In the Des Plaines River watershed, 18% of the institutional land use is in the floodplain.

3.2 SOILS AND DRAINAGE

The Will County Soils report (University of Illinois, 1962) provides information on soil types and drainage patterns. The most prevalent soils of Will County originated from till of silty clay loam texture that was deposited by the glaciers and is unsorted. This soil material occurs predominately in the central and eastern portions of the County and are moderately slow to slowly permeable.

In the northeastern portion of the county, in the vicinity of Frankfort, the soils were generally formed in silty clay till which is slow to very slowly permeable.

The far northwestern portion of the county, north and west of the DuPage River, is occupied by till material of loam texture. The soils that developed in this material are generally moderately permeable.

In the area east of the DuPage River, particularly in the vicinity of Plainfield and Channahon, the surface soils tend to be loamy drift material deposited by the glaciers underlain by loamy gravel. While the surface soils are only moderately permeable, the underlying gravel is very rapidly permeable and the water table tends to be very low except in low lying areas of the landscape.

Southwest of the Kankakee River, the soil is largely made up of sand and sandy loam textures. These soil textures have low water holding capacity and are very rapidly permeable.

The floodplain areas of the Kankakee River and its tributaries tend to be medium textured outwash sorted by glacial meltwater. These soils are moderately permeable but the water table is often high. In the Des Plaines River Valley and portions of the Kankakee River Valley, the soils tend to be medium textured drift material underlain by limestone .

Scattered throughout the County are areas of highly organic wetland soils (mucks and peats) formed from herbaceous plant remains. These are a special category of hydric soils found in the lowest landscape positions such as closed depressions and are very poorly drained with high water tables for long durations. Important concentrations of these soils occur along Rock Run and along an eastern tributary of Lily Cache Creek in southwestern DuPage Township.

Drainage and runoff potential of the soil is dependent on a number of factors including the permeability of the surface and underlying soils, the height of the water table, the slope of the land surface, position in the landscape, and the degree of artificial drainage. To some degree, the water holding capacity of the soils will also affect runoff potential. Soils with high water holding capacity will tend to absorb rainfall from small events during dry periods. They will tend to have higher runoff potential in spring and fall when evaporation and transpiration rates are low and lower runoff

potential in summer when evaporation rates are higher. In most cases, soils with high water holding capacity also drain slower.

In general, higher permeability, coarse-textured soils will tend to pass water through their horizon more quickly and have lower surface runoff potential than soils with lower permeability. However, at lower positions in the landscape, where the water table is at or near the surface, even highly permeable soils will remain wet and tend to have higher runoff potential.

Wetlands tend to occur in areas where the water table is high, which is generally in low lying areas of the landscape. Wetlands also occur in localized depressional areas where soil permeability is very low causing a "perched" water table that is above the more regional water table. Wetlands can even occur on hillsides where the water table intersects the land causing water to "seep" out of the side of the hill. Hillside seeps are quite rare in northeastern Illinois and Will County. While high water table and/or low permeability soils often associated with wetlands would tend to lead to high runoff potential, the depressional topography generally results in very little surface runoff being discharged from wetland areas.

Artificial drainage, such as agricultural drain tiles and ditches, can lower the water table. Drain tiles are used, often in combination with ditching, in many areas of the County. Disruption of the artificial drainage system will generally result in restoration of water levels and hydric conditions. Although many areas with hydric soils no longer contain wetlands, hydric soils formed under saturated conditions and are an indicator of past and present wetlands.

3.3 FLOODING

Flooding is one of the primary motivators for preparing watershed plans and initiating countywide stormwater programs. Although a countywide stormwater committee had been meeting for a number of months, flooding in July 1996 prompted the Will County Board and the stormwater committee to begin preparation of this plan. The July 1996 flood was the result of extremely heavy rainfall over the southern portions of Kane, DuPage, and Cook Counties and northern Will County. The heaviest rainfall was centered over Aurora where 16.9 inches of rainfall was reported in less than 24 hours. This is the second highest rainfall ever recorded, anywhere in the country, outside of areas affected by hurricanes. Many of the creeks and rivers in the northeastern portion of the County experienced record high stages. During flood mitigation planning following the flood, it was reported that over 400 residences experienced first floor flooding.

In general, flooding occurs from a number of sources including overbank flooding along streams and rivers and local drainage-related flooding due to ponding in isolated depressions, high water tables, and inadequate stormwater drainage. Basement flooding can also occur where sanitary sewer systems accept excess stormwater runoff.

Flooding should be distinguished from flood damages. Flooding is a natural, regularly-occurring phenomenon. Floods result in flood damages only when they cause destruction, such as when they inundate developed areas. Floods damage buildings and infrastructure, threaten health and safety,

destroy agricultural crops, and disrupt business and traffic, making what had been a natural (and often benign) occurrence a hazard to people and modern development.

Crop damage can also occur from flooding. Crop losses can be the result of excessively wet spring seasons preventing farmers from planting their entire fields and from extended duration floods later in the growing season that damage crops established but not yet harvested. On the other hand, drought can also cause substantial crop losses.

Because of the moderate to high permeability of the surface and subsurface soils in many areas of Will County, runoff to many of the streams in the undeveloped portions of the County is largely from subsurface sources. Development results in a transition from native soil cover to impervious surfaces and lawns that are modified, compacted, and positively graded during construction. These changes are likely to cause a shift from streamflows dominated by subsurface runoff and characterized by gradual rises and falls to streamflows dominated by surface runoff and characterized by rapid rises and falls. For example, the rapidly permeable subsoils of much of the Lily Cache Creek watershed (DuPage River watershed) combined with its relatively small size, may make the creek particularly susceptible to increased drainage and flooding problems due to changes in land cover associated with urbanization. The same may be true for Terry Creek (Kankakee River watershed) whose watershed is also small and largely made up of sandy loams and sands.

Flood damage information was requested from each of the municipalities and townships in Will County as part of this stormwater planning process. Approximately 19 of the municipalities and 12 of the townships responded to the request. In addition, the Will County Land Use Department, selected WCSMPC members, and NRCS provided additional information. A large scale color map depicting the locations of reported flood damage areas is available for viewing at the Will County Land Use Department. Because the information was provided voluntarily based on response to a survey, the mapping should not be considered as a complete or reliable source of information for site specific delineations of flood damage areas. Instead, it should be viewed as an indicator of the types and generalized locations of countywide flood damages. The following findings are based on the information presented on the flood damage map as well as the written questionnaires sent to each of the municipalities and townships.

Findings:

- Significant overbank flooding was primarily reported along the DuPage River and to a lesser extent along the Des Plaines River. However, other small isolated areas of overbank flooding were reported throughout the County.
- Numerous areas of local drainage-related flooding were reported. The most significant concentrations were generally reported in the most urbanized townships. One municipality reported large areas of unspecified flood damages that were generally outside the floodplain.
- Local drainage problems are often the result of structures located in isolated depressions and former wetlands with no surface outlet. Other local drainage problems are associated with older developments that were constructed on flat topography without effective stormwater drainage systems. Finally, some local drainage problems are related to high water tables which may be partly the result of field tiles that no longer function properly.

- Urban runoff is sometimes discharged to agricultural drain tiles and urban construction activities often disrupt drain tiles.
- Nearly 50% of the existing mapped floodplain occurs in land uses that are available for development (agriculture and vacant). Flood damages could increase locally (within the development) if development occurs in these currently undeveloped floodplain areas. Flood damages could increase dramatically downstream if the floodplain storage in these areas is not preserved.

Discussion: There are a few locations of concentrated flood damages, primarily along the DuPage River and within one of the municipalities. Outside of these areas, flood damages appear to be limited to isolated locations scattered around the county. Experience in other parts of the region, other parts of the country, and even comparison of the rural and urban portions of the County suggests that as the level of urbanization increases, flood damage potential also increases. Flood damages can increase for two primary reasons. The first is that as urbanization and associated runoff volumes increase, floodplains expand to include those areas that were previously outside the floodplain. The second reason is that as the level of development and value of land increases, the potential for structures to be constructed in inappropriate, flood prone locations increases. Both of these causes of increased flood damage can be minimized through proper planning and regulation.

3.4 STREAMBANK EROSION

While erosion and deposition within a stream is a natural process, this process is greatly accelerated as a watershed urbanizes. Excessive streambank erosion can be both a water quality concern as discussed in the next section and an infrastructure concern as discussed below. Particularly in urban areas, severe streambank erosion can result in loss of adjacent private property and can even threaten structures constructed too close to the stream. At the other end of the erosion process is deposition which can lead to reduced conveyance capacity within the stream and blockage of culverts. Only limited information was obtained from the surveys related to streambank erosion and the findings below are largely based on observations by SWCD/NRCS staff as well as the authors of this plan.

Findings:

- Locations where streambank erosion was identified as a problem include Hammel Creek in Shorewood, Milne Creek in Lockport, Rock Creek outside of Peotone, and numerous locations on Forked Creek tributary to the downstream end of the Kankakee River and Jackson Creek tributary to the downstream end of the Des Plaines River.
- Erosion appears to be occurring in both urbanized and rural areas of the county.
- It appears that the identified erosion problems occur more in channelized reaches than in natural reaches.

Discussion: As discussed previously, urbanization tends to cause a shift from subsurface-dominated runoff to surface-dominated runoff. This results in rapid rise and fall of streamflow levels and increases in the frequency and duration of bankfull flow rates. It is generally accepted that the bankfull flow rate (typically 1- to 2-year event) most controls the shape of the channel. Another contributor to streambank erosion is changes in riparian, streamside vegetation. Changes in riparian vegetation from native, deep rooted species to turf grass and other shallow rooted species greatly

reduces the ability of the stream to withstand high velocity flow and rapid water level fluctuations. Finally, channel straightening, which reduces the length and increases the slope of the stream, tends to increase erosion as the stream attempts to dissipate energy by reestablishing a natural meander pattern to reduce its slope. While streambank erosion has not been reported as a great concern, as urbanization continues out into the more rural areas of the county, significant problems could develop.

3.5 WATER QUALITY AND WATERBODY USE IMPAIRMENT

The Will County Stormwater Management Planning Committee identified flooding and its prevention as the primary concerns for Will County. However, the goals and objectives suggest that water quality is also an issue that should be addressed. Also, unlike flooding, considerable published information exists on water quality and that information is summarized here.

Water pollution problems are caused by many sources including agricultural runoff, construction site runoff, urban runoff, failing septic systems, and industrial and municipal wastewater discharges. In addition to potential human health concerns, degraded water quality leads to impaired aquatic ecosystems and recreational fisheries. In addition to water pollution, physical changes in a waterbody or watershed such as channelization, removal of riparian vegetation, excessive erosion, dredging, hydrologic destabilization (a shift from gradually variable streamflows to rapidly variable streamflows), and loss of wetlands can be sources of waterbody impairment.

The previously discussed shift from groundwater-dominated hydrology to surface water-dominated hydrology typically associated with urbanization can significantly affect water temperatures, water chemistry, and flow variability. This can have a profound affect on streams, lakes, and wetlands in terms of their ability support aquatic and recreational uses. The increase in flow variability and water level fluctuation associated with a shift from groundwater to surface water can cause significant channel erosion leading to physical changes to the shape and sediment composition of streams, lakes, and wetlands as well as degraded water quality.

Significant data is available on stream and water quality in Will County. This data comes from the Illinois Department of Natural Resources and the Illinois Environmental Protection Agency. The information on stream and lake quality in the findings of this section were generally taken from the Illinois Water Quality Report: 1994-1995 (often referred to as the 305b report) prepared by the Illinois EPA. The data in the Illinois Water Quality Report is summarized in Table 3-6.

Two basic types of stream classifications are presented in the Illinois Water Quality Report. There are use support classifications and biological indicators (indices of biotic integrity). The use support classifications are ratings of the level to which a waterbody is supporting its designated uses. Potential designated uses are fish consumption (i.e., fish are safe for human consumption), aquatic life (i.e., the waterbody supports aquatic life including fish and bottom dwelling organisms), swimming (primary contact), secondary contact (i.e., boating, etc), and public water supply. Virtually all of the streams in Will County have fish consumption, aquatic life, and swimming as their designated uses. The Kankakee River also has public water supply as a designated use. In most of the streams, the only evaluated use is aquatic life. In addition to these individual uses, there is an

overall use rating. In most cases, if the waterbody is supporting the aquatic life use, it is considered to be supporting its designated uses, overall. For example, there are some streams that are not supporting the swimming use but are still considered to be fully supporting their designated uses overall because they support the aquatic life use. There are four levels of use support:

- full support;
- partial support/minor impairment;
- partial support/moderate impairment; and
- non-support.

The other type of classification system is based on biological indicators.. There are three separate indices. The first index is the index of biotic integrity (AIBI). This index is based on fish surveys. Based on the number of fish and diversity of fish species, as well as the presence of species that are intolerant of pollution, an index on a scale of 12 to 60 is computed. Fish population characteristics integrate the impact of chemical, hydrologic, and physical conditions of a stream and are therefore ideal indicators of overall stream quality.

The second index is the predicted index of biotic integrity (PIBI). This index is on the same scale as the AIBI but is based on observed habitat conditions rather than actual fish samples. The intent of the PIBI is to be able to predict the AIBI when no fish sample data is available. The PIBI could also be used as an indicator of the potential of the stream to support a diverse and balanced population of fish. In many cases the PIBI is higher than the AIBI, indicating relatively good aquatic habitat compared to the fish communities present. This is generally due to low water quality but could also be due to a downstream impediment to fish migration such as a dam.

The PIBI could also be lower than the AIBI which might suggest the movement of fish from nearby reaches with better habitat.

The final index is the macroinvertebrate biotic index (MBI). The MBI is very similar to the AIBI except that it is based on macroinvertebrates (e.g., insects, crawfish, etc.) in the bottom of the stream rather than fish. The MBI is on a scale from 1 to 10. Because macroinvertebrates are

Table 3-6 Will County Stream Quality (IEPA, 1996)

Waterway	Use Support[1]	Assessment Level and Date[2]	Biological Stream Characterization		
			Rating[3]	Approximate Monitoring Location	Monitoring Date
DuPage River Watershed					
Mink Creek	Full Support	PJ, 1995	NR	-	-
Lily Cache Creek	Minor Impairment	E/HS,1992	C	Chapins Road	1992
Lily Cache Creek	Full Support	E/HS,1992	B	Country Club Drive near DuPage River Confluence	1992
West Branch DuPage River	Full Support	M,1983	D	75th Street, Naperville	1983
East Branch DuPage River	Minor Impairment	E/HS,1990	C	Joliet-Naperville Road	1990
DuPage River	Minor Impairment	M,1983	C	Chapins Road	1983
DuPage River	Full Support	E/HS,1990	D	Near Confluence with Des Plaines River	1990
Des Plaines River Watershed					
Des Plaines River	Minor Impairment	C/PM, 1995	NR	Upstream of Confluence with CSSC	-
Chicago Sanitary and Ship Canal (CSSC)	Non-Support	C/PM, 1995	E	Upstream of Confluence with Des Plaines R.	1995
Illinois & Michigan Canal	Full Support	NR	-	-	-
Long Run Creek	Full Support	E/HS,1992	NR	-	-
Fiddyment Creek	Non-Support	M,1985	NR	-	-
Fraction Run	Full Support	NR	NR	-	-
Spring Creek	Minor Impairment	M,1983	D	Draper Ave, Joliet	1983
Union Ditch	Full Support	PJ, 1995	NR	-	-
Frankfort Tributary	Full Support	PJ, 1995	NR	-	-

Table 3-6 Will County Stream Quality (IEPA, 1996)

Waterway	Use Support[1]	Assessment Level and Date[2]	Biological Stream Characterization		
			Rating[3]	Approximate Monitoring Location	Monitoring Date
Marley Creek	Minor Impairment	M, 1976	C	Francis Road near Marley Road	1976
Hickory Creek	Minor Impairment	E/HS, 1991	B	Marley Road, near New Lenox	1991
Hickory Creek	Minor Impairment	C/PM, 1995	D	4th Ave, Joliet	1995
Sugar Run	Minor Impairment	M, 1983	D	Patterson Road	1983
Des Plaines River	Moderate Impairment	M, 1989	C	Downstream of Confluence with Sugar Run	1989
Cedar Creek	Full Support	NR	NR	-	-
Jackson Branch	Full Support	E/HS, 1991	NR	-	-
Jackson Creek	Full Support	E/HS, 1991	B	Manhattan Road near Bush Road	1991
Rock Run	Moderate Impairment	M,1983	D	near Interstate 80	1983
Grant Creek	Minor Impairment	M, 1983	D	Blodget Road near Interstate 55	1983
Des Plaines River	Moderate Impairment	E/HS & CS, 1990	D	Grundy County line	1990
Little Calumet River Watershed					
Plum Creek	Full Support	M, 1984	C	Exchange Street	1984
Deer Creek	Non-Support	E/HS, 1990	NR	-	-
Thorn Creek	Moderate Impairment	M, 1983	D	Lincoln Hwy, Chicago Heights	1983
Kankakee River Watershed					
Pike Creek	Full Support	E/HS, 1991	C	Not Reported	1991
Trim Creek	Full Support	E/HS & CS, 1991	A	Kankakee County	1995
Exline Creek	Full Support	E/HS & CS, 1994	NR	-	-

Table 3-6 Will County Stream Quality (IEPA, 1996)

Waterway	Use Support[1]	Assessment Level and Date[2]	Biological Stream Characterization		
			Rating[3]	Approximate Monitoring Location	Monitoring Date
Marshall Slough	Full Support	PJ, 1995	NR	-	-
Black Walnut Creek	Minor Impairment	M, 1985	NR	-	-
Rock Creek	Full Support	E/HS & CS, 1994	NR	-	-
South Branch Forked Creek	Full Support	E/HS, 1994	B	Warner Bridge Road	1991
Forked Creek	Full Support	E/HS & CS, 1994	B	Ballou Road	1994
Forked Creek	Full Support	E/HS & CS, 1994	A	Kankakee St. at Goodwin Road	1994
Jordan Creek	Full Support	M, 1976	NR	-	-
Prairie Creek	Full Support/ Threatened	E/HS & CS, 1994	B	New River Road	1994
Terry Creek	Full Support	M, 1976	NR	-	-
Horse Creek	Full Support	E/HS & CS, 1994	A	Zilm Road, Kankakee Road	1994
Kankakee River	Full Support	E/HS & CS, 1994	A	Warren Bridge Road	1994
Kankakee River	Full Support	C/PM,E/HS & CS, 1994	B	Interstate 55	1995

[1] Overall Use Support level which is virtually always based on support of aquatic life.

[2] Where assessment is based on monitoring (any assessment type except PJ), the entire upstream reach is assumed to have same use support level as monitoring site.
NR - Indicates assessment method not reported.
PJ - Indicates assessment based on professional judgement.
M - Indicates unspecified monitoring that is more than five years old.
C/PM - Indicates fixed station chemical/physical monitoring , conventionals plus toxics.
E/HS - Indicates ecological/habitat surveys.
CS - Indicates combined sampling of sediment, water, and biota for chemical analysis.

[3] Biological stream characterization based on fish surveys at site indicated.
NR - No biological stream characterization for this reach of stream.

much less mobile than fish, the MBI can be useful for making upstream/downstream comparisons in the vicinity of features than may be affecting stream quality (i.e., wastewater plant discharges, construction sites, urban developments, etc.).

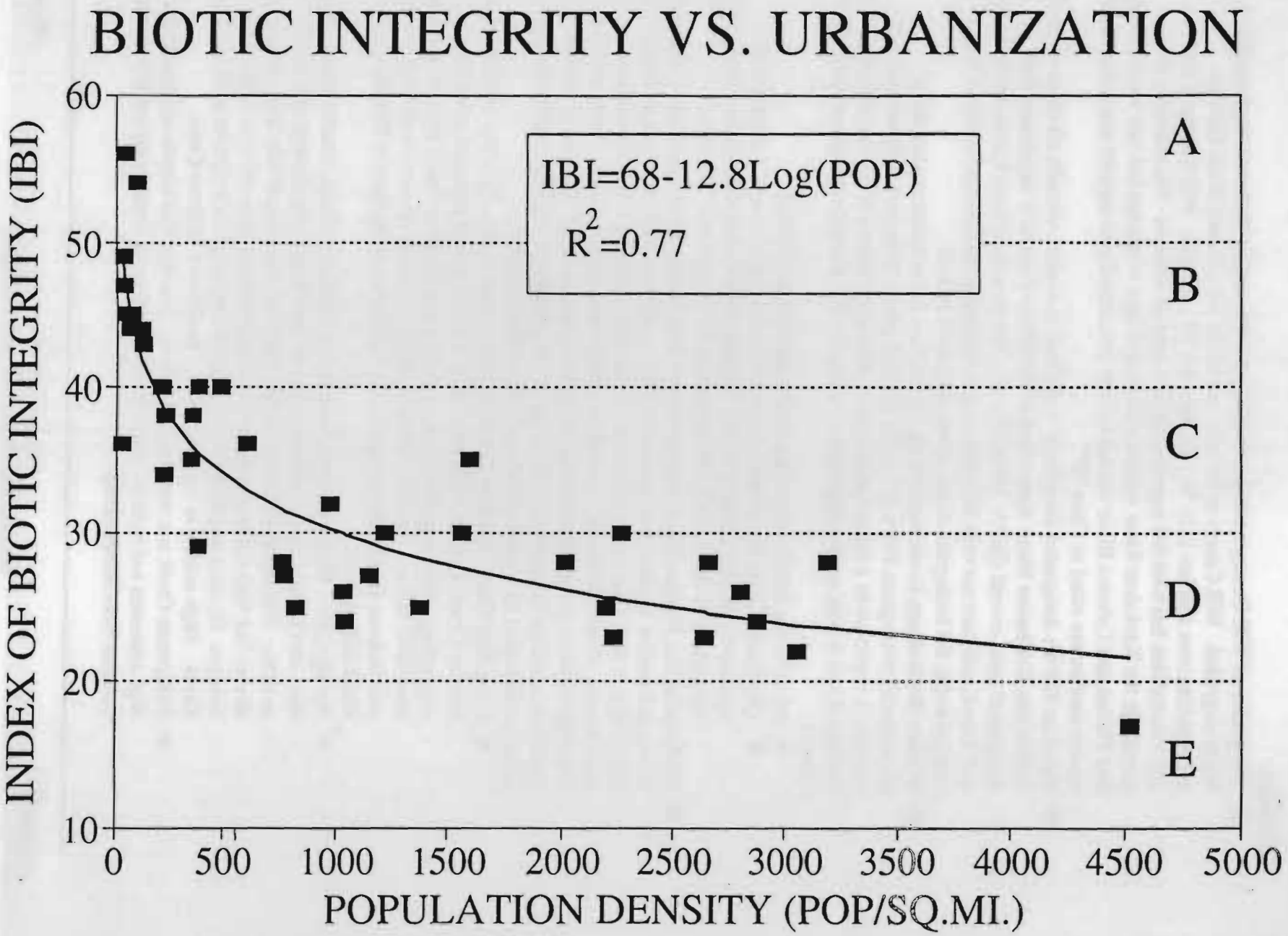
The AIBI is the most commonly used of the biotic indices. Another way to present the AIBI is a system referred to as the Biological Stream Characterization (BSC) presented in Special Report #13 of the Illinois State Water Plan Task Force (IEPA, 1989). The table below presents the BSC and its relationship to the AIBI.

Table 3- 7 Illinois Biological Stream Characterization

AIBI	Rating	Aquatic Resource Description
51-60	A	Unique Aquatic Resource
41-50	B	Highly Valued Aquatic Resource
31-40	C	Moderate Aquatic Resource
21-30	D	Limited Aquatic Resource
<20	E	Restricted Aquatic Resource

NIPC performed a correlation analysis between stream quality, based on AIBI, and watershed population density for numerous streams around the region (Dreher, 1996). The results are shown graphically in Figure 3-6. In that analysis it was found that there were no A or B streams with watershed population densities above approximately 200 to 300 people per square mile. It is clear from the analysis that there is a strong correlation between stream quality and population density. It is also apparent that a stream=s sensitivity to population density decreases with increasing population density. Analysis in other parts of the country (Schueler, 1994) has shown similar results when relating watershed imperviousness to stream quality. In general, it was found that stream quality was substantially degraded when watershed imperviousness exceeded 10% to 15%. In both the NIPC and Schueler analyses most of the observed watershed development occurred prior to implementation of modern stormwater best management practices.

Figure 3-6


BIOTIC INTEGRITY VS. URBANIZATION
IBI=68-12.8Log(POP)
R2=0.77
A
B
C
D
E
INDEX OF BIOTIC INTEGRITY (IBI)
60
50
40
30
20
10
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
POPULATION DENSITY (POP/SQ.MI.)

Findings:

- The quality of Will County's stream is highly variable ranging from very high quality to highly degraded. Will County is the only one of the six counties in the Chicago metropolitan area that has both "A" streams and "D" streams. Will County is also the only county that has both full support and non-support streams. For example, three streams in the Kankakee River watershed contain Class A reaches but two streams in the Des Plaines and Calumet River watersheds are considered non-support and a number of stream reaches are rated as Class "D".
- Based on IEPA's designated stream use classification system, virtually all of the streams **within the Kankakee River watershed** in Will County are fully supporting their designated uses, overall (IEPA, 1996). Three of the streams (Horse Creek, Forked Creek, and Trim Creek) are not only fully supporting all designated uses but contain Class A reaches under the biological stream characterization system.
- **Within the DuPage River watershed**, the DuPage River mainstem has minor impairments throughout DuPage County but as it passes through less developed Will County, it improves to a full support stream. However, from a biological perspective, the DuPage River is only a moderate aquatic resource ("C" stream) throughout most of Will County.
    - Mink Creek is fully supporting its designated uses, overall.
    - Lily Cache Creek has minor impairments and is rated as a "C" stream at its upstream end near Chapins Road. Further downstream, Lily Cache Creek is fully supporting its designated uses, overall and improves to a "B" stream.

Within the Des Plaines River watershed, the Des Plaines River mainstem is identified as having only minor impairments upstream of the confluence with the Chicago Sanitary and Ship Canal (CSSC) but having moderate impairments (greater level of impairment) downstream of the confluence. Consistent with the use support ratings, near where the Des Plaines River leaves Will County, the river is rated as a "D" stream but further upstream, the river is generally a "C" stream. The quality of the Des Plaines River is largely determined by its watershed upstream of Will County.

- Long Run Creek, Fraction Creek, Hickory Creek upstream of the confluence of Marley Creek, Cedar Creek, and Jackson Creek are all reported to be fully supporting their designated uses, overall. Only Hickory Creek and Jackson Creek have BSC ratings. Hickory Creek upstream of the confluence with Marley Creek and Jackson Creek downstream of the confluence with Jackson Branch are both rated as B streams.
- Spring Creek, Hickory Creek downstream of Marley Creek, Marley Creek, Sugar Run, and Grant Creek are all reported to have minor impairments and are "D" streams. The reported causes for less than full use support vary from stream to stream but high nutrient concentrations appears to be problematic in all of the streams. Siltation and habitat alterations are reported as problems in all but Marley Creek. High salinity is reported to be a problem in Hickory Creek.
- Fiddyment Creek is a non-support stream. The reported causes of impairment are high ammonia and nutrient concentrations, primarily from municipal point source but also from urban runoff.

Will County contains headwater areas of **the Calumet River watershed**, including the Calumet River tributaries of Thorn Creek, Deer Creek, and Plum Creek.

- Thorn Creek is moderately impaired overall and is a "D"stream. This is largely the result of siltation and stream modifications associated with development activities.
- Deer Creek is not supporting its designated uses and is considered a non-support stream (IEPA, 1996). This is largely the result of municipal wastewater discharges but Deer Creek has also been channelized and nearly its entire watershed is urbanized.
- Plum Creek is fully supporting its designated uses, overall but is only a moderate aquatic resource ("C" stream) from a biological perspective.

There are relatively few lakes in Will County and very little data on the lakes that do exist. Three (Braidwood, Strip Mine Area 4, and Michigan Beach) of the five lakes evaluated are reported to be fully supporting all designated uses (IEPA, 1996). Monee Reservoir is reported as having minor impairments for recreational use related to suspended sediments and substantial aquatic weed growth. Milliken Lake has moderate impairments for recreational use, again related to suspended sediments and substantial aquatic weed growth. Pine Lake in University Park is not included in the IEPA network. However, IDNR has done some fish sampling and found that fish diversity and numbers were low due to limited food sources caused by excessive aquatic plant growth. IDNR made recommendations for improving the fishery.

Discussion: Consistent with NIPC's findings regionwide, there is a very strong relationship between stream quality and the level of urbanization in Will County. The streams in the very rural southern portion of the County are almost universally full support streams and several are "A" streams. The streams in the northern urbanized portions of the County are almost universally partial to non-support streams and a number are "D" streams. The data suggest that progressive new development standards that address the quantity and quality of runoff from urban development and better protect the habitat of streams and wetlands will be necessary to preserve high quality streams and protect their beneficial uses in the face of future urbanization that is projected to occur throughout much of the county.

3.6 SUMMARY

Will County is very diverse in its land uses with portions of the County being quite urban and other portions being quite rural. The major watershed population densities range from a high of 885 people per square mile to a low of 92 people per square mile. Within the subwatersheds, the variability is undoubtably greater. The data used to develop Figure 3-6 shows that a number of the tributaries to the Des Plaines and DuPage Rivers have population densities over 1,000 people per square mile.

Concentrated overbank flooding problems appear to be limited to a few locations but there are numerous smaller scale flood problems scattered around the county. Many of the identified flooding problems scattered around the County were attributed to local drainage problems rather than overbank flooding.

More overbank flooding and drainage problems were reported than water quality problems. However, the data from IEPA suggests that water quality problems and stream use impairment are at least as prevalent as flooding.

Significant reported flooding and water quality problems are generally limited to the most urbanized portions of the county. Without adequate stormwater controls, these problems are likely to continue and spread to other areas as the County urbanizes. This is particularly relevant in light of population forecasts that show the County population doubling over the next 25 years.

CHAPTER 4

ASSESSMENT OF STORMWATER MANAGEMENT IN WILL COUNTY

The purpose of this chapter is to assess the current status of stormwater management programs and practices in Will County. The primary focus of this assessment is on urban stormwater. However, considering the large amount of agricultural land use in the county, agricultural runoff must also be addressed. As in Chapter 2, this assessment is organized into the four functional categories listed below.

- Administration and Management
- Regulation
- Planning
- Maintenance

Each municipality and township was requested to complete a questionnaire that was sent out in February 1997. The survey requested information related to the following activities:

- The primary stormwater-related issues facing the community and the level of public involvement;
- Planning and maintenance of stormwater management facilities as well as methods of funding those activities;
- Coordination between municipalities, townships, and drainage districts; and
- Regulatory standards for stormwater drainage, floodplain management, soil erosion and sediment control, and stream and wetland protection.

After several follow-ups, a response to the questionnaire was received by 23 of the municipalities (66%), 11 of the townships (48%), and one drainage district (See Appendix A for a copy of the questionnaire along with a summary of the responses). The following assessment is based on review of those responses and the agency descriptions in Chapter 2 as well as review of local water resource studies, and input from Will County staff, the stormwater Committee, and NRCS regarding local programs and conditions. The assessment is intended to reflect the adequacy of local programs with respect to achieving the goals and objectives adopted by the Will County Stormwater Committee and in addressing the stormwater conditions and problems identified in Chapter 3.

4.1 ADMINISTRATION AND MANAGEMENT

In addition to basic administration and management of a stormwater program, activities that are categorized under this element include public education, coordination with adjacent communities and relevant federal, state, and local agencies, and management of stormwater-related data. The findings in this section are primarily based on the questionnaire.

Findings:

Administration

- The municipalities and the County have primary responsibility for administration and management of stormwater activities in Will County**.**

Community Concerns

- In most communities, the most significant concerns of the residents as well as the community leaders were reported to be drainage problems and overbank flooding. Significantly fewer reported concerns about water quality. However, two communities indicated that water quality issues are the number one concern.

Public Education/Involvement

- Almost half (40%) of the communities indicated that they had performed some form of public education related activities and over 60% indicated that the public recognized stormwater management as a significant issue. Most of the public education appeared to be related to site or event specific issues.
- Although there has been some informal education of residents by the communities, there are no countywide programs to educate the public on generalized stormwater issues and the role that the residents play in addressing stormwater flooding and water quality.
- The DuPage River Watch was the only water resource related stewardship organization identified for Will County and it did not appear that the group has much membership within the County.
- Public complaints appear to be addressed in roughly equal numbers of communities by officials, staff, and consultants. In many communities, all three are involved at some stage of addressing complaints. Some communities have a formalized system of addressing complaints and a couple have forms that are completed for each complaint. In general, complaints are first investigated by staff and minor corrective action taken. For larger problems, consultants are involved to identify alternatives and develop a plan to alleviate the problem.

Coordination

- Less than a third of the communities have coordinated with their neighbors to address maintenance or problem remediation needs. A few more stated that there was coordination of stormwater standards. However, most acknowledged that the coordination of standards was through adoption of the same NIPC model ordinances and not through direct discussions with their neighbors.
- There was essentially no reported coordination between the drainage districts and the municipalities. There appeared to be somewhat better coordination between the drainage districts and the townships. One township road district reported that the drainage district provides copies of project plans.
- One drainage district responded to the questionnaire. Since the time of the questionnaire, a number of the drainage districts have begun taking a greater interest in this countywide stormwater plan. Through a committee of drainage districts and others, potential roles for drainage districts have been suggested.

- All but three municipalities and one township felt that there was a need for more regional coordination of stormwater programs and standards. In general, the communities felt that coordination should occur at the watershed level and that stream and wetland protection and management were issues best addressed at a more regional level. Most also felt that stormwater regulations should be standardized.

Data Collection/Storage

- The County currently has a geographic information system (GIS) database. The database contains land use, streams, floodplains, and watershed boundaries. Other relevant information such as soils are not currently within the database.
- Although there have been a number of flood control and local drainage studies (as discussed in Section 4.3), there is currently no central repository for these studies to increase their accessibility for use in watershed studies of for reference during the subdivision review process. Also, there is no central database of development information.

Regional/State/Federal Involvement

- The Northeastern Illinois Planning Commission provides assistance in regional coordination of programs as well as technical assistance to communities and stormwater planning committees but is limited in resources and authority. NIPC provides and sponsors training and technical education opportunities. In particular, NIPC has developed design guidance for urban best management practices (BMPs) in the form of a course notebook. NIPC has also assisted other counties in preparing guidance and developing tools for inclusion in their technical reference manuals.
- State and federal agencies are generally not involved in managing or coordinating stormwater programs except to the extent that the state authorized the five Chicago metropolitan collar counties to form stormwater committees and develop and enforce countywide programs. Some state and federal agencies provide technical assistance and sponsor training opportunities as discussed in Chapter 2.
- IDNR and FEMA are becoming more involved in education of citizens and public officials, particularly in relation to flood proofing and enforcement of floodplain rules. A flood insurance program and floodplain management workshop was held in Joliet in May 1997.
- The WCSMPC is attempting to coordinate stormwater management through development of a countywide stormwater program.

Countywide Program Funding

- The WCSMPC is currently funded at a minimal level with a single staff person funded under the Land Use Department and other expenses needing approval by the County Board. However, there have been indications that money will be made available to implement the plan. Funding needed to continue and expand the current effort is addressed in Chapter 6 of this plan and will be address by the WCSMPC and the County Board in the future.
- There is no known outside source of funding for basic administration of a stormwater program. However, as discussed in subsequent sections, there are sources of funding to help implement certain elements of the program.

Discussion: Goal 1 specifically calls for consolidation of existing programs and activities into a unified countywide structure. It is apparent that there is a need for such a structure since there is little coordination occurring at this time. However, based on the level of support for more regional coordination of stormwater programs and standards, this goal appears consistent with the desires of the municipalities and townships.

Although there has been some training and public education, it has not been consistent and has been in response to specific flood events rather than in a more formalized manner as called for under the objective of Goal 1.

4.2 REGULATION

This section summarizes local (municipal and county) regulatory standards and evaluates the ability of the local as well as state and federal standards to meet the goals and objectives of the Will County program. This section also addresses program related issues such as methods of funding regulatory activities and mechanisms for enforcing ordinances.

This assessment is primarily based on the questionnaire which included detailed questions on local regulatory standards, on consultation with state and federal officials regarding their regulatory programs, and on review of Illinois drainage law.

Findings: The Will County regulatory program is assessed in terms of four categorical areas; 1) floodplain management, 2) stormwater drainage and detention, 3) soil erosion and sediment control, and 4) stream and wetland protection. General findings related to regulation are also presented.

- Floodplain Regulations: Table 4-1 summarizes the floodplain management standards for the 24 municipalities responding to the questionnaire as well as information on state and federal standards and requirements. Appendix C presents the current status of Flood Insurance Studies in Will County including the type and year of study, whether floodways have been delineated, and whether elevations data exists for the floodplains. The information in Appendix C is presented by community. Findings related to the ordinances and floodplain mapping are discussed below.

Table 4-1: Sumary of Floodplain Management Regulatory Standards

Municipality	Purpose Statement[1]	Compensatory storage ratio for floodway/floodfringe/ depressions	Floodway appropriate uses	Offsite increases in stage or velocity prohibited?	Floodway Environmental mitigation beyond IDNR minimums?
Aurora	hf	1.25/1.25/1.0	IDNR	no	no
Beecher	hf	1.0/–/–	IDNR excluding dg,stp[2]	no	no
Bolingbrook	hf,wq,ah,r,a	1.5/1.5/1.0	IDNR	yes	no
Braidwood	hf,wq,ah,r,a	1.0/–/–	IDNR	no	no
Channahon	hf,wq,ah,r,a	1.0/1.5/1.5	IDNR	no	no
Crest Hill					
Crete	hf,wq,ah,r,a	1.0/1.0/1.0	IDNR	no	no
Diamond					
Elwood					
Frankfort	hf,wq,ah,r,a	1.5/1.5/1.0	IDNR	no	no
Godley					
Joliet	hf,wq,ah,r,a	1.0/1.0/1.0	NIPC	no	no
Lemont	none	?/?/?	IDNR	no	yes[3]
Lockport	hf,wq,ah,r,a	1.0/1.0/1.0	IDNR	no	no
Manahatten	hf,wq,ah,r,a	1.5/1.5/–	IDNR	yes	no
Minooka	hf,wq,ah,r,a	1.5/1.5/1.5	IDNR excluding stp[2]	yes	yes
Mokena	hf	1.0/1.0/1.0	IDNR	no	no
Monee	hf,wq,ah,r,a	1.0/1.5/–	IDNR	no	no
Naperville	hf,wq,ah,r,a	1.5/1.5/1.0	IDNR	only 0.1 foot rise allowed	yes
New Lenox	hf,wq	1.0/1.0/1.0	IDNR	no	no
Orland Park					
Park Forest					
Peotone					
Plainfield	hf,wq	1.5/1.5/–	IDNR excluding dg[2]	no	no
Rockdale					
Romeoville	hf,wq,ah,r,a	1.0/1.0/1.0	IDNR	no	no
Sauk Village					
Shorewood	hf	1.5/1.2/–	IDNR excluding pl, pr[2]	yes	yes
Steger					
Symerton	no ordinance				
Tinley Park	hf,wq,ah,r,a	1.0/1.0/1.0	IDNR	no	no
University Park	hf,wq,ah,r,a	1.0/1.0/1.0	IDNR	no	no
Wilmington					
Woodridge	hf,wq,ah	1.5/1.5/1.0	IDNR	yes	yes
County of Will[4]	hf,wq,ah,r,a	1.25/1.25/–	IDNR	yes	no

[1] Elements included in the Purpose Statement - hf=hydrologic functions, wq=water quality, ah=aquatic habitat, r=recreation, a=aesthetics

[2] Uses exluded from IDNR list of appropriate uses: dg=detached garages, pl=parking lots, pr=roadways parallel to the water course, stp=new wastewater treatment plants

[3] Channel modifications discouraged

[4] Does not reflect new ordinance adopted April 1998

State and Regional Floodplain Management

- The minimum state floodplain ordinance requirements are sufficient to meet the standards for participation in the National Flood Insurance Program.
- The minimum state floodplain ordinance requirements are not sufficient to prevent increases in flood stage over time since no compensatory storage is required for flood fringe fill activities. Also, the state minimum requirements only protect mapped floodways (with drainage areas greater than one square mile). Also, the state minimum requirements only protect mapped floodways (and mapped floodplains where no designated floodway exists). Generally floodways and/or floodplains are only mapped for stream reaches with drainage areas greater than one square mile in urban areas and 10 square miles in rural areas.
- The NIPC-recommended standards in the Model Floodplain Ordinance should be sufficient to prevent increases in flood stage related to floodplain fill activities. The model also recommends that floodplain mapping be based on future land use conditions so that new structures do not become subject to flooding as the watershed urbanizes. Certain NIPC standards are intended to protect the hydrologic, water quality, and ecological functions of streams and floodplain in addition to preventing flood damages. In general, it will be less expensive and more effective to protect these functions than to restore them after they are lost.
- To address nonpoint sources of pollution, the Illinois EPA recommends that the water quality and stream protection standards of the NIPC/IDNR floodplain ordinance be adopted by the community.

Floodplain Mapping

- FEMA recently produced a countywide digital Flood Insurance Rate Map (DFIRM). While this map resolved discrepancies at community boundaries and included map amendments and additional studies that have occurred since the original studies, the DFIRMs are still based on land use, hydrology, and hydraulics from the studies referenced in Appendix C. Most of the studies were completed in the early to middle 1980s and the analyses were based on late 1970s and early 1980s conditions. However, some of the streams, such as Forked Creek, Hickory Creek and some of its tributaries, Jackson Branch, the Kankakee River, Lily Cache Creek, and Marley Creek are currently being restudied or have been restudied in the last ten years. Most of the restudies are being done using more sophisticated hydrologic techniques than some of the original analyses. Considering the growth in some parts of the County since 1980, many of the maps do not adequately reflect current land use conditions and consequently, expansions of the floodplain likely have occurred.
- The Kankakee River tributaries, except Forked Creek, do not have floodways delineated nor do they have flood elevations associated with them. Fraction Run in the Des Plaines River watershed and Union Ditch in the Hickory Creek watershed also do not have floodways or flood elevations associated with them. Finally, upstream reaches and small tributaries of various other streams do not have floodways or flood elevations. The remaining streams throughout the County at least have elevations associated them and many also have floodways.

- Regulating floodplain development without elevations is difficult due to the inexact location of the floodplain boundary, the difficulty in determining safe minimum structure elevations, and the inability to calculate floodplain fill compensatory storage requirements.
- Floodplain *map amendments*, that are official changes made to the floodplain boundary based on better information regarding the location of the floodplain (i.e. better topographic data), have been included in the countywide remap. Similarly, floodplain *map revisions*, that are changes made to the official floodplain boundary caused by physical changes to the land that move the floodplain boundary (i.e. floodplain fill activities), have also been incorporated into the countywide remap. Map amendments and revisions that occurred after the beginning of 1995 are not included in the 1995 remap.
- Floodplain boundaries are generally delineated only for stream reaches with drainage areas greater than one square mile. Although streams and drainageways with less than one square mile drainage area may not be regulated, flooding can certainly occur along these stream reaches. Also, non-riverine depressional areas subject to flooding are generally not mapped as floodplain.

Municipal and County Floodplain Ordinances

- All but one of the municipalities that responded to the survey and the County (collectively referred to as "communities") have adopted a floodplain ordinance consistent with the minimum state requirements. One community reported having no floodplain ordinance or standards.
- Approximately two thirds of the responding communities included protection of hydrologic functions, water quality, aquatic habitat, recreation, and aesthetics in the purpose statement of their floodplain ordinance. However, in many cases it appeared that the standards in their ordinance were insufficient to actually meet these purposes.
- Almost 85% of the communities that responded require compensatory storage for fill in the flood fringe (compensatory storage for fill in the floodway is mandated by the State). The compensatory storage ratios vary from 1.0 to 1.5. Approximately 60% of the communities require compensatory storage for fill of depressional storage areas.
- Only four of the 24 communities that responded limit floodway appropriate uses more restrictively than IDNR. The IDNR allowable uses excluded by the four communities included new wastewater treatment plants, detached garages, and parking lots.
- Only a few of the communities require mitigation of floodway construction activities beyond the IDNR minimum requirements in terms of both preventing increased flood stages and environmental mitigation.

Stormwater Drainage and Detention Regulations: Table 4-2 summarizes the stormwater standards for the 24 communities (including the County) responding to the questionnaire as well as information on state and federal standards and requirements. Findings related to stormwater drainage and detention standards are discussed below.

Federal, State, and Regional Requirements

- There are no state or federal requirements that communities regulate stormwater drainage and detention.
- Under the federal National Pollutant Discharge Elimination System (NPDES) stormwater permitting program, all communities with population over 100,000 are required to monitor their existing stormwater discharges and address discharges where water quality standards are not being met. The USEPA released proposed rules for Phase II of the NPDES program in the January 9 Federal Register. The proposed rules state that all "census designated urban areas" will be required to comply under Phase II. Nearly 19 percent of the County is classified as "urban", including most of the municipalities in the DuPage River, Des Plaines River, and Calumet River watersheds. Like Phase I, it is likely that Phase II will be delegated to the states.
- Also under the NPDES stormwater program, the Illinois EPA requires that all new construction activities disturbing over five acres prepare a stormwater pollution prevention plan. The plan is supposed to address stormwater runoff in addition to construction site runoff. There is no state review of these plans nor field verification that they are being implemented. Under the proposed rules of Phase II, all construction activities disturbing one acre would be covered.
- Illinois drainage law appears to necessitate that discharge rates not be *unreasonably* increased over pre-development levels.
- NIPC has a model stormwater drainage and detention ordinance that addresses 100-year and 2-year discharge rates for detention, water quality, and protection of onsite depressional storage and wetlands.
- To address nonpoint sources of pollution, the Illinois EPA recommends that the nonpoint source pollution control and wetland protection standards of the NIPC stormwater drainage and detention ordinance be adopted by the community. Non-point sources must be addressed as a condition of Facility Plan modifications.

Municipal and County Ordinances

- All but two of the 24 communities (23 municipalities and the county) that responded to the survey have stormwater drainage and detention standards. Two communities reported having no stormwater ordinance or standards.
- Five of the communities reported having standards consistent with the NIPC model ordinance. Most of the remaining communities have adopted at least some of the NIPC recommended standards.

Table 4-2: Summary of Selected Stormwater Drainage and Detention Requirements

Municipality	2-Year release rate	100-Year release rate	Runoff minimization requirements?	Depresional storage protection?	Water quality design requirements?	Onstream/floodway detention allowed?	Flood fringe detention allowed?	Detention in wetlands allowed?
Aurora	0.04	MWRDGC+25%	no	yes	no	no	yes[1]	yes[3]
Beecher	–	MWRDGC 3-yr	no	no	no	yes/yes[1]	yes[1]	no
Bolingbrook	0.04	0.30	yes	yes	yes	yes/yes[1]	yes[1]	yes
Braidwood	no ordinance							
Channahon	0.04	0.15	yes	yes	yes	no[2]/yes[1]	yes[1]	yes[3]
Crest Hill								
Crete	none	MWRDGC 3-yr	no	yes	no	yes/yes	yes[1]	yes
Diamond								
Elwood								
Frankfort	0.04	0.15	yes	yes	yes	yes/no	yes[1]	yes[3]
Godley								
Joliet	0.04	0.15	no	yes	yes	yes/no	yes[1]	yes[3]
Lemont	none	MWRDGC 3-yr	yes	?	no	yes/no	no	no
Lockport	0.04	0.15	no	yes	yes	yes/no	yes[1]	yes[3]
Manahatten	0.04	0.15	yes	no	no	yes/yes[1]	yes[1]	yes[3]
Minooka	0.04	0.15	yes	yes	no	no[2]/yes	yes	yes[3]
Mokena	none	MWRDGC 3-yr	no	yes	no	no/no	yes[1]	yes[3]
Monee[4]	none	MWRDGC 3-yr	no	no	no	yes/no	no	yes
Naperville	none	0.15[5]	no	yes	no	no/yes	yes	yes[3]
New Lenox	none	0.15	no	yes	no	yes/no	yes[1]	yes
Orland Park								
Park Forest								
Peotone								
Plainfield	none	MWRDGC 10-yr	no	no	no	yes/no	yes[1]	yes
Rockdale								
Romeoville	0.04	0.15	no	yes	no	no/no	yes[1]	yes[3]
Sauk Village								
Shorewood	10 hr. det. time	0.15	yes	no	no	no[2]/yes[1]	yes[1]	no[3]
Steger								
Symerton	no ordinance							
Tinley Park	none	MWRDGC 3-yr	no	yes	no	yes/yes[1]	yes[1]	yes[3]
University Park	0.04	0.15	yes	yes	yes	no[2]/yes[1]	yes[1]	no[3]
Wilmington								
Woodridge	none	0.10	no	yes	no	yes/yes[1]	yes[1]	yes[3]
County of Will[6]	0.04	0.15	yes	no	no	yes/yes	yes	yes

[1] Controlled discharge required
[2] Environmental mitigation required for onstream impoundments (no indicates only if public bebefit)
[3] Pre-treatment required prior to discharge to wetlands (no indicates allowed only if wetland is of low quality and detention will improve it)
[4] Ordinance contains stricter standards than indicated here. The enforced standards shown are here.
[5] Use 0.10 cfs/acre 100-year release rate for DuPage County
[6] Does not reflect new ordinance adopted April 1998

- All of the communities with ordinances (22) require control of the 100-year event. Approximately 55% use a release rate of 0.15 cfs/acre and most of the remaining use a release rate equal to the 3-year pre-development discharge from the site. One community uses a 100-year release rate of 0.10 cfs/acre.
- Almost 55% of the communities have a two year release rate and all but one of those use a release rate of 0.04 cfs/acre (as recommended by NIPC).
- Over 40% of the communities have runoff volume minimization requirements and almost 25% require that drainage and detention features be designed for water quality benefits
- Although not specifically asked in relation to drainage and detention standards, it appears from the floodplain management responses that over 35% of the communities do not protect onsite depressional storage volume.
- Almost 70% of the communities allow onstream detention but only 55% allow floodway detention and most of those require a controlled discharge.
- All but two of the communities allow detention in the flood fringe and virtually all require a controlled discharge from flood fringe detention when it is allowed.
- Over 80% of the communities allow detention in wetlands but two thirds of them require pre-treatment prior to discharge of runoff to the wetland.
- Four of the communities still allow use of Technical Paper 40 rainfall that predicts substantially lower 100-year precipitation amounts (5.6 inches in 24 hours) than the generally accepted Bulletin 70 rainfall (7.6 inches).

Soil Erosion and Sediment Control Regulation: Table 4-3 summarizes the soil erosion and sediment control standards for the 24 communities (including the County) responding to the questionnaire as well as information on state and federal standards and requirements. Findings related to soil erosion and sediment control standards are discussed below.

State and Regional Requirements

- Under the federal NPDES stormwater program, the state requires that all new construction activities over five acres prepare a stormwater pollution prevention plan to address construction site runoff. Under the proposed rules of Phase II, all construction activities disturbing one acre would be covered. There is no state review of these plans nor field verification that they are being implemented.
- NIPC has a model soil erosion and sediment control ordinance. The NIPC model has a minimum regulated development size of 5,000 square feet except in the vicinity of streams, lakes, and wetlands where the minimum regulated development is 500 square feet. The NIPC model also includes all of the provisions in Table 4-3.
- To address nonpoint sources of pollution, the Illinois EPA recommends that the standards of the NIPC soil erosion and sediment control ordinance be adopted by the community.

Table 4-3: Summary of Soil Erosion and Sediment Control Regulatory Standards

Municipality	Applicabilitly (minimum site area)	Ordinance includes list of principles	Inspection required at critical stages	Explicitly mandated maintenance	Ordinance includes design standards
Aurora	no minimum	yes	no	yes	yes
Beecher	no ordinance				
Bolingbrook	5,000 SF	yes	yes	yes	yes
Braidwood	no ordinance				
Channahon	no minimum	yes	yes	yes	yes
Crest Hill					
Crete	5 acres	no	no	yes	yes
Diamond					
Elwood					
Frankfort	5,000 SF[2]	yes	yes	yes	yes
Godley					
Joliet	no minimum	yes	no	yes	yes
Lemont	no minimum	yes	yes	yes	yes
Lockport	no minimum	yes	yes	yes	yes
Manahatten	5,000 SF	yes	no	yes	yes
Minooka	1 acre	yes	yes	yes	yes
Mokena	None	no	yes	yes	yes
Monee	no ordinance				
Naperville	2 acres	yes	no	yes	yes
New Lenox	100 CY	no	no	yes	no
Orland Park					
Park Forest					
Peotone					
Plainfield	no minimum	no	no	no	no
Rockdale					
Romeoville	not specified	yes	no	yes	yes
Sauk Village					
Shorewood	see note [1]	yes	no	yes	yes
Steger					
Symerton	no ordinance				
Tinley Park	no minimum	no	no	yes	no
University Park	see note [2]	yes	no	no	yes
Wilmington					
Woodridge	5,000 SF	yes	no	yes	no
County of Will[3]	no minimum	no	no	yes	no

[1] 5,000 Square Feet or 500 SF within 25 ft of a lake or stream.

[2] 5,000 Square Feet or 500 SF within 25 ft of a wetland or exceeds 100 cubic yards of excavation.

[3] Does not reflect new ordinance adopted April 1998.

Municipal and County Ordinances

- Four of the 24 communities (23 municipalities and the County) that responded to the survey do not have any soil erosion and sediment control (SESC) standards.
- Five of the 20 communities with ordinances have standards consistent with the NIPC model.
- Eight of the communities apply SESC standards to all development regardless of size. Most of the remaining communities have a 5,000 square foot disturbance limit above which SESC must be applied. A couple communities use a 500 square foot limit in the vicinity of streams, lakes, or wetlands. Three communities allow disturbance of relatively large areas (one to five acres) before SESC standards are applied.
- Most of the communities (70%) have a list of principles, such as minimizing the area and time of disturbance, that serve as guidelines when preparing site development and erosion control plans.
- Only 2 of the communities do not explicitly require maintenance of SESC throughout the duration of the project but thirteen (65%) of the communities do not require inspection at critical stages to ensure that the measures are working properly.
- Five (25%) of the communities do not have design standards for SESC measures.
- Based on discussion with NRCS and SWCD staff, design, installation, and maintenance of soil erosion and sediment control plans is problematic. Many of the measures identified in the soil erosion and sediment control plans are inappropriate for the situation; many measures identified on the plans are never installed; and measures that are installed initially are often not maintained throughout the construction process.

Stream and Wetland Regulation: Findings related to stream and wetland protection standards area provided below.

Federal and Regional Requirements

- Under Section 404 of the Clean Water Act, the Corps of Engineers regulates the discharge of dredged or fill material into wetlands or other waters of the United States. Once a permit is required, the Corps has the authority to protect many wetland functions. However, the Corps primarily focuses on the "flora and fauna" of wetlands and generally does not review for stormwater functions such as protection of depressional storage. Also, if there is no direct modification of the wetland, the Corps can not regulate discharge of stormwater or construction site erosion into wetlands, encroachment on the periphery of wetlands, vegetation removal, or conversion to open water by impoundment. Also, the Corps has very limited staff resources for enforcement of wetland protection requirements.
- NIPC has a model stream and wetland protection ordinance. The ordinance is formatted as an overlay district that essentially zones all or selected streams, lakes, and wetlands, as well as setbacks, as lowland conservancy districts in which only limited activities can occur. This format can reduce the need for professional wetland assistance on the part of the community, but it may allow less flexibility to

enhance degraded wetlands as part of the development process. The standards in the NIPC model can also be applied in a similar fashion as the floodplain ordinance which may allow greater flexibility.

- To address nonpoint sources of pollution, the Illinois EPA recommends that the standards of the NIPC stream and wetland protection ordinance be adopted by the community.

Municipal and County Ordinances

- Of the 24 communities (23 municipalities and the County) responding to the questionnaire, nine have stream and wetland protection standards. All but one of those appear to have standards consistent with the NIPC standards. The one has buffer and setback requirements but apparently no avoidance standards.
- Approximately half the communities require a 25 foot setback or buffer for streams, lakes, and wetlands. Two of the communities have larger buffer/setback requirements and one community has smaller. Four of the communities did not specify the setback or buffer size.

General:

- In most communities, the village engineer or a consultant is responsible for permit review and enforcement. However, public works, planning, and/or building and zoning departments are also involved in a number of communities.
- The regulatory standards most often cited as requiring the most enforcement action are soil erosion and sediment control and floodplain filling. The significant need for enforcement action related to SESC is a problem throughout the northeastern Illinois region and throughout most of the country.
- The communities use a number of different enforcement mechanisms for non-compliant development activities including threat or actual use of letter of credit, red tagging, revocation of building permits, fines, and legal action.
- Although the WCSMPC goals and objectives allow for watershed specific standards, none of the communities have tailored standards to watershed specific conditions.
- Overall, regulatory standards and enforcement are not directly coordinated between municipalities. However, some indirect consistency has occurred through adoption of some of the NIPC model ordinances by several municipalities.
- Comments in the questionnaires indicate a desire on the part of many municipalities for consistent countywide standards.
- Funding of local regulatory programs is generally through permit fees. However, a few municipalities fund permit review and inspection functions using general revenues.

Discussion:

The goals that are relevant to a regulatory program and discussion regarding the level at which these goals are being met is provided below.

Goal 1 calls for consolidating the existing stormwater management programs and activities into an effective, unified countywide structure. Currently there is very little deliberate coordination of stormwater standards. However, at least some consistency exists since a number of communities have adopted the NIPC model ordinances or many of the provisions within those ordinances. Because there is no countywide structure, the level of protection provided by the community ordinances varies from watershed to watershed and within watersheds.

Goal 2 Prevent increases in stormwater-related flooding problems associated with development. Although state and federal agencies regulate floodways and wetlands, the state and federal standards and programs are not sufficient to meet this goal. In particular, the state and federal requirements do not fully protect watershed storage in floodplains and depressional storage areas and do not require detention or other measures to prevent increases in runoff rates from new development.

Current local ordinances in many communities go much further than the state and federal agencies in preventing increases in stormwater related flooding problems and many are generally sufficient to meet the WCSMPC goals and objectives. However, the lack of sufficient standards in other communities will not provide the desired level of protection countywide.

Where the current floodplain maps are inadequate and where there are no floodplain elevations, there is significant potential for buildings to be constructed in floodprone areas and for loss of floodplain storage. This is likely to lead to increases in flood damages.

Goal 3 and the objective under it suggests that restoration of streams, lakes, and wetlands should be considered as part of watershed planning and remediation activities. Although this goal does not call for protection of streams, lakes, and wetlands, it will generally be less expensive and more effective to protect these features than to restore them after they have been degraded by development activities.

Some communities have standards that are generally sufficient to protect stream, lakes, and wetlands from both direct impacts and stormwater runoff impacts. Typically, these are communities that have adopted the NIPC model ordinances or many of the provisions within those models. The state minimum floodplain ordinance, without the NIPC-recommended language will not protect these features. Communities that desire to expand their wastewater service area or plant capacity beyond the currently permitted levels are required to adopt the nonpoint source pollution control and stream and wetland protection standards of the four NIPC model ordinances. Also, Phase II of the stormwater NPDES program may require the communities to adopt standards similar to those in the NIPC model ordinances.

Conclusions: Countywide, the current regulatory environment does not provide the level of regulatory consistency or protection envisioned in the goals and objectives. The standards in the NIPC model ordinance are sufficient to meet the level of protection suggested by the Goals. However, those standards are also in excess of the goals in terms of water quality and stream and wetland protection.

Given the projected growth in Will County (over 100% increase in population from 1990 to 2020 which is the highest in the northeastern Illinois region), updated floodplain mapping in certain areas or an approach to make the best use of the existing mapping is needed to prevent construction in the actual floodplain and loss of floodplain storage. It will also be important to quickly implement sufficient standards to meet the goals and objectives to ensure that future development is constructed according to those standards and additional problems are not created.

4.3 PLANNING

In this section, previous and ongoing stormwater and watershed planning efforts as well as existing watershed planning data are discussed first. Then findings regarding the previous efforts as well as funding of watershed planning and capital improvement projects are presented.

Current and Previous Stormwater and Watershed Planning Efforts

Areawide Water Quality Management Plan: In the late 1970s watershed plans were developed by the Northeastern Illinois Planning Commission as part of the Areawide Water Quality Management Plan (NIPC, 1979). The DuPage River, Lower Des Plaines River, Hickory Creek, Little Calumet River, and Kankakee River watershed studies covered Will County. Although the primary focus of these studies was on water quality, runoff rates and volumes were also modeled. These studies identified existing (1975) water quality conditions and predicted year 2000 water quality conditions based on several water quality management scenarios. Regionwide, these studies were the basis for several of NIPC policies and standards for stormwater and nonpoint source pollution management. Locally, implementation of these plans has focused primarily on wastewater treatment as opposed to nonpoint sources of pollution.

Hickory Creek: In the 1970s, the IDNR constructed a flood control reservoir in the Sauk Trail Preserve and made channel improvements downstream of the reservoir to alleviate flooding on Hickory Creek in the Lincolnwood Manor and Prestwick subdivisions. The reservoir is now managed by the Forest Preserve District of Will County.

A Little Hickory Creek strategic planning study was prepared for IDNR-OWR to address flooding in Frankfort. This study identified sources and causes of flooding as well as flood control alternatives. Mapping of the 100-year floodplain was also prepared. The study recommended that an onstream reservoir be constructed along with a diversion of a portion of the watershed to the reservoir that does not naturally drain there. Because the benefit/cost ratio of the project was 0.33, IDNR could not implement the project. However, they could assist in funding the project up to the amount of the

benefits. A variation on the recommended reservoir is currently being constructed as part of a development in Frankfort. The diversion is not being constructed.

Spring Creek: A flood control dam was proposed for Spring Creek to work in conjunction with the reservoir built on Hickory Creek to protect areas of Joliet from flooding. The Hickory Creek Preserve lands were purchased by the Forest Preserve District for storage of water behind the Spring Creek dam. The dam was never constructed.

The Forest Preserve District of Will County, the Will-South Cook SWCD, and the NRCS are preparing a watershed plan for Spring Creek. This effort is in the very early stages, however, based on discussions with NRCS, it appears that addressing flooding will be the primary focus of the plan.

Hammel Creek: A Hammel Creek strategic planning study was prepared by IDNR-OWR to address flooding in Shorewood. This study identified sources and causes of flooding as well as flood control alternatives. Mapping of the 100-year floodplain was also prepared. The study recommended that a levee be constructed. Because the benefit/cost ratio of the project was 1.03, the levee could be implemented by IDNR. The Village of Shorewood's engineering consultant reviewed the IDNR report and recommended revisions to the IDNR plan. The consultant noted that the IDNR report did not consider future land use conditions in the largely agricultural watershed. Based on the projected future land use condition, the consultant recommended pursuing three reservoirs and a diversion to bypass some of Hammel Creek flow past the high damage area. The consultant also recommended revised stormwater standards for new development. The recommended stormwater standards have been adopted by the Village. The diversion is no longer feasible since development has occurred in the path of the proposed diversion. Portions of the recommended reservoirs are being constructed as developments are constructed in their vicinity. The Village of Shorewood is currently preparing a village-wide stormwater plan.

Little Calumet River: In the Little Calumet River watershed, the Natural Resources Conservation Service prepared a floodplain management plan and environmental assessment in 1975. Although, the primary purposes of the study were to develop floodplain maps and reduce flood damages, a significant portion of the plan was devoted to assessing the environmental and cultural resources of the watershed and developing alternatives for their protection. The recommended plan was largely a flood control plan that included a number of structural and non-structural measures to reduce flood damages and prevent future damages. The floodplain mapping only covered a portion of Thorn Creek in Will County. No projects were proposed in Will County.

Local Drainage Plans: The villages of Bolingbrook, Tinley Park, and Frankfort have each prepared or are in the process of preparing master drainage plans for their communities.

The purpose of the Bolingbrook plan was to identify existing and potential future problem areas and to develop preventive and remedial strategies to address the problems. Although the primary focus of the plan was flooding, the stated objectives of the plan also identified preservation and enhancement of stream corridors, floodplains, and wetlands and maintenance of water quality for aesthetic, habitat, and recreation purposes. General preventive recommendations primarily consisted

of updating the Village's floodplain and stormwater ordinances. Watershed specific recommendations were also prepared for each of the identified watersheds.

The Tinley Park Central Detention Plan identified eleven regional detention sites for future growth areas. The regional detention basins would be used instead of onsite detention. The plan identified standards for the regional detention basins, standards for conveyance to the detention basins, and mechanisms for funding the basins. This plan is being implemented as growth occurs. This plan covered areas of Tinley Park in Cook County.

The Frankfort Stormwater Management Plan is being prepared at this time. The draft plan identified basement flooding, overbank flooding, and streambank erosion as the three basic problem types. The draft plan included 17 recommendations including further study for selected high damage areas, elevating selected roads that are frequently inundated, providing homeowners with floodproofing information, and implementing measures to improve regulatory floodplain management in the Village.

The efforts above for which reports were available are summarized in Table 4-4.

Miscellaneous: The Forest Preserve District, Will County Land Use Department, NRCS, and a private developer received a grant to assist them in implementation of a demonstration project to protect high quality wetland habitat on a development parcel adjacent to Forest Preserve District land. The agency team is working with the developer to set aside vernal pool amphibian habitat, establish swale and wetland biofilters upstream of the vernal pool, and establish a buffer.

A number of local, state, and federal agencies are involved in the Prairie Parklands ecosystem partnership under the Conservation 2000 initiative of the IDNR. Under this initiative, the partnership will be preparing watershed plans for Grant Creek, Jordan Creek, Prairie Creek, and Jackson Creek.

A Thorn Creek ecosystem partnership has recently been formed that will be addressing restoration and protection needs for Thorn Creek and Deer Creek.

The Conservation Foundation is expanding their activities from DuPage County to Will and Kane Counties. The Foundation has a DuPage River Coalition that has been very active in protecting and restoring the DuPage River.

Table 4-4: Flood Control, Drainage, and Water Quality Studies and Plans*

Title	Author, Year	Water Body, Location	Subject
Areawide Water Quality Management Plan	NIPC, 1979	Little Calumet, Lower Des Plaines, DuPage, and Kankakee Rivers, Hickory Creek, and Sanitary & Ship Canal	Regional Water Quality Enhancement and Protection.
Environmental Assessment Hickory/Spring Creek Flood Control Project	De Leuw, Cather & Company for IDNR, 1981	Spring Creek and Hickory Creek Watershed	Assessment of proposed flood control projects
Strategic Planning Study for Flood Control	Tenny Pavonni for Illinois IDNR, 1990	Little Hickory Creek, Frankfort	Flood control study that identified a flood control reservoir and non-structural measures
Draft Stormwater Management Plan, Village of Frankfort	Robinson Engineering, Ltd., 1997	Village of Frankfort Drainageways	Local flood control Study with structural and non-structural flood control recommendations.
Little Calumet River Floodwater Management Plan and Environmental Assessment	Little Calumet River Steering Committee and NRCS, MWRDGC, and IDNR, 1975	Little Calumet River and tributaries in Cook and Will Counties	Floodplain mapping and Flood control study that identified a number of structural and non-structural measures.
Comprehensive Stormwater/Floodplain Management Plan	SEC Donohue/Rust Engineering and Infrastructure, Inc. Phase I, 1993 Phase II, 1993 Phase III, 1996	Village of Bolingbrook rivers, streams, and drainageways, Will and DuPage Counties	Local drainage and flood control plan recommending preventive and remedial measures including floodplain & wetland protection and enhancement.
Village of Tinley Park Central Detention Policy Manual	Robinson Engineering, Ltd., 1981	Village of Tinley Park Drainageways, Cook County	Regional Detention Plan with sites identified, standards established, and implementation mechanism developed.
West Romeoville Master Watershed Plan	Lindley & Sons, Inc., 1992	Lily Cache Slough	Plan to prevent increase flooding of Lily Cache Slough, including recommended modifications to an outlet structure and upstream detention

Table 4-4: Flood Control, Drainage, and Water Quality Studies and Plans*

Title	Author, Year	Water Body, Location	Subject
			release rates.
Recommendation for Hammel Creek Watershed Stormwater Management Plan	A. McGurr Ltd. Engineers, 1987	Hammel Creek, Shorewood	Review of IDNR Strategic Planning Study for Hammel Creek. Revisions to the IDNR plan were recommended.
Strategic Planning Study for Flood Control	Illinois DNR, 1983	Hammel Creek, Shorewood	Identified sources and causes of flooding as well as flood control alternatives. Recommended construction of a levee.
Inventory and Analysis of Urban Water Damage Problems in Village of Shorewood	Globetrotter's Engineering Corporation, 1979	Hammel Creek, Shorewood	Described the nature, location, & frequency of flood problems and potential flood control improvements
Village of University Park Pine Lake Fish Population Survey	Illinois DNR, 1996	Pine Lake, University Park	Documents several fish sampling events and makes recommendations to improve recreational fishery.

* Does not include Flood Insurance Studies which are listed in Appendix C.

The Kankakee River Partnership Council and the Alliance to Restore the Kankakee River are working on watershed planning and restoration projects.

The Northeastern Illinois Planning Commission and the Openlands Project, under funding from IDNR, are preparing a waterway trails plan that will include the DuPage, Des Plaines, and Kankakee Rivers.

Watershed Planning Data

There are several daily rainfall gages in Will County (Elwood, Joliet Brandon Road Dam, Monee Reservoir, and Peotone). However, there is only one hourly gage within Will County (located in Crete) supported by National Oceanic and Atmospheric Administration (NOAA). All wastewater treatment plants are required to record daily precipitation as part of their discharge permit. Some of these plants may collect hourly data.

There are four streamflow gages in Will County (Chicago Sanitary and Ship Canal at Romeoville, East Branch DuPage River at Bolingbrook, DuPage River at Shorewood, and Hickory Creek at Joliet). However, only two of those gages have significant watershed areas in Will County (DuPage River and Hickory Creek) and only one has most of its watershed in Will County (Hickory Creek). The Sanitary and Ship Canal, East Branch DuPage River, DuPage River, and Hickory Creek gages have been operational since 1984, 1988, 1940, and 1944, respectively.

Currently the only wetland database for non-agricultural areas in Will County is the National Wetland Inventory. In many areas, this database is out of date. The inventory also has information regarding wetland type but no information regarding wetland quality. The NRCS has a wetland database for agricultural areas in Will County. This database is updated every five years. The wetland delineations on aerial photographs are available for viewing in the Will-South Cook Soil and Water Conservation District office.

The Illinois EPA publishes stream quality data in their biannual water quality report as discussed in Chapter 3. There are many streams for which no biological quality information exists and the streams are evaluated on an infrequent basis.

Findings:
These findings are primarily based on review of the studies discussed above and the questionnaires sent to each of the municipalities.

- A couple reasonably comprehensive, multi-objective studies have been performed which addressed flooding, water quality, stream and wetland protection, and recreation. However, most of the identified studies had a limited, single objective focus.
- The NIPC Areawide Water Quality Management Plan was relatively comprehensive but did not identify specific local actions for nonpoint source control.
- The Bolingbrook plan was quite comprehensive and appeared to be the most consistent with the priorities of the goals and objectives of this stormwater plan. The primary purpose of the plan was flood prevention and remediation but it recognized the importance and inter-relationships of water quality and stream and wetland protection with flooding. Because the plan was prepared by a local government, its scope was limited to smaller and partial watershed units. Many elements of the plan have been and are being implemented.
- There is currently a lack of precipitation and streamflow data need to develop hydrologic models for each of the Will County watersheds.
- Although wetland data exists for the county, it is either out of date or it only covers a portion of the county.
- Watershed hydrologic and hydraulic models exist for a number of watersheds throughout the county. However, many are quite old (developed for flood insurance studies) and lack sufficient detail to perform detailed watershed studies. Also, many used out of date precipitation data. The models developed for the more recent flood insurance studies referenced in Section 4.2 may be adequate for use in watershed planning.
- Funding of capital improvements by municipalities is typically with general revenues. However, some use other sources of funds such as grants, motor fuel tax, impact fees, and gaming revenues.

- Funding is available from a number of state and federal agencies for a variety of watershed and project planning implementation purposes as described in Chapter 2. However, the purposes of each of the individual agencies is relatively narrow, with no one source available to develop or implement plans that comprehensively address flooding, water quality, and habitat protection issues.
- Allocation of IEPA and USEPA funds for nonpoint source pollution control projects is generally based on a targeted watershed approach and the presence of a locally prepared and IEPA approved watershed management plan. Within Will County, many of the streams are priority one as listed below (IEPA, 1997). There are no Priority 2 streams but Spring Creek, Sugar Run, and Grant Creek are Priority 3. The remaining streams are not prioritized.

  Illinois EPA Priority One Streams in Will County
  - Prairie Creek
  - Forked Creek downstream of the confluence with the South Branch of Forked Creek
  - Horse Creek
  - Trim Creek
  - Kankakee River upstream of the confluence with Horse Creek
  - Hickory Creek downstream of the confluence with Marley Creek
  - Des Plaines River
  - Lily Cache Creek in DuPage and Wheatland Townships
  - DuPage River from confluence with East and West Branches to 2 miles downstream

  Both Braidwood and Strip Mine Area 4 Lakes are Priority 1 (IEPA, 1997). The remaining lakes in the County are not prioritized.

  Although many streams and lakes in Will County have a high priority rating, IEPA approved watershed management plans may still be necessary to be eligible for Section 319 watershed restoration and protection grants.
- Recently, IEPA has made $15,000 grants available to local watershed groups to assist them in planning efforts. The funding is not sufficient to prepare a full watershed plan but should instead be viewed as "seed" money. Watershed groups that have taken advantage of these funds include the DuPage River Coalition in DuPage County, the Blackberry Creek watershed committee in Kane County, and the Waubonsie Creek watershed committee in Kendall County.
- Funding is available through IDNR under the Conservation 2000 program for the ecosystem partnership watersheds. Funding is available for habitat acquisition and restoration projects, education projects, and watershed research.
- NRCS has recently been assisting a number of watershed organizations in preparing relatively comprehensive plans. Although NRCS may not have the resources to perform modeling and other staff intensive activities, they may be able to provide valuable assistance in facilitating and coordinating the watershed planning process, as well as providing technical assistance.

- Federal law makers considered designating the Illinois River - as well as a number of other large rivers in the U.S. - as an American Heritage River. While the Illinois River did not receive the designation the watershed was designated for special funding. The funding implications are unknown at this time but at least some funding may be available for watershed planning and implementation activities.
- In the last several years a number of grassroots watershed organizations have formed. The purpose of these organizations vary from open space protection, to stream preservation, to flood control. However, they all share a common interest in protecting and improving watershed conditions.

Discussion: The objective under Goal 1 calls for preparation watershed plans to address watershed specific conditions. Although there are a few good examples, watershed planning is not being performed countywide. Historically, stormwater was being managed on the basis of political boundaries which are generally too small to encompass major watersheds or, in many cases, planning and analysis was done to remediate problems rather than to prevent problems. However, there are particular instances where planning is being done on a watershed (or sub-watershed) basis and address all or most of the concerns identified in the WCSMPC goals and objectives. These instances may serve as good models for future watershed planning efforts under the WCSMPC which can facilitate better coordination between municipal jurisdictions.

The formation of a growing number of watershed organizations suggests that there is increasing support for watershed based planning and protection and enhancement of the water resources of the County's watersheds.

4.4 MAINTENANCE

In this section, inspection and maintenance responsibilities and mechanisms are discussed. Both stormwater infrastructure and the natural drainage system are addressed. The findings are based on the questionnaires sent to each of the municipalities and townships.

Findings:

- Almost 45% of the municipalities assume responsibility for maintenance of stormwater drainage and detention facilities. In most of the remaining cases, homeowners associations are responsible for maintenance but in two cases, park districts are responsible. In some cases, homeowners associations or individual property owners are responsible for mowing of detention basins but the municipality is responsible for more involved maintenance such as addressing significant erosion and inspecting outlet structures. In some other cases, the municipalities have assumed responsibility for maintenance of older detention facilities but new facilities are the responsibility of homeowners associations. Homeowners associations often do not dedicate sufficient resources nor do they have the technical expertise to properly maintain these facilities.
- Approximately half the townships that responded to the questionnaire indicated that they are at least somewhat involved in maintenance of drainage and detention facilities. In most cases township maintenance is limited to drainage swales and ditches. However, some report also assisting in detention maintenance.

- Less than half the municipalities have a scheduled preventative maintenance program. The other half generally perform maintenance activities in response to complaints. Some of those communities performing maintenance in response to complaints are those that have attempted to delegate maintenance responsibility to homeowners associations.
- One of the townships has installed trash racks over detention basin outlet structures and report that they clean curb and gutter on a semi-regular basis.
- Almost 40% of the municipalities and 45% of the townships inspect or maintain stream channels. One township and two or three of the municipalities have regular inspection programs for streams that drain through their jurisdiction. The remainder perform these activities in response to complaints or obvious problems.
- Approximately one third of the townships identified lack of stream maintenance as problematic. Flooding and siltation were reported as the primary issues resulting from lack of maintenance.
- Discharge of stormwater runoff to agricultural drain tiles by scattered development was reported to be causing flooding by one of the townships.
- Funding of inspection and maintenance activities by municipalities and townships is almost exclusively with general revenues. However, some municipalities use motor fuel tax revenues.

Discussion:

Goal 4 calls for maintenance and management of natural and manmade stormwater drainage and storage features to ensure sustainable operation.

Unlike many areas of the region, a significant number of municipalities in Will County assume responsibility for maintenance of stormwater management facilities. Although a number of municipalities do not have formal maintenance and inspection programs, it does not appear that lack of maintenance is a significant problem.

Also unlike many areas of the region, a significant number of municipalities and townships perform stream inspection and maintenance activities. However, stream maintenance still appears to be problematic, at least in unincorporated areas of the County where problems were reported.

There is essentially no coordination of maintenance activities between jurisdictions. Maintenance coordination, particularly with respect to natural streams, is important to ensure that those efforts are effective in producing the desired local results while not causing problems for those upstream and downstream.

Long term maintenance of agricultural drainage tiles needs to be addressed since urban stormwater runoff is increasingly being discharged to the tiles, significantly increasing the load on these systems that were intended to convey only groundwater.

4.5 SUMMARY

Many of the WCSMPC goals and objectives are being met in some communities but not consistently throughout the County. Goal 1 which calls for a coordinated approach to stormwater management is clearly not being met. In large part, this is due to the current organizational framework which is fragmented with no agency or organization playing a central coordinating role.

Some of the municipalities have reasonably comprehensive stormwater-related regulations. However, these regulations are not consistent countywide or within watersheds. This results in levels of protection which vary across the County and across watersheds. Also, some of the communities are working with either inadequate (no elevation data) or out of date (significant land use changes have occurred) floodplain maps. This reduces the value of otherwise adequate regulatory standards.

Stormwater infrastructure maintenance is occurring in many communities but, in many cases, it is occurring in a reactive manner rather than in a preventative manner. Maintenance and management of the natural stream system is occurring but only in selected locations and clearly not in any coordinated fashion. This lack of coordination of inter-jurisdictional streams can limit the value of many potentially good efforts. Coordination is also necessary to ensure that the stream maintenance goals between jurisdictions are not in conflict. For example, clearing the stream to increase conveyance through one community may increase flood flows and stages in a downstream community.

Based on comments in the questionnaire and formation of the WCSMPC, it appears that there is recognition that better coordination is needed to address stormwater regulatory, planning, and maintenance needs. Chapter 5 presents the recommendations for a countywide program to enhance the current positive aspects and address the current short-comings of stormwater management in Will County.

CHAPTER 5
RECOMMENDATIONS FOR A COUNTYWIDE STORMWATER PROGRAM

This chapter presents the recommendations for the Will County stormwater program. The recommendations are based on the goals and objectives of Chapter One and the findings in Chapters Three and Four. The recommendations are divided into the following categories.

- Programmatic recommendations for a countywide stormwater program (Section 5.1). The recommendations are organized into the four functional categories used in Chapters 2 and 4.
- Regulatory standards recommendations (Section 5.2) for floodplain management, stormwater drainage and detention, soil erosion and sediment control, and stream and wetland protection.
- Watershed planning recommendations for preparing comprehensive watershed plans (Section 5.3).

5.1 STORMWATER PROGRAM RECOMMENDATIONS

5.1.1 Administration and Management

The goals and objectives, presented in Chapter 1, specify a unified countywide stormwater management framework to provide consistent standards and levels of service throughout the county. This is particularly important within watersheds since local actions have effects throughout the watershed. In addition, there are certain economies of scale associated with coordinated countywide efforts such as public education and technical training. Also, there was a strong level of support (85%) among those responding to the Will County stormwater questionnaire for more regional coordination of stormwater management programs, standards, and issues. Finally, the theme among many of the funding agencies is to emphasize watershed approaches. A countywide program will be in a better position to demonstrate that projects for which funding is being sought have been coordinated at the watershed level. The following are recommendations for administration and management of a Will County stormwater management program.

Continue and Enhance the Role of WCSMPC: As required by state statutes, the WCSMPC should continue to be composed of half County and half municipal representatives. Although an advisory body to the Will County Board, the WCSMPC should take the lead in coordinating stormwater management in Will County as well as drafting ordinances and watershed plans for County Board consideration.

The primary purpose of the WCSMPC should be to provide countywide coordination of stormwater management in Will County, to ensure consistent levels of flood mitigation, and to prevent stormwater related problems throughout the county's watersheds. This will provide for a consolidated countywide framework as specified in the Goals and Objectives. The recommended WCSMPC activities should be categorized into the four functional categories areas identified in Chapter 2: 1) administration and management; 2) regulation; 3) planning; and 4) maintenance. Staffing considerations are discussed in Chapter 6.

Assign and Train Staff: The County should assign or acquire sufficient staff to manage a countywide stormwater program and implement the recommendations in this Stormwater Plan. Adequate resources should be allocated to allow periodic training and participation in regional stormwater management forums to ensure that staff remain current on the latest technologies and practices.

Provide Technical Support: One important role of staff assigned to the stormwater program will be to provide technical support to municipalities and developers, as well as to individual citizens. Technical assistance can be provided in such areas as ordinance review and implementation, stream and stormwater facility maintenance and management, and addressing local drainage concerns. To adequately serve this role, it will be vital that the County have knowledgeable staff well trained in all areas of stormwater management.

Coordinate Professional Education: To achieve the goals and objectives of this plan as well as the recommended regulatory standards, training will be needed for site planners, design engineers, and landscape architects in methods of BMP and site design to minimize the stormwater related impacts of development. Training should also be provided on such topics as maintenance, emergency management, and flood mitigation. Training opportunities should be initiated by the WCSMPC and County using existing training resources. Several training resources exist in the region including professional organizations (e.g., the American Society of Civil Engineers, Illinois Society of Professional Engineers, and Illinois Association for Floodplain and Stormwater Management), the Northeastern Illinois Planning Commission, the Natural Resources Conservation Service, and the University of Wisconsin Extension.

Develop Public Education Program: A key to long term support for a countywide stormwater program is grass roots public support. Public involvement is also important because the cumulative actions of individuals can have significant watershed impacts. A public information program should be established to enlighten local officials and the public regarding stormwater issues and the importance of streams and wetlands for mitigating the impacts of stormwater. The public information program should be coordinated with other County agencies such as the Forest Preserve District, the schools, and local interest groups. Although it is important to reach all citizens, there are key citizens groups that should be targeted. These citizens groups include those that live adjacent to waterbodies and homeowners associations that may be responsible for maintenance and management of waterbodies and components of the stormwater management system (e.g., detention basins).

Develop Funding Mechanism: Developing adequate funding of the stormwater management program should be assigned a high priority. While grants may be used to supplement the program, a consistent source of dedicated local funding must be identified to provide for a consistent level of service and to allow for long term planning and implementation of the program. A number of basic funding alternatives and sources exist for Will County and six are discussed here: 1) the existing County corporate budget, 2) the stormwater taxing authority provided for in the stormwater authorizing legislation, 3) a stormwater service charge considered by the state legislature on a

number of occasions, 4) Special Service Areas (SSAs), 5) permit application fees, and 6) grants and other outside sources. Each of these have advantages and disadvantages.

County corporate budget: The source of funding for WCSMPC activities during the current program planning stage has been the county's general corporate fund. The primary advantage of this source is the relative ease with which it can be used. The County Board can simply establish a Stormwater Committee line item in the budget. The primary concerns with this revenue source are the potential need to cut other programs to fund the stormwater program at an adequate level and the annual uncertainty regarding funding level.

Stormwater taxing authority: Prior to the 1991 tax cap legislation, this was a straightforward means of funding a countywide stormwater program. This is how the DuPage County and Lake County programs are funded. While the WCSMPC budget and tax rate are subject to County Board approval under this taxing authority, this method provides a dedicated source of funds that can not be diverted to other County uses. Due to the tax cap, a referendum is now required to utilize this funding mechanism, making it more difficult to implement than when the stormwater legislation was originally passed. The outcome of a referendum would depend on the amount of education provided prior to the vote and the amount of the tax request for a typical property owner.

A disadvantage to both of the above approaches is that they are ad valorem based systems in which property owners pay based on the value of their property. However, property value may not correlate well with the contribution of stormwater runoff and stormwater program support needs. Also, these approaches may not allow for variable taxing levels across the County to address variable funding needs among watersheds.

Stormwater service charge (user fee): Legislation has been considered by the Illinois legislature several times to allow a service charge system of funding County stormwater programs. Although attempts to pass the bill in various forms are continuing, the bill has not yet passed.

Under a service charge system, individual properties pay based on their contribution to stormwater runoff. Impervious area is generally used as the indicator of stormwater runoff contribution. This is much like any other utility such as sanitary sewer service or electric service with each property owner receiving a monthly or annual bill. (However, the stormwater bill does not vary on a monthly or annual basis like most utility bills.) Under this system, the charge per impervious acre can be varied by watershed based on the funding needs of that watershed. Also, incentives for developments that utilize stormwater management measures beyond those required by the countywide ordinance could be built into the fee structure. (For example, residents within developments that utilize natural swale drainage could be charged a lower rate than residents in storm sewered developments.)

The primary disadvantage to this system is the substantial initial investment required to set up and implement the system. Perhaps the most costly aspect of the program is implementing the billing system. First, the runoff contribution for each parcel of land must

be calculated (using an indicator such as impervious area). Then, based on the funding needs, as outlined in a financial plan, the charge per unit of runoff and per property must be determined. Finally, a system of sending bills and tracking payment must be established. While a user fee system has many advantages, the substantial up-front investment must be taken into consideration.

Special Service Area (SSA): Special service areas are often used to fund services provided to subsections of the community. This system has some of the advantages of the user fee approach and is already authorized by state statute. While it may not be appropriate to fund an entire countywide program using an SSA, an SSA could be used to fund watershed specific activities such as development and implementation of watershed plans, maintenance activities, and flood control projects. In this respect, it allows the watershed variability of the user fee approach. However, like the other approaches, the payment by each property owner is based on property value rather than on the volume of runoff contributed.

Permit Application Fees: Once a countywide ordinance is adopted, permit review and inspection activities should be funded through permit application fees. This is consistent with the way most communities are currently funding permit review and enforcement activities. Fees should be established based on such factors as the type and complexity of permit and area of development or disturbance. The fees should offset expected staff time to review permits, make routine site inspections, and perform enforcement activities.

Grants and Other Outside Funding: The WCSMPC and the County should not rely on grants and other outside sources to fund the countywide program. However, grants can be a valuable supplement to enhance the activities of an ongoing program and to fund larger capital projects. Recommendations regarding specific activities for which outside funding should be pursued are provided in subsequent sections.

Recommendations: During the initial establishment period of the program, it may be most practical to operate within the current corporate budget. However, long term, the following techniques should be considered for countywide and watershed-specific activities.

Countywide activities:

- County corporate budget,
- countywide stormwater tax via referendum,
- countywide service charge,
- permit application fees (for permit review and enforcement activities), and
- grants from state and federal agencies.

Watershed activities:

- watershed-specific service charge,
- watershed-specific special service area,
- countywide stormwater tax via referendum,
- County corporate budget, and
- grants from state and federal agencies.

5.1.2 Regulation

In a largely rural yet rapidly urbanizing county such as Will, a primary emphasis of the stormwater management program should be to prevent exacerbating existing problems and creating any new problems. Two primary preventative tools are acquisition of critical water resource features such as floodplains and wetlands and a comprehensive and consistent regulatory program for development activities. Acquisition is discussed further under Planning (Section 5.1.3) and regulatory program recommendations are discussed here. This section focuses on the procedural elements of the regulatory program while Section 5.2 provides recommendations for regulatory standards.

There are two general types of regulatory controls: land use restrictions (e.g., zoning ordinances) and design standards (e.g., subdivision ordinances). Land use restrictions are generally used to protect sensitive landscape features such as floodplains and wetlands. Land use restrictions are intended to preserve the natural functions of these areas, such as stormwater storage and flow control, as well as to prevent damages to property that would result if building were to occur in those areas. Design standards are primarily used to control the rate and volume of stormwater runoff and are intended to minimize the impact of development on downstream areas. Most comprehensive regulatory programs make use of both types of controls.

Developing a countywide regulatory program involves drafting and adopting a countywide stormwater ordinance that applies to both incorporated and unincorporated areas, preparing a technical reference manual to support the ordinance, instituting a structure to enforce the ordinance, and establishing a means of funding the program.

Prepare and Adopt a Countywide Ordinance: To provide a consistent level of protection and to provide equity throughout the county, a program for consistent countywide regulation and enforcement should be developed. Standards should be established for countywide use and, where appropriate, modified at the watershed level to meet watershed specific needs. To be consistent with the WCSMPC goals and to prevent increases in flood damages, the stormwater ordinance should be comprehensive, specifying standards for stormwater drainage and detention, floodplain management, soil erosion and sediment control, and stream and wetland protection in a single document.

As discussed in Chapter 4, communities wishing to participate in the National Flood insurance program, must adopt minimum floodplain protection and building standards. These minimum standards have been incorporated into a model floodplain ordinance developed by the IDNR-OWR with assistance from NIPC. These standards, at a minimum, should be incorporated into the countywide ordinance. Recommended ordinance standards are discussed in Section 5.2

As also discussed in Chapter 4, a community desiring to expand its wastewater plant capacity or service area must also address nonpoint source pollution. This is outlined in Illinois Water Quality Management Plan (IEPA, 1992) which contains the following policy statement. “State actions, such as approvals for Facilities Plans or Facility Planning Area modifications, must assure that the applicants or petitioners have addressed the need for stream, wetland, and lake management plans or ordinances to mitigate the potential direct and indirect adverse environmental effects that may result

as a consequence of a proposed activity." IEPA recommends adoption and enforcement of the nonpoint source pollution control standards in the four NIPC model ordinances. Since many municipalities and the County have been through the FPA amendment process and many more will need to in the near future, the countywide ordinance should be sufficient to satisfy the IEPA requirements. While the WCSMPC has endorsed the need to coordinate ordinances to address IEPA's requirements, WCSMPC has not specifically endorsed the ordinance standards in the NIPC models recommended by IEPA. Recommended ordinance standards are discussed in Section 5.2

Some of the FEMA regulatory floodplain maps for Will County are either inadequate, since they do not include elevations, or out of date due to significant land use changes. While updating of the floodplain maps should be performed as part of the watershed planning process, watershed plans may not be completed within sufficient time to prevent inappropriate floodplain development from occurring. During preparation of the countywide ordinance, interim measures such as safety factors or floodplain buffers should be developed to address the shortcomings of the current mapping. FEMA and IDNR should be petitioned to update the least adequate floodplain maps as soon as possible.

The County and the municipalities should compare the countywide stormwater ordinance to existing local ordinances to identify and resolve potential conflicts. There may also be opportunities to coordinate existing ordinance and zoning requirements such as open space requirements, park donations, etc with the stormwater ordinance.

Prepare Technical Reference Manual: In support of the countywide watershed development ordinance, a technical reference manual should be developed to provide guidance in meeting the ordinance. The reference manual should include guidance on intent and interpretation of the ordinance as well as guidance on design methodologies and procedures. The manual should be updated from time to time as new information becomes available and as experience is gained in implementing the ordinance.

Institute Ordinance Implementation and Enforcement Structure: Once adopted, there are several approaches to implementing the ordinance. One end of the spectrum of possible methods would be to have all permitting and inspection carried out by the WCSMPC or County with very limited involvement by municipal staff. The other end of the spectrum would be to maintain the current system with all permitting and inspection carried out at the local level and no involvement by the WCSMPC and County except to craft the minimum ordinance to be adopted by all. The first approach would take too much control away from the municipalities and would remove inspection responsibility too far from those most familiar with the development site and its watershed. However, it would provide the greatest level of regional or watershed coordination to ensure that developments are reviewed considering the larger watershed implications. The second approach would be simpler to implement from an administrative perspective but, based on experience in Lake and DuPage Counties, would provide inadequate oversight and lead to inconsistent enforcement. Further, many municipalities may not have sufficient staff and/or financial resources to adequately enforce a comprehensive ordinance. Finally, the second approach would provide little in the way of watershed coordination of development activities.

The recommended approach is one that is between the two ends of the spectrum described above. It is recommended that WCSMPC and the County maintain responsibility for all permit and enforcement activities but have a mechanism for delegating that responsibility to interested municipalities. Municipalities that adopt requirements that are at least as stringent as the countywide ordinance, and have demonstrated qualifications would receive delegation and be responsible for permit review and enforcement within their jurisdiction. To protect those entities that are adequately enforcing the ordinance from the impacts of those that are not, the WCSMPC and County should periodically review permits and constructed facilities and retain authority to retract delegation where enforcement problems exist.

Since most municipalities currently provide permit review and inspection services for stormwater drainage and detention, soil erosion and sediment control, and certain floodplain development, it is anticipated that these regulatory areas would be most readily delegated to the local level. The County would be responsible for permit review and enforcement in unincorporated areas of the County and in those municipalities not desiring or qualifying for delegation. This recommended approach utilizes the positive aspects of the two ends of the spectrum identified previously. It employs local knowledge and access to development sites combined with WCSMPC and County oversight to ensure that watershed perspectives are considered, to provide technical assistance, and to ensure consistent enforcement throughout the county.

For wetlands and certain floodplain modifications, permit applications are currently reviewed and enforced by the Corps of Engineers and the Illinois Department of Natural Resources, respectively. However, there are a number of floodplain and wetland standards that are not currently addressed by the Corps or IDNR (See Section 5.2). Permit review and enforcement for these standards will need to occur locally.

The WCSMPC and County should continue to utilize the services of the Corps and IDNR for disturbances and modifications allowed under the countywide ordinance. The WCSMPC and County should also develop formal arrangements with the Corps and IDNR to coordinate and expedite permit reviews. At the time of ordinance adoption, the specific wetland and floodplain activities that can appropriately be delegated to the municipalities should be established.

Although most permits will be reviewed at the local level, there should be provisions for a pre-application meeting(s) involving the developer and both municipal and WCSMPC staff, particularly for larger developments. This would provide a degree of watershed review and regional perspective as well as take advantage of the technical expertise of stormwater staff. WCSMPC and the County should also maintain a central file of all permits issued within the county. This will provide for a central database which can easily be accessed by municipal and stormwater staff as a resource for the pre-application meetings and will streamline incorporation of development data into the watershed planning process.

Fund Regulatory Activities: As discussed previously, permit review and enforcement activities should be funded through permit applications fees. Delegated municipalities should establish and receive permit fees for activities within their jurisdiction. However, the stormwater program should receive a percentage of each permit application fee to fund WCSMPC's oversight role, including

pre-application meetings and periodic delegation reviews. The County should receive the full permit fee for those developments that it reviews.

Because the ordinance and technical reference manual apply countywide and must be prepared in advance of enforcement of the ordinance, preparation of these documents should be through the chosen baseline countywide funding mechanism(s) discussed previously. WCSMPC and the County should pursue funding to update floodplain mapping with particular attention given to those rapidly developing areas without floodplain elevations associated with them. Funding to update floodplain maps may be available from IDNR and FEMA. Based on past experience, FEMA financial assistance is much more likely to be available if the local government funds at least a portion of the analysis and mapping and initiates the effort.

5.1.3 Planning

Planning should be carried out both at the countywide level and at the watershed level by the WCSMPC and the County. WCSMPC is the logical entity to coordinate stormwater planning since it is less inhibited by political boundaries. In terms of countywide coordination and planning, the WCSMPC can represent the stormwater interests of the municipalities and the County as a unified voice. In terms of watershed planning, the WCSMPC can more readily perform watershed level planning than individual municipalities and can facilitate preventative and remedial projects that will consider and benefit both upstream and downstream interests.

Perform Countywide Planning and Coordination Activities: In support of watershed planning and the regulatory program, certain countywide stormwater planning efforts should be undertaken. These include coordination with other planning programs (i.e., open space, transportation, emergency management, etc.), wetland mapping, and coordination with other counties.

> Coordination with Other County Planning Activities: WCSMPC should coordinate with other County planning activities such as transportation planning and open space planning. Transportation systems can have a significant impact on the drainage system and natural resources of the County as well as provide opportunities such as creation of regional stormwater storage areas.
>
> The Forest Preserve District of Will County has an open space acquisition program. WCSMPC should coordinate with the district to identify opportunities to acquire areas of regional stormwater significance as part of the District's open space program.
>
> The Will County emergency management agency is responsible for planning for flood and other emergencies. WCSMPC should provide hydrologic data and flood risk information to WCEMA, to support their efforts. WCSMPC and WCEMA should also coordinate collection of high water information during floods for use in watershed computer modeling. Finally, mechanisms should be developed to provide improved coordination and information dissemination between the WCEMA, the County, and the municipalities during emergency conditions.

Coordination with Active Drainage Districts: Where active, drainage districts have the potential to perform many functions consistent with implementation of this plan. For example, drainage districts have the ability to levee assessments to perform stream maintenance and restoration activities. Drainage districts may also be able to address existing and future drainage problems. WCSMPC and the County should encourage future and existing drainage districts to establish and re-establish boundaries based on watershed boundaries.

Assist Municipalities and the County in Obtaining Community Rating System Credits: The National Flood Insurance Program's Community Rating System (CRS) was created to provide incentives to communities to reduce the potential for flood damages. The purpose of the program is to encourage, by flood insurance premium adjustments, community and state activities beyond those required by the NFIP. The CRS has three goals which are to:

1) reduce flood losses,
2) facilitate accurate insurance ratings, and
3) promote the awareness of flood insurance.

Involvement in the CRS program is voluntary and any community participating in the NFIP may apply for CRS classification. CRS credits are given to communities for activities such as:

1) public information,
2) improved floodplain mapping,
3) improved standards for floodplain and stormwater management,
4) flood damage reduction activities, and
5) flood preparedness activities.

Many of the activities and standards recommended in this plan will make all of the communities in Will County eligible for CRS credits. WCSMPC and the municipalities should evaluate the benefits of CRS credits relative to cost of compiling the information and completing the application forms.

Hydrologic Data Collection: Another countywide planning effort that should be undertaken is hydrologic data collection that can later be used in support of watershed modeling efforts. At least several years of simultaneous rainfall and streamflow data are needed to adequately calibrate hydrologic and hydraulic computer models. Additional years of data add confidence to the accuracy of the models on which floodplain delineations and problem solving decisions are based.

As discussed in Chapter 4 (Section 4.3) there are several daily rainfall gages in Will County but only one hourly gage supported by National Oceanic and Atmospheric Administration (NOAA). Additional reliable hourly rainfall gages should be identified or installed in strategic locations in the County to provide hourly distributions for the rainfall totals from the daily gages. The areal distribution of the daily gages should also be reviewed to ensure adequate coverage of the county.

There are four streamflow gages in Will County but only two of those gages have significant watershed areas in Will County. Additional streamflow gages should be added to supplement the current network and provide adequate calibration data for watershed models.

WCSMPC should coordinate with Will County EMA to identify gages that should be provided with telemetry so that EMA can obtain real-time river stage information during emergencies. As discussed above, high water information should be collected after major flood events.

WCSMPC should request assistance from the USGS in identifying appropriate precipitation and streamflow gage locations and in installing and operating the gages.

Coordination With Other Counties: Although county boundaries are sufficiently large to facilitate watershed level planning, the Will County watersheds extend beyond the County boundaries in both the upstream and downstream directions. WCSMPC should coordinate with downstream Kankakee and Grundy Counties to identify their concerns that may be impacted by Will County's plan. Upstream Cook, DuPage, and Kane Counties should be made aware of Will County's plans and encouraged (particularly Cook) to manage stormwater in a manner consistent with Will County. WCSMPC should also coordinate with Lake County Indiana. This plan as well as the recommended watershed development ordinance should be circulated among the surrounding counties for review and comment.

Floodplain Mapping: As discussed in Chapter 4 under "floodplain regulations" (Section 4.2), many of the floodplains delineated on the FEMA floodplain maps are based on analyses and watershed conditions of the 1980s (See Appendix B). Many of these maps may be out-of-date due to changes in land use, changes in channel conditions, and out-of-date information on rainfall frequencies. The floodplain maps for each of the creeks should be reviewed to identify the least adequate maps and FEMA and IDNR should be petitioned to update those maps as soon as possible. Interim measures such as safety factors and floodplain buffers should be considered until the floodplain maps can be updated.

Wetland Mapping: The current National Wetland Inventory (NWI) is severely out of date in Will County. The NRCS has compiled a more up to date database of wetland areas within the agricultural areas of the county. These maps should be used instead of the NWI maps in those areas.

Advanced Identification (ADID) wetland studies have been prepared for Lake and McHenry Counties. These two studies have been very comprehensive in identifying the location and boundary of existing wetlands, evaluating the functions provided by the wetlands, identifying exceptional quality wetlands, and developing wetland protection and public education strategies. While Will County's primary concern with wetlands is in preserving the storage associated with them, an ADID study could benefit Will County by providing up-

to-date mapping of wetlands in both agricultural and urban areas. In addition, the ADID functional evaluations can be invaluable in making permit decisions both at the local level and at the federal (Corps of Engineers) level. The functional assessments can also be a valuable tool when identifying and evaluating critical areas for an acquisition program that should be coordinated between WCSMPC and the Forest Preserve District. For these reasons, the WCSMPC should request that USEPA Region 5 initiate an ADID study in Will County.

Perform Watershed Planning and Coordination Activities: To address the specific conditions of each watershed, watershed plans should be prepared. These watershed plans should be coordinated with neighboring counties within the watershed. Watershed and sub-watershed plans should be prepared by County staff and/or their consultants to ensure consistency in planning and evaluation procedures among watersheds and to improve staff knowledge of watershed conditions. This section describes the administrative tasks that should be performed to guide and facilitate the watershed planning process. Recommendations regarding an approach to watershed planning and the issues that should be addressed in a watershed plan are provided in Section 5.3.

Prioritize Watersheds: Because development of watershed plans for all of the watersheds in Will County is a long term process, watersheds and sub-watersheds should first be prioritized. The prioritization should consider the following:

- projected population growth in the watershed,
- adequacy of existing floodplain mapping,
- degree of structural damage
- degree of life/safety concerns
- degree of traffic damages,
- local watershed planning efforts already underway, and
- local level of financial participation..

One of the first considerations should be to prevent future watershed problems from developing. Thus, those watersheds that are expected to experience significant urbanization and do not have adequate floodplain maps should be given high priority. Those watersheds that have significant existing flooding problems should also be addressed relatively quickly to remediate existing damages and prevent further damages from occurring.

Establish Watershed Planning Procedures: Watershed planning procedures should be established to ensure consistency among watershed plans. Watershed planning should consider development of improved floodplain maps, identification of regionally significant natural storage areas, identification of potential wetland mitigation banks, identification and prioritization of remediation needs (i.e., flood control, stream stabilization, etc,), and include an implementation plan. Standards for evaluating remedial projects should also be developed. Section 5.3 presents a recommended watershed planning approach.

Watershed advisory committees should be assembled during the watershed planning process to obtain input on watershed specific concerns and objectives and to improve implementability of the watershed plans. The advisory committees should include County

and local jurisdictions and organizations as well as Resource agencies. The following groups should be considered for inclusion on advisory committees.

Local Agencies and Organizations	**Resource Agencies**
county representatives	Will-South Cook SWCD
municipalities	Northeastern Illinois Planning Commission
townships	Illinois EPA
park districts	Natural Resources Conservation Service
Forest Preserve District	US Fish & Wildlife Service
County Health Department	Corps of Engineers
County Highway Department	USEPA
drainage districts	Farm Bureau
citizens organizations	developer associations
other interested parties	Will County Governmental League

Fund Watershed Planning and Implementation Activities: Although funding may be available from several agencies for watershed planning and implementation activities, the missions of the agencies often vary. For example, funding is available from IDNR-OWR and the Corps of engineers to address flooding problems and funding may be available from EPA and IDNR (under the ecosystem partnership initiative) to address water quality problems, including streambank erosion. Some of the agencies' funding programs (particularly the water quality related programs) are generally focused on implementing plans rather than preparing plans.

Section 2.1 discussed each of the state and federal agencies as well as funding available through those agencies. Section 4.3 discussed funding specifically available for watershed planning and implementation activities.

NRCS has perhaps the most flexible assistance available of any of the agencies and, as discussed in Section 4.3, has been assisting local watershed groups to prepare watershed plans with concerns that range from flood control to water quality to habitat restoration. NRCS provides technical, planning and in some cases financial assistance.

Because of the limited amount of funding available from the resource agencies for planning activities, these agencies should not be relied upon when preparing initial work program budgets for watershed planning. WCSMPC and the County should be prepared to fund **watershed** planning with in-house funds and then pursue outside sources to supplement WCSMPC funds and assist staff.

5.1.4 Maintenance

Manmade stormwater facilities should be maintained to ensure that they function as designed. Natural drainage systems should be maintained to prevent excess debris accumulation and erosion to ensure that they provide adequate conveyance and support a full range of natural functions.

Develop Maintenance Standards for Stormwater Infrastructure: Appropriate maintenance and inspection standards and schedules should be developed by the WCSMPC for stormwater infrastructure, including detention basins. The standards should include maintenance and inspection schedules as well as a checklist of maintenance activities.

All infrastructure installed as part of new development should consider maintenance as part of the design. For example, urban stormwater drainage systems should not discharge into agricultural tile systems which are difficult to maintain and were not intended to convey surface runoff.

Develop Mechanism to Maintain Stormwater Infrastructure: Because of the importance of functioning stormwater infrastructure, particularly detention basins, the WCSMPC should develop a mechanism and provide coordination and training to municipalities to ensure that infrastructure is maintained. There are a variety of methods that may be employed to carry out maintenance activities. The following are some examples.

- Public Works staff financed using SSAs
- Homeowners association with a *backup* SSA if work is not performed
- Homeowners association with municipal authority to perform and charge for work not performed
- Maintenance agreements with park districts for landscape maintenance and public works inspection of structures

The SSAs listed above are methods that several communities in Kane County use to fund stormwater maintenance activities. In some cases the special service area is used to generate revenues to cover maintenance costs born by the municipality. In other cases, the municipality has a *backup* SSA, which can be used if the homeowners association is not performing the required maintenance.

The selected maintenance mechanism(s) should be incorporated into stormwater ordinance language to provide authority to implement the selected mechanisms. In all cases drainage easements should be established to allow maintenance access.

Develop Maintenance Standards for Natural Drainage Systems: Appropriate maintenance and inspection standards and schedules should be developed by the WCSMPC to ensure consistent levels of service throughout watersheds and throughout the county. This is particularly important for stream maintenance where inadequate maintenance activities can lead to downstream problems such as increased flow rates, streambank erosion, or water quality degradation as well as greater need for follow up maintenance.

Develop Mechanisms to Maintain Natural Drainage Systems: While in an undisturbed environment streams and drainage systems are self-maintaining, in the human-altered environment, management

and maintenance is needed to counteract the affects of influences such as modified hydrology, fire suppression, and introduction of invasive, non-native plants. Mechanisms for implementing maintenance activities should be developed. Municipalities, the County, or drainage districts are the most likely entities to perform stream maintenance within their jurisdictions. Drainage districts or the County may be the best entities to perform stream maintenance in rural areas. Because of its inter-jurisdictional nature, stream maintenance could be overseen and coordinated by WCSMPC. The County may also want to consider cost-sharing arrangements to provide incentives for stream maintenance. Grants from IEPA may be available for certain stream maintenance and restoration activities provided an IEPA approved watershed management plan exists. Mechanisms for stream maintenance should be further explored during watershed planning activities.

5.1.5 Summary

This section provided the programmatic recommendations for a countywide stormwater program in Will County. Figure 5-1 presents the general framework in graphical form with each of the four functional areas represented. Chapter 6 presents a plan for implementing the recommendations.

5.2 REGULATORY STANDARDS RECOMMENDATIONS

The regulatory program recommendations (Section 5.1.2) call for a countywide stormwater ordinance that applies to both incorporated and unincorporated areas. The section also specifies that the ordinance should be comprehensive, specifying standards for stormwater drainage and detention, floodplain management, soil erosion and sediment control, and stream and wetland protection in a single document. While preparation and adoption of ordinance language will be performed during implementation of this plan, recommended ordinance standards for new development and substantial redevelopment are presented here. These standards are intended to be the principles upon which explicit and detailed ordinance criteria and specifications will be based.

5.2.1 Comprehensive Purpose Statement

The ordinance should include a comprehensive purpose statement addressing the following concerns and objectives.

- Ensure that new development in Will County does not cause increases in flood damages within and downstream of the county.
- Minimize the need for expenditure of public funds on flood control projects, repairs to flood damaged public facilities, and on flood related emergency services.
- Prevent increases in economic disruption due to flooding and drainage problems.
- Maintain eligibility in the National Flood Insurance Program (NFIP) by equaling or exceeding the program requirements and thereby making federally subsidized flood insurance available at reduced rates through the Community Rating System.
- Meet the minimum IEPA nonpoint source pollution control standards for wastewater facility planning area and wastewater treatment plan expansions.
- Protect the natural hydrologic functions, water quality, aquatic habitat, recreation, and aesthetics of streams, lakes, wetlands, and floodplains.**

The standards required to maintain eligibility in the NFIP are denoted by "*". As discussed previously (Section 5.1.2), the Illinois Water Quality Management Plan states that approvals of wastewater facility planning area modifications must assure that applicants have addressed the nonpoint source pollution impacts of development. To address this issue, IEPA recommends adoption of the nonpoint source standards in the NIPC model ordinances. The non-point pollution control standards from the NIPC model ordinances are denoted by "**". While some of the standards that follow are required by the NFIP and IEPA, many of the standards are also necessary to meet the goals and objectives of this plan. However, endorsement of these standards will be considered with the drafting of the countywide stormwater ordinance.

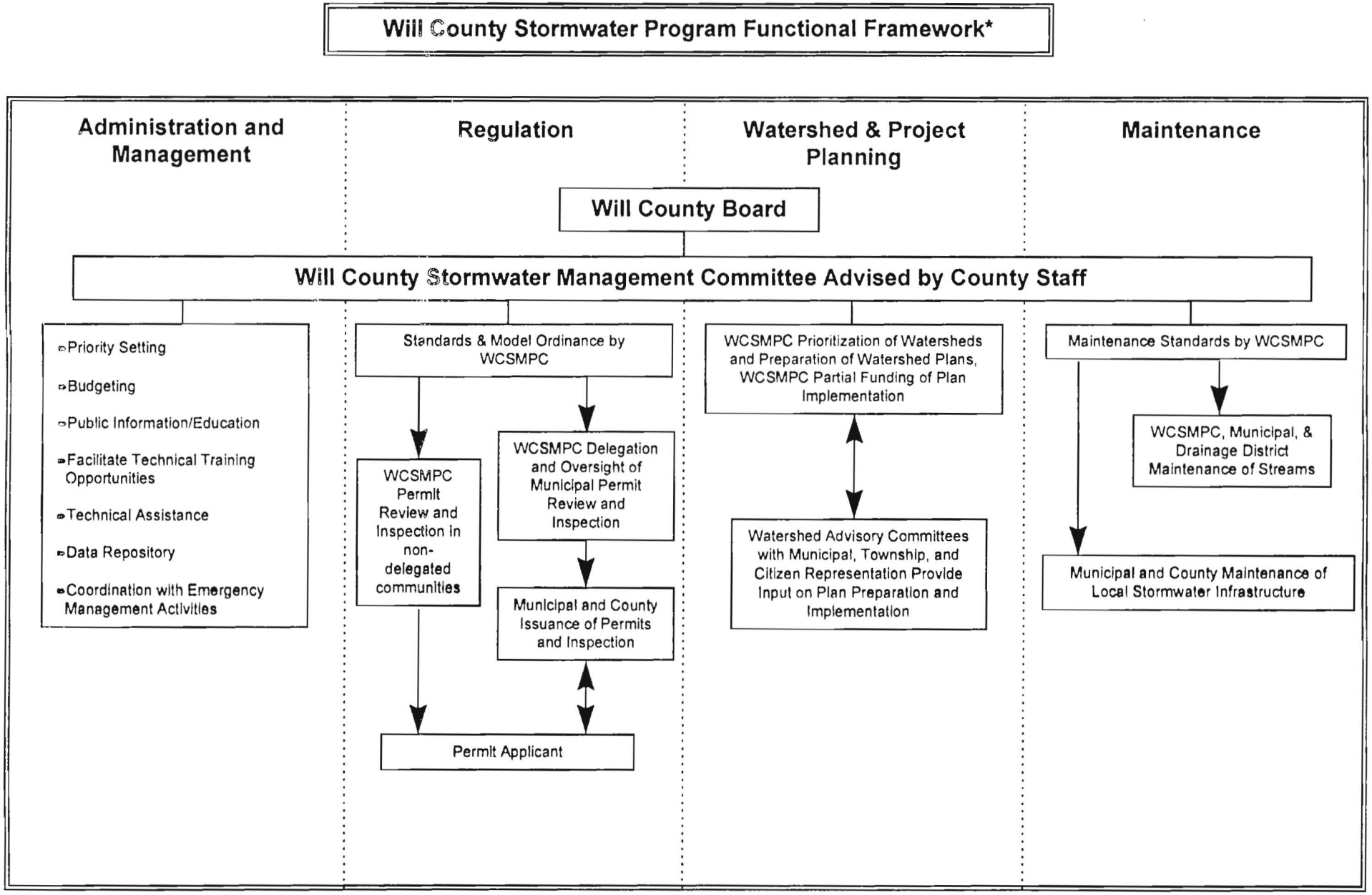
5.2.2 Floodplain Management

The following standards related to floodplain management should be considered during development of the countywide ordinance.

Ordinance Applicability: The applicability of the ordinance should be extended to include significant drainageways and depressional storage areas with drainage areas less than one square mile. Building in these areas could lead to significant flood damages to new buildings constructed within these low lying areas and to a loss of floodplain storage, resulting in increases in flood flows downstream.

Con**sider Future Land Use When Delineating Floodplains/Floodways:** The impact of any modifications to the existing regulatory floodplain or floodway boundary (through map revisions or restudies) should be computed for both existing and future land use conditions. In most casesadequate on-site stormwater management should prevent local increases in instream flow rates and flood stages as the watershed develops. However, on larger rivers such as the Des Plaines River, DuPage River, and Kankakee River, flow rates will continue to increase as the watersheds becomes more urbanized. To prevent construction and resulting flood damages in areas that will one day be in the floodplain, an assessment should be done to determine the worst case development condition (existing or future) and the regulatory floodplain mapped appropriately.

Figure 5-1


Will County Stormwater Program Functional Framework*
Administration and Management
Regulation
Watershed & Project Planning
Maintenance
Will County Board
Will County Stormwater Management Committee Advised by County Staff
Priority Setting
Budgeting
Public Information/Education
Facilitate Technical Training Opportunities
Technical Assistance
Data Repository
Coordination with Emergency Management Activities
Standards & Model Ordinance by WCSMPC
WCSMPC Permit Review and Inspection in non-delegated communities
WCSMPC Delegation and Oversight of Municipal Permit Review and Inspection
Municipal and County Issuance of Permits and Inspection
Permit Applicant
WCSMPC Prioritization of Watersheds and Preparation of Watershed Plans, WCSMPC Partial Funding of Plan Implementation
Watershed Advisory Committees with Municipal, Township, and Citizen Representation Provide Input on Plan Preparation and Implementation
Maintenance Standards by WCSMPC
WCSMPC, Municipal, & Drainage District Maintenance of Streams
Municipal and County Maintenance of Local Stormwater Infrastructure

*/**Restrict Floodway Development to Reasonable Appropriate Uses: IDNR identifies appropriate uses for the floodway in the Model Floodplain Ordinance. Restricting development to these appropriate uses is required to meet minimum state standards.

Floodway appropriate uses should be limited to a restricted list that includes only public flood control projects, public recreation and open spaces, water dependent activities, and roadway crossings to minimize nonpoint source impacts to streams. The additional appropriate uses allowed by IDNR-OWR such as new wastewater treatment plants, accessory structures such as garages, and parallel roadways may result in additional flood damages. These uses also interfere with floodway functions such as water quality mitigation and habitat protection and potentially subject the waterway to polluting substances such as untreated wastewater, gasoline, and household chemicals.

****Mitigate Floodway Construction Activities**: Floodway modifications may unintentionally lead to increased conveyance capacity and therefore increased downstream flow rates. Channel modifications can also create erosion problems as the stream attempts to re-establish equilibrium stream length, slope, and sinuosity.

Onstream impoundments act as sediment and nutrient traps leading to degraded aesthetic conditions such as low water clarity (due to high turbidity) and extensive algae blooms. Further, impoundments can impede the natural movement of fish. Also, periodic dredging may be required to maintain desired water depths. To minimize these impacts, avoidance and mitigation standards for activities in the floodway should include the following:

- Demonstrate that there is no practical alternative to the channel and floodway modification and that onstream impoundments are in the public interest.
- Compensatory storage at a conservative ratio greater than 1:1.
- Preservation of the original floodway surface area
- Maintain or improve natural channel conditions such as stream length, slope, sinuosity, pool and riffle pattern, and channel substrates.
- Impoundments must not prevent migration of indigenous fish species or cause degraded water quality conditions.
- A nonpoint source pollution control plan should be implemented throughout the watershed upstream of the proposed onstream impoundment to address siltation and water quality issues.

These requirements are intended to prevent increases in flood flows, minimize the potential for downstream streambank erosion, reduce maintenance and environmental impacts associated with dredging, prevent impediments to fish migration, and prevent low water quality conditions within the impoundment.

Compensate for Lost Storage in the Flood Fringe and Depressional Storage Areas: To prevent loss of watershed storage and resulting increases in flood flows and stages, hydraulically equivalent compensatory storage should be required for all fill activities in the flood fringe and depressional storage areas. As a safety factor, compensatory storage should be provided at a conservative ratio greater than 1:1.

Require a Flood Protection Elevation: To provide a factor of safety and minimize flood damages of those properties within the floodplain, a flood protection elevation above the base flood elevation should be required for all structures. IDNR recommends a flood protection elevation of at least one foot above the base flood elevation (one foot of freeboard). NIPC recommends two feet of freeboard and applying the flood protection elevation to structures both inside and adjacent to the floodplain that would be flooded by water at the flood protection elevation.

Require that a Letter of Map Revision (LOMR) be Obtained for all Floodplain Modifications: During the development process, permitted site grading or flow control may result in removal of land from the floodplain. Without a LOMR, those properties within the former floodplain will be required to obtain unnecessary flood insurance. Also, a LOMR provides an official record, filed with FEMA, of floodplain modifications.

5.2.3 Stormwater Drainage and Detention

The following standards related to stormwater drainage and detention should be considered during development of the countywide ordinance.

Ordinance Applicability: The stormwater drainage and detention standards (with the possible exception of detention requirements) should apply to all development, regardless of size. However, as a practical matter, the requirement that a permit be obtained may be limited to developments over a specified size.

****Control the 2-year Release Rate:** The 2-year discharge rate from development sites should be sufficiently low to prevent increases in instream flow rates. A 2-year release rate is specified to prevent increases in streambank erosion which is largely the result of increases in the magnitude of 2-year and smaller runoff events. A 2-year release rate will also prevent increases in damages to those areas subject to flooding by events smaller than the 100-year event. In the absence of a watershed plan, a 2-year release rate equal to the lower of 0.04 cfs/acre or the pre-development discharge rate from the site should be used.

NIPC found that for a typical northeastern Illinois watershed (Upper Salt Creek), consistent use of a 0.04 cfs/acre release rate would have prevented increases in instream 2-year flow rates as the watershed developed (Dreher et al, 1989). As watershed plans are developed, the onsite release rate required to prevent increases in instream flow rates should be computed and the ordinance refined as necessary.

Control the 100-year Release Rate: The 100-year discharge rate from development sites should be sufficiently low to prevent increases in instream flood flow rates and enlargement of 100-year floodplains as the watershed develops. In the absence of a watershed plan, a 100-year release rate equal to the lower of 0.15 cfs/acre or the pre-development discharge rate from the site should be used. The rationale for 0.15 cfs/acre for the 100-year event is similar to the rationale for the 0.04 cfs/acre release rate for the 2-year event. As watershed plans are developed, the onsite release rate

required to prevent increases in instream flow rates should be computed and the ordinance refined as necessary.

****Minimize Increases in Runoff Volumes**: Increases in runoff volumes should be minimized through use of a runoff volume reduction hierarchy which specifies minimization of impervious surfaces, maximization of infiltration opportunities, and use of natural drainage practices in addition to using detention.

It should be recognized that detention is very effective in preventing increases in runoff *rates* but does not prevent increases in runoff *volumes*. Therefore, the effectiveness of detention decreases with increasing watershed size (Dreher, 1989). This standard is intended to address this issue. The only means of minimizing increases in instream flow rates in large watersheds is by minimizing increases in runoff volumes.

This standard is also important for enhancing pollutant filtering and minimizing the hydrologic impacts to downstream streams, lakes, and wetlands.

Standards for infiltration practices should be considered to minimize the potential for contamination of groundwater resources in the quest to minimize changes in surface hydrology.

****Require Detention Designs which Maximize Water Quality Benefits:** Wet and wetland detention basins have been shown to be much more effective than dry bottom basins in achieving stormwater pollutant removal and the ordinance should express a preference for wet and wetland basins. Wet basins landscaped with native wetland and prairie vegetation have been found to be particularly effective at removing pollutants and preventing inbasin shoreline erosion.

Preserve Onsite Depressional Storage: Existing onsite depressional and wetland storage should be preserved independently of required detention volumes. Even with no change in land cover, significant increases in flood volumes and rates can be experienced if watershed depressional storage is lost.

Discourage Detention in the Flood Fringe: Detention in the floodplain is difficult to design to function properly under all flood stage conditions. When detention must be placed in the flood fringe, compensatory storage should be provided for the entire floodplain volume displaced by the detention basin.

****Prohibit Detention in the Floodway:** Detention in the floodway is also difficult to design to function properly under all flood stage conditions. In addition, the detention basin may block flood flows, reducing the conveyance capacity of the floodway.

****Prohibit Onstream Detention**: Onstream detention should be prohibited unless it provides regional flood control benefits, is in the public interest, and best management practices are provided upstream. This standard is intended to avoid the high maintenance costs often associated with onstream facilities and to protect the water quality and habitat of the stream.

****Prohibit Direct Discharge of Stormwater Runoff to Wetlands**: Stormwater runoff should be treated and detained prior to discharge to natural and mitigation wetlands. Excessive pollutant loads and significant changes in the magnitude and frequency of water level fluctuations within wetlands can severely stress wetland plant and wildlife communities. While wetlands are able to provide significant pollutant filtering benefits, excessive pollutant loads can exceed their assimilation capacity.

Detention Should be Designed Using Appropriate Hydrologic Methods: Detention basins should be designed using appropriate hydrologic methods and using rainfall data from the Illinois State Water Survey Bulletin 71 publication (Huff and Angel, 1992).

****Require Formal Maintenance Agreements for all New Stormwater Facilities**: For stormwater infrastructure to function properly it must be maintained in its design condition. Maintenance agreements should identify responsible parties, maintenance requirements and schedules, and should identify adequate funding arrangements for long term maintenance.

Address Agricultural Tile Systems: Agricultural tile systems were designed to drain groundwater under free flow conditions and were not constructed for maintenance access. Also, many of the tiles were installed up to 80 years ago and were constructed of lower strength materials than modern storm sewers. Surcharging of drain tiles as a result of discharge of surface stormwater runoff can rupture these tiles that are difficult to maintain and repair and do not have easements associated with them to allow maintenance access.

Information on the location of drain tiles is very limited and as a result, tiles can easily be disrupted during the construction process. This can lead to significant drainage problems on- and off-site including basement flooding and septic system failure if the drainage system is not reestablished.

5.2.4 Soil Erosion and Sediment Control

The following standards related to soil erosion and sediment control should be considered during development of the countywide ordinance. These standards are intended to prevent loss of culvert, channel, and floodplain capacity due to sediment accumulations. These standards will also protect water quality as well as aquatic and riparian habitat from the impacts of excessive sediment loads.

****Ordinance Applicability:** Soil erosion and sediment control measures should be required for land disturbances of all sizes. However, as a practical matter, the requirement that a permit be obtained generally may be limited to those activities disturbing more than 5,000 square feet unless adjacent to a waterbody or wetland where the maximum disturbance without a permit should be 500 square feet.

****Include Comprehensive Set of Principles Which Minimize Sediment Transport from the Site:** The set of principles should include provisions to minimize the time and area of disturbance, follow the natural contours of the site, and avoid sensitive areas.

****Require Soil Erosion and Sediment Control Measures Consistent with Established Guidance:** The ordinance should include explicit design and operation standards for soil stabilization, sediment control measures, conveyance channels, and other important priorities. The recommendations in the latest amendment of the "Illinois Urban Manual - A Technical Manual Designed for Urban Ecosystem Protection and Enhancement" prepared by the NRCS for the Illinois Environmental Protection Agency and in the latest amendment of "Illinois Procedures and Standards for Urban Soil Erosion and Sedimentation Control" (commonly known as the Greenbook) (Northeastern Illinois Soil Erosion and Sedimentation Control Steering Committee, 1988) may also be adopted by reference.

****Require Installation of Sediment Control Measures Prior to Land Disturbance:** Sediment control measures, such as sedimentation basins and silt fences, should be installed prior to significant land disturbance activities to ensure that sediment generated during construction is captured.

****Require Early Implementation of Erosion Control Measures**: Soil erosion control measures such as temporary seeding, mulching, and erosion control blanket should be implemented soon after the end of active disturbance of the land and prior to final grading if final grading will not be completed for a significant period of time. This includes stabilization of soil stockpiles.

****Require Routine Inspection and Maintenance of all Soil Erosion and Sediment Control Measures:** For soil erosion and sediment control measures to be effective, they must be routinely inspected and maintained. Although construction activities are only temporary, it is not uncommon for soil erosion and sediment control measures such as erosion blanket, silt fences, and sediment traps to require maintenance or replacement several times during the construction process.

****Provide Effective Enforcement Tools:** Without the threat of enforcement, it is often difficult to ensure that measures are adequately maintained. Effective enforcement tools include stop work orders and fines that specify each day as a separate violation.

5.2.5 Stream and Wetland Protection

The following standards related to stream and wetland protection should be considered during development of the countywide ordinance.

****Protect the Beneficial Functions of Streams, Lakes, and Wetlands from Damaging Modifications:** Certain wetland disturbances such as vegetation removal, draining, and impoundment are only regulated by the Corps if they are associated with a dredge or fill activity. Also, the quality and quantity of runoff discharged to wetlands should be addressed as discussed under the stormwater drainage and detention standards.

****Prohibit the Modification of High Quality, Irreplaceable Wetlands, Lakes, and Stream Corridors:** Certain high quality wetlands are essentially unmitigatable and therefore modification should be prohibited.

****Discourage Modification of Wetlands for Stormwater Management Purposes:** Wetlands should not be modified to create detention basins unless the wetland is severely degraded, runoff is pre-treated prior to discharge to the wetland, and wetland functions can be improved as part of the modification.

****Discourage Watercourse Relocation or Modification:** Relocations or modifications should only be allowed when necessary to remedy existing erosion problems, restore natural conditions, or to accommodate utility crossings.

****Require Mitigation for All Unavoidable Stream Modifications:** Environmental mitigation as specified under floodway modifications in the Floodplain Management section (Section 5.2.2) should be required for all stream modifications.

****Discourage Armoring of Channels and Banks:** Unless native vegetation and gradual bank sloping are inadequate to prevent severe erosion, stream channels and banks should not be armored with hard materials. Armoring tends to reflect flow energy and exacerbate erosion downstream while vegetation tends to absorb energy. Armoring also tends to destroy aquatic habitat.

****Discourage Culvert Crossings of Streams:** Unnecessary culvert crossings should be avoided. Installation of culverts destroys aquatic habitat and the high exit velocities can lead to downstream scour.

****Discourage onstream Impoundments:** Unless in the public interest and the environmental mitigation criteria outline in the floodplain regulations section are met, onstream impoundments should be avoided.

****Protect Buffers Along All Waterbodies and Wetlands:** A buffer of appropriate width comprised of native vegetation should be maintained or established along the shoreline of all streams, lakes, and wetlands. Exceptions to the native vegetation requirement may be allowed to facilitate water dependent activities, maintenance, or recreational access such as for beaches and boat launches, where appropriate. This standard is intended to minimize streambank and shoreline erosion that often accompanies removal of deep rooted, stabilizing vegetation and can often lead to significant property damage.

****Protect Setbacks Along All Waterbodies and Wetlands:** Beyond the buffer described above, a setback should be established along the shoreline of all streams, lakes, and wetlands. Only limited types of development should be allowed within the setback. The development types should be limited to the following:

- Minor improvements such as pedestrian or bicycle trails and educational signs.
- Maintenance access for utilities
- Parks and recreational areas
- Private and public lawns

This standard recognizes that erosion is a natural process and adequate setbacks are necessary to prevent erosion from threatening structures and their foundations.

****Require Mitigation for Wetland and Waterbody Modifications:** All wetland modifications should be mitigated at a minimum 1.5:1 acreage replacement ratio and maintenance and monitoring should be required for a full five years or until full restoration of natural wetland or waterbody functions is achieved (whichever is longer).

5.3 WATERSHED PLANNING METHODOLOGY AND ISSUES

The purpose of watershed planning is to identify the unique resources and problem areas of a watershed and to develop a plan to prevent potential future problems and remediate existing problems. This section outlines a recommended planning methodology and the issues that should be addressed in a comprehensive watershed plan.

An interdisciplinary team should be assembled to guide the watershed planning process and prepare the watershed plans. The following disciplines should be considered when assembling the team: water resources and environmental engineering, environmental planning, land use planning, and mapping/GIS. This team will likely be composed of County staff and their consultants. However, it may also be possible to utilize local, regional, state, and federal resource agencies when assembling the team. Use of County staff to prepare the watershed plans will ensure consistency in methodology between watersheds.

5.3.1 Watershed Planning Methodology

The watershed planning methodology described below should be used in conducting the watershed plan process. This methodology should not be viewed as rigid procedural requirements but as a guide or checklist during preparation of watershed plans.

1) Assemble Watershed Advisory Committee: The WCSMPC and staff should assemble a watershed advisory committee. The advisory committees should include County and local jurisdictions and organizations as well as Resource agencies. The following groups should be considered for inclusion on advisory committees.

Local Agencies and Organizations	Resource Agencies
county representatives	Will-South Cook SWCD
municipalities	Northeastern Illinois Planning Commission
townships	Illinois EPA
park districts	Natural Resources Conservation Service
Forest Preserve District	US Fish & Wildlife Service
County Health Department	Corps of Engineers
County Highway Department	USEPA
drainage districts	Farm Bureau
citizens organizations	developer associations
other interested parties	Will County Governmental League

Staff of local governments and local citizens groups will have the greatest knowledge of watershed conditions and be most affected by those conditions. Consultants and resource agencies can provide additional technical expertise and experiences from other watersheds within the region. Also, the resource agencies may have funding and can provide input regarding fundable alternatives.

The purpose of the advisory committee is to assist the WCSMPC and staff in establishing goals and objectives for the watershed plan and providing input on plan alternatives as well as strategies for implementing the recommendations.

2) Establish Preliminary Goals and Objectives: The goals and objectives of the watershed plan should be related to the unique conditions, problems, and opportunities of the watershed. However, the goals and objectives of the watershed should begin with and be consistent with the goals and objectives of the countywide stormwater plan. The objectives identified early in the planning process should be used to guide the direction of the process. However, the goals may evolve over time as information on watershed conditions is collected.

3) Inventory Watershed Resources and Conditions: Previous reports and studies and background data on the watershed should be assembled and inventories of the stream corridor and watershed conducted. Watershed data assembled should include floodplain, wetland, land use/land cover, soils, and vegetation maps as well as hydrologic information such as rainfall and streamflow data. This will provide information on watershed conditions and resources that affect stream hydrology and conditions. The stream corridor inventory should be conducted to assess the condition of the stream corridor itself and identify problems areas such as severe streambank erosion and debris blockages that could exacerbate flooding. Stream cross-section, rainfall, and streamflow data will be needed if detailed hydrologic/hydraulic analyses for flood assessment and floodplain mapping are to be performed.

4) Analyze Watershed Characteristics, Problems, and Opportunities: Based on the information collected and assembled above, watershed problems can be identified and the sources, causes, and magnitude of the problems analyzed. This step may include detailed quantitative hydrologic and hydraulic modeling and GIS based analysis. The next section (5.3.2) identifies watershed planning issues that should be considered during this component of the planning methodology.

5) Analyze and Recommend Alternatives for Problem Remediation and Prevention: Alternatives for remediation and prevention of problems should be developed and should consider both watershed and site-specific measures as well as structural and non-structural techniques. Evaluation of alternatives should also consider impacts to onsite and downstream stream, lake, and wetland resources. Costs and potential funding sources should be developed for each of the alternatives. Considering the watershed goals and objectives, financial resources, and the estimated costs for project implementation, alternatives should be selected and recommended projects should be prioritized.

6) Develop an Effective Action Plan: An action plan should be prepared which identifies funding sources, the responsibilities of the various parties that will implement the plan, and a schedule for

implementation. This is an extremely important step. Without specific tasks assigned to specific parties, it is unlikely that the plan will be implemented.

7) Monitor Implementation Progress of the Plan: Implementation activities should be monitored to ensure that recommended activities are occurring. The results of plan implementation should also be monitored to assess the adequacy of the plan in meeting its objectives and to identify additional measures that may be necessary to achieve the objectives.

5.3.2 Comprehensive Watershed Planning Issues

A comprehensive watershed plan should identify and address in a comprehensive fashion the problems, needs, and opportunities in the watershed. Subjects which commonly will need to be addressed include the following.

Flood Damage and Mitigation Needs: While flood damages may occur in specific locations, flooding is the result of runoff from the entire upstream watershed. Thus, flood damages, particularly from overbank flooding, must be analyzed on a watershed basis. Since watersheds rarely follow political boundaries, analysis of flooding problems must necessarily be addressed on an intergovernmental basis which has been facilitated though formation of the WCSMPC. In addition to addressing existing flooding problems, potential future problems should also be identified and watershed-specific regulatory standards should be identified, where appropriate.

Emergency Preparedness Needs: Flood damages and life/safety impacts can often be significantly reduced through proper emergency preparedness to facilitate timely evacuations, sand bagging, and moving of valuables to higher levels. In some watersheds it may be appropriate to develop a flood threat recognition and warning system. The system could include flood stage forecast maps which identify areas that are likely to be inundated given the flood stage at a location(s). With real time flood stage information, emergency managers can use the maps to predict which areas are potentially being flooded and likely to be in need of services. Emergency preparedness needs should be coordinated with Will County EMA to provide them with the tools that they need.

Floodplain Mapping Status and Needs: The floodplain maps in many areas of Will County were prepared in the early 1980s. However, selected streams have been restudied within the last ten years. Generally, in the more urban areas of the county, the mapping was prepared based on hydrologic and hydraulic modeling. In the more rural areas, the mapping was done by more approximate means such as regression equations and using the historic flood of record as the regulatory flood (except where there have been restudies, in which case modeling was used). Due to land use changes, better rainfall information, and greater sophistication in watershed modeling techniques, the accuracy of many of the existing maps is questionable. The current floodplain mapping for each watershed should be evaluated in terms of the following.

> **Changes in land use since the time of the mapping:** Changes in land use since the time of the mapping may have significantly altered the flood risk within and adjacent to the currently mapped floodplain.

Changes in hydraulic conditions since the time of the mapping: Installation or removal of significant hydraulic structures since the time of the mapping may have significantly altered the flood risk within and adjacent to the currently mapped floodplain.

Adequacy of the geographic coverage of the mapping: Most regulatory maps do not extend into the headwaters of streams where the drainage area is less than one square mile.

Adequacy of the hydrologic and hydraulic (H/H) analysis supporting the floodplain mapping: Many of the regulatory floodplains in Will County were studied using approximate methods and do not have elevations associated with them. Also, many of the early hydraulic analyses were performed with an insufficient number of cross sections to adequately represent the channel hydraulics. This was identified as a contributing factor in the flood height increases associated with the Des Plaines River remapping.

Recent flooding experience: Recent experience may help identify inaccuracies in the current regulatory floodplain.

The number and significance of map revisions (LOMRs) and map amendments (LOMAs) that have occurred since the time of the mapping: LOMRs and LOMAs are not shown on existing floodplain maps and information on them can be difficult to obtain from FEMA. This problem is supposed to be addressed by the digital countywide mapping format recently adopted by FEMA. Also LOMRs and LOMAs are often not requested for floodplain modifications permitted by IDNR-OWR.

If it is determined that floodplain mapping for the watershed is not adequate, funding to update the maps should be identified and new maps prepared.

Identification of Regionally Significant Storage Areas: Throughout Will County there exist depressional storage areas that store significant runoff volumes. If these depressional storage areas are lost, substantial increases in downstream flow rates and flood damages may result. In a study of Butterfield Creek in south Cook County, Illinois, it was found that 100-year discharge rates would increase from 35% to 100%, depending on watershed location, if watershed depressional storage was lost (USDA, 1987). The 35% to 100% increase was independent of any land uses changes in the watershed. Many depressional storage areas may also be groundwater recharge zones important for stabilizing streamflows and lake levels within the watershed. Watershed planning should identify significant depressional areas and develop strategies for their preservation.

In addition to identifying existing watershed storage areas, opportunities for creation of additional regional storage areas should be identified. For example, regional storage areas could be created behind existing or future roadway embankments to serve as regional detention for portions of the watershed.

Channel and Shoreline Erosion: Although erosion is a natural process, excessive channel and shoreline erosion often occurs in urban and agricultural watersheds. Excessive erosion can lead to property loss and threaten structures as well as being a significant sediment source causing

sedimentation downstream. Streambank and shoreline erosion occurs as a result of both hydrologic destabilization due to urbanization and local instream factors. Hydrologic destabilization is the result of increases in volumes and rates of runoff due to urban development. Increases in runoff rates and volumes result in increased stream velocities as well as increased stream and lake water level fluctuations. Local instream factors include channelization and loss of deep rooted, stabilizing streambank and shoreline vegetation.

Alternatives to remediate excessive channel and shoreline erosion should consider both watershed measures to address hydrologic destabilization and instream measures. Watershed measures to address hydrologic destabilization could include retrofitting of existing detention basins to improve runoff rate control during 2-year and smaller runoff events and creation and/or utilization of regional storage areas described previously. Potential instream measures include reestablishment of native deep rooted vegetation and bio-technical erosion control measures which use a combination of structural and vegetative measures to control streambank and shoreline erosion.

Alternatives to prevent excessive stream and shoreline erosion should also consider both watershed and riparian corridor measures. Watershed measures should include adequate stormwater controls to prevent hydrologic destabilization as the watershed develops. Instream measures should include stream corridor management to prevent and address invasion of non-native and undesirable vegetation, prevent disturbance of natural streams that are currently stable, and restore channelized streams that may be unstable. Finally, buffers and setbacks should be established along streams and shorelines so that normal erosion does not later threaten structures and property developed along the stream or shoreline.

Sedimentation: Like erosion, sedimentation is also a natural process. Excessive sedimentation can reduce the conveyance and storage capacity of stream channels, culverts, and floodplains, increasing flood heights and damages. Sedimentation is the result of erosion of upland land surfaces (agricultural and construction sites), washoff of sediments from urban land surfaces (impervious areas), and streambank erosion in upstream reaches. Watershed planning should identify the primary existing or potential causes of excessive sedimentation and identify alternatives to reduce the sources of sediment. Plans should also assess dredging and other sediment removal options once the sources of sediment have been addressed.

Stream Maintenance and Management: Stream maintenance is a necessary activity to address streambank erosion and sedimentation as discussed above as well as to address excessive accumulations of debris. Significant debris accumulations can increase flood heights and cause further erosion. Stream maintenance needs should be identified during the watershed planning process. Also, given the specific watershed conditions, appropriate management measures should be identified to reduce future maintenance needs. As mentioned above, appropriate management measures may include regular inspections, reestablishing and maintaining stabilizing plant communities, and establishing and protecting appropriate buffers widths. To facilitate stream management and maintenance, technical guidelines should be developed and responsible parties should be identified.

Water Quality Remediation and Protection: Water quality problems are typically related to high concentrations of suspended sediment, nutrients, pesticides, oil and grease, organic matter, and heavy metals. Sources of these pollutants include agricultural and urban runoff, upstream channel erosion, failing septic systems, and point sources. Water quality problems can also be the result of conditions within the waterbody itself such as resident carp populations and certain recreational activities which stir up bottom sediments and lead to high turbidity levels. Watershed planning should identify sources and causes of the problems as well as alternatives to remediate the problems. During evaluation of alternatives to improve water quality, other factors, such as lack of physical aquatic and riparian habitat, should be considered since addressing water quality alone may not be sufficient to meet certain watershed goals.

Important or sensitive groundwater recharge areas should also be identified and protected to prevent contamination of groundwater resources.

Aquatic and Riparian Habitat Restoration and Protection: Impairment of stream, lake, and wetland habitats can be the result of watershed influences, as previously described, or direct physical modifications such as channelization, filling, or vegetation removal. Direct modifications destroy habitat diversity, disturb natural substrates, and can lead to streambank erosion.

As watershed planning is being undertaken, regional restoration opportunities for stream corridors, lakes, and wetlands should be evaluated. There may be opportunities, for example, to accomplish restoration objectives as part of flood control projects, enhancement of regional storage areas, or remediation of streambank erosion. Restoration of aquatic and riparian habitat should consider both watershed induced impacts and direct modifications. Restoration techniques include revegetating riparian areas with native plants and enhancing channel features such as stream riffles and meanders.

Identify Coordination Opportunities with Other Programs: There are often opportunities to achieve watershed based stormwater objectives through coordination with other programs such as open space, recreation, and transportation planning. Watershed planning should be coordinated with open space acquisition programs to acquire particularly important and/or sensitive natural areas such as wetlands, regional storage sites, and broad floodplains. As discussed previously, roadways can be designed to create stormwater storage areas or wetlands to benefit downstream areas.

5.3.3 Summary

In summary, the key principles of this watershed planning methodology are to base recommended actions on identified flooding problems and waterbody impairments and to approach the solution of watershed problems in a holistic, comprehensive fashion.

CHAPTER 6
PLAN IMPLEMENTATION CONSIDERATIONS

6.1 ADOPTION OF STORMWATER PLAN

The first step toward implementation of this Will County Stormwater Plan is approval of the plan by the WCSMPC and adoption by the County Board. The steps leading to adoption of the plan are listed below.

1) WCSMPC approval of the draft plan: The final draft plan is presented to the WCSMPC. After incorporating comments from the WCSMPC members, the Stormwater Plan is approved for public review.
2) Public review period: The WCSMPC puts the approved draft plan out for public review during which time the plan is sent to the municipalities, IDNR, NIPC, neighboring counties, and other interested agencies and parties for review and comment. A public hearing is held during this period. Relevant comments received during the review period and hearing are then addressed in the final stormwater plan at the discretion of the WCSMPC.
3) Adoption by the County Board: The County Board adopts, by ordinance, the final Will County Stormwater Management Plan.
4) Implement Adopted Plan: The County Board begins implementation of the adopted plan through the WCSMPC using County staff.

6.2 PHASING OF RECOMMENDATIONS

In general, the order in which the stormwater plan recommendations are implemented is dependent on a number of factors including the extent of existing problems, the rate of urbanization, and available funding. While flooding problems currently exist in Will County, the high rate of projected growth in the County (over 100% increase in population over the next 25 years - the highest projected rate in the region) indicates an urgent need to prevent new problems from being created. Also, remediating flooding problems is quite expensive while the cost to prevent flooding problems is generally much less.

These factors suggest that the first recommendations to be implemented should be those related to the regulatory program to minimize new problems related to new development and avoid exacerbation of existing problems. However, certain administrative and management recommendations will also be necessary to support the regulatory program. As the regulatory program is being implemented, the WCSMPC should also begin to focus on maintenance and planning needs.

Table 6-1 lists each of the recommendations from Chapter 5 (Section 5.1) along with the phase in which it should be implemented. For simplicity, implementation of the recommendations is

Table 6-1: Phasing of Plan Recommendations

Plan Recommendation	Phase*
Administration and Management Recommendations	
Assign Staff and Provide Training	**1-3**
Provide Technical Support	**1-3**
Develop and Implement Public Education Program	**1-3**
Coordinate Professional Education	**2-3**
Develop Funding Strategies and Fund Program	**1-3**
Regulatory Recommendations	
Prepare and Adopt Countywide Ordinance	**1**
Prepare Technical Reference Manual	**1-2**
Develop Ordinance Enforcement Structure	**1**
Enforce Ordinance**	**2-3**
Planning Recommendations	
Perform Countywide Planning Coordination Activities	**1-3**
Prepare and Implement Watershed Plans	**3**
Maintenance Recommendations	
Develop Maintenance Standards for Infrastructure	**2**
Develop Mechanism to Maintain Stormwater Infrastructure	**2**
Maintain Stormwater Infrastructure**	**2-3**
Develop Maintenance Standards for Natural Drainage System	**3**
Develop Mechanism to Maintain Natural Drainage System	**3**
Maintain Natural Drainage System**	**3**

***** Where multiple phases are given, the first number indicates the phase in which the activity would start and the second number indicates the phase through which the activity would continue.

** These activities are not explicit recommendations from Chapter 5 but are implied by the other recommendations and are obvious components of the program presented in this plan.

divided into three phases. At this time no dates have been assigned to the phases. It should be noted that there will be overlap in the three phases. For example, it would not be advisable to wait until all of the phase one tasks are complete before beginning the phase two tasks.

The phasing of stormwater program activities is illustrated graphically in Figure 6-1. The lines in the figure indicate when activities would be started and completed. Many of the activities are ongoing and would continue indefinitely.

6.3 DISCUSSION OF PHASING

Each of the recommendations and activities are discussed below in terms of the phase(s) in which they are carried out. Those activities that are multi-phase or ongoing are repeated under each relevant phase. The staffing and funding recommendations are discussed at the end of each Phase description. Refer to Chapter 5 for more in depth discussion of the recommendations.

Phase 1

The phase one recommendations are primarily related to preparation of a countywide stormwater ordinance and activities required to support preparation of the ordinance.

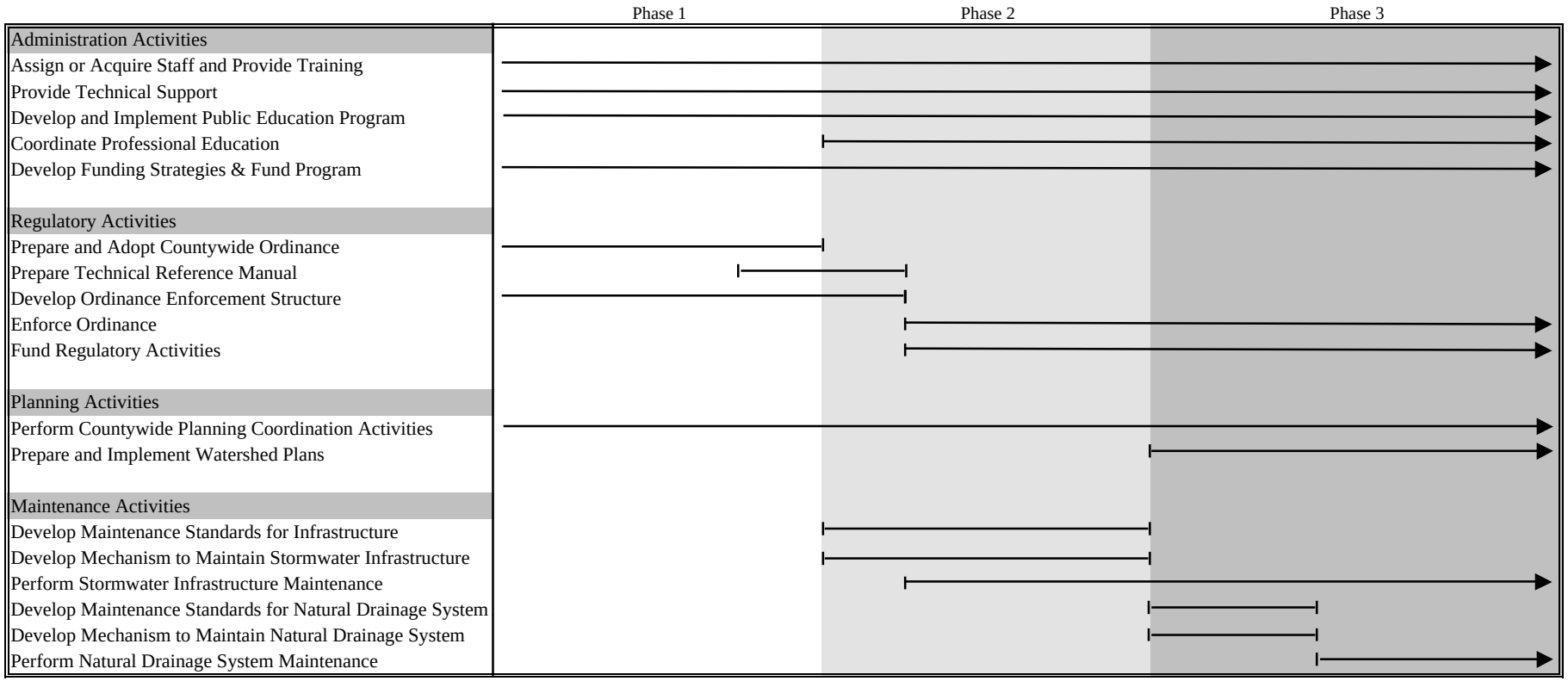
Provide Technical Support: County staff assigned to the stormwater program will be the central technical resource for the County in terms of interpretation and enforcement of the ordinance. As such, technically qualified staff will be needed to perform this function. This function will be important as the ordinance is being developed to assist the communities and public in understanding the purpose and standards of the ordinance.

Develop and Implement Public Education Program: A public education program should begin as soon as practical to develop grass roots support for adequate regulatory standards and increased funding levels that will be required. It is important to generate recognition and interest early in the program to develop a constituency and to provide a central repository for information regarding significant stormwater problems and issues.

Prepare and Adopt Countywide Ordinance: Staff (along with possible consultant assistance) should prepare a countywide ordinance as soon as practical to minimize adverse effects from new development. The WCSMPC should petition FEMA and/or IDNR to update the most inaccurate floodplain maps and interim measures should be developed and incorporated into the ordinance to address maps that cannot be updated in a timely manner. Although development of a countywide ordinance is generally a one-time activity, it is likely that ordinance revisions will be necessary from time to time.

Prepare Technical Reference Manual: Preparation of the technical reference manual should begin once the standards in the ordinance have been established such that the reference manual is available on or before the effective date of the ordinance. Although

Figure 6-1 Will County Stormwater Program Phasing



Key: Ongoing activity with start date

activity with start and end dates

development of a technical reference manual is essentially a one-time activity, it is likely that periodic revisions to the manual will be required as the ordinance is modified and as new information becomes available.

Develop Ordinance Enforcement Structure: This includes determining which regulatory components will be delegated and under what conditions. It also includes proceeding with the process of delegating ordinance enforcement to the municipalities. The WCSMPC enforcement structure should be in place before the effective date of the ordinance.

Perform Countywide Planning Coordination Activities: County staff should perform ongoing coordination activities. In particular, WCSMPC should coordinate with Forest Preserve District and Highway Department planning activities as well as coordinating with neighboring counties to ensure consistency with the plan. Also, updating of floodplain maps and preparation of a Will County wetland ADID study should be pursued to ensure that floodplain and wetland information needed to support the regulatory program is available when, or shortly after, the ordinance is adopted.

Assign Staff and Provide Training: Appropriate staff should be assigned to the stormwater program and provided with adequate training. During the first phase, an engineer will be needed to prepare the ordinance, provide technical assistance, and perform coordination activities. A public information specialist may be needed to perform public education activities. Although, the phase 1 activities will involve a significant time commitment, particularly for the engineer, these activities could be assigned to existing County staff.

Develop Funding Strategies and Fund Phase I: Assuming that a consultant is used to assist in developing the ordinance, the primary program costs during phase I are staff salaries, consulting fees to develop the ordinance, and expenses related to public education materials. The specific mix of funding sources should be determined by the WCSMPC, County Board, and staff. However, it is likely that the costs for Phase 1 could be covered by the County corporate budget.

Mechanisms for funding regulatory activities should be developed. In particular, a fee structure for permit review and inspection activities should be developed and funding and assistance for updating floodplain maps should be pursued. Funding of the regulatory program will be an ongoing activity.

Phase 2

The Phase 2 activities are primarily related to interpretation and enforcement of the countywide ordinance.

Provide Technical Support: This is an ongoing activity that will continue from Phase 1.

Develop and Implement Public Education Program: This is an ongoing activity that will continue from Phase 1.

Coordinate Professional Education: With the County ordinance adopted in Phase 1, there will be training needs for both design and permit review professionals. Coordination should be provided so that these opportunities are available as ordinance implementation begins. This activity should begin prior to the effective date of the countywide ordinance.

Prepare Technical Reference Manual: Preparation of the technical reference manual should begin in the later stages of Phase 1 and be completed in the early stages of Phase 2. As described under Phase 1 should be completed on or before the effective date of the ordinance.

Enforce Ordinance: Depending on the number of municipalities that seek ordinance enforcement authority, much of this activity may be performed by the municipalities. During Phase II, much of the effort will be related to the delegation process.

Develop Maintenance Standards for Stormwater Infrastructure: Having consistent standards for maintenance is important to ensure that stormwater management features are functioning as designed. Standards and guidance, including schedules, for maintaining stormwater infrastructure should be prepared and distributed to those responsible for maintenance prior to the effective date of the ordinance.

Develop Mechanism to Maintain Stormwater Infrastructure: It will be important that a mechanism to maintain the stormwater infrastructure installed with each new development be developed and implemented to ensure the long term functioning of the infrastructure. A number of potential mechanisms were discussed in Chapter 5. Specification of maintenance responsibilities for stormwater infrastructure should be included in the ordinance.

Perform Infrastructure Maintenance: Infrastructure maintenance activities should be performed utilizing the mechanisms developed in the previous recommendation. Infrastructure maintenance will be an ongoing activity.

Assign Staff and Provide Training: As Phase 2 gets underway, it may be appropriate to assign or hire a staff person to administer the countywide stormwater program. This person could be the engineer identified in Phase 1 or could be another person. An engineer(s) will also be needed to perform regulatory related functions. These functions include participation in pre-application conferences, municipal regulatory delegation and oversight activities, review of permits, and field inspections. The required number of regulatory engineers will depend on the number of municipalities that are granted ordinance enforcement authority. The public information specialist position would continue into this phase. A total of three part time or full time staff positions are envisioned during this phase.

Develop Funding Strategies and Fund Phase 2: The primary program costs during Phase 2 will be for staff and ongoing program expenses. As discussed previously, the specific mix

of funding sources should be determined by the WCSMPC, County Board, and staff. Much of the permit review and enforcement costs could be covered by permit application fees. Other staff activities, including the process of delegating permit review and enforcement to the municipalities, may need to be covered by a countywide source of funds.

Phase 3

Priority three is maintenance of the natural drainage system and watershed planning and implementation. While watershed planning and a countywide maintenance program are very important, they are also expensive and are therefore delayed until Phase 3 due to financial constraints. However, availability of grants and other watershed planning and implementation assistance may alter the timing of watershed planning somewhat.

Provide Technical Support: This is an ongoing activity that will continue from Phase 1.

Develop and Implement Public Education Program: This is an ongoing activity that will continue from Phase 1.

Coordinate Professional Education: This is an ongoing activity that will continue from Phase 1.

Enforce Ordinance: Depending on the number of municipalities that seek ordinance enforcement authority, much of this activity may be performed by the municipalities. During Phase 3, much of the effort will be related to oversight activities such as pre-application meetings, field inspections, and periodic delegation reviews. It is likely that staff will review permits for at least a few of the small municipalities as well as the unincorporated areas.

Prepare and Implement Watershed Plans: Watershed plans should be prepared based on the procedures in Section 5.3. Funding and technical assistance should be sought to assist in development of the plans.

Develop Maintenance Standards for the Natural Drainage System: Having consistent standards for maintenance is important to minimize avoidable flood hazards and to discourage maintenance activities that could exacerbate problems elsewhere. Standards and acceptable procedures should be included in the technical reference manual. Dissemination of the materials prepared on appropriate standards and procedures should target drainage districts, township maintenance departments, municipalities, and major land owners.

Develop Mechanism to Maintain Natural Drainage System: A mechanism is needed to implement the maintenance activities. Cooperative arrangements between the municipalities and the County should be developed. Also, grant opportunities should be

pursued for certain maintenance activities, particularly stream maintenance to address erosion problems and debris blockages.

Perform Natural Drainage System Maintenance: Natural drainage system maintenance activities should be performed utilizing the mechanisms developed in the previous recommendation. Drainage system maintenance will be an ongoing activity.

Assign Staff and Provide Training: Under Phase 3, additional engineers will be needed to perform (or oversee) watershed planning and implementation as well as stream maintenance. The number of engineers required to perform watershed planning activities will depend on the rate at which watershed plans are to be prepared and the extent to which consultants are used to prepare the plans. However, it is likely that one to two watershed engineers will be needed assuming at least some assistance from consultants.

If maintenance of the major streams throughout the County is coordinated by WCSMPC and the County, a one half to three quarter staff position will be needed to perform periodic inspections of the county's stream network to assess maintenance needs, hire and manage maintenance contractors, and to perform maintenance work. In addition to the three part time or full time staff discussed under Phase 2, it is likely that two to three staff positions will be needed for Phase 3 for a total of five to six staff positions.

Develop Funding Strategies and Fund Phase 3: Program costs during Phase 3 will include staff, consulting fees (to assist in watershed plan development), contractor fees (to perform stream maintenance activities) as well as ongoing program expenses. In addition, any capital projects identified during watershed planning will need to be funded. As discussed previously, the specific mix of funding sources should be determined by the WCSMPC, County Board, and staff. Outside sources of assistance should be pursued, including potential grants for stream maintenance and restoration activities and technical assistance from various agencies for preparing watershed plans. Outside sources of funding is also likely to be available for cost effective flood control projects.

As discussed under Phase 2, regulatory activities should be largely funded through permit fees. Implementation of watershed plans and stream maintenance specifically benefit the residents and businesses in that watershed. Thus, it may be appropriate to develop special service areas or other means of generating watershed specific revenue sources during Phase 3.

6.4 STAFFING CONSIDERATIONS

The following table (Table 6-2) summarizes potential staff requirements for each phase. Actual staff requirements will need to be updated from time to time based on actual workload and extent to which activities are performed in-house vs. by consultants. The table should only be used as an indicator of expected stormwater program staffing needs associated with implementing the plan and not necessarily as an indicator of new staff positions. It may be possible to address many of these activities with existing staff.

Table 6-2: Summary of Staff Requirements

Position[1]	Responsibilities	Phase[2]
Chief Engineer/ Program Administrator	**Staff liaison to WCSMPC, staff management and technical direction, periodic Plan update, budgeting and prioritization, countywide planning and coordination, and technical assistance.**	**1**
Administrative/Public Information Specialist	**Support program administrator, prepare public information materials, and coordinate technical education activities.**	**1**
Ordinance Administrator (Permit Review Engineer)	**Participate in pre-application meetings, ensure watershed consistency of County development activities, permit review, and technical assistance.**	**2**
Permit Reviewer/Field Inspector	**Perform permit reviews and field inspections for WCSMPC reviewed permits. Periodic reviews of municipal permits.**	**2**
Watershed Engineer(s)	**Watershed planning activities, ordinance support, and technical assistance.**	**3**
Stream Maintenance Coordinator	**Inspect streams and prioritize stream maintenance activities, contract management for stream maintenance contractors, and technical assistance.**	**3**

[1] Functions of some or all of these positions may be performed by current Land Use Department staff (i.e. permit reviews are already performed by Engineering staff).

[2] Phase during which position(s) should be filled.

REFERENCES

Dreher, D.W., G.C. Schaefer and D.L. Hey, "Evaluation of Stormwater Detention Effectiveness in Northeastern Illinois", Northeastern Illinois Planning Commission. Chicago, Illinois. June 1989.

Dreher, D.W., "Watershed Urbanization Impacts on Stream Quality Indicators in Northeastern Illinois, in Assessing the Cumulative Impacts of Watershed Development on Aquatic Ecosystems and Water Quality, A National Symposium. " Northeastern Illinois Planning Commission. Chicago, Illinois. March 1996.

Hershfield, D.M., "Rainfall Frequency Atlas of the United States", U.S. Department of Commerce, Weather Bureau. Technical Paper 40. 1961.

Huff, F.A. and J. Angel, "Frequency Distributions and Hydroclimatic Characteristics of Heavy Rainstorms in Illinois", Illinois State Water Survey. Champaign, Illinois. Bulletin 70. 1989.

Huff, F.A. and J.R. Angel, "Rainfall Frequency Atlas of the Midwest", Illinois State Water Survey. Champaign, Illinois. Bulletin 71. 1992.

Illinois EPA, "Biological Stream Characterization: Biological Assessment of Illinois Stream Quality", Special Report 13 of Illinois State Water Plan Task Force. Springfield, Illinois. September 1989.

Illinois EPA, "Illinois Water Quality Management Plan". Bureau of Water. Springfield, Illinois. December, 1992.

Illinois EPA, "Illinois Water Quality Report, 1994-1995". Bureau of Water. Springfield, Illinois. August, 1996.

Illinois EPA, ATargeted Watershed Approach - A Data Driven Prioritization@. Bureau of Water. Springfield, Illinois. March, 1997.

Northeastern Illinois Planning Commission, "Areawide Water Quality Management Plan", Chicago Illinois. 1979.

Northeastern Illinois Planning Commission, "Model Stream and Wetland Protection Ordinance For the Creation of a Lowland Conservancy Overlay District: A Guide for Local Officials". Chicago, Illinois. October 1988.

Northeastern Illinois Planning Commission and Illinois Department of Natural Resources - Office of Water Resources, "Model Floodplain Ordinance for communities within Northeastern Illinois". Chicago, Illinois. July 1996.

Northeastern Illinois Planning Commission, "Model Stormwater Drainage and Detention Ordinance: A Guide for Local Officials". Chicago, Illinois. July 1990.

Northeastern Illinois Planning Commission, "Model Soil Erosion and Sediment Control Ordinance: A Guide for Local Officials". Chicago, Illinois. September 1991.

Northeastern Illinois Planning Commission, "1990 Base Data from U.S. Census Bureau distributed to Quarter Section", Research Services Department. 1994. ***

Northeastern Illinois Planning Commission, "Population, Household, and Employment Forecasts as Endorsed by the Northeastern Illinois Planning Commission". Chicago, Illinois. November 1997

Northeastern Illinois Soil Erosion and Sedimentation Control Steering Committee, "Procedures and Standards for Urban Soil Erosion and Sedimentation Control in Illinois". Lisle, Illinois. October 1988.

Price T.H. and D.W. Dreher, "Investigation of Hydrologic Design Methods for Urban Development in Northeastern Illinois", Northeastern Illinois Planning Commission. Chicago, Illinois. December 1991.

Schueler, T.R., "The Importance of Imperviousness" in Watershed Protection Techniques. A Quarterly Bulletin on Urban Watershed Restoration and Protection Tools, Vol. 1, No. 3. Center for Watershed Protection. Silver Spring, Maryland. Fall 1994.

Uchtmann, D.L. and D. Rolf, "Illinois Drainage Law". University of Illinois at Urbana-Champaign, College of Agriculture, Cooperative Extension Service - Circular 1305. Urbana, Illinois. December 1991.

United States Department of Agriculture, Soil Conservation Service, "Floodplain Management Study - Butterfield Creek and Tributaries - Cook and Will Counties, Illinois", Prepared for the Illinois Department of Transportation, Division of Water Resources. November, 1987.

United States Department of Agriculture, Natural Resources Conservation Service, "Illinois Urban Manual - A Technical Manual Designed for Urban Ecosystem Protection and Enhancement". Champaign, Illinois. 1995.

United States Geological Survey, "RF3 Reach Files,". 1986.

United States Geological Survey, "1:24,000 Drainage Basins Based on Gaging Stations", Pre-Release Coverage. 1996

University of Illinois, Agricultural Experimentation Station, AWill County Soils - Soils Report 80".Urbana, Illinois. 1962

APPENDIX A

SUMMARY OF STORMWATER MANAGEMENT QUESTIONNAIRES

Municipal and Township Surveys

SUMMARY
WILL COUNTY STORMWATER MANAGEMENT SURVEY
MUNICIPAL SURVEY

A stormwater management questionnaire was prepared by the Will County Stormwater Management Planning Committee to assess the current stormwater management framework and to identify the most critical concerns of the local governments in Will County. The questionnaire also included questions regarding local regulatory standards for stormwater drainage and detention, floodplain management, soil erosion and sediment control, and stream and wetland protection. The following summarizes the responses received from the municipalities and the County.

After each question, first the number of Yes and No responses are given. Then narrative responses are shown. The individual responses are separated by a semicolon. If the same or similar response was given by more than one municipality, the number of repeats is shown in parenthesis.

The municipalities responding to the questionnaire are listed below.

Aurora	Frankfort	Mokena	Shorewood
Beecher	Joliet	Monee	Symerton
Bolingbrook	Lemont	Naperville	Tinley Park
Braidwood	Lockport	New Lenox	University Park
Channahon	Manhattan	Plainfield	Woodridge
Crete	Minooka	Romeoville	County of Will

PUBLIC EDUCATION/INVOLVEMENT/ISSUES

1. Are there currently any ongoing efforts to educate the public about the problem causes, needs and costs of stormwater management in your community? **Yes (10) No (12)**

If yes, please describe the format of those efforts and the primary issue(s) that are addressed. *Occasional public hearings on floodprone property development (Braidwood); Occasional discussion at annual neighborhood meetings, articles in village newsletter, and stormwater drainage committee formed by mayor (Frankfort); Three public meetings and flood committee formed after July 1996 flood (Shorewood); Neighborhood meetings (Plainfield); Overhead plumbing program (Woodridge); Target specific subdivisions (Naperville); Educate those residents directly benefiting from Village projects (Minooka); Floodproofing workshop and handouts at the counter (County)*

2. Does the general public within your community recognize stormwater and related water resource concerns as serious issues in terms of water quantity and quality? **Yes (13) No (10)**

If yes, please describe important local concerns. *Homeowners have expressed concern for new development and impacts on flooding, lakes, and streams(multiple); flooding along Trim Creek (Beecher); DuPage River quality and flooding (Shorewood); Sewer backups, combined sewer backup, flood mitigation, and floodplain management, drainage, only when it directly affects them (multiple).*

3. Rank, in order of importance, the most critical elements of stormwater management as they pertain to your community. (1 = most important, 5 = least important)

Element	Importance				
	1	2	3	4	5
a. Water Quality	2	1	5	12	2
b. Overbank Flooding	6	8	2	5	0
c. Drainage Problems	14	6	3	0	0
d. Erosion\Sedimentation	0	6	12	3	0
e. Other (describe)	0	1	0	0	0

Any further Comments? *Special flood hazard areas are the most important, flooding not a problem (University Park); Combined Sewer backup (Joliet); Worst problem for Crete is I/I into sanitary sewers; Wetlands #4 for Woodridge; They are all important, prefer to consider this prioritization (County)*

4. Are there any water resource related stewardship programs (e.g., Adopt-a-Stream, Friends of ..., etc.) operating within your jurisdiction? **Yes (3) No (20)**

If yes, please list the programs and the primary activities that they are involved with. *DuPage River Watch; No, but Adopt-a-Stream would be a good idea; Community group but not on a regular basis (Woodridge); IL Heritage Corridor (Lemont)*

5. Inquiries and complaints regarding stormwater issues handled by: (check all that apply)

Municipal staff 19 Municipal officials 14 Consultants 14

Others (please specify) _____

Please describe the inquiry/complaint follow-up system. Also, please list agencies, if any, to whom complaints or inquiries are referred. Numerous communities have formalized systems generally consisting of complaint forms, work orders for investigation, work orders for minor corrective action, and consultant review if appropriate.
Agencies that that complaints and inquiries are referred to included IDNR, FEMA, Trim Creek Drainage District, and FEMA, DuPage County DEC (Woodridge)

PLANNING, MAINTENANCE, AND FUNDING

6. Have any drainage, flood control or other water resource related plans (e.g., lake restoration, stream management, etc.) been prepared for your community? **Yes (11) No (12)**

If yes, please briefly describe the purpose and date of the plans and include copy(s) (plans can be returned if necessary). *Bolingbrook (Rust, CEMCON drainage plans); University Park (Pine Lake Management Plan-weeds, fishability), Beecher (Trim Creek clean and rip rapping); Joliet (Master storm sewer plan and Glenwood detention project); Romeoville (Lily Cache Slough master plan); Lockport (bioengineering, bank restoration); Frankfort (Corps built flood control reservoir); Shorewood (Hammel Creek Study); Woodridge (Project related studies, possibly without watershed plan (Woodridge); Naperville (fixing detention ponds); Tinley Park (regional detention master plan).*

7. Has an inventory of stormwater management facilities (i.e., detention basin and storm sewer locations and specifications) been prepared? **Yes (13) No (10)** Is the inventory updated on a regular basis? **Yes (11) No (1)**

If yes, please describe the format of the inventory and the frequency of updates. *Updated annually (multiple); Updated with each new development (multiple); Partial inventory and new development added; No, but working on it (Channahon)*

8. Does your community assume responsibility for maintenance of stormwater drainage and detention facilities?

Yes (10) No (13)

If no, please describe who has responsibility (i.e., homeowners association, individual lot owners, etc.) and what mechanisms (if any) are used to ensure maintenance is being performed. *No, but inspect during storm events; Homeowners association or park district; Property owner; Jointly with park district (Woodridge); Inspect and maintain swales but not detention basins (Minooka)*

9. If you answered yes to question 8, is inspection and maintenance of stormwater facilities (i.e., detention basins, storm sewers, swales, etc.) performed through a: (check one)

a) scheduled preventative maintenance program 6

b) in response to complaints 7

If you checked "a)" Please describe the maintenance program and schedule. *Storm sewers, etc. on five year rotation, detention as needed; Detention mowing, silt removal, and erosion control as needed (multiple); Detention mowed and cleaned on weekly basis for those detention basins the village is responsible for (Shorewood); Mokena inspects detention bi-weekly and catch basins twice yearly and ditches and swales regularly*

10. Is stream channel and drainageway inspection and maintenance performed in your community on a regular basis?
Yes (9) No (14)

If yes, please explain the nature of these activities and who performs them (staff, individual property owners, drainage districts, volunteer groups, etc.). *Staff quarterly inspection and cleaning by street department; Public*

works inspections; Street department; Drainage district is responsible but has insufficient funds; Annual inspection and cleaning of Hickory and Spring Creeks; No streams in Village; Intermittent inspections and by complaint; Annual inspection and ongoing maintenance program

11. Please describe the source of funding for the following elements of your stormwater management program. (i.e., general revenue, permit fees, homeowners associations, etc.)

a. Capital Improvements (sewer rehabilitation, local flood projects, etc.)

General revenues (19); Motor fuel tax (2); Grants (5); Gaming (1); Impact fees (2); No capital improvements (2)

b. Maintenance and Operations (detention and storm sewer maintenance, street sweeping, etc.)

Motor fuel tax(3); General revenues (21); No maintenance (2)

c. Regulatory (plan review, construction site inspection, etc.)

Permit fees (18); General revenue (4); No regulatory review (1)

COORDINATION

12. Has your community made any efforts to coordinate stormwater management regulations and design criteria with adjacent communities? **Yes (7)** **No (16)**

If yes, please describe the coordination efforts. *Meetings with Plainfield and Romeoville staff (Bolingbrook); Yes, through adoption of NIPC models (multiple); Yes, through adoption of DEC ordinance (Naperville and Woodridge)*

13. Are plans for new development reviewed for potential stormwater impacts to property owners outside your corporate boundaries in addition to being reviewed for conformance with ordinance standards?
Yes (12) **No (11)**

If yes, please describe the procedure used to assess impacts outside your boundaries. *Meet with impacted property owner (Bolingbrook); Coordinate with Will County (multiple); Developer required to look offsite when cross-jurisdictional (Frankfurt); Plainfield looks downstream and prohibits diversions; Verify that downstream facilities have adequate capacity (multiple)*

14. Have other stormwater management efforts (e.g., maintenance, remedial activities, etc.) been coordinated with neighboring jurisdictions? **Yes (5)** **No (18)**

If yes, please describe the coordination efforts and any agreements that may be in place. *No formal agreements but maintenance understandings between jurisdictions (Plainfield); Coordinate with DEC(Woodridge); Coordinated on a specific project for (Tinselly/Orland Park); Mokena has coordinated drainage projects with Frankfort and the township road district*

15. Have Drainage Districts made an adequate effort to coordinate drainage activities (i.e., maintenance activities, channelization projects, etc.) within your jurisdiction? **Yes (1)** **No (16)** **NA (6)**

If yes, please describe the coordination efforts.

No responses

16. Do you believe there is a need for more regional coordination (e.g., watershed, county, or multi-county level) of stormwater management programs, standards, and issues? **Yes (19)** **No (3)** **No answer (1)**

If yes, what are the most important issues to be coordinated, at what level should they be coordinated, and who should be responsible for the coordination?

Minimum standards (multiple); Stormwater plans should be approved by a single agency with watershed plan as a guide (New Lenox); Yes, but those that allowed flooding conditions should fix them (University Park); Qualified yes–fear of taxation with out representation; Streams and wetlands (multiple); Watershed level (multiple); Stronger coordination where watersheds cross county boundaries (Naperville)

REGULATIONS/STANDARDS

Stormwater Drainage and Detention

General Stormwater:

17. Does your community enforce a stormwater drainage and detention ordinance? **Yes (21)** **No (2)**

If you answered no to this question, please proceed to the **Floodplain Management** questions. If you answered yes, please answer the following questions.

18. Which of the following are addressed in the purpose statement of your ordinance? (check all that apply)

Runoff Volume 11 Runoff Rate 18 Water Quality 11

19. Are formal maintenance agreements or contracts required for new detention facilities? **Yes (7)** **No (14)**

If yes, please provide a sample maintenance agreement or contract. *(University park attached contract; No contract but noted on plat (Joliet); Use covenants and deed restrictions)*

20. Is there a requirement that concentrated detention basin outflows be discharged to a defined drainageway with adequate capacity? **Yes (16) No (5)**

21. Is there an acreage threshold below which stormwater detention requirements do not apply? **Yes (15) No (6)**

If yes, list the minimum sizes for each of the following development types

Residential *1 ac (1); 2 ac (1); 2.5 ac (1); 3 ac (3); 5 ac (8);*

Commercial/Industrial *0 ac (1); 1 ac (5); 2 ac (6); 5 ac (1)*

Other (please specify) *Right of way owned by governmental unit exempt*

22. What recurrence interval storm must be conveyed by the minor drainage system (i.e., storm sewers)? (check one)

5-Year 1 10-Year 20

Other (please specify) _____

Detention Sizing Standards:

23. What method of detention sizing is required? (check one)

Not Specified 0 Modified Rational(MWRDGC) 12

Hydrograph routing 6 TR55 nomograph 3

Other (please specify) _____

24. Is a safety factor required on calculated detention volumes? **Yes (2) No (19)**

If yes, please specify *One foot freeboard (Tinselly Park and Romeoville)*

25. What is the specified release rate for the 100-Year event? (check one)

MWRDGC Method (3-Year) 6 0.15 cfs/acre 11 0.10 cfs/acre 1

Other (please specify) *0.3 cfs/acre (Bolingbrook); MWRDGC 10-year and c=0.15 (Plainfield)*

26. Does the ordinance require detention to control events in addition to the 100-Year? (e.g., the 2-year event) **Yes (10) No (10)**

If yes, please specify:

Size of event: *2-year (Bolingbrook, New Lenox, Joliet, Romeoville, Lockport, Channahon, and Shorewood)*

Release rate: *0.04 (Bolingbrook, New Lenox, Joliet, Romeoville, Lockport, and Channahon); at least 10-hour detention time for 24-hour, 2-year event*

27. What rainfall data source is required? (check one)

Not specified 0 Bulletin 70 17 TP40 4

Other (please specify) _____

28. Is the design storm distribution specified? **Yes (6) No (12)**

If Yes, what distribution is specified? (check all that apply)

SCS Type I 0 SCS Type II 5 Huff First 4 Huff Third 4

Other (please describe) *Huff 2nd and 4th; Appropriate Huff*

Detention in Sensitive Areas:

29. Is detention allowed in the floodway? **Yes (11) No (9)** *(No, unless on-stream (Joliet))*

If yes, is a controlled discharge required? **Yes (8) No (3)** *(No, varies by project (Crete))*

30. Is detention allowed in the flood fringe? **Yes (19) No (2)**

If yes, is a controlled discharge required? **Yes (16) No (3)**

31. Is on-stream detention prohibited unless it provides regional storage? **Yes (7) No (13)**

If yes, please describe any mitigation requirements for allowable on-stream detention. *NIPC floodplain language (University Park and Shorewood);*

32. Is detention allowed in existing wetlands? **Yes (17) No (4)**

If yes, is a pre-settling or stilling basin required before discharge to the wetland? **Yes (12) No (5)**

Runoff Volume Control and Water Quality:

33. Does the ordinance emphasize a runoff volume reduction hierarchy which promotes minimization of impervious area, maximization of infiltration, and use of natural drainage practices (e.g., swales, depressional storage areas) over storm sewers? **Yes (10) No (11)**

34. Are detention designs required to maximize water quality mitigation benefits (e.g., preference for wet bottom or wetland basins over dry bottom basins)? **Yes (7) No (14)**

Floodplain Management

35. Does your community enforce a floodplain management ordinance? **Yes (22) No (1)**

If you answered no to this question, please proceed to the **Soil Erosion and Sediment Control** questions. If you answered yes, please answer the following questions.

36. Has your community adopted the "Model Floodplain Ordinance for Communities Within Northeastern Illinois" (1996) as required by IDNR-OWR? **Yes (22) No (1)** *Two use 1994 version*

37. Which of the following are addressed in the purpose statement of your ordinance? Protection of: (check all that apply)

hydrologic functions 20 water quality 18 aquatic habitat 16

recreation 15 aesthetics 15

38. Is the list of "Appropriate Uses" for the floodway more restrictive than the full list allowed by the State? **Yes (5) No (17)**

If yes, what uses are not allowed? (check all that apply)

Detached garages and other non-inhabitable structures 3

Parking lots 2 Roadways parallel to the watercourse 2

New treatment plants 3 Other (please specify) _____

39. Is additional mitigation of floodway construction activities required beyond IDNR/OWR minimums? **Yes (8) No (14)**

If yes, please answer the following questions.

a. Is a safety factor required for any compensatory storage needed? **Yes (8) No (0)**

If yes, please specify: *1.5 (6); 1.25 (2)*

b. Are off-site increases in stage or velocity prohibited? **Yes (6) No (1)**

c. Is environmental impact mitigation required? **Yes (4) No (4)**

If yes, please describe: *NIPC onstream impoundment language (Shorewood); Maintain riparian environment (Naperville and Woodridge); replacement of impacted habitat (Minooka)*

d. For the following areas, please indicate whether compensatory storage is required for all construction and specify the safety factor.

Flood fringe **Yes (17) No (0)** If yes, safety factor *1.0 (7); 1.25 (2) 1.5 (8)*

Depressional storage **Yes (13) No (5)** If yes, safety factor *1.0 (11); 1.5 (2)*

Wetlands **Yes (12) No (5)** If yes, safety factor *1.0 (8); 1.5 (4); 3.0 for critical (1)*

Soil Erosion and Sediment Control

40. Does your community enforce a soil erosion and sediment control ordinance? **Yes (19) No (4)**

If you answered no to this question, please proceed to the **Stream And Wetland Management** questions. If you answered yes, please answer the following questions.

41. Is there an acreage threshold below which soil erosion and sediment control standards do not apply?
Yes (11) No (8)

If yes, please specify the minimum disturbance area *5,000 ft² (6); 100 CY (1); 1 acre (1); 2 acres (1); 5 acres (1); 500 SF if within 25 ft of a wetland (2)*

42. Does the ordinance include a list of principles to establish the objectives of soil erosion and sediment control and convey a project design philosophy to minimize impacts? **Yes (13) No (6)**

43. Does the ordinance specify critical stages at which inspections will be performed? **Yes (7) No (12)**

44. Does the ordinance explicitly require that soil erosion and sediment control practices be maintained throughout the duration of construction? **Yes (17) No (2)**

45. Does the ordinance include soil erosion and sediment control design standards? **Yes (14) No (5)**

Streams and Wetland Management

46. Does your community have stream and wetland protection regulations? **Yes (9) No (14)**

If you answered no to this question, please proceed to the **Permit Review and Enforcement** questions. If you answered yes, please answer the following questions.

47. Are modifications to high quality, irreplaceable wetlands, lakes and stream corridors prohibited?
Yes (8) No (1) *Need COE approval (Romeoville)*

48. Are stream channel modifications discouraged? **Yes (9) No (1)**

49. Is development within setbacks and/or buffers adjacent to streams, lakes, and wetlands controlled?
Yes (10) No (0)

If yes, please specify both buffer (only native vegetation allowed) and setback (some landscape alternatives allowed but no significant structures) widths for: *separate buffers and setbacks not specified*

Streams 10 (1); 25 (4); 75 (1) Lakes 10 (1); 25 (3); 75 (2) Wetlands 5 (1); 25 (3); 75 (2)
DEC Ordinance (Woodridge)

Permit Review and Enforcement

50. Please describe enforcement mechanisms for non-compliant development activities.

Fines (2); Use letter of credit to fix (4); Letter of credit reduction withheld (2); red tag (5); revocation of building permit (2); Circuit court (3); Issue compliance ticket; legal action (3); record notice against property; Withhold occupancy permit (1)

51. List the water resource related standards requiring the most enforcement action (e.g., erosion control, floodplain development, etc.)

Erosion control (7); Improper grading; Filling of swales (2); Redirecting runoff; No problems, but detention requires most monitoring; Stormwater management (2); Floodplain development (8)

52. Who is responsible for stormwater related permit review and enforcement within your community? (i.e., consultant or staff - which department?)

Village engineer (8); Consultant (5); Development department; Public works (3); Consultant until after construction complete (2); Consultant and planning department (2); Building and zoning (2)

53. Please use the remaining space to provide other comments and/or suggestions related to stormwater management needs in Will County or to unique aspects of your program not adequately reflected by the questionnaire.

Channahon: 1) Funding is a big issue and need to coordinate county/municipal efforts so funds are not wasted; 2) Need to recommend purchase of existing homes in floodplain and avoid building more

Frankfort: A single jurisdiction should oversee countywide management. Should comprehensively plan flood control and regional detention by watershed.

Plainfield: Need to map depressional storage areas and smaller drainageways. Need to address groundwater table and quality concerns. Need to identify regional detention areas through watershed planning.

Naperville: 1) Major issue is structure of regulatory program and whether to seek COE permit delegation; 2) Need for sufficient staff to run a program; 3) Need strong policy on agricultural development issues; 4) Water quality–both preventive and remedial–should receive increased focus.

SUMMARY
WILL COUNTY STORMWATER MANAGEMENT SURVEY
TOWNSHIP SURVEY

A stormwater management questionnaire was prepared by the Will County Stormwater Management Planning Committee to assess the current stormwater management framework and to identify the most critical concerns of the local governments in Will County. The following summarizes the responses received from the township highway departments.

After each question, first the number of Yes and No responses are given. Then narrative responses are shown. The individual responses are separated by a semicolon. If the same or similar response was given by more than one township, the number of repeats is shown in parenthesis.

The townships responding to the questionnaire are listed below.

Crete	Lockport	Plainfield	Wesley
Green Garden	Monee	Reed	Wheatland
Homer	Peotone	Troy	Will
Joliet			

PUBLIC EDUCATION/INVOLVEMENT/ISSUES

1. Are there currently any ongoing efforts to educate the public about the problem causes, needs and costs of stormwater management in your community? **Yes (1)** **No (11)**

If yes, please describe the format of those efforts and the primary issue(s) that are addressed. *Will Twsp. discusses at board meetings; Homer Twsp. tries to get residents along streams to be responsible for cleaning them out.*

2. Does the general public within your community recognize stormwater and related water resource concerns as serious issues in terms of water quantity and quality? **Yes (2)** **No (11)**

If yes, please describe important local concerns. *DuPage River flooding in Troy Twsp.*

3. Rank, in order of importance, the most critical elements of stormwater management as they pertain to your community. (1 = most important, 5 = least important)

	Importance				
Element	1	2	3	4	5
a. Water Quality	4	0	1	7	0
b. Overbank Flooding	1	5	4	2	0
c. Drainage Problems	7	5	0	0	0
d. Erosion\Sedimentation	0	2	7	3	0
e. Other (describe)	0	0	0	0	0

Any further Comments? None

4. Are there any water resource related stewardship programs (e.g., Adopt-a-Stream, Friends of ..., etc.) operating within your jurisdiction? **Yes (0) No (12)**

If yes, please list the programs and the primary activities that they are involved with._____

5. Inquiries and complaints regarding stormwater issues handled by: (check all that apply)

Municipal staff __2__ Municipal officials __6__ Consultants __0__

Others (please specify) *Township highway commission*

Please describe the inquiry/complaint follow-up system. Also, please list agencies, if any, to whom complaints or inquiries are referred. *Have received no complaints (Reed); Plugged culverts most common problem*

PLANNING, MAINTENANCE, AND FUNDING

6. Have any drainage, flood control or other water resource related plans (e.g., lake restoration, stream management, etc.) been prepared for your community? **Yes (0) No (12)**

If yes, please briefly describe the purpose and date of the plans and include copy(s) (plans can be returned if necessary).

7. Has an inventory of stormwater management facilities (i.e., detention basin and storm sewer locations and specifications) been prepared? **Yes (1) No (11)** Is the inventory updated on a regular basis? **Yes (0) No (1)**

If yes, please describe the format of the inventory and the frequency of updates. *Wesley Twsp. has paper file*

8. Does your community assume responsibility for maintenance of stormwater drainage and detention facilities?

Yes (5) No (7)

If no, please describe who has responsibility (i.e., homeowners association, individual lot owners, etc.) and what mechanisms (if any) are used to ensure maintenance is being performed. *Yes, ditch drainage only (5); no, but provide assistance occasionally to clear out major blockages (Homer), also 25% of residents do not have sense to be responsible and they throw grass, leaves, etc. into drainageways*

9. If you answered yes to question 8, is inspection and maintenance of stormwater facilities (i.e., detention basins, storm sewers, swales, etc.) performed through a: (check one)

a) scheduled preventative maintenance program __1__

b) in response to complaints __2__

If you checked "a)" Please describe the maintenance program and schedule. *Homer Twsp. constructs trash racks over detention outlets and cleans curbs and gutter once a year*

10. Is stream channel and drainageway inspection and maintenance performed in your community on a regular basis?
Yes (5) No (7)

If yes, please explain the nature of these activities and who performs them (staff, individual property owners, drainage districts, volunteer groups, etc.). *By road district in right of way (2); Homer Twsp. makes routine inspections of creeks and streams that cross roads and removes debris as necessary*

11. Please describe the source of funding for the following elements of your stormwater management program. (i.e., general revenue, permit fees, homeowners associations, etc.)

a. Capital Improvements (sewer rehabilitation, local flood projects, etc.)

General revenues (4); Block grants (2); Unknown (1); None (5)

b. Maintenance and Operations (detention and storm sewer maintenance, street sweeping, etc.)

General revenues (6); Unknown (1); None (2)

c. Regulatory (plan review, construction site inspection, etc.)

General revenue (1); Unknown (1); None (1)

COORDINATION

12. Has your community made any efforts to coordinate stormwater management regulations and design criteria with adjacent communities? **Yes (1) No (11)**

If yes, please describe the coordination efforts. *Wheatland Twsp. meets with county and city when subdivisions are proposed*

13. Are plans for new development reviewed for potential stormwater impacts to property owners outside your corporate boundaries in addition to being reviewed for conformance with ordinance standards?
Yes (1) No (11)

If yes, please describe the procedure used to assess impacts outside your boundaries.

14. Have other stormwater management efforts (e.g., maintenance, remedial activities, etc.) been coordinated with neighboring jurisdictions? **Yes (0) No (11)**

If yes, please describe the coordination efforts and any agreements that may be in place. _____

15. Have Drainage Districts made an adequate effort to coordinate drainage activities (i.e., maintenance activities, channelization projects, etc.) within your jurisdiction? **Yes (3) No (7) NA (1) Unknown (1)**

If yes, please describe the coordination efforts.

Drainage district contacts township when repairs are needed; New plans are provided for road district (Wheatland)

16. Do you believe there is a need for more regional coordination (e.g., watershed, county, or multi-county level) of stormwater management programs, standards, and issues? **Yes (8) No (1) No answer (3)**

If yes, what are the most important issues to be coordinated, at what level should they be coordinated, and who should be responsible for the coordination?

Flooding is most important issue and should be multi-county level coordination by counties; Coordinated at county level by watershed

Questions 17 through 52 were regulatory standards and enforcement questions not relevant to townships.

53. Please use the remaining space to provide other comments and/or suggestions related to stormwater management needs in Will County or to unique aspects of your program not adequately reflected by the questionnaire.

Starting to see more interest by the county in controlling development in floodplains and wetlands. Would like to see no building permits issued in the floodplain because township has to deal with them later.

Joliet Twsp.: If we are going to reduce flooding in Will County, need to clean and channelize all of the streams, creeks, and rivers in the area. Also need to look at the amount of farmland being used up.

Will Twsp.: There are four active drainage districts with assessments in Will Twsp. and they do there job really well.

Troy Twsp.: There are a lot of beaver dam blockages on Rock Run Creek. DuPage River silted in some locations and it is imperative that it be cleaned out. Drainageways are cleaned out in subdivisions. Work with property owners where there are no easements

Homer Twsp.: Major cause of flooding is due to not keeping streams clean. Some of this is caused by dumping of grass and leaves–people don't understand. Township often called to remove fallen trees or limbs from stream and township

tells them of their (the homeowners) responsibility to keep it clear. Concerned that if local government takes over responsibility for detention maintenance, residents will dump more to get rid of debris they don't want. Flooding of farm land is caused by scattered development that discharges to agricultural farm tiles unable to handle surface runoff. Erosion is becoming more of a problem. Many people would like to clean streams but they are told to leave them alone (not sure by whom).

APPENDIX B

STATUS OF WILL COUNTY FLOOD INSURANCE STUDIES

Status of Will County Flood Insurance Studies

Community	Watercourse	Methods of Hydrologic Analysis[1], Year[2]	Floodway Map[3]	Elevations[4]
Beecher	Trim Creek	Approximate, 1980	Yes	Yes
	Trim Creek Tributary	Approximate, 1980	Yes	Yes
Bolingbrook	Lily Cache Creek	Approximate, 1984[5]	Yes	Yes
	Naperville Rd Trib.	Approximate, 1984[5]	Yes	Yes
	Lily Cache Lane Trib.	Approximate, 1984[5]	Yes	Yes
	East Branch DuPage River	Approximate, 1984	Yes	Yes
Braidwood	Included in Unincorporated Will County Study			
Channahon	Included in Unincorporated Will County Study			
Crest Hill	Included in Unincorporated Will County Study			
Crete	Deer Creek	Approximate, 1980	No	No
	Goose Creek	Approximate, 1980	Yes	Yes
Diamond	Included in Unincorporated Will County Study			
Elwood	Jackson Creek	Approximate, 1982	Yes	Yes
Frankfort	Hickory Creek	Detailed, 1993	Yes	Yes
	Hickory Creek Trib. 1	Approximate, 1979	Yes	Yes
	Trib. A of Trib. 1	Approximate, 1979	No	No
	Hickory Creek Trib. 2	Approximate, 1979	No	No
	Hickory Creek Trib. 3	Approximate, 1979	No	No
	Hickory Creek Trib. A D.S of Sauk Trail	Detailed, 1993	Yes	Yes
	Hickory Creek Trib. A U.S. of Sauk Trail	Approximate, 1993	No	No
Godley	Included in Unincorporated Will County Study			
Joliet	Des Plaines River	Detailed, 1980	Yes	Yes
	Hickory Creek	Detailed, 1980	Yes	Yes
	Spring Creek	Detailed, 1980	Yes	Yes
	I & M Canal	Detailed, 1980	Yes	Yes

Community	Watercourse	Methods of Hydrologic Analysis[1], Year[2]	Floodway Map[3]	Elevations[4]
Joliet (cont.)	Rock Run North	Detailed, 1986	Yes	Yes
	Rock Run South	Detailed, 1986	Yes	Yes
	Rock Run Slough	Detailed, 1986	Yes	Yes
	Rock Run Trib. 1	Approximate, 1986	No	No
	Rock Run Trib. 2	Detailed, 1986	Yes	Yes
	Rock Run Trib. 3	Detailed, 1986	Yes	Yes
	Sunnyland Drain	Detailed, 1991	Yes	Yes
	Sunnyland Drain Trib.	Detailed, 1991	Yes	Yes
	Thorne Creek	Detailed, 1980	Yes	Yes
Lockport	I & M Canal	Approximate, 1982	No	No
	Milne Creek D.S. of Division Street	Approximate, 1982	Yes	Yes
	Milne Creek U.S. of Division Street	Approximate, 1982	No	No
	Fiddyment Creek D.S. of Elm St. extended	Approximate, 1982	Yes	Yes
	Fiddyment Creek U.S. of Elm St. extended	Approximate, 1982	No	No
	Fraction Run	Approximate, 1982	No	No
	Big Run	Approximate, 1982	No	No
	Division St. Trib. of Milne Creek	Approximate, 1982	No	No
	Unnamed Trib. to I&M Canal near Maryknoll Dr.	Approximate, 1982	No	No
	Unnamed Trib. to I&M Canal near Key West Dr.	Approximate, 1982	No	No
Manhattan	Manhattan Creek	Approximate, 1982	Yes	Yes
	Wilson Creek	Approximate, 1982	No	No
Minooka	DuPage River	Approximate, 1988	Yes	Yes
Mokena	Hickory Creek	Approximate, 1979	Yes	Yes

Community	Watercourse	Methods of Hydrologic Analysis[1], Year[2]	Floodway Map[3]	Elevations[4]
Mokena (cont.)	East Branch Marley Creek	Detailed, 1993	Yes	Yes
	East Branch Marley Creek Trib. C	Approximate, 1979	No	No
Monee	Included in Unincorporated Will County Study			
New Lenox	Hickory Creek	Approximate, 1979	Yes	Yes
	Hickory Creek Trib. A	Approximate, 1979	No	No
	Trib A. of Hickory Creek Trib. A	Approximate, 1979	No	No
	Hickory Creek Trib. B	Approximate, 1979	No	No
	Jackson Branch	Detailed, 1993	Yes	Yes
Peotone	Included in Unincorporated Will County Study			
Plainfield	DuPage River	Approximate, 1982	Yes	Yes
	Lily Cache Creek	Detailed, 1992	Yes	Yes
	Springhole Creek	Approximate, 1982	Yes	Yes
	West Norman Drain	Detailed, 1992	Yes	Yes
	East Norman Drain	Approximate, 1982	Yes	Yes
Rockdale	I & M Canal	Approximate, 1983	No	No
	Thorne Creek	Approximate, 1983	Yes	Yes
Romeoville	Des Plaines River	Detailed, 1991	Yes	Yes
	I & M Canal	Approximate, 1982	No	No
	Chicago Sanitary and Ship Canal	Approximate, 1982	No	No
Shorewood	DuPage River	Approximate, 1987	Yes	Yes
Steger	Hammel Creek	Approximate, 1987	Yes	Yes
	Isolated depressions	Approximate, 1983	No	No
Symerton	Included in Unincorporated Will County Study			
University Park	Thorn Creek	Detailed, 1980	Yes	Yes
	Deer Creek	Detailed, 1980	Yes	Yes

Community	Watercourse	Methods of Hydrologic Analysis[1], Year[2]	Floodway Map[3]	Elevations[4]
University Park (cont.)	Butterfield Creek East Branch	Detailed, 1980	Yes	Yes
Willmington	Kankakee River	Detailed, 1991	Yes	Yes
	Kankakee River East Channel	Detailed, 1991	Yes	Yes
	Forked Creek	Approximate, 1991	Yes	Yes
	Kahler Road Drainage Ditch	Approximate, 1991	Yes	Yes
Unincorporated Will County	Des Plaines River	Detailed, 1981	Yes	Yes
	Long Run	Approximate, 1981	Yes	Yes
	Fiddyment Creek	Approximate, 1981	Yes	Yes
	Fraction Run	Approximate, 1981	No	No
	Manhattan Creek	Approximate, 1981	Yes	Yes
	Manhattan Road Ditch	Approximate, 1981	Yes	Yes
	Jackson Creek	Approximate, 1981	Yes	Yes
	Jackson Branch	Detailed, 1993	Yes	Yes
	Hickory Creek	Detailed, 1993	Yes	Yes
	Spring Creek	Approximate, 1981	Yes	Yes
	Spring Creek Trib.	Approximate, 1981	Yes	Yes
	Hickory Creek Trib. 1	Approximate, 1981	No	No
	Hickory Creek Trib. A D.S. of Sauk Trail	Detailed, 1993	Yes	Yes
	Hickory Creek Trib. A U.S. of Sauk Trail	Approximate, 1993	No	No
	Marley Creek	Detailed, 1993	Yes	Yes
	East Marley Creek	Detailed, 1993	Yes	Yes
	Union Drainage Ditch	Approximate, 1981	No	No
	Kankakee River	Detailed, 1993	Yes	Yes
	Grant Creek	Approximate, 1981	No	No

Community	Watercourse	Methods of Hydrologic Analysis[1], Year[2]	Floodway Map[3]	Elevations[4]
Unincorporated Will County (cont.)	Prairie Creek	Approximate, 1981	No	No
	Forked Creek	Approximate, 1981	Yes	Yes
	Jordan Creek	Approximate, 1981	No	No
	South Br. Forked Cr.	Approximate, 1981	No	No
	Horse Creek	Approximate, 1981	No	No
	Terry Creek	Approximate, 1981	No	No
	Rock Creek	Approximate, 1981	No	No
	Black Walnut Creek	Approximate, 1981	No	No
	Marshall Slough	Approximate, 1981	No	No
	Exline Creek	Approximate, 1981	No	No
	Trim Creek	Approximate, 1981	No	No
	Pike Creek	Approximate, 1981	No	No
	DuPage River	Approximate, 1981	Yes	Yes
	West Branch DuPage River	Approximate, 1981	Yes	Yes
	East Branch DuPage River	Approximate, 1981	Yes	Yes
	Lily Cache Creek	Detailed, 1992	Yes	Yes
	Lily Cache Creek Trib.	Approximate, 1981	Yes	Yes
	Rock Run	Detailed, 1993	Yes	Yes
	Rock Run South	Detailed, 1993	Yes	Yes
	Rock Run Trib. 1	Detailed, 1993	Yes	Yes
	Rock Run Trib. 2	Detailed, 1993	Yes	Yes
	Rock Run Trib. 3	Detailed, 1993	Yes	Yes
	Rock Run Slough	Detailed, 1993	Yes	Yes
	Sunnyland Drain	Detailed, 1991	Yes	Yes
	Sunnyland Drain Trib.	Detailed, 1991	Yes	Yes
	Sugar Run	Approximate, 1981	Yes	Yes

Community	Watercourse	Methods of Hydrologic Analysis[1], Year[2]	Floodway Map[3]	Elevations[4]
Unincorporated Will County	West Norman Drain	Detailed, 1992	Yes	Yes
	Naperville Road Trib.	Approximate, 1981	Yes	Yes
	Wolf Creek	Detailed, 1992	Yes	Yes
	Plum Creek	Approximate, 1981	Yes	Yes
	Thorn Creek	Approximate, 1981	Yes	Yes
	Deer Creek	Detailed, 1981	Yes	Yes
	Hammel Creek	Approximate, 1981	Yes	Yes
	All Rivers and Streams not listed above	Approximate, 1981	No	No

[1] Detailed" indicates hydrograph producing methods, "Approximate" indicates regional equations or no computation of flows. Note that this usage differs from FIS which uses these terms in reference to the hydraulic methods used.

[2] "Year" indicates year that Flood Insurance Study was Published. Study completion date is typically several years prior to publication date.

[3] "Yes" indicates that a Floodway Map exists. "No" indicates that only a Flood Insurance Rate Map exists.

[4] "Yes" indicates that elevations are available for the floodplains within that community area. "No" indicates no elevations available and floodplain boundary taken from Hydrologic Atlases published by the US Geological Survey. Floodplains with no computed elevations are referred to as "approximate" in the FIS.

[5] Currently being restudied

APPENDIX C

GLOSSARY OF TERMS

GLOSSARY OF TERMS

The following glossary of terms is intended for use with the Will County Comprehensive Stormwater Management Plan. To improve understanding by the reader the descriptions included here may, in some cases, deviate from the definitions used in federal, state, and local regulations.

BASE FLOOD ELEVATION: The water surface elevation resulting from the 100-year frequency flood event.

BEST MANAGEMENT PRACTICE (BMP): A measure used to control the adverse stormwater-related effects of development. BMPs include structural devices (e.g., swales, infiltration basins, and detention basins) designed to remove pollutants, reduce runoff rates and volumes, and protect aquatic habitat. BMPs also include non-structural urban site design measures such as minimizing impervious surfaces, utilizing native landscaping, and establishing buffers along streams, lakes, and wetlands. Finally, BMPs include institutional measures such as public education efforts to stop dumping of household chemicals into storm drains.

BUFFER: A strip of land along a stream, lake, or wetland planted with native vegetation. The width of the buffer is measured from the ordinary high water mark of a perennial or intermittent stream, the ordinary high water mark of a lake or pond, or the edge of a wetland. Development within buffers is typically limited to improvements such as piers or docks necessary to allow access to the water.

CHANNEL: Any river, stream, creek, brook, branch, natural or artificial depression, ponded area, flowage, slough, ditch, conduit, culvert, gully, ravine, wash, or natural or manmade drainage way, which has a definite bed and bank or shoreline, in or into which surface or groundwater flows, either perennially or intermittently.

CHANNEL MODIFICATION: Alteration of a channel by changing the physical dimensions or materials of its bed or banks. Channel modification includes damming, riprapping (or other armoring), widening, deepening, filling, straightening, relocating, lining, and significant removal of vegetation. Channel modification does not include the clearing of debris or removal of trash.

COMPENSATORY STORAGE: An artificially excavated, hydraulically equivalent volume of storage within the floodplain used to balance the loss of flood storage capacity when fill or structures are placed within the floodplain.

DEPRESSIONAL STORAGE: The volume of storage available below the base flood elevation contained in low lying areas that have no drainage outlet.

DESIGN STORM: A precipitation event that, statistically, has a specified duration and probability of occurring in any given year (expressed as average frequency of occurrence in years or as probability in percent).

DETENTION BASIN: A facility designed to temporarily store runoff either on, below, or above the ground surface, accompanied by controlled release of the stored water.

DEVELOPMENT: Any man-made change to real estate by private or public entities including clearing, grading, excavation or fill, construction or reconstruction of buildings, installation of utilities, subdivision, or change in land use.

DISCHARGE: The rate at which water moves through a channel or pipe; measured by volume per unit of time (cubic feet per second).

DRY DETENTION BASIN: A detention basin designed to drain completely after temporary storage of stormwater runoff and to be normally dry over the majority of its bottom area.

DRY WELL: An open cell, usually cylindrical, formed below the ground surface, surrounded by and having a bed of granular material for infiltration and disposal of collected runoff into the ground.

EROSION: The general process whereby earth is removed by flowing water, wave action, or wind.

FEMA: The Federal Emergency Management Agency is the federal disaster relief agency. FEMA is also responsible for administration of the National Flood Insurance Program.

FLOOD INSURANCE RATE MAP (FIRM): A Flood Insurance Rate Map, issued by FEMA that is an official community map, on which FEMA has delineated both the special hazard areas and the risk premium zones applicable to the community. This map may or may not depict floodways.

FLOODPLAIN: A relatively level, continuous area adjacent to a lake or stream channel which is submerged during times of flood; and natural depressions including wetlands which are periodically inundated by stormwater.

FLOODWAY: The channel and that portion of the floodplain adjacent to a stream or watercourse which is needed to convey the anticipated existing 100-year frequency flood discharge with no more than a 0.1 foot increase in stage due to any loss of flood conveyance or storage and no more than a ten percent increase in velocities. In some cases, the floodway may include that portion of the floodplain containing 90% of the floodplain storage volume. Floodways can be calculated based on either existing or future land use runoff conditions.

FLOODWAY MAP: Map issued by FEMA that delineates the floodway, 100-year floodplain, and 500-year floodplain. Elevations for the 100-year flood are usually indicated at selected locations.

FLOOD CONTROL: Flood mitigation measures, usually structural, to reduce the extent (elevation and/or area) of flooding. Generally includes reservoirs, levees, and channelization.

FLOOD MITIGATION: An action or set of actions taken to prevent flooding or mitigate the impacts of flooding. Remedial and/or preventative actions come in the form of stormwater regulations for development, floodplain management, stormwater detention/retention, levees, and non-structural activities such as open space preservation.

FLOODPROOFING: Any combination of structural and non-structural additions, changes or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

FLOOD PROTECTION ELEVATION: The elevation above which regulated structures within the floodplain must be elevated. The flood protection elevation is equal to the base flood elevation plus a specified amount of freeboard. The freeboard is typically one or two feet.

FLOODPLAIN MANAGEMENT: A set of actions taken to minimize damage to persons and property within the floodplain. These actions often include floodplain development regulations, floodplain acquisition and preservation and floodproofing.

FREEBOARD: An increment of elevation added to a design elevation or structure to provide a factor of safety for uncertainties in calculations, unknown localized conditions, wave actions, future development, and unpredictable effects such as those caused by ice or debris jams.

HYDROLOGY: The science of the behavior of water, including its dynamics, composition, and distribution in the atmosphere, on the surface of the earth, and underground.

HYDROLOGIC BUDGET: The components of atmospheric water which include precipitation, evaporation, surface runoff, subsurface runoff, and groundwater recharge.

IMPERVIOUS SURFACE: Man-made or natural materials through which water, air or roots cannot penetrate and which prevents the movement of surface water down to the water table.

INFILTRATION: The passage or movement of water into the soil.

LETTER OF MAP AMENDMENT (LOMA): Official determination by FEMA that a specific structure is not in a 100-year flood zone; amends the effective Flood Hazard Boundary Map or FIRM.

LETTER OF MAP REVISION (LOMR): Letter that revises the base flood or 100-year frequency flood elevations, flood insurance rate zones, flood boundaries or floodways as shown on an effective Flood Hazard Boundary Map or FIRM.

MAJOR DRAINAGE SYSTEM: That portion of a drainage system needed to store and convey flows beyond the capacity of the minor drainage system.

MINOR DRAINAGE SYSTEM: 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 usually designed to handle the 10-year runoff event or less.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP): A federal program to provide flood insurance to businesses and residents within communities adhering to minimum state and federal floodplain management standards. The NFIP is administered by the Federal Emergency Management Agency (FEMA)

NONPOINT SOURCE POLLUTION: Pollution which has no single discharge point or origin. Pollutants are usually comprised of sediment, organic compounds, toxic metals and various

pathogens. Sources of nonpoint source pollution typically include urban and agricultural runoff and effluent from septic systems and landfills.

ORDINARY HIGH WATER MARK: The point on the bank or shore up to which the presence and action of surface water is so continuous so as to leave a distinctive mark such as by erosion, destruction or prevention of terrestrial vegetation, predominance of aquatic vegetation or other easily recognized characteristics.

PEAK FLOW: The maximum rate of flow of water at a given point in a channel or conduit.

POINT SOURCE POLLUTION: Pollution which is discharged from a single point or structure. Most often, a point source is a pipe delivering effluent from a wastewater treatment facility or industrial facility.

POSITIVE DRAINAGE: Provision for overland paths for all areas of a property including depressional areas that may also be drained by storm sewer.

RECEIVING WATERS: Streams, lakes, wetlands, etc., into which stormwater is discharged.

REMEDIATE: To remedy or fix a problem. For example, flood control reservoirs can be used to remediate flooding problems.

RETENTION BASIN: A facility designed to completely retain a specified amount of stormwater runoff without release except by means of evaporation, infiltration, emergency bypass or pumping.

RIPARIAN ENVIRONMENT: Land bordering a waterway or wetland that provides habitat or amenities dependent on the proximity to water.

RUNOFF: Water which moves through the landscape, either as surface or subsurface flow, which originates from atmospheric precipitation, initially in the form of rain or snow. Runoff is that portion of the hydrologic budget which produces surface water in streams, lakes, and wetlands.

SEDIMENTATION: The process that deposits soils, debris, and other materials either on other ground surfaces or in bodies of water or stormwater drainage systems.

SETBACK: The horizontal distance between any portion of a structure or any development activity and the ordinary high water mark of a perennial or intermittent stream, the ordinary high water mark of a lake or pond, or the edge of a wetland, measured from the structure's or development's closest point to the ordinary high water mark, or edge. Allowable development features within setbacks typically include minor improvements such as walkways and signs, utilities, park facilities, and lawns.

STORMWATER: Those waters that run off the land surface which originate from atmospheric precipitation, whether initially in the form of rain or snow.

STORMWATER DRAINAGE SYSTEM: All means, natural or manmade, used for conveying stormwater to, through or from a drainage area to the point of final outlet from a property. The

manmade and natural stormwater drainage system includes but is not limited to any of the following: conduits and appurtenant features, canals, channels, ditches, streams, culverts, streets, storm sewers, detention basins, swales and pumping stations.

STORMWATER MANAGEMENT: A set of actions taken to store, convey, or otherwise manage stormwater runoff to minimize the negative impacts of runoff from urban surfaces. Broadly interpreted, stormwater management encompasses both structural and non-structural measures to directly manage runoff as well as measures to protect natural water features such as streams, floodplains, lakes, and wetlands.

STORM SEWERS: Usually enclosed conduits that transport excess stormwater runoff toward points of discharge, sometimes called storm drains**.**

URBAN RUNOFF POLLUTANTS: Contaminants commonly found in urban runoff which have been shown to adversely affect uses in receiving water bodies. Pollutants of concern include sediment, heavy metals, petroleum-based organic compounds, nutrients, oxygen-demanding organics (BOD), pesticides, salt, and pathogens.

WATERSHED: All land area drained by, or contributing water to, the same stream, lake, or stormwater facility**.**

WET DETENTION BASIN: A detention basin designed to maintain a permanent pool of water after the temporary storage of stormwater runoff.

WETLANDS: Areas that are inundated or saturated by surface water 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.

WETLAND MITIGATION: Measures taken to compensate for wetland disturbances such as filling, dredging, draining, impoundment, and vegetation removal. Mitigation measures include enhancement of existing wetlands (including the disturbed wetland) and creation of new wetlands.

2-YEAR EVENT: A runoff, rainfall, or flood event having a fifty percent chance of occurring in any given year. On average, an event of this size or larger will occur once every 2 years. Rainfall depths of various frequencies and durations can be found in Bulletin 70 from the Illinois State Water Survey.

100-YEAR EVENT: A rainfall, runoff, or flood event having a one percent chance of occurring in any given year. On average, an event of this size or larger will occur once every 100 years. Rainfall depths of various frequencies and durations can be found in Bulletin 70 from the Illinois State Water Survey.

APPENDIX D

ACRONYMS

ACRONYMS

ADID - Advanced Identification of Wetlands Study

BMP - Best Management Practice

BSC - Biological Stream Characterization

EPA, Illinois (IEPA) - Illinois Environmental Protection Agency

EPA, United States (USEPA) - United States Environmental Protection Agency

FEMA - Federal Emergency Management Agency

FEQ - Full Equations Model, a computer model for simulating flow in rivers and streams.

FIRM - Flood Insurance Rate Map

FIS - Flood Insurance Study

GIS - Geographic Information System

HEC - Hydrologic Engineering Center - A branch of the Corps of Engineers.

HEC-1 - Computer model for simulating rainfall-runoff events

HEC-2 - Computer model for estimating flood heights in rivers.

HSPF -Hydrologic Simulation Program-Fortran, a computer model for simulation extended periods of rainfall-runoff.

HWL - High Water Level

IDNR, OWR - Illinois Department of Natural Resources, Office of Water Resources

IDOT - Illinois Department of Transportation

WCSMPC - Will County Stormwater Management Planning Commission

NFIP - National Flood Insurance Program

NIPC - Northeastern Illinois Planning Commission

NPDES - National Pollutant Discharge Elimination System

NPS - Non Point Source pollution

NRCS - Natural Resources Conservation Service (formerly known as SCS)

NWL - Normal Water level

PDR - Purchase of Development Rights

SCS - Soil Conservation Service (now known as NRCS)

SWCD - Soil and Water Conservation District

TDR - Transfer of Development Rights

TR20 - Computer model for rainfall-runoff events

USACE - United States Army Corps of Engineers

USCOE - United States Corps of Engineers (same as USACE)

USDA - United States Department of Agriculture

USGS - United States Geological Survey

WSP2 - Water Surface Profiles 2, a computer model for estimating flood heights in rivers.