Agenda Item Executive Summary

Title: Stormwater Master Plan Final Draft

Presenter: Steven M. Saunders, Director of Public Works/Village Engineer

Agenda Date: 12/10/2013

Consent: ☐ YES ☑ NO

☐ Ordinance
☐ Resolution
☐ Bid Authorization/Award
☑ Policy Direction
☐ Informational Only

Item History:

July 9, 2013 Study Session
November 14, 2013 Study Session

Executive Summary:

On July 9 of this year, Baxter & Woodman (B&W) presented a first draft of the Stormwater Master Plan to the Council. Based on the Council's input at that meeting and continuing staff input over the past few months, B&W has revised the draft Stormwater Master Plan.

The plan is being brought back to the Council at this time for final review and comment. B&W and staff will incorporate final Council comments and publicize a revised draft, prior to bringing the plan back to the Council for adoption in early 2014.

Recommendation / Suggested Action:

Review B&W's Pre-Final Draft Stormwater Master Plan and provide direction for finalizing the Master Plan.

Attachments:

1) Agenda Report
2) Draft Stormwater Master Plan*

*Please note that there are 12 appendices to the B&W report. Due to the size of these items, they have not been included as part of the packet. Full copies of the report and all appendices will be available at the December 10 meeting, as well as in the Village Manager's office and at the Library.

Agenda Report

Subject: **Stormwater Master Plan Final Draft**

Prepared By: Steven M. Saunders, Director of Public Works/Village Engineer

Date: December 5, 2013

On July 9 of this year, Baxter & Woodman (B&W) presented a first draft of the Stormwater Master Plan to the Council. Based on the Council's input at that meeting and continuing staff input over the past few months, B&W has revised the draft Stormwater Master Plan. The revisions made to the Master Plan since July 9 are summarized below.

1. Added tables, figures, exhibits, and appendices.
2. Added the Financial Plan (Section 10).
3. Added project descriptions for programmed and non-programmed capital improvement projects (Section 3).
4. Added a paragraph describing the MWRD's impending regulatory program regarding inflow and infiltration to the sanitary sewer system (section 4).
5. Deleted the recommendation to implement a cost-sharing program for disconnection of sump pumps and foundation drains from the sanitary sewer system (Section 4).
6. Added Floodplain Management (Section 5).
7. Added information about the IEPA's requirements for water quality monitoring (Section 6).
8. Added potential action steps for protecting and enhancing water quality (Section 6).
9. Updated the status of the IEPA's establishment of Total Maximum Daily Load limits for Lake Michigan (Recommendation 6, Section 6).
10. Added a recommended Long-Term Water Quality Monitoring Plan (Table 2).
11. Deleted the recommendation to consider implementing a stormwater fee credit program and a stormwater incentive program (Section 7).
12. Revised and expanded the narrative on Development Policies and Regulations (Section 8) based on direction received at the November 14, 2013 Study Session.

The plan is being brought back to the Council at this time for final review and comment. B&W and staff will incorporate final Council comments and publicize a revised draft, prior to bringing the plan back to the Council for adoption in early 2014.

Recommendation:

Review **B&W's Pre-Final Draft Stormwater Master Plan** and provide direction for finalizing the Master Plan.

Attachments:

1. Draft Stormwater Master Plan

VILLAGE OF WINNETKA

STORMWATER MASTER PLAN

Prepared by

BAXTER & WOODMAN
Consulting Engineers

VILLAGE OF WINNETKA, ILLINOIS
STORMWATER MASTER PLAN

ACKNOWLEDGMENTS

Special acknowledgements go to all those who contributed much time and effort towards the development of the Stormwater Master Plan.

Village Council 2012-2013

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Consultants

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Christopher B. Burke Engineering, Ltd.

MGP, Inc.

Municipal & Financial Services Group

Strand Associates, Inc.

Thanks to the many property owners and other interested parties who offered input at public meetings as this Stormwater Master Plan was being developed.

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2. Flood Risk Reduction Assessment: Additional Study Areas, prepared by Baxter & Woodman Consulting Engineers, Inc., December 2012
3. Sanitary Sewer Evaluation Survey-Flow Monitoring Study: Report, prepared by Strand Associates, Inc., August 2012
4. Repetitive Loss Outreach Project
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9. Stormwater Best Management Practices
10. Village of Winnetka Budget 4/1/2013-3/31/2014
11. Stormwater Utility Feasibility Study: Final Report, prepared by Municipal & Financial Services Group, May 2013
12. Village Council Presentations

SECTION 1

INTRODUCTION

"...a village in a natural setting committed to its tradition
of residential neighborhoods, citizen involvement, local shops and educational excellence..."

A 2020 Vision for Winnetka

1. INTRODUCTION

Figure 1. Village Hall

The Village has an ambitious goal to develop a comprehensive, multi-faceted plan to manage stormwater runoff quantity and quality, and sanitary sewer discharges, in a manner that protects and enhances property values and promotes a thriving and sustainable community. This Master Plan is central to achieving that goal.

The Stormwater Master Plan establishes a vision for the Village's stormwater program with actionable goals and objectives that serve as a roadmap to realizing that vision. It incorporates multiple goals and objectives into a single comprehensive plan for stormwater management, which will guide investment and policy decisions in order to improve the quality of life in Winnetka.

This document is the result of planning efforts and research undertaken by the Village Council, Village staff and residents, along with a team of consultants. These efforts began in earnest after a devastating flood in September 2008 and continued steadily through the fall of 2013. The building blocks include several Flood Risk Reduction Assessments, a Sanitary Sewer Flow Monitoring Study with subsequent Sanitary Sewer Evaluation Surveys, and a Stormwater Utility Feasibility Study. Property owners and other interested parties offered input at numerous public meetings providing direction at each step.

The Stormwater Master Plan is intended to serve as a guide to Village policy and decision making over the next five to ten years. The Plan should be updated periodically as objectives are accomplished and goals are met.

Figure 2. Winnetka Public Works

SECTION 2

OUR VISION

"An effective plan helps Village leaders make informed decisions by providing an inventory of values shared by residents as well as an inventory of the community's physical attributes."

A 2020 Vision for Winnetka

2. OUR VISION

Figure 3. Downtown Winnetka

Winnetka is a unique, established Village located on the shore of Lake Michigan, just 16 miles north of the City of Chicago, so it is a very desirable place to live. Residents enjoy a wealth of recreational and environmental benefits by living so close to Lake Michigan and Skokie River. But, the Village was mostly developed before the advent of floodplain maps and modern stormwater management techniques and several recent extreme storm events have resulted in extensive flood damages. Furthermore, increased environmental awareness has led to studies showing that stormwater runoff from urbanized areas can impair rivers and lakes for designated uses such as public water supply, swimming, and fishing.

The Village intends to improve its stormwater management system and the quality of its stormwater runoff. To make sure that it remains a very desirable place to live for generations to come, the Village of Winnetka will…

- Reduce the risk of flooding throughout the Village with improvements to stormwater infrastructure.
- Reduce basement back-ups and sanitary sewer overflows by reducing the amount of inflow and infiltration into the sanitary sewer system.
- Maintain participation and good standing in the National Flood Insurance Program and improve floodplain management practices to minimize flood damages and reduce flood insurance premiums for property owners.
- Protect and enhance the quality of water in Lake Michigan and the Skokie River.
- Encourage the use of stormwater best management practices throughout the Village to reduce runoff volumes and improve the quality of stormwater runoff.
- Establish development regulations for the Village which are state of the art with regard to stormwater management.
- Effectively maintain the storm and sanitary sewer systems to promote optimum performance.
- Fund stormwater management initiatives through a sustainable and equitable source of revenue.

Figure 4. Playing Fields at Country Day School

SECTION 3

STORMWATER CAPITAL IMPROVEMENTS

"...maintain and upgrade the Village's infrastructure
in keeping with Village character and high community standards."

A 2020 Vision for Winnetka

3. STORMWATER CAPITAL IMPROVEMENTS

GOAL

Reduce the risk of flooding throughout the Village with improvements to stormwater infrastructure.

OBJECTIVE

Design and construct stormwater infrastructure improvements recommended by the Village's Flood Risk Reduction Assessments. Plan the improvements to be implemented first in areas with the most severe and repetitive flooding. Infrastructure improvements that address structural flooding will be prioritized ahead of improvements that address standing water and overland flow in streets and yards.

FLOOD RISK REDUCTION ASSESSMENTS

In response to the flood damage resulting from severe storm events in September 2008 and July 2011, the Village initiated Flood Risk Reduction Assessments (prepared by Christopher B. Burke Engineering, Ltd., dated September 2009, June 2011, and October 2011) to determine what improvements could be made to mitigate flood damage from future storm events in the areas that have proven to be the most susceptible to flooding. Then, as a first step in the development of this Stormwater Master Plan, the Village conducted a Flood Risk Reduction Assessment of the areas within the Village that had not yet been assessed, known as the "Additional Study Areas" (prepared by Baxter & Woodman, dated December 2012). Exhibit 1 shows the boundaries of each study area in the Flood Risk Reduction Assessments.

PROGRAMMED IMPROVEMENTS

Final engineering began in 2012 for several of the improvements recommended in the Flood Risk Reduction Assessment: 25-, 50-, and 100-year Protection (prepared by Christopher B. Burke Engineering, Ltd., October 2011). These projects include: the Winnetka Avenue Pump Station Improvements, Lloyd Park Outlet, Tower Road/Foxdale Area Improvements, and Northwest Winnetka Improvements. Final engineering for the Willow Road Tunnel is scheduled to begin in early 2014. These five projects are the highest priority projects because they would alleviate flooding in areas of the Village susceptible to widespread structural flooding caused by overland flow. Table 1 shows the estimated cost of the Programmed Improvements. The projects are briefly described below.

Winnetka Avenue Pump Station Improvements

The Winnetka Avenue Pump Station is an existing, key piece of infrastructure constructed in 1995. The station provides stormwater drainage for a large area on Winnetka's west side. The pump station is located at a point where a ditch on the Cook County Forest Preserve District's property enters the Skokie River. This ditch is the main point of discharge for western Winnetka's storm sewers, and in times of heavy rain, the level of the River rises above the ditch and water must be evacuated through pumping.

The planned improvements include the replacement of four existing pumps at the station to increase capacity from 40,000 gallons/minute to 60,000 gallons/minute. These improvements are expected to improve flow in upstream storm sewers in south and west Winnetka and increase the discharge capacity of the Forest Preserve ditch.

Figure 5. Winnetka Avenue Pump Station

Spruce Street Outlet Area Improvements

This is a large drainage area east of the railroad grade separation bounded on the north side by Tower Road, and on the south by approximately Spruce Street. This drainage area experiences significant flooding along Sheridan Road from Maple Street south, along Spruce Street east to the lake, and along Tower Road east of Old Green Bay Road. Engineering work for northeast Winnetka projects is complete.

The planned improvements include a new outlet from Sheridan Road at Lloyd Park, and a relief sewer along Old Green Bay Road and Tower Road. These improvements are expected to alleviate structural and surface flooding along Sheridan Road south of Maple Street and along Tower Road east of Old Green Bay Road for up to 100-year events.

Northwest Winnetka Improvements

The improvements in northwest Winnetka focus on a large watershed area, where significant elevation changes cause flooding during moderate and heavy rains.

The planned improvements include an additional trunk sewer along Tower Road; multiple lateral sewers to drain Forest Glen, Vernon, Edgewood, Greenwood, and Grove areas; and a larger outlet pipe to the pond on the south side of Tower Road.

These improvements are expected to alleviate structure and surface flooding along Forest Glen, Tower, Greenwood, Edgewood, and Grove streets for up to 100-year events.

Willow Road Tunnel

The recommended alternative consists of a large storm sewer under Willow Road (the "Tunnel Project") extending from Glendale Avenue to Lake Michigan, with multiple storm sewers extending into each of the benefitted study areas (South of Willow Road Study Area, Cherry Street Outlet Study Area, and the Underpass Study Area).

Project	Estimate of Project Cost	
Winnetka Avenue Pump Station Improvements	$ 750,000	
Spruce Street Outlet Area Improvements		
Lloyd Park Outlet	$ 398,786	
Tower Road/Foxdale Area	$ 1,162,853	
Northwest Winnetka Improvements		
Tower Road/Greenwood Area	$ 3,581,924	
Forest Glen Extension	$ 685,000	
Willow Road Tunnel		
North Willow, South Willow, & Provident	$ 27,969,048	
Cherry Street Outlet Area	$ 2,000,000	
Winnetka Underpass Area	$ 4,400,000	
Area F (west of Hibbard Road)	$ 100,000	*
Total =	$ 41,047,611	

* Cost estimate not yet finalized, but expected to be less than $100,000

Table 1. Stormwater Capital Improvements Plan

NON-PROGRAMMED IMPROVEMENTS

Flooding in the Additional Study Areas primarily consists of standing water and overland flow in streets and yards. This nuisance flooding most commonly results in sewer back-ups, basement seepage, and sump pump failures. A few cases of overland flow into structures have also been reported, but the projects recommended in the Flood Risk Reduction Assessment for the Additional Study Areas are still being considered for future funding. Design and construction of these improvements may be programmed at a later date.

Study Area A

The recommended improvements for this area consist of constructing new storm sewers along Asbury Avenue and Pine Tree Lane ranging from 24 to 36 inches in place of the existing 12- to 18-inch sewers, along with inlet capacity improvements.

Study Area C

The recommended improvements for this area consist of replacing existing 12- to 36-inch storm sewers along Merrill Street, Green Bay Road, and Gage Street with 18- to 48-inch sewers, along with inlet capacity improvements.

Study Area E

The recommended improvements for this area consist of constructing new storm sewers along Hickory Lane, Sumac Lane, and Boal Parkway ranging from 18 to 30 inches in place of the existing 8- to 24-inch sewers, along with inlet capacity improvements.

Study Area G

The recommended improvements for this area consist of constructing new storm sewers along Hibbard Road, Kent Road, Auburn Road, and Gordon Terrace ranging from 24 to 48 inches in place of the existing 8- to 30-inch sewers, along with inlet capacity improvements.

Study Area N

The recommended improvements consist of improvements to overland flow paths.

Study Area O

The recommended improvements for this area consist of consist of replacing existing 22- and 24-inch storm sewers along Chestnut Street, Linden Street, Ridge Avenue, and Pine Street with 42- and 48-inch sewers, along with inlet capacity improvements.

RECOMMENDATIONS

1. Complete design and construction of the Winnetka Avenue Pump Station Improvements, Lloyd Park Outlet, Tower Road/Foxdale Area Improvements, Northwest Winnetka Improvements, and the Willow Road Tunnel.

2. Since an adverse tailwater condition limits the effectiveness of the modeled storm sewer improvements in Area N, a detailed topographic survey of Area N should be performed to determine how residences can be protected against overland flooding by making improvements to the overland flow paths.

3. Evaluate the feasibility of constructing the improvements that are currently not programmed once the planned capital projects have been constructed.

SECTION 4

INFILTRATION & INFLOW

"The capacity of municipal utilities is a critical element in land use planning for the community."

A 2020 Vision for Winnetka

4. INFLOW & INFILTRATION

GOAL

Reduce basement back-ups and sanitary sewer overflows by reducing the amount of inflow and infiltration (I/I) into the sanitary sewer system.

OBJECTIVE

Investigate and eliminate sources of I/I on public and private property.

BACKGROUND

I/I is an important problem in the community. Excessive I/I causes basement backups and sanitary sewer overflows to occur. Both incidents are health hazards that must be taken seriously.

Public sanitary sewers and private sanitary services both contribute to the problem. On the public side, leaky sewers and manholes take in groundwater infiltration. In some cases, illicit connections between the public storm sewer system and sanitary sewer systems cause clear-water inflow.

On the private side, downspout connections and leaky service pipes play a role, but the largest sources of I/I are typically sump pump and foundation drain connections to the sanitary service.

In early 2014, the Metropolitan Water Reclamation District of Greater Chicago (MWRD) is expected to impose new requirements related to I/I. These requirements will apply to the Village since the Village's sanitary sewers connect to sewers owned by the MWRD. In order to meet these requirements, the Village will likely have to assess and rehabilitate 50% of its sanitary sewer system within 5 years, develop a long-term operation and maintenance program for its sanitary sewers, and investigate sources of I/I from private property as part of its long-term operation and maintenance program.

Figure 6. Sanitary Sewer Manhole

ELIMINATING SOURCES OF I/I ON PUBLIC PROPERTY

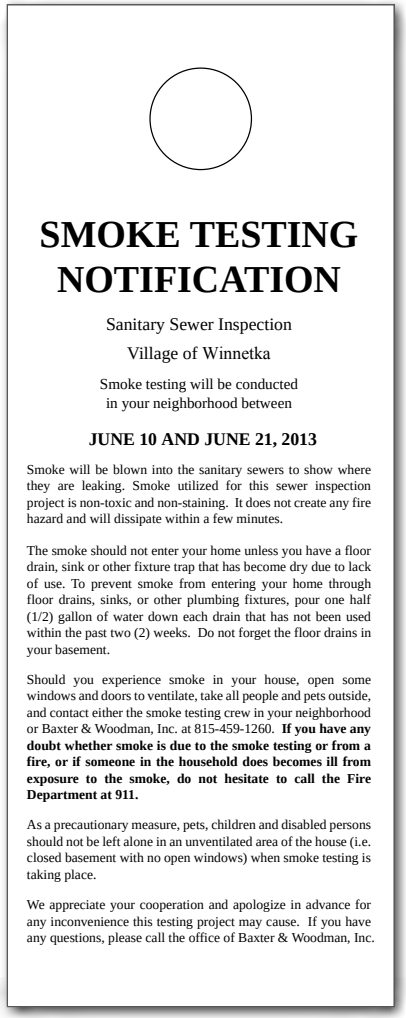
The Village completed a study (prepared by Strand Associates, Inc., dated August 2012) in which sanitary sewer flows were monitored over a period of time to identify areas of the sanitary sewer system most affected by I/I. The flow monitoring results were used to prioritize areas of the Village for a thorough investigation of the sources of I/I. Common sources include: defects in manholes and pipe joints that allow groundwater infiltration; and direct connection of sump pumps, foundation drains, and downspouts to the sanitary sewer system. These sources can be detected using methods ranging from manhole inspections to smoke testing, televising, and dye testing the sewer system.

The first phase of the Sanitary Sewer Field Investigation and Pilot Rehabilitation Project began in May 2013. This phase includes investigation of nine priority areas, development of a rehabilitation program for identified sources of I/I, and construction of improvements to eliminate I/I. Exhibit 3 shows the nine priority areas investigated in this project. The results of the Pilot Rehabilitation Project will be used to estimate the cost of improvements in the second and third phases of the Sanitary Sewer Evaluation Survey, which are expected to be completed in 2014 and 2015, respectively.

ELIMINATING SOURCES OF I/I ON PRIVATE PROPERTY

The largest sources of I/I from private property are sump pump and foundation drain connections to the sanitary sewer system. These sources are not typically found while investigating sources of I/I on public property using the aforementioned methods. Finding sump pump and foundation drain connections usually requires building-to-building canvassing.

Canvassing consists of entering private property to identify the discharge points for all building downspouts outside the home and the discharge location of any sump pumps inside the house. This is a labor intensive process and usually includes scheduling appointments on evenings and weekends if contact with 100% of the businesses and residents in the project area is required. A strong policy is required to eliminate illegally connected sump pumps since this type of program is often viewed as intrusive.



SMOKE TESTING NOTIFICATION

Sanitary Sewer Inspection

Village of Winnetka

Smoke testing will be conducted in your neighborhood between

JUNE 10 AND JUNE 21, 2013

Smoke will be blown into the sanitary sewers to show where they are leaking. Smoke utilized for this sewer inspection project is non-toxic and non-staining. It does not create any fire hazard and will dissipate within a few minutes.

The smoke should not enter your home unless you have a floor drain, sink or other fixture trap that has become dry due to lack of use. To prevent smoke from entering your home through floor drains, sinks, or other plumbing fixtures, pour one half (1/2) gallon of water down each drain that has not been used within the past two (2) weeks. Do not forget the floor drains in your basement.

Should you experience smoke in your house, open some windows and doors to ventilate, take all people and pets outside, and contact either the smoke testing crew in your neighborhood or Baxter & Woodman, Inc. at 815-459-1260. **If you have any doubt whether smoke is due to the smoke testing or from a fire, or if someone in the household does becomes ill from exposure to the smoke, do not hesitate to call the Fire Department at 911.**

As a precautionary measure, pets, children and disabled persons should not be left alone in an unventilated area of the house (i.e. closed basement with no open windows) when smoke testing is taking place.

We appreciate your cooperation and apologize in advance for any inconvenience this testing project may cause. If you have any questions, please call the office of Baxter & Woodman, Inc.

Figure 7. Smoke Testing Door Hanger

The investment of resources in canvassing and removal of sump pump and foundation drain connections does have its rewards, though. These illegal connections to the sanitary sewer can increase the domestic flow rate by 30 times during storm events. That means that a typical 8-inch sanitary sewer, which can serve over 300 residences without overflows or basement back-ups if only sewage is connected to the pipe, can serve only 10 residences without overflows or basement back-ups if sewage is combined with 10 sump pumps or foundation drains.

Even though these disconnections would be made on private property, a strong case can be made for investing public funds to remove sump pump and foundation drain connections to the sanitary sewer system. This is because the Village can dramatically increase its available sewer capacity with a relatively small investment. Consider that the removal of 30 private sump pumps (approximately $150,000) could have the same system-wide benefit as rehabilitating 40,000 feet of sanitary sewer (approximately $2,000,000).

RECOMMENDATIONS

1. Continue with the three phases of the Sanitary Sewer Evaluation Survey in order to find and eliminate sources of I/I on public property.

2. Commit to eliminating illegal connections to the sanitary sewer system. Include building-to-building canvassing of all businesses and residences adjacent to future storm sewer capital improvement projects. Any sump pumps or foundation drains that are connected to the sanitary sewer system can be disconnected and connected to the new storm sewer.

3. Smoke test sanitary sewers along all streets that have future storm sewer, water main, or roadway capital improvement projects planned.

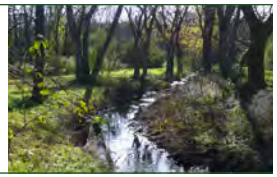
SECTION 5

FLOODPLAIN MANAGEMENT

"Geography and landscape affect the appropriateness
or intensity of specific land uses."

A 2020 Vision for Winnetka

5. FLOODPLAIN MANAGEMENT



GOALS

Maintain participation and good standing in the National Flood Insurance Program (NFIP) and improve floodplain management practices to minimize flood damages and reduce flood insurance premiums for property owners.

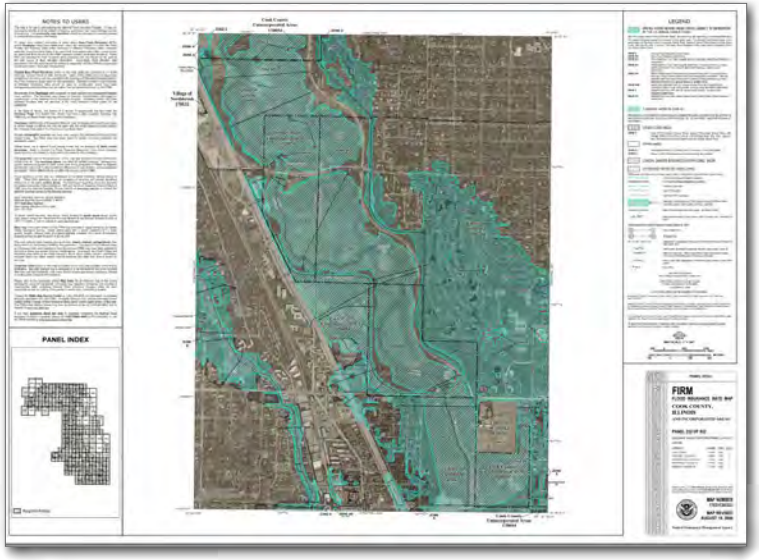
OBJECTIVES

- Advise property owners about flood hazards, flood insurance, and flood protection measures.
- Adopt and enforce regulations that exceed the NFIP's minimum standards for new development and re-development.
- Reduce future flood damage to existing buildings by helping property owners retrofit or relocate existing flood prone buildings.
- Improve flood warning systems and flood response procedures.

NATIONAL FLOOD INSURANCE PROGRAM

The National Flood Insurance Program (NFIP) is based on a cooperative agreement between the Federal Emergency Management Agency (FEMA) and local units of government. FEMA agrees to underwrite flood insurance policies within a community and the community agrees to regulate development in the floodplain. Participation in the NFIP is voluntary, but communities have incentive to join because Federally-backed flood insurance is only available in participating communities and a non-participating community will not receive Federal aid for damage to insurable buildings in the floodplain.

The three basic components of the NFIP are floodplain mapping, flood insurance, and floodplain management regulations. Floodplain mapping is provided by FEMA on a series of maps called Flood Insurance Rate Maps, which designate areas of a community according to various levels of flood risk. Regardless of its risk level, any building in an NFIP participating community can be covered by a flood insurance policy, even buildings not located in a mapped floodplain. A flood insurance policy is only mandated for Federally-backed mortgages on buildings in the floodplain. Any new buildings constructed within the floodplain, and any improvements or repair of existing buildings is subject to the Flood Hazard Protection Regulations (Chapter 15.68) of the Village Code.



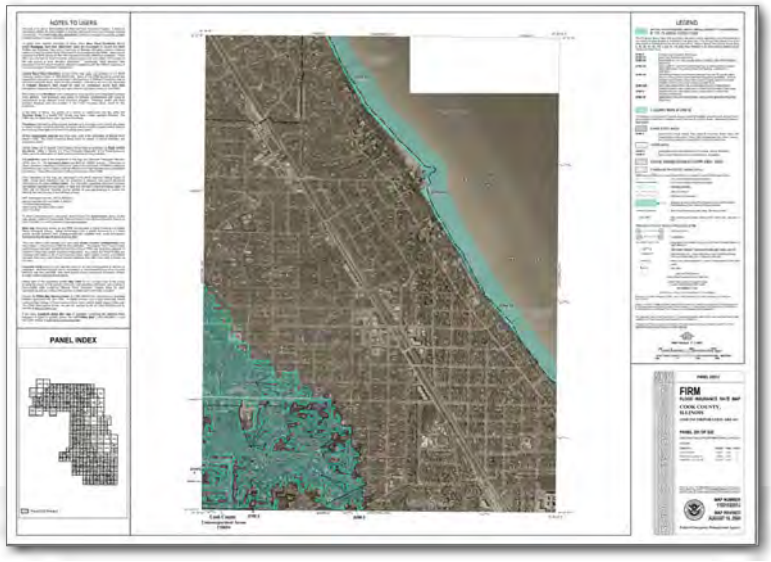


Figure 8. Flood Insurance Rate Maps of Winnetka

The Village of Winnetka joined the NFIP on November 9, 1973 and has remained in good standing with the program ever since.

COMMUNITY RATING SYSTEM

The Community Rating System (CRS) is a voluntary program designed to reward a community for doing more than meeting the NFIP minimum requirements to reduce flood damages. Communities can be rewarded for activities such as: reducing flood damage to existing buildings, managing development in in areas not shown in the floodplain on the Flood Insurance Rate Maps, protecting new buildings from floods greater than the 100-year flood, helping insurance agents obtain flood data, and helping people obtain flood insurance. The reward for these activities comes in the form of reduced premiums for flood insurance policy holders.

Before a community can apply for the CRS, the community must first be audited by FEMA and the Illinois Department of Natural Resources (IDNR) and be found in full compliance with the NFIP. An application to the CRS must then be submitted within one year of the audit.

Once a community has been accepted into the CRS, the community's floodplain management activities are rated according to the scoring system described in the CRS Coordinator's Manual. CRS communities are rated on a scale of 1-10. A Class 10 community receives no reduction in flood insurance premiums, but every class above 10 receives an additional 5% premium reduction. Class 1 requires the most credit points and provides a 45% premium reduction.

How much discount property owners in your community can get

Rate Class	Discount SFHA*	Discount Non-SFHA**	Credit Points Required
1	45%	10%	4,500 +
2	40%	10%	4,000 - 4,499
3	35%	10%	3,500 - 3,999
4	30%	10%	3,000 - 3,499
5	25%	10%	2,500 - 2,999
6	20%	10%	2,000 - 2,499
7	15%	5%	1,500 - 1,999
8	10%	5%	1,000 - 1,499
9	5%	5%	500 - 999
10	0%	0%	0 - 499

Figure 9. From FEMA's publication, *National Flood Insurance Program Community Rating System – A Local Official's Guide to Saving Lives, Preventing Property Damage, and Reducing the Cost of Flood Insurance*

In 2013, there are 54 Illinois communities in the CRS program, all of which are rated between 8 and 5.

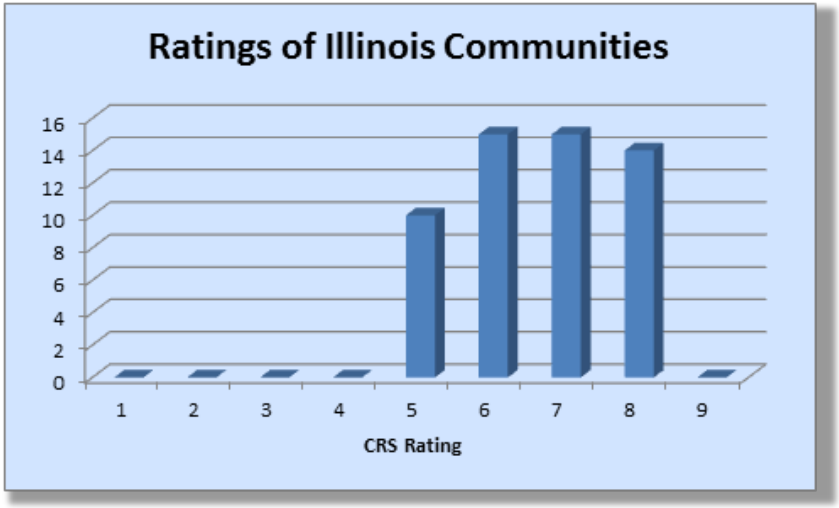


Figure 10. CRS Rating of Illinois Communities in 2013

The Village of Winnetka was audited by FEMA and IDNR on May 8, 2013 and was accepted into the CRS program on July 9, 2013. On October 2, 2013, the Village received a preliminary indication that it would be rated either at either 8 or 7. The final determination is subject to the Village submitting documentation regarding its floodplain management activities by April 30, 2014. The effective date of the Village's entry into the CRS program is expected to be October 1, 2014.

REPETITIVE LOSS AREA ANALYSIS

The NFIP considers a property a Repetitive Loss Property if two or more flood insurance claims of more than $1,000 have been paid within any 10-year period since 1978. According to FEMA's records, there are 18 Repetitive Loss Properties within the Village. Many more properties in Winnetka may have reached the damage threshold for Repetitive Loss Properties, but not all properties are

covered by flood insurance and flood insurance claims are not submitted for all flood damage sustained.

FEMA maintains a list of Repetitive Loss properties that includes the property address, dates of claims, the current insured's name, and/or the previous owner's name. Communities in the CRS program are required to update the list periodically by reviewing the list for current information and noting whether the insured buildings have been removed, retrofitted, or otherwise protected from the cause of the repetitive flooding.

The CRS program has two special conditions for communities with 10 or more Repetitive Loss Properties. One condition requires the Village to implement an annual outreach project to the properties in the Repetitive Loss Areas that have insurable buildings. The outreach project must advise the recipient that:

- the property is in or near an area subject to flooding;
- certain property protection measures are appropriate for the flood situation;
- sources of financial assistance may be available for property protection measures; and
- flood insurance is available.

The other condition requires the Village to adopt either a Floodplain Management Plan or a Repetitive Loss Area Analysis prior to its entry into the CRS program.

Adopting a Floodplain Management Plan requires adherence to a rigorous 10-step planning process that involves public participation, an assessment of the flood hazard, goal setting, and formal adoption by the Village Council. These plans are typically developed at a Countywide scale and Cook County is currently developing an All Hazards Mitigation Plan. That Plan would meet the CRS requirement for a Floodplain Management Plan, but the Plan is not expected to be ready for the Village Council to adopt until after April 30, 2014, when the Village is required to submit documentation of its floodplain management activities for entry into the CRS program.

Figure 11. Cook County is in the process of developing an All Hazards Mitigation Plan. Information about the Plan is available at: http://www.cookcountyhomelandsecurity.org/hazard-mitigation-plan/

As an alternative to adopting a Floodplain Management Plan, the Village could adopt a Repetitive Loss Area Analysis by adhering to these five steps.

- Step 1 – Advise all the properties in each repetitive loss area that an analysis of the area will be conducted and request their input on the hazard and recommended actions.
- Step 2 – Contact agencies or organizations that may have plans or studies that could affect the cause or impacts of the flooding.
- Step 3 – Visit each building in the repetitive loss areas and collect basic data. Building entry is not necessary for this step since adequate information can be collected by observing the building from the street.
- Step 4 – Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible. The review must consider the full range of property protection measures for the types of buildings affected, including: preventative activities, property protection activities, natural resource protection activities, emergency services measures, structural projects, and public information activities.
- Step 5 – Document the findings in a report. The report should include: a summary of the process that was followed and how property owners were involved in the process; a problem statement with a map of the affected area; a list or table showing basic information for each building in the affected area; the alternative approaches that were reviewed; and a list of action items identifying the responsible party, when the action should be completed, and how it will be funded.

Unless the repetitive loss areas have similar building and flooding characteristics and similar mitigation measures are appropriate, a separate report should be prepared for each of the Village's four repetitive loss areas.

RELOCATION AND RETROFITTING OF EXISTING BUILDINGS

Removing buildings from the floodplain and other flood prone areas is the most effective way to reduce flood damages because it is a permanent form of mitigation. These activities can be partly funded through FEMA's Pre-Disaster Mitigation (PDM) and Hazard Mitigation Grant Programs (HMGP) when the Cost Benefit Ratio exceeds 1.0. The Village will become eligible to apply for PDM and HMGP funding once Cook County completes development of the All Hazards Mitigation Plan and the Village Council adopts the Plan.

When it is not feasible to remove a flood prone building, one or more of the retrofitting projects listed below can be an effective way to protect buildings, particularly when the flood waters are shallow or slow-moving.

- Elevating buildings above predicted flood levels;
- Dry floodproofing buildings (implementing measures designed to keep water from entering a building);
- Wet floodproofing buildings (implementing measures designed to minimize damage to a structure and its contents from water that is allowed into a building;

- Protecting basements from sewer back-ups; and
- Constructing barriers, including levees, berms, and floodwalls.

FLOOD WARNING AND RESPONSE PLAN

Advance identification of an impending storm is only the first part of an effective Flood Warning and Response Plan. To truly realize the benefit of an early flood warning system, the warning must be then be disseminated quickly to floodplain occupants and critical facilities. Finally, appropriate response activities must be implemented, such as: directing evacuation, sandbagging, and moving building contents above flood levels.

The development of a Flood Warning and Response Plan requires an assessment of the nature of the flood hazard and the expected impacts of flooding, the preparation of flood inundation maps, as well as a description of the warning devices used and the specific flood response actions taken at different flood levels. Fortunately, Cook County is currently developing an All Hazards Mitigation Plan, which should address flood warning and response at a Countywide scale. Participation in the development of the Plan will raise the Village's awareness of resources that can be used to improve: threat recognition, warning notification, critical facilities protection, and recovery and mitigation.

RECOMMENDATIONS

1. Conduct an annual Repetitive Loss Outreach project to each of the Village Repetitive Loss Areas to educate property owners about flood hazards, flood insurance, and flood protection measures. (See Appendix 4)
2. Develop and adopt a Repetitive Loss Area Analysis to help property owners retrofit or relocate existing flood prone buildings.
3. Participate in the development of the Cook County All Hazards Mitigation Plan and adopt the Plan. This will make the Village eligible for grants from FEMA and help the Village make improvements to its flood warning systems and flood response procedures.
4. Adopt floodplain management regulations from the Cook County Watershed Management Ordinance that exceed the Village's current regulations. (See Section 8)

SECTION 6

WATER QUALITY

"...a mature, built-out community needs a plan that identifies community assets worthy of protection and areas in need of improvement."

A 2020 Vision for Winnetka

6. WATER QUALITY

GOALS

Protect and enhance the quality of water in Lake Michigan and the Skokie River. In doing so, maintain compliance with the conditions of the Village's National Pollutant Discharge Elimination System (NPDES) Phase II permit.

OBJECTIVES

- Conduct public education and outreach on stormwater quality.
- Involve the public in Village efforts to protect and enhance stormwater quality.
- Eliminate illicit discharges to the storm sewer system.
- Prevent stormwater pollution from active construction sites.
- Require new development and re-development projects to minimize stormwater runoff volume and provide water quality treatment for stormwater runoff after construction.
- Prevent stormwater pollution resulting from municipal operations.
- Monitor the quality of water discharging from the storm sewer system.

EXISTING NPDES PHASE II PROGRAM

The Village has a General NPDES Permit from the Illinois Environmental Protection Agency (IEPA) for discharges from its municipal separate storm sewer system (General Permit). The General Permit requires the Village to develop, implement, and enforce a stormwater management program designed to reduce the discharge of pollutants from the municipal separate storm sewer system to the maximum extent practicable. The program

Figure 12. Spruce Street Outfall

must include the following six Minimum Control Measures and must include at least annual water quality monitoring to evaluate the effectiveness of the program.

1. Public education and outreach on stormwater impacts
2. Public involvement/participation
3. Illicit discharge detection and elimination
4. Construction site stormwater runoff control
5. Post-construction stormwater management in new development and re-development
6. Pollution prevention/good housekeeping for municipal operations

The Village submitted a Notice of Intent (NOI) to the IEPA describing the practices which would be implemented in order to comply with the conditions of the permit. These practices include:

- Publishing educational articles for the general public on topics related to stormwater pollution prevention in Village and Park District newsletters;
- Providing residents obtaining a pet license with information on proper pet waste management;
- Providing residents purchasing yard waste bags and tags with information on responsible lawn and garden care;
- Providing all residents with information on swimming pool cleaning and maintenance, residential stormwater management, and safe disposal procedures for prescription drugs and sharps;
- Posting signage at storm sewer outfall locations notifying residents to report suspected non-stormwater discharges;
- Inspecting storm sewer outfalls for illicit discharge indicators;
- Enforcing the Engineering Design Guidelines for new development and redevelopment, including review of site plans prior to construction, as well as site inspections during and at the conclusion of construction;
- Cleaning the storm sewer system regularly;
- Maintaining the Public Works fleet inside the Public Works facility where wash water and vehicle fluids drain to the sanitary sewer system; and

The Village submits a report to the IEPA annually on the status of its NPDES Phase II Program. The IEPA has audited the Village's NPDES Phase II program on one occasion and did not suggest any substantive changes to the program, but the Village should begin a long-term water quality monitoring program since IEPA inspectors are increasingly enforcing the water quality monitoring requirement.

Figure 13. Pollution Reporting Sign

EXISTING WATER QUALITY DATA

Between September 2012 and March 2013, the Village collected end-of-pipe samples at four outfalls to monitor a wide range of water quality parameters during both wet- and dry-weather conditions. Samples were collected on five different days – three wet-weather days and two dry-weather days. Three of the four monitored outfalls discharge to Lake Michigan (at Spruce Street, Cherry Street, and Elder Lane) and the fourth outfall discharges to a tributary of Skokie River (at Hibbard Road south of Willow Road). Exhibit 4 shows the locations where water quality samples were collected. Samples were tested for: temperature, dissolved oxygen, pH, total dissolved solids, total suspended solids, total phosphorus, nitrate, nitrite, ammonia, total Kjeldahl nitrogen, oils/fats/grease, fecal coliform, conductivity, chloride, total metals, and dissolved metals. All tests were performed at an independent laboratory, with the exception of fecal coliform, which was tested at the Village's water plant.

The results of the water quality testing summarized in Exhibit 5 indicate levels of fecal coliform in storm sewer discharges that are elevated. Levels of nitrogen, phosphorus, total dissolved solids, and total suspended solids appear to be elevated, as well. (Full Laboratory Reports are included in Appendix 5.) These findings are typical for urban runoff, but they suggest that the Village will have to take action to protect and enhance the quality of water in Lake Michigan and the Skokie River. Logical action steps would include investigation for illicit connections to the storm sewer system, public education about sources of nutrients in runoff, increased street sweeping, and increased erosion control at construction sites in the Village.

Fecal coliform is used as an indicator of fecal contamination. Sources of fecal contamination in urban settings can include wildlife (e.g., geese), pets, leaking sanitary sewers, dumpster leaks, grease trap leaks, pavement wash water and catch basin debris.

Nutrients, such as phosphorus and nitrogen, are a common concern in runoff from urban watersheds. There are a variety of sources of nutrients, including fertilizer, yard waste, eroded soils and sediments, organic loadings (e.g. manure), and detergents.

Dissolved solids refer to any minerals, salts, metals, cations or anions dissolved in water. They are not typically associated with health effects, but total dissolved solids is used as an aggregate indicator of the presence of a broad array of chemical constituents.

Suspended solids generally represent sediment in stormwater runoff. The greater the amount of total suspended solids in water, the murkier it appears.

Exhibit 6 demonstrates how the water quality varies by sampling location and over time. For reference, recent ambient water quality data for Lake Michigan and Skokie River is included, where the data was available.

RECOMMENDATIONS

1. Continue to implement existing practices related to the Village's NPDES Phase II Program.

2. Incorporate development of a stormwater pollution prevention webpage into the ongoing redesign of the Village's website. An outline for this webpage is included as Appendix 5. This webpage should include links to pertinent information, including public education materials (See Appendix 6), the Village's Notice of Intent to comply with the NPDES Phase II permit, and the Village's most recent NPDES Phase II Annual Report.

3. Develop a Stormwater Pollution Prevention Plan for the Public Works Facility and the Village's parks.

4. Incorporate periodic stormwater pollution prevention training into the training program for Public Works employees. A training video is included as Appendix 6.

5. Implement a long-term water quality monitoring program to monitor the effectiveness of Village initiatives on the quality of water discharging from the storm sewer system (See Table 2). For example, the Village can track fecal coliform readings over time as illicit connections to the drainage system are found and removed. Or, if elevated nutrient levels persist, the Village may initiate a public education campaign about the use of phosphorus-free fertilizer. A long-term water quality monitoring program may also be a condition of the permit the Village plans to obtain for a new storm sewer outfall to Lake Michigan.

Water Quality Parameters for Annual Sampling at Location 2	Cost of Lab Test
Flow	N/A*
Temperature	N/A*
Dissolved Oxygen	N/A*
pH	N/A*
Total Dissolved Solids	$ 10.00
Total Suspended Solids	$ 10.00
Nitrite	$ 10.00
Nitrate	$ 10.00
Ammonia	$ 22.50
Total Kjeldahl Nitrogen	$ 22.50
Total Phosphorus	$ 22.50
Chloride	$ 11.25
Fecal Coliform	N/A**
Total Annual Cost =	$ 118.75

* Field measurement
** Test performed at Village water plant

Table 2. Long-Term Water Quality Monitoring Plan

6. A study was completed by the IEPA in July 2013 that established a Total Maximum Daily Load (TMDL) limit for *E. coli* at Lake Michigan beaches, and another study is underway to establish TMDL limits for pollutants of concern in the Skokie River watershed. Once completed,

these studies will include recommended actions to reduce pollutant loadings which are likely to affect Winnetka. Therefore, the Village should participate in the TMDL development process for both watersheds.

7. Implement a strategy to incorporate stormwater Best Management Practices (BMPs) into public and private improvements (See Section 7).

8. Update the stormwater quality standards in the Village Code and the Engineering Standards Manual (See Section 8).

SECTION 7

STORMWATER BEST MANAGEMENT PRACTICES

"...maintaining the natural features of the Village
for the enjoyment of future generations remains a high priority."

A 2020 Vision for Winnetka

7. STORMWATER BEST MANAGEMENT PRACTICES

GOAL

Encourage the use of stormwater Best Management Practices (BMPs) throughout the Village to reduce runoff volumes and improve the quality of stormwater runoff.

OBJECTIVE

Encourage the use of stormwater BMPs in private and public improvements.

Stormwater BMPs

Simply put, a stormwater BMP is a practice used to manage the impacts of stormwater runoff. Some stormwater BMPs occur naturally, such as wetlands, woods and other natural vegetation. Other stormwater BMPs are man-made structures, such as detention ponds, swales, rain gardens, or permeable pavement.

Source - American Society of Landscape Architects

Figure 14. Parkway Rain Garden

When land is developed, impervious surfaces such as rooftops, roads, parking lots, and driveways are created. These impervious surfaces generate stormwater runoff because they do not allow rain to soak into the ground. Impervious surfaces also accumulate pollutants deposited from the atmosphere, leaked from a vehicle, or wind-blown in from adjacent areas. During storm events, pollutants quickly wash off impervious surfaces and are rapidly delivered to downstream waters. Some common pollutants found in urban stormwater runoff include sediment, nutrients (nitrogen and phosphorus), heavy metals, oil and grease. Stormwater BMPs are inserted into the landscape to improve water quality and reduce the flooding associated with increased impervious cover and surface runoff.

Stormwater BMPs in Private Improvements

Potential strategies to encourage the use of stormwater BMPs in private improvements can be classified into five different categories: financial incentive programs, awards and recognition programs, distribution programs, stormwater utility fee discounts, and ordinance requirements. Local examples of each category are provided below. Note that the following examples are presented for reference only and not all are recommended; however, creating some incentive for private property owners to install BMPs may be a condition of the permit the Village plans to obtain for a new storm sewer outfall to Lake Michigan.

Source - Lincoln Way Supply

Figure 15. Permeable Paver Driveway

- Financial Incentive Programs (Grants, Rebates, Cost-Sharing)
  - ◊ Water Quality Improvement Program (DuPage County) – Grants are awarded annually (up to 20% of project cost) for projects providing a regional water quality benefit.
  - ◊ Sustainable Backyard Program (Chicago) – Residents can receive rebates on purchases of trees (up to $100), native plants (up to $60), compost bins (up to $50), and rain barrels (up to $40). Workshops provide basic information on the installation and maintenance of rain barrels, compost bins, native plants, and trees.
  - ◊ Rain Garden Cost-Share (Glenview) – Residents can apply for a grant of 50% of the project costs (up to $1,000) for a rain garden installed according to the Village's rain garden guidelines and which provides a drainage benefit.

Source - The Conservation Foundation

Figure 16. Rainwater Harvesting Concept

  - ◊ Local Drainage Inspection Program (Glenview) – Residents voluntarily participate in a cost-sharing program with the Village in which individual lots are reviewed for drainage problems and recommendations are provided to solve the drainage problems on private

property. A green infrastructure alternative is often considered among the potential solutions. Residents receive a site visit by a registered professional engineer with stormwater expertise, a written report with recommended improvements, cost estimates for the potential improvements, a list of recommended local contractors, and a voucher to cover permitting fees (up to $200). The cost of the program ($800 per property) is split evenly between the Village and the property owner.

- Distribution Programs
  - ◊ Rain Barrel Program (Metropolitan Water Reclamation District of Greater Chicago) – Rain barrels are sold to residents ($58 plus tax) within the MWRDGC service area. An installation kit and delivery are included. Rain barrels may be purchased directly from the MWRDGC or from participating municipalities.
  - ◊ Rain Garden Program (Woodstock) – The City installed demonstration rain gardens in high visibility areas and developed installation guidelines for residents to install their own rain gardens. The guidelines are available on the City's website and at brochure racks at City facilities.
- Awards and Recognition Programs
  - ◊ Conservation at Home (The Conservation Foundation) – Residents receive a free site visit for site specific advice on the use of native landscaping, rain barrels, organic fertilizers, and the removal of invasive plants. Reference materials are provided for purchasing plants. Participants that follow-through can have their landscape certified. Donations are suggested ($25 for current members or $50 for non-members) for yard signs signifying participation in the program.

Source - The Conservation Foundation

Figure 17. Conservation Award Sign

- Stormwater Utility Fee Discounts
  - ◊ Incentives and Credits (Downers Grove) – An incentive is a one-time reduction in the stormwater utility fee applied to the resident's account balance. It is offered to assist property owners with the cost of materials, construction and installation of rain barrels ($25), rain gardens ($250), permeable pavers ($300), and other qualifying practices (30% up to $300 per property). A credit is an ongoing reduction in the amount of stormwater fees assessed to a parcel (up to 100%) in recognition of site practices that reduce the impact of stormwater runoff.
- Ordinance Requirements
  - ◊ BMP Ordinance (Lakewood) - This ordinance requires the installation of BMPs for any development in the R-2 Zoning District that exceeds 500 square feet of new impervious area or that adds impervious area past the side or rear yard building setback lines. Appropriate BMPs are selected by the resident according to the Village's BMP hierarchy. The Village provides an applicant with a FAQ sheet, BMP profile sheets, and standard maintenance agreements to streamline the permitting and design processes.
  - ◊ Watershed Development Ordinance - Water Quality Treatment Requirements (Lake County) – All development resulting in at least 0.5 acre of new impervious area is required to retain 0.01 inch of runoff for every 1% of impervious surface. Hydrocarbon (e.g. oil and grease) removal technology with a minimum 70% removal rate is required for 0.5 inch of runoff from new impervious surfaces resulting from the following types of development: vehicle fueling and service facilities; and parking lots with more than 25 new stalls.

Figure 18. Rain Garden at Baxter & Woodman's Corporate Headquarters

Stormwater BMPs in Public Improvements

In order to encourage the use of stormwater BMPs in public improvements, the Village can begin evaluating the feasibility of incorporating stormwater BMPs into each capital improvement and facility improvement project. Stormwater BMPs that could potentially be incorporated into capital improvements include: permeable pavement, planter boxes, and hydrodynamic separators. Installing catch basins, where inlets would otherwise be installed,

is another possible BMP. Stormwater BMPs that could potentially be incorporated into facility improvement projects include: rain gardens, rain barrels, permeable pavements, bio-swales, infiltration strips, and green roofs. Incorporating BMPs into public projects may be another condition of the permit the Village plans to obtain for a new storm sewer outfall to Lake Michigan.

Source - Filterra

Figure 19. Tree Box Filter

RECOMMENDATIONS

1. Implement an Award or Recognition Program for BMPs installed on private property. This program should be similar to The Conservation Foundation's Conservation at Home Program (See Appendix 8). Although the Village is outside of The Conservation Foundation's typical service area, the Foundation would be willing to mentor Village staff or a local conservation group, such as Openlands, to administer the program.

2. Participate with the MWRDGC to distribute rain barrels to interested residents (See Appendix 8). Village participation may simply be advertising that rain barrels are available from the MWRDGC, or the Village could maintain a supply of rain barrels from the MWRDGC and distribute them.

3. The Village should implement a formal process to incorporate stormwater BMPs in public improvements. The required scope of services within Requests for Proposals issued by the Village should specifically include an evaluation of the feasibility of incorporating green infrastructure elements into the project. Preference should be given to BMPs that require less maintenance and to designs that maximize the durability of the BMP. For example, turning movements by heavy vehicles can be damaging to permeable pavements, but a new public parking area could be designed with conventional pavement driving aisles and permeable pavement parking stalls.

SECTION 8

DEVELOPMENT POLICIES & REGULATIONS

"The physical character of a community is determined
by the interrelationship of factors that affect how land is used."

A 2020 Vision for Winnetka

8. DEVELOPMENT POLICIES & REGULATIONS

GOAL

Establish development regulations for the Village which are state of the art with regard to stormwater management.

OBJECTIVE

Update the Village's development regulations in light of current and pending regional, state, and Federal regulations, as well as current practices in stormwater management.

EXISTING DEVELOPMENT REGULATIONS

The Village regulates residential and commercial development primarily through Titles 12, 15, and 16 of the Village Code, along with the Public Works and Engineering Design Guidelines. Depending on the size and scope of the project, a development project within the Village may also fall under the jurisdiction of the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC), the Cook County Department of Transportation and Highways, the Illinois Environmental Protection Agency (IEPA), Illinois Department of Natural Resources, the Illinois Department of Transportation, and/or the U.S. Army Corps of Engineers. Regional, state, and Federal regulations are updated from time to time and the Village's regulations should also be updated to maintain compatibility with overlapping jurisdictions.

The MWRDGC has been granted the authority to adopt a stormwater management ordinance with Countywide authority. As a first step toward establishing the MWRDGC's stormwater management program, the District adopted the Cook County Stormwater Management Plan on February 15, 2007. After a first draft of the ordinance, an economic impact study, and then a second draft of the ordinance, the MWRDGC finally adopted the Cook County Watershed Management Ordinance (WMO) on October 3, 2013 with an effective date of May 1, 2014.

Figure 20. Redevelopment Project

COMPARISON OF STORMWATER MANAGEMENT REQUIREMENTS

Exhibit 7 is a side-by-side comparison of the Village's current stormwater regulations, the Countywide WMO and other area stormwater regulations. Each set of regulations represented in the comparison includes the following common elements:

- Runoff requirements;
- Floodplain requirements;
- Natural area requirements; and
- Construction site requirements.

Generally speaking, runoff requirements and construction site requirements apply to development sites without regard to location. Examples include prohibiting the obstruction of runoff from an adjacent site and requiring a contractor to control erosion during construction. Sometimes these requirements depend on the size of the development. For instance, stormwater detention is typically only required when a certain amount of new impervious area is created. Floodplain requirements and natural area requirements, on the other hand, apply only to development in certain areas.

Local governments have complete authority over runoff requirements and they each attempt to set reasonable standards for protecting adjacent or downstream properties, although the actual requirements vary widely. Floodplain requirements, natural area requirements and construction site requirements all must meet minimum federal and/or state standards.

Countywide ordinances tend to regulate stormwater management from a "big picture" perspective. They typically regulate development that might impact a neighborhood or larger region and do not regulate development at a smaller scale. Meanwhile, municipal ordinances tend to regulate stormwater management down to the discharge point of a downspout.

AUTHORIZATION TO ENFORCE THE WATERSHED MANAGEMENT ORDINANCE

The WMO allows authorized municipalities to issue Watershed Management Permits within their corporate boundaries, so the Village has the opportunity to petition the MWRD for this authorization. The benefits of being an authorized municipality include control over the timing of permit issuance and offering applicants a permit process that involves coordination with fewer government agencies.

To become an authorized municipality, the Village would have to adopt the Countywide WMO. This can be done in one of the following ways.

- The Village could adopt the Countywide WMO without modifying the Village's current regulations and enforce whichever regulation is more stringent. This is the simplest option, but with two sets of standards it will be difficult for permit applicants to know what the requirements are for a given project and what they need to submit to get a permit.
- The Village could adopt the Countywide WMO and repeal the Village's current regulations. This is not recommended because certain provisions of the WMO are much more permissive than the Village's current regulations.

- The Village could adopt the Countywide WMO and update the Village's current regulations so the two documents fit together seamlessly. This is the best option.

REVIEW OF VILLAGE ZONING PROVISIONS WITH STORMWATER RUNOFF IMPLICATIONS

The Village's Zoning Ordinance includes provisions related to stormwater management from new development. Examples of these provisions include:

- Encouragement of detached garages in the rear quarter of a lot. Section 17.30.040.E.1 of the Village Code exempts the first 400 square feet of floor area associated with a one-story detached garage (provided it is located in the rear quarter of the lot) from inclusion in the building size (i.e. FAR) calculation. This provision was enacted to discourage the construction of front-facing garages, both as a means to reduce the appearance of bulk created by such garages, and to counteract the aesthetic of front-facing garage doors. However, constructing garages in the rear quarter of the lot leads to increases in the amount of impermeable surface on a lot, due to the need to construct a lengthy driveway to access the garage.
- Maximum impermeable surface coverage. Section 17.30.030.B of the Village Code sets the maximum percentage of a lot that can be covered by impermeable surfaces at 50% of the area of the lot, for residential properties. This limit has an impact on stormwater runoff, because the single factor most proportional to the amount of stormwater generated by a property is the amount of impermeable surface on the lot.
- Treatment of semi-permeable surfaces (e.g. gravel, pavers). Section 17.04.030.I.1 of the Village Code defines "Impermeable Surfaces and provides that only 80% of an area covered with brick, stone, or concrete pavers shall be considered to be an impermeable surface.
- Construction of deep basements. The construction of basements significantly deeper than eight feet is becoming more common in new construction, but it is not addressed in the Village's Zoning Ordinance. These deep basements may have an impact on stormwater management when constructed in low-permeability soils. Modern basement construction relies on footing drainage and sump pumps to limit hydrostatic pressure on basement walls. Deep basements with multiple sump pumps would reduce the groundwater table immediately adjacent to the building and convert the groundwater to surface water or discharge it directly to the storm sewer system. Stormwater management facilities are sized based on surface runoff calculations, and, for standard basements, sump pumps are a negligible contribution. However the contribution of multiple sump pumps at an increasing number of homes may need to be accounted for in stormwater calculations.

RECOMMENDATIONS

1. The Village should petition the MWRD to become an authorized municipality.

Figure 21. New residence elevated above base flood.

2. The Village should adopt the Countywide WMO by reference and update the Village's current regulations so the two documents fit together seamlessly. In particular, the Village should:

   ◊ Maintain existing Village regulations where the existing regulations are more restrictive than the new WMO, such as:

   - Size of regulated development,
   - Types of regulated development,
   - Exempted projects,
   - Allowances for re-development,
   - Permit term,
   - Protection of off-site properties, and
   - Rainfall data.

   ◊ Match new WMO regulations where the WMO is more restrictive than existing Village regulations, such as:

   - Projects requiring MWRD approval,
   - Flood protection elevation, and
   - Compensatory storage.

   ◊ Match new WMO for projects regulated by the WMO and consider applying these requirements to projects that are not regulated by the WMO. In the cases listed below, the WMO would establish new or more restrictive regulations in the Village, but these regulations might be overly burdensome for certain types of projects regulated by the Village.

   - Long-term maintenance of stormwater management infrastructure – Stormwater detention facilities require maintenance, but the Village would have to

weigh the benefits of residents routinely maintaining private infrastructure against the amount of effort necessary to enforce the required maintenance.

- Allowable release rate – The WMO establishes an allowable release rate that in most cases would require significantly more detention volume than currently required by the Village. In may not be practical or possible to provide the required storage volume on single-family residential lots.

- Protection of depressional storage areas – Preserving existing depressional storage on a parcel reduces the impact of new impervious area on surrounding properties, but the presence of a depressional storage area on a parcel may not be discovered by the Village without submittal of a topographic site plan. If a topographic survey is required for every permit application, the permit for some small projects would cost more than the construction.

- Water quality – Improving the quality of stormwater runoff is important, but it may not be reasonable to require the infrastructure necessary to improve water quality for some of the minor projects regulated by the Village.

- Runoff volume reduction – Reducing the volume of runoff from a parcel reduces the impact of development on surrounding properties, but it may not be reasonable to require the infrastructure necessary to reduce the volume of runoff for some of the minor projects regulated by the Village.

- Inspection frequency – The WMO requires at least three erosion control inspections for each permitted development. It may not be practical for Village staff to inspect some of the minor projects regulated by the Village on three separate occasions.

◊ Match new WMO for projects regulated by the WMO, but do not apply these requirements to other projects regulated by the Village.

- Buffer areas – The required buffer areas will be difficult, if not impossible, to meet on residential properties platted prior to the WMO.

- Wetland mitigation – Very few isolated wetlands exist within Village limits and those that do are likely to be found on public property, where they would be protected. Therefore, the value of wetland mitigation requirements in the Village is questionable.

- Riparian areas - The required setbacks will be difficult, if not impossible, to meet on residential properties platted prior to the WMO.

◊ Other

- Variances - Only the MWRD will be allowed to issue a variance for projects regulated by the new WMO; however, the Village should reserve the right to issue variances for all other regulated projects.

- Development requiring detention – The Village should maintain its existing detention regulations, which require detention for more types of development than the WMO, and consider crediting the storage volume within stormwater best management practices toward the required detention volume.

- Site stabilization – The existing Village regulations require stabilization within 30 days of removal of existing vegetation, while the new WMO requires stabilization within 14 days after construction activities have ceased. The Village should adopt both requirements as a dual performance standard for all development.

3. The following provisions of the Village Code should be amended.

   ◊ Compliance with the Public Works and Engineering Design Guidelines is required by Title 14, Chapter 04, Section 130.A.1.a of the Village Code (General Construction Standards for Utilities in Public Rights-of-Way). A requirement to comply with these Guidelines should be added in Title 15, Chapter 32, Section 10 (Construction Permits Required).

   ◊ Downspout Connections - Title 15, Chapter 24, Section 140 of the Village Code requires a direct connection of downspouts to storm sewers, which contradicts the Public Works and Engineering Design Guidelines (Paragraph II.C.8 and Paragraph II.D.5). The Village Code should be revised to eliminate this contradiction.

   ◊ Public Nuisances - Title 9, Chapter 16, Section 020 of the Village Code effectively prohibits non-stormwater discharges to the drainage system; however, these regulations should clearly require the spiller to pay for cleaning a spill. They should also exempt non-stormwater discharges that are non-toxic, such as fire flows. The model Illicit Discharge and Connection Ordinance in Appendix 8 includes example language for these revisions.

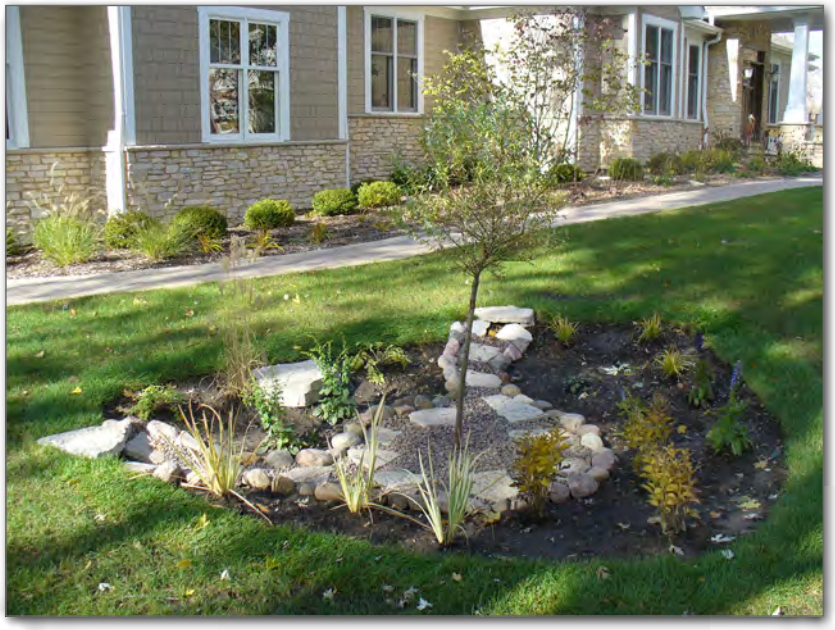


Figure 22. New Residence with Rain Garden

4. The Village should review its Zoning Ordinance to determine whether the provisions which are related to stormwater management reflect should be revised.
5. The Village should develop site plan review checklists and site inspection forms to standardize its policies and procedures.
6. The Village should link as-built plans, maintenance agreements, and inspection reports to GIS.

SECTION 9

OPERATIONS & MAINTENANCE

"...proper maintenance of public properties...should keep public lands and infrastructure functioning well and strive for an appearance that reflects the high standards met by private property owners."

A 2020 Vision for Winnetka

9. OPERATIONS & MAINTENANCE

GOAL

Effectively maintain the storm and sanitary sewer systems to promote optimum performance.

OBJECTIVE

Schedule and fund regular maintenance of the storm and sanitary sewer systems, including stormwater Best Management Practices (BMPs).

STORM SEWER SYSTEM MAINTENANCE

The Village storm sewer system consists of 66.3 miles of sewer main, 2.6 miles of streams and ditches (maintained partly by the Park District and the Forest Preserve District), approximately 1,400 drainage structures, and eight pump stations. Typical system maintenance activities include: catch basin cleaning, television inspection, point repairs, sewer jetting, root cutting, street sweeping, leaf collection, and the removal of dead or dying trees along streams.

Each year, the Village plans to maintain 1/7 of the storm sewer system so that the entire system receives routine maintenance every seven years. $410,000 is budgeted for storm sewer maintenance in fiscal year 2013.

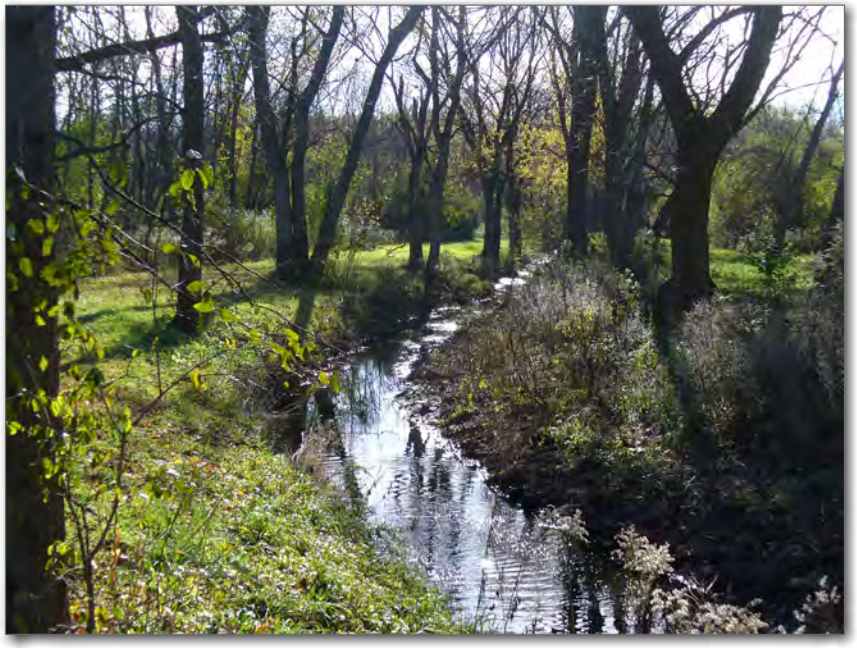


Figure 23. Drainage Ditch maintained by Village

SANITARY SEWER SYSTEM MAINTENANCE

The Village sanitary sewer system consists of 46.8 miles of sewer main, 1,131 manholes and one pump station. Typical system maintenance activities include: I/I monitoring, television inspection, point repairs, sewer jetting, root cutting, and sewer lining.

Each year, the Village plans to maintain 1/7 of the sanitary sewer system so that the entire system receives routine maintenance every seven years. $863,500 is budgeted for sanitary sewer maintenance in fiscal year 2013.

Source - USEPA

Figure 24. Storm Sewer System Maintenance

RECOMMENDATIONS

1. Continue to clean and maintain 35,300 lineal feet of sewer mains and 162 manholes so that 1/7 of the entire sanitary sewer system will be maintained each year.

2. Continue to clean and maintain 50,000 lineal feet of sewer mains and 200 catch basins so that 1/7 of the entire storm sewer system will be maintained each year.

3. Inventory stormwater BMPs and develop a plan for regular maintenance of the BMPs to ensure optimal effectiveness in reducing runoff volumes and increasing water quality.

SECTION 10

FINANCIAL PLAN

"…the development and ambience of the community continues to be emphasized, as do efforts to maintain the character of the Village and the elements that distinguish it from the typical suburban appearance of many Chicago metropolitan communities."

A 2020 Vision for Winnetka

10. FINANCIAL PLAN

GOAL

Fund stormwater management initiatives through a sustainable and equitable source of revenue.

OBJECTIVE

Implement a stormwater utility to fund most of the Village's stormwater management initiatives. Utilize General Fund reserves and revenues to keep stormwater fees as low as possible.

STORMWATER UTILITY FEASIBILITY

In order to determine the feasibility of implementing a stormwater utility to fund the planned capital improvements and necessary maintenance of the storm sewer system, the Village conducted a Stormwater Utility Feasibility Study in the Spring of 2013. The results of the Study and the recommendations of the Final Report (prepared by Municipal & Financial Services Group, dated May 7, 2013) are summarized in this Section.

The total cost of the capital improvements to the Village's storm sewer system in the 1990s and 2000s comes to approximately $3.5 million. The total cost of the capital improvements planned by the Village over the next five years is over $41 million. These improvements cannot be funded by cash reserves or grants alone. Increasing property taxes would not be an equitable way to fund these improvements, since the value of property has very little correlation with its need for stormwater management and since tax-exempt properties benefit from the Village's stormwater infrastructure. A stormwater utility, however, is a feasible and equitable means of funding the planned stormwater capital improvements.

Using this approach, the Village would issue debt to fund the planned capital improvements and necessary maintenance of the storm sewer system and then pay the debt service using fees paid by property owners proportional to a property's use of the stormwater infrastructure. The implementation of a stormwater utility and associated stormwater fee will provide:

- A dedicated source of revenue for stormwater expenditures allowing for funding of significant capital investments required to improve the stormwater system;
- Increased equity for all parcel owners, as costs will be allocated based on stormwater contribution rather than property value and those that do not contribute to stormwater funding now will pay their fair share;
- Fiscal accountability, due to the fact that stormwater fee revenues can only be used for stormwater expenditures and would be adjusted based on needs;

- Increased public awareness of stormwater issues and the significant investments that are required to manage stormwater in the Village.

STORMWATER FEE STRUCTURE

The fee charged to each parcel would be based on a measurement of the impervious area on the parcel, since this is the single most important factor influencing the rate and volume of stormwater runoff. Impervious area data is also readily available for each parcel using the Village's GIS data. The normalized average residential parcel within the Village has approximately 3,400 square feet of impervious area, so this amount of impervious area would be considered one Equivalent Residential Unit (ERU) and the fee charged to each parcel would be expressed in terms of ERUs, allowing for fractions of ERUs.

STORMWATER FUNDING

30-year bonds would be used to fund the planned stormwater capital improvement projects and maintenance needs. In order to minimize the stormwater fees necessary to pay the debt service for these bonds and ease the transition to stormwater utility funding, the Village would supplement stormwater fees with General Fund reserves and revenues. As the debt associated with the stormwater projects is retired, the Village would reduce the amount of the stormwater fee commensurately.

STORMWATER FEE

Table 3 provides an estimate of the stormwater fees based on Municipal & Financial Services Group's recommended fee structure and funding approach.

	FY14	FY15	FY16	FY17	FY18
Annual Stormwater Fee per ERU	$262.00	$356.00	$358.00	$360.00	$362.00

Table 3. Recommended Stormwater Fees

RECOMMENDATIONS

1. Create a stormwater database billing file. Review the draft impervious area database, parcel by parcel, to ensure an accurate impervious area is assigned to each parcel. Assign the impervious area and the associated stormwater fee to a billing account that identifies: the parcel impervious area, number of ERUs, stormwater bill, parcel identification number, parcel owner and billing address. Once the file has been developed, test the file for accuracy and make any necessary final adjustments.

2. Legally establish the stormwater utility. Review the draft stormwater utility ordinance provided by MFSG and revise it as necessary for Village Council approval and adoption.

3. Finalize the stormwater fee. Adjust the recommended fee stated in the Stormwater Utility Feasibility Study based on updated capital project costs and any credits or incentives the Village offers. The fee can either be adopted as part of the stormwater utility ordinance or it can be adopted as a separate fee schedule referenced in the ordinance.

4. Adopt policies and procedures for the stormwater utility. These procedures will establish the day-to-day operation of the utility, including: billing on the current utility bill or as a separate bill, handling appeals, and updating the billing database. If the Village decides to allow credits and incentives, the process for determining these adjustments should be formalized.

5. Provide public outreach and education. Residents, businesses, and tax-exempt entities need to understand the reason for the stormwater utility before they begin paying the stormwater fee. The Village should employ a combination of the following public outreach and education strategies: provide information on a website; identify one individual as the contact for all information related to the stormwater utility; conduct a series of public meetings and forums; provide an online stormwater bill calculator; and conduct one-on-one meetings with key property owners.

6. Train Village staff responsible for customer service. Staff should be prepared to answer questions about billing and respond to appeals. If the Village decides to allow credits and incentives, staff should be prepared to answer question on that topic, as well. A flier listing the answers to frequently asked questions would help ensure consistent and accurate responses to the most common questions. Staff training should extend beyond the date the first stormwater bills are sent.

SECTION 11

IMPLEMENTATION PLAN

"A successful plan captures the imagination of residents,merchants and local officials, while reflecting a consensus view that allows diverse members f the community to support actions for the common good."

A 2020 Vision for Winnetka

11. IMPLEMENTATION PLAN

Village of Winnetka Stormwater Master Plan		2014				2015				2016				2017				2018				2019
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	and Beyond
Section 3: Stormwater Capital Improvements																						
1	Complete design of Winnetka PS, Lloyd Park Outlet, Tower/Foxdale, NW Winnetka/Forest Glen	■																				
1	Complete construction of Winnetka PS, Lloyd Park Outlet, Tower/Foxdale, NW Winnetka/Forest Glen	■	■	■	■																	
1	Complete design of Willow Road Tunnel	■	■	■	■	■	■	■	■													
1	Complete construction of Willow Road Tunnel									■	■	■	■	■	■	■	■	■	■	■	■	
2	Complete detailed topographic survey of Area N																					■
3	Evaluate the the feasibility of additional capital improvements																					■
Section 4: Inflow and Infiltration																						
1	Complete SSES - Phase 1	■																				
1	Complete SSES - Phase 2		■	■	■	■																
1	Complete SSES - Phase 3						■	■	■	■												
2	Complete building-to-building canvassing	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
3	Smoke test streets prior to capital improvements		■				■				■				■				■			■
Section 5: Floodplain Management																						
1	Conduct an annual Repetitive Loss Outreach project to each of the Repetitive Loss Areas	■				■				■				■				■				■
2	Develop and adopt a Repetitive Loss Area Analysis	■																				
3	Participate in the development of the Cook County All Hazards Mitigation Plan and adopt the Plan	■	■																			
Section 6: Water Quality																						
1	Continue to implement the current NPDES Phase II program	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2	Incorporate a stormwater pollution prevention webpage into the redesign of the Village's website	■																				
3	Develop a Stormwater Pollution Prevention Plan for the Public Works Facility and Village parks																■					
4	Incorporate stormwater pollution prevention training into Public Works employee training			■				■				■				■				■		■
5	Implement a water quality monitoring program	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
6	Participate in the ongoing TMDL development process and update the NPDES Ph II program	■	■	■	■	■	■	■	■													
Section 7: Stormwater BMPs																						
1	Implement an award or recognition program for BMPs installed on private property									■	■	■	■	■	■	■	■	■	■	■	■	■
2	Participate with the MWRDGC to distribute rain barrels to interested residents	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3	Implement a formal process to incorporate stormwater BMPs in public improvements					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Section 8: Development Policies and Regs																						
1	Petition the MWRD to become an authorized municipality	■																				
2	Adopt the Countywide WMO by reference and the current stormwater management regulations	■																				
3	Amend the Village Code	■	■																			
4	Review the Zoning Ordinance		■																			
5	Develop site plan review checklists and site inspection forms		■																			
6	Link as-built plans, maintenance agreements, and inspection reports to GIS			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Section 9: Operations and Maintenance																						
1	Clean and maintain 1/7 of the sanitary sewer system	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2	Clean and maintain 1/7 of the storm sewer system	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3	Inventory stormwater BMPs and develop a plan for regular BMP maintenance																		■	■	■	■
Section 10: Financial Plan																						
1	Create a stormwater database billing file	■	■																			
2	Legally establish the stormwater utility	■	■																			
3	Finalize the stormwater fee	■	■																			
4	Adopt policies and procedures for the stormwater utility	■	■	■																		
5	Provide public outreach and education	■	■	■	■	■																
6	Train Village staff responsible for customer service	■	■	■	■	■																

GLOSSARY

Best Management Practices (BMPs) – A practice used to improve stormwater quality and reduce the flooding associated with increased impervious cover and surface runoff. Some stormwater BMPs occur naturally, such as wetlands, woods and other natural vegetation. Other stormwater BMPs are man-made structures, such as detention ponds, swales, rain gardens, or permeable pavement.

General Permit (ILR10/ILR40) – Permits written to cover a category of discharges instead of an individual facility. Application for coverage under a general permit is by submitting a Notice of Intent to comply with the conditions of the general permit and is much less rigorous than applying for an individual permit.

Illinois Environmental Protection Agency (IEPA) – The State agency that issues NPDES permits.

Inflow and Infiltration (I/I) – Terms used to describe the ways that groundwater and stormwater enter into a sanitary sewer system. Inflow is stormwater that enters into a sanitary sewer system at points of direct connection to the system. Infiltration is groundwater that enters a sanitary sewer system through cracks and/or leaks in the sanitary sewer pipes.

Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) – An independent government and taxing body that manages water supply, wastewater, and stormwater in Cook County, Illinois.

National Flood Insurance Program (NFIP) – The program enabling property owners in participating communities to purchase insurance protection from the Federal government against losses from flooding.

National Pollutant Discharge Elimination System (NPDES) – The national program for issuing, modifying, revoking, and reissuing, terminating, monitoring and enforcing permits and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318 and 405 of the Clean Water Act.

Notice of Intent (NOI) – The mechanism used to register for coverage under a General NPDES Permit.

Total Maximum Daily Load (TMDL) – A regulatory term in the Clean Water Act describing the value of the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards.

EXHIBITS

"This Plan continues a tradition of community planning that has played a critical role in the development of the Winnetka we see today."

A 2020 Vision for Winnetka

EXHIBIT 1 - DRAINAGE AREAS MAP

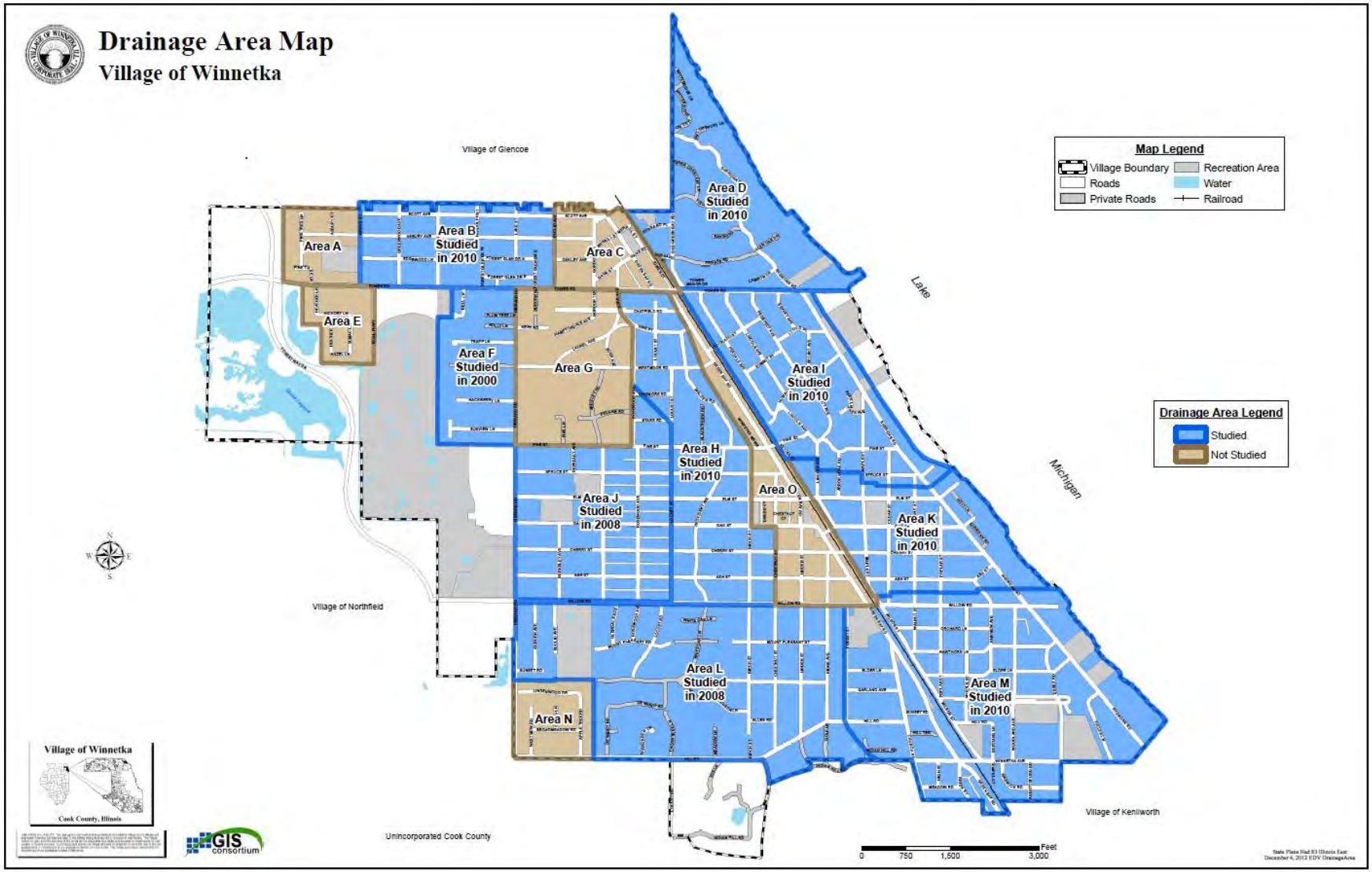
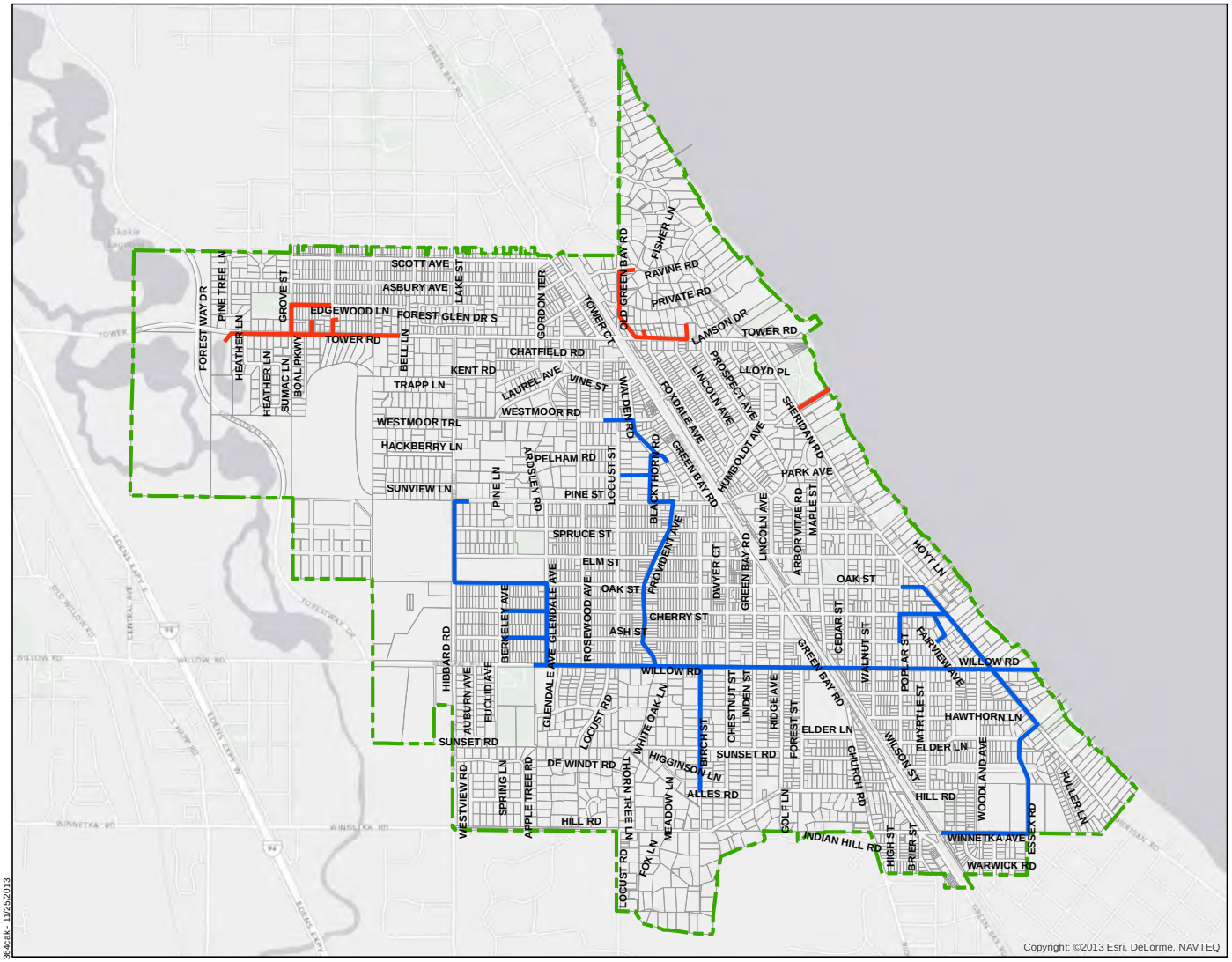


EXHIBIT 2 - STORMWATER CAPITAL IMPROVEMENTS PLAN



VILLAGE OF WINNETKA, ILLINOIS

STORMWATER CAPITAL IMPROVEMENTS PLAN

Legend

- Village Boundary
- Construction in 2014
- Construction in 2016 - 2018

EXHIBIT 2

N

1 inch = 1,500 feet

BAXTER & WOODMAN Consulting Engineers

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EXHIBIT 3 - SANITARY SEWER FIELD INVESTIGATION AND PILOT REHABILITATION PROJECT

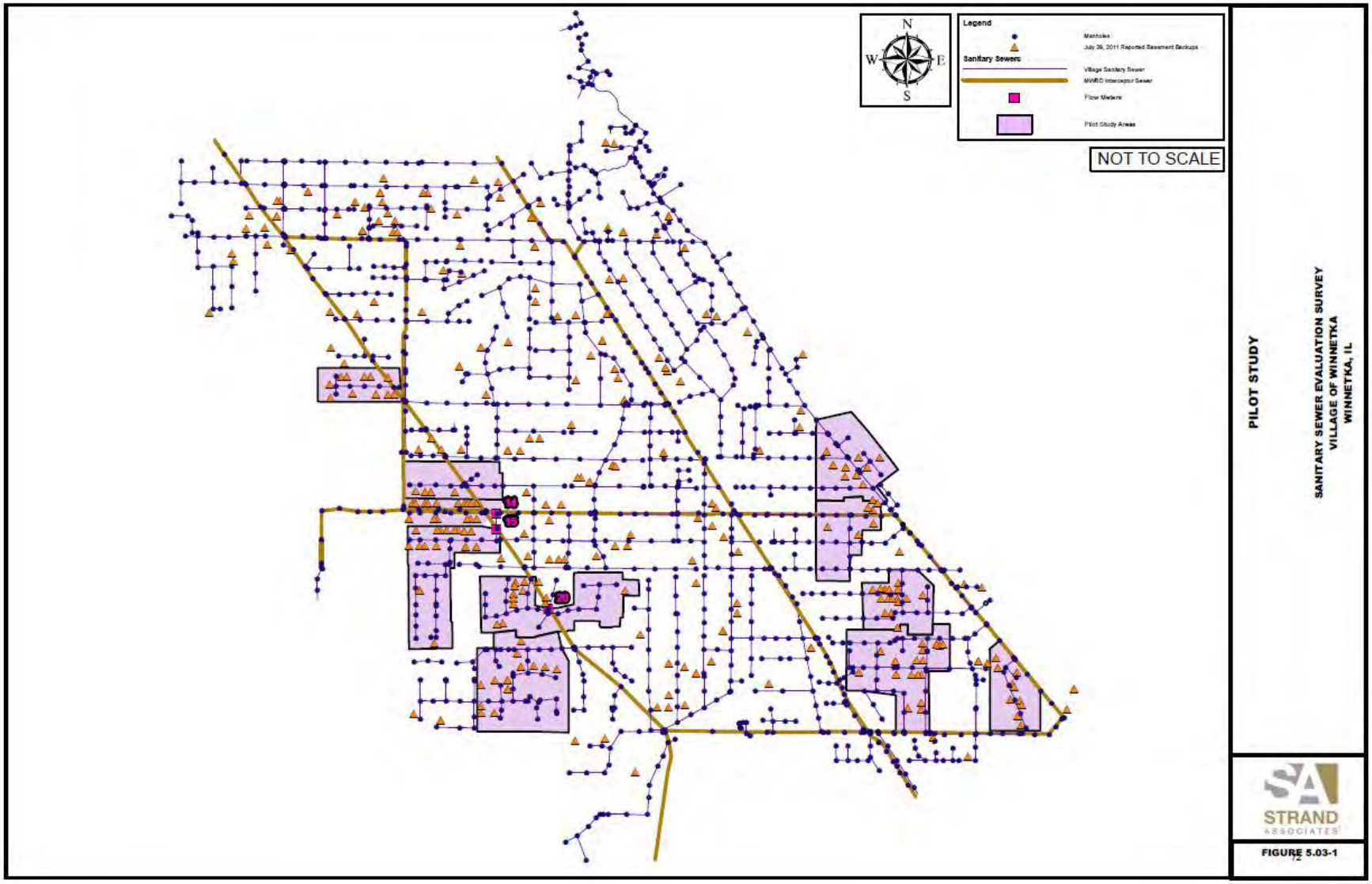


EXHIBIT 4 - WATER QUALITY SAMPLING LOCATIONS

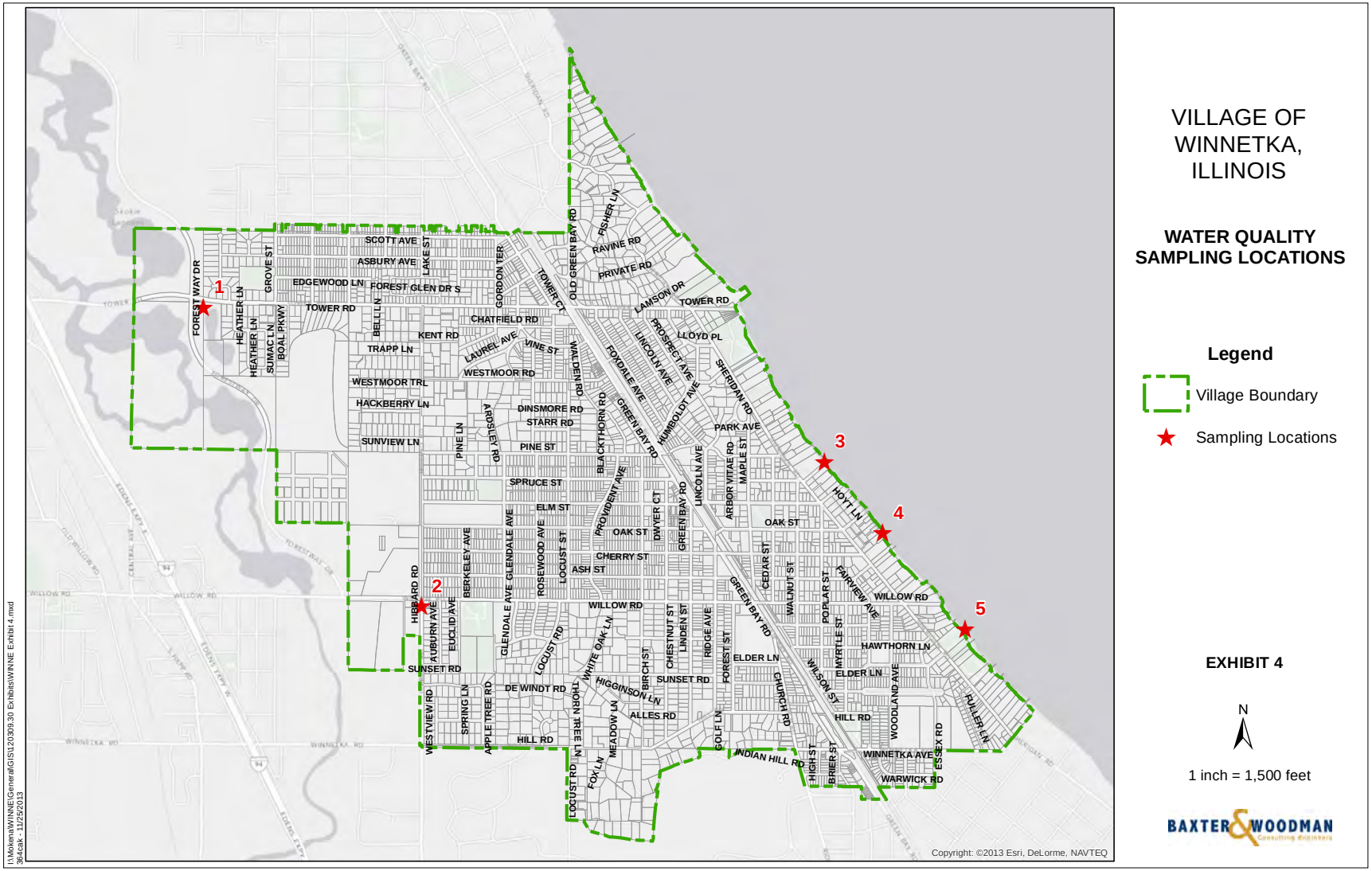


EXHIBIT 5 - SUMMARY OF WATER QUALITY MONITORING DATA

PARAMETER (units)	Water Quality Standards General Use [2]	Water Quality Standards Lake Michigan (Open Waters) [3]	SAMPLING LOCATION AND DATE														
			9/18/2012 (Wet Weather)					9/25/2012 (Dry Weather)					11/12/2012 (Wet Weather)				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Flow (cfs)			X	<.01	0.5	0.29	0.14	X	X	0.12153	0.0625	X	X	X	0.023	0.018	X
Temperature (degress F)				63	63	63	64			68	65				51	51	
Dissolved Oxygen (mg/l)	5.0	*		3.2	8.84	8.91	5.51			8.44	7.24				9.45	10.07	
pH (SU)	6.5 - 9.0	7.0 - 9.0		7.8	7.6	8	7.9			8.4	8.4				7.8	7.8	
Total Dissolved Solids (mg/l)		1000, 180 (OW)		244	512		422			266					400	338	
Total Suspended Solids (mg/l)	narrative - offensive conditions			12.5	U		U			105					9.5	U	
Nitrite (mg/l)				U	U		U			U					1.18	U	
Nitrate (mg/l)		10		0.523	1.83		1.45			0.48					0.961	0.79	
Ammonia (mg/l)	15			0.501	0.1		1.01			1.31					1.93	U	
Total Kjeldahl Nitrogen (mg/l)				1.27	31		1.96			3.77					4	0.725	
Phosphorus, Total (mg/l)	*	0.007		0.322	0.264		0.305			0.983					0.866	0.363	
Conductivity (umhos/cm)				370	640		671			388					744	584	
Chloride (mg/l)	500	500, 12 (OW)		36.6	139		86.4			32.5					121	57.8	
Oil, Fats, and Grease (mg/l)	narrative - offensive conditions			U	U		1.37			1.98					5.83	1.86	
Fecal Coliform (no/100 ml)	200 per 100 ml	*		>2419.6	33.1	>2419.6	>2419.6			>2419.6	770.1				>2419.6	770.1	
Arsenic, Total (mg/l)		0.05		U	U		U								U	U	
Arsenic, Dissolved (mg/l)	*	*		U	U		U								U	U	
Cadmium, Total (mg/l)				U	U		U								U	U	
Cadmium, Dissolved (mg/l)	*	*		U	U		U								U	U	
Chromium, Total (mg/l)				U	U		U								U	U	
Chromium, Dissolved (mg/l)	*	*		U	U		U								U	U	
Chromium, Hexavalent, Total (mg/l)	0.016 (AS), 0.011 (CS)	0.016 (AS), 0.011 (CS)		U	0.01		U								U	U	
Copper, Total (mg/l)				0.0383	0.109		0.0128								0.0378	0.0235	
Copper, Dissolved (mg/l)	*	*		0.028	0.105		0.0097								0.0289	0.0209	
Lead, Total (mg/l)		0.05		0.012	U		U								U	U	
Lead, Dissolved (mg/l)	*	*		U	U		U								U	U	
Mercury, Total (mg/l)		mg/L - 1,700 (AS); 910 (CS); 3.1 (HHS); 1.3		U	U		U								U	U	
Mercury, Dissolved (mg/l)	0.0022 (AS), 0.0011 (CS), 0.00012 (HHS)			U	U		U								U	U	
Nickel, Total (mg/l)				U	U		U								U	U	
Nickel, Dissolved (mg/l)	*	*		U	U		U								U	U	
Selenium, Total (mg/l)	1.0	0.01		U	U		U								U	U	
Selenium, Dissolved (mg/l)		0.005 (CS)		U	U		U								U	U	
Silver, Total (mg/l)	0.005			U	U		U								U	U	
Silver, Dissolved (mg/l)				U	U		U								U	U	
Zinc, Total (mg/l)				0.0145	0.015		0.0121								0.0254	0.012	
Zinc, Dissolved (mg/l)	*	*		U	0.0157		0.0117								0.0183	U	

Sampling locations:
1. Tower Road (and Forestway Drive)
2. Willow Road (and Hibbard Road)
3. Spruce Street (and Sheridan Road)
4. Cherry Street (and Sheridan Road)
5. Elder Lane (and Sheridan Road)

= Water Quality Standard Consistently Not Met

PARAMETER (units)	Water Quality Standards General Use [2]	Water Quality Standards Lake Michigan (Open Waters) [3]	SAMPLING LOCATION AND DATE									
			3/11/2013 (Wet Weather)					4/29/2013 (Dry Weather)				
			1	2	3	4	5	1	2	3	4	5
Flow (cfs)			X	9	0.63	0.17	0.33	X	5.94	5.42	0.25	0.42
Temperature (degress F)				42	39	39.5	40		51.8	50	50	51.8
Dissolved Oxygen (mg/l)	5.0	*		9.9	10.34	10.66	10.52		9.6	10.4	10.14	9.79
pH (SU)	6.5 - 9.0	7.0 - 9.0		7.5	6.8	7.2	7.2		8.4	7.2	8.4	8.4
Total Dissolved Solids (mg/l)		1000, 180 (OW)		306	440	314			732	460		1050
Total Suspended Solids (mg/l)	narrative - offensive conditions			11	U	49			7	52.5		2
Nitrite (mg/l)				0.272	0.214	0.14			U	U		U
Nitrate (mg/l)		10		0.26	0.184	0.15			2.06	1.36		2.82
Ammonia (mg/l)	15			0.288	0.27	0.272			1.32	4.63		0.408
Total Kjeldahl Nitrogen (mg/l)				1.11	1.15	1.42			6.57	11.4		1.34
Phosphorus, Total (mg/l)	*	0.007		0.289	0.26	0.0983			0.126	0.234		0.168
Conductivity (umhos/cm)				588	841	618			1140	764		1730
Chloride (mg/l)	500	500, 12 (OW)		107	189	134			162	179		381
Oil, Fats, and Grease (mg/l)	narrative - offensive conditions			U	U	U			U	U		U
Fecal Coliform (no/100 ml)	200 per 100 ml	*		1413.6	1533.1	>2419.6	-	-	387.3	>2419	1299.7	>2419
Arsenic, Total (mg/l)		0.05		U	U	U						
Arsenic, Dissolved (mg/l)	*	*		U	U	U						
Cadmium, Total (mg/l)				U	U	U						
Cadmium, Dissolved (mg/l)	*	*		U	U	U						
Chromium, Total (mg/l)				U	U	U						
Chromium, Dissolved (mg/l)	*	*		U	U	U						
Chromium, Hexavalent, Total (mg/l)	0.016 (AS), 0.011 (CS)	0.016 (AS), 0.011 (CS)		U	U	U						
Copper, Total (mg/l)				0.0204	0.0153	U						
Copper, Dissolved (mg/l)	*	*		0.0146	0.0103	U						
Lead, Total (mg/l)		0.05		0.00796	U	U						
Lead, Dissolved (mg/l)	*	*		U	U	U						
Mercury, Total (mg/l)		mg/L - 1,700 (AS); 910 (CS); 3.1 (HHS);		U	U	U						
Mercury, Dissolved (mg/l)	0.0022 (AS), 0.0011 (CS), 0.00012 (HHS)			U	U	U						
Nickel, Total (mg/l)				U	U	0.00585						
Nickel, Dissolved (mg/l)	*	*		U	U	U						
Selenium, Total (mg/l)	1.0	0.01		U	U	U						
Selenium, Dissolved (mg/l)		0.005 (CS)		U	U	U						
Silver, Total (mg/l)	0.005			U	U	U						
Silver, Dissolved (mg/l)				U	U	U						
Zinc, Total (mg/l)				0.0217	0.0236	0.0716						
Zinc, Dissolved (mg/l)	*	*		0.0124	0.0129	0.0179						

Sampling locations:
1. Tower Road (and Forestway Drive)
2. Willow Road (and Hibbard Road)
3. Spruce Street (and Sheridan Road)
4. Cherry Street (and Sheridan Road)
5. Elder Lane (and Sheridan Road)

= Water Quality Standard Consistently Not Met

EXHIBIT 5 FOOTNOTES

1. Sampling Notes

Location 1 has a flap gate which was closed on each day samples were collected
U = undetected by laboratory analysis
X - if there was no flowing water, then a sample was not collected

2. Water Quality Standards - General Use Streams
- water quality standards for waters without a specific designation
AS = acute standard; CS = chronic standard; HHS = human health standard

Dissolved Oxygen
A) During the period of March through July
  i) 5.0 mg/L at any time; and
  ii) 6.0 mg/L as a daily mean averaged over 7 days.
B) During the period of August through February,
  i) 3.5 mg/L at any time;
  ii) 4.0 mg/L as a daily minimum averaged over 7 days; and
  iii) 5.5 mg/L as a daily mean averaged over 30 days.

Total Suspended Solids/Fats, Oils and Grease
No numeric standard, however, narrative standard for waters of State to be free of sludge, oil, color, turbidity, etc. other than natural origin.

Total Ammonia Nitrogen
Acute Standards, Chronic Standards, and Sub-Chronic Standards for Total Ammonia Nitrogen vary based on temperature and pH of waterbody.
In no case shall total ammonia nitrogen exceed 15 mg/l.

Phosphorus
Phosphorus as P shall not exceed 0.05 mg/l in any reservoir or lake with a surface areas of 20 acres or more, or in any stream at the point where it enters any such reservoir or lake.

Fecal Coliform
A) During the months May through October, based on a minimum of five samples taken over not more than a 30 day period, fecal coliform (STORET number 31616) shall not exceed a geometric mean of 200 per 100 ml, nor shall more than 10% of the samples during any 30 day period exceed 400 per 100 ml in protected waters. Protected waters are defined as waters which, due to natural characteristics, aesthetic value or environmental significance are deserving of protection from pathogenic organisms. Protected waters will meet one or both of the following conditions:
  i) presently support or have the physical characteristics to support primary contact;
  ii) flow through or adjacent to parks or residential areas.
B) Waters unsuited to support primary contact uses because of physical, hydrologic or geographic configuration and are located in areas unlikely to be frequented by the public on a routine basis as determined by the Agency at 35 Ill. Adm. Code 309.Subpart A, are exempt from this standard.

Metals
The water quality standards for Cadmium (dissolved), Chromium (trivalent, dissolved), Copper (dissolved), Lead (dissolved), Nickel (dissolved), and Zinc (dissolved) varies based on hardness values. A hardness value of 400 mg/l was used for evaluation purposes. This number is based on field colormetric tests.
The water quality standards for Arsenic (trivalent, dissolved) are 0.36 mg/l (AS) and 0.19 mg/l (CS).

EXHIBIT 5 FOOTNOTES

3. Water Quality Standards - Lake Michigan (Open Waters)

Dissolved Oxygen

Must not be less than 90% of saturation, except due to natural causes

Fecal Coliform

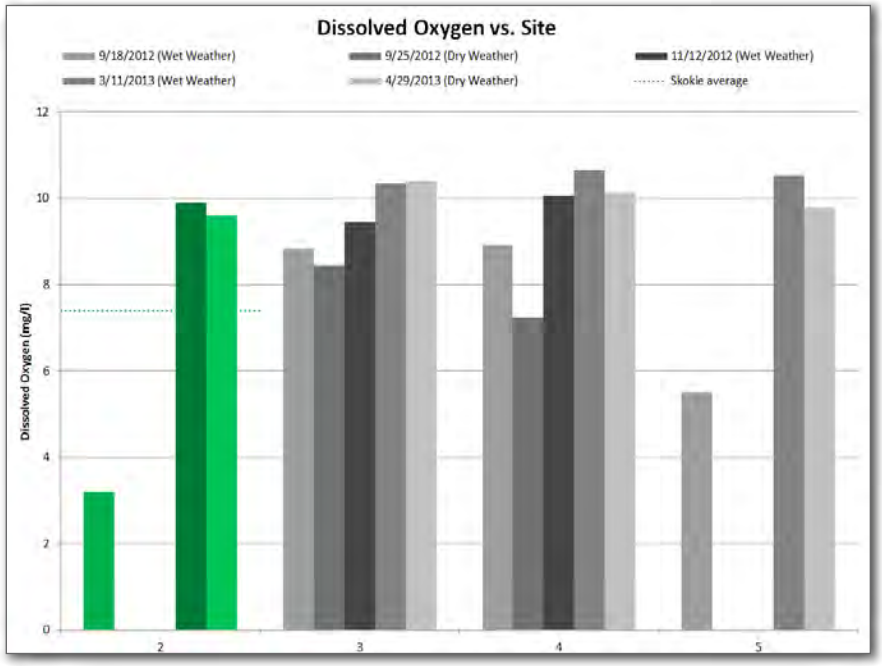
Based on a minimum of five samples taken over not more than a 30-day period, fecal coliform (STORET number 31616) must not exceed a geometric mean of 20 per 100 ml in the Open Waters of Lake Michigan as defined in Section 302.501. The remaining waters of the Lake Michigan Basin must not exceed a geometric mean of 200 per 100 ml, nor shall more than 10% of the samples during any 30 day period exceed 400 per 100 ml.

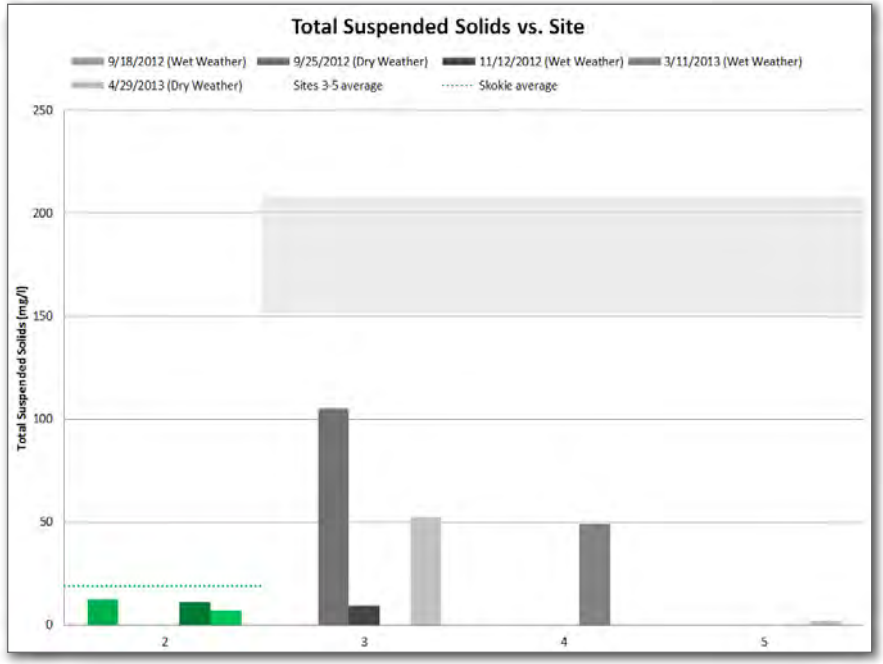
Metals

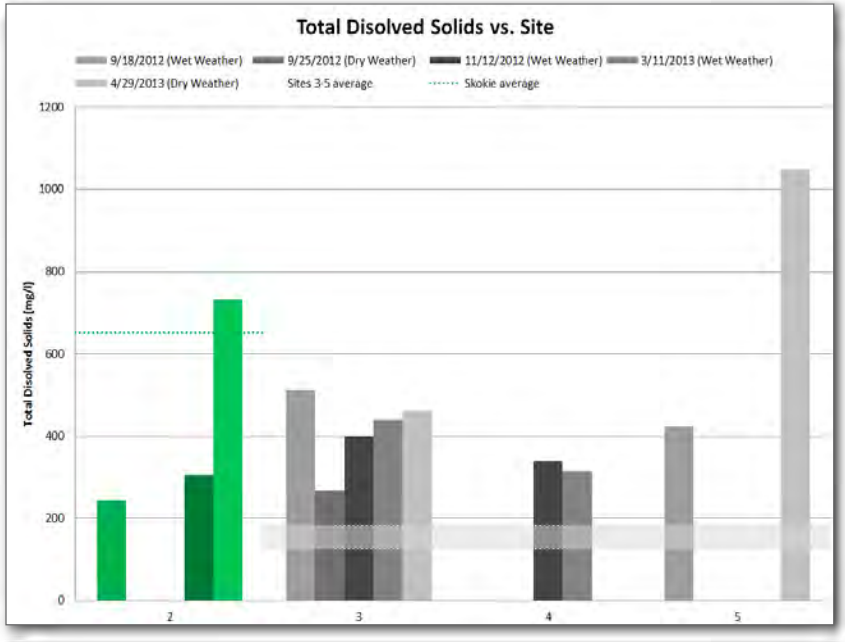
The water quality standards for Cadmium (dissolved), Chromium (trivalent, dissolved), Copper (dissolved), Lead (dissolved), Nickel (dissolved), and Zinc (dissolved) varies based on hardness values.

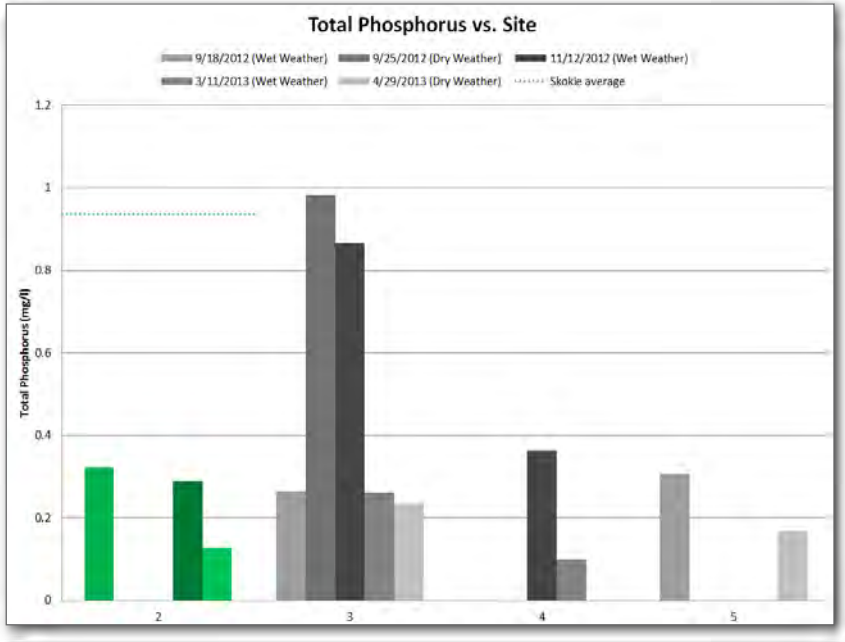
The water quality standards for Arsenic (trivalent, dissolved) are 0.34 mg/l (AS) and 0.148 mg/l (CS).

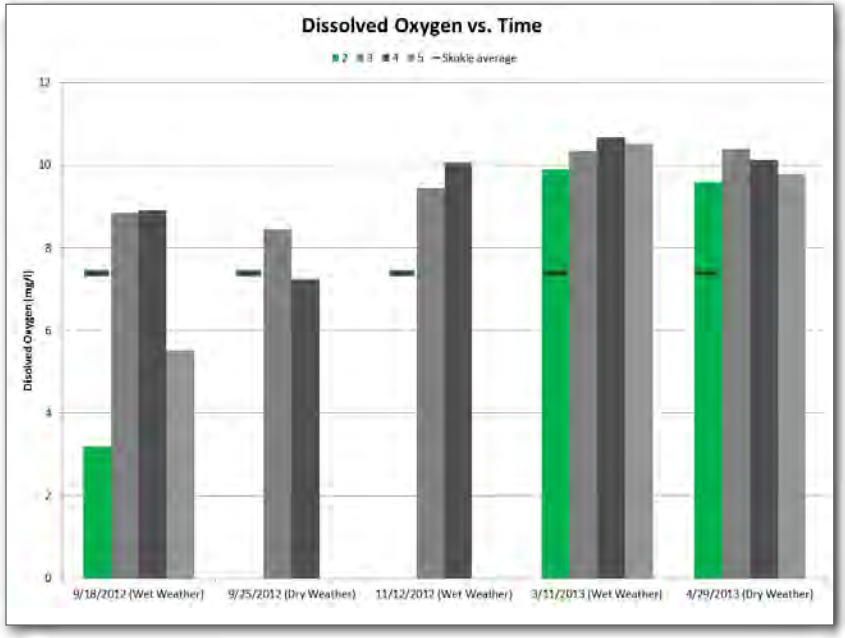
EXHIBIT 6 - WATER QUALITY MONITORING RESULTS

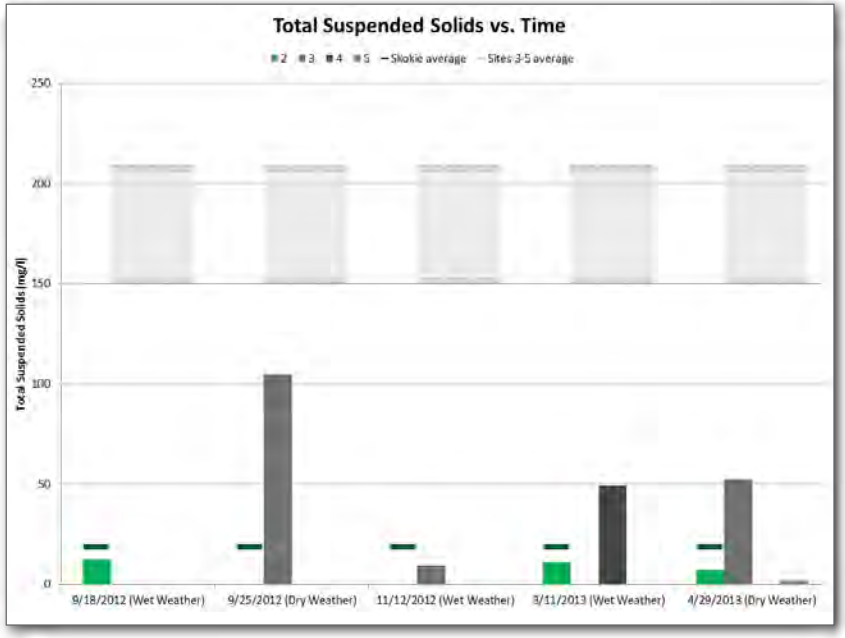


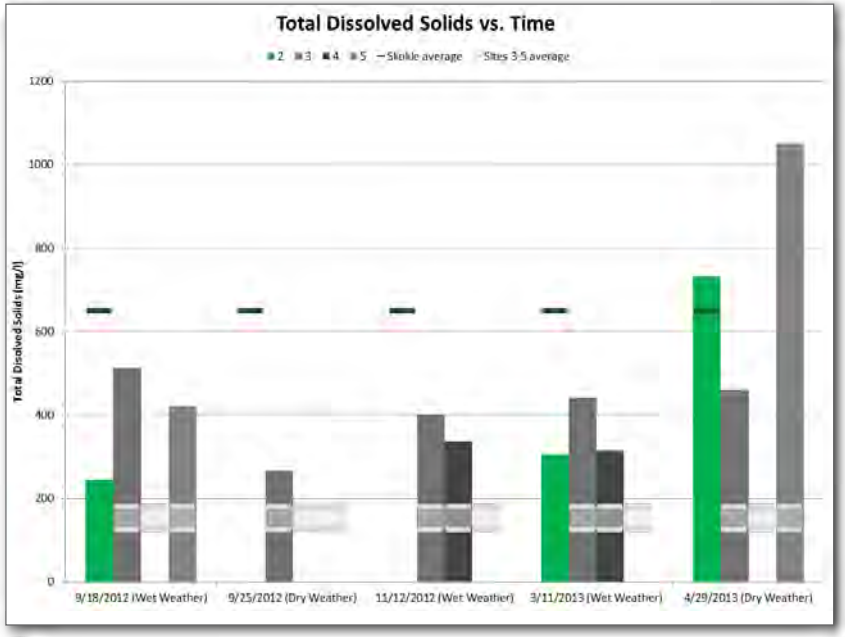


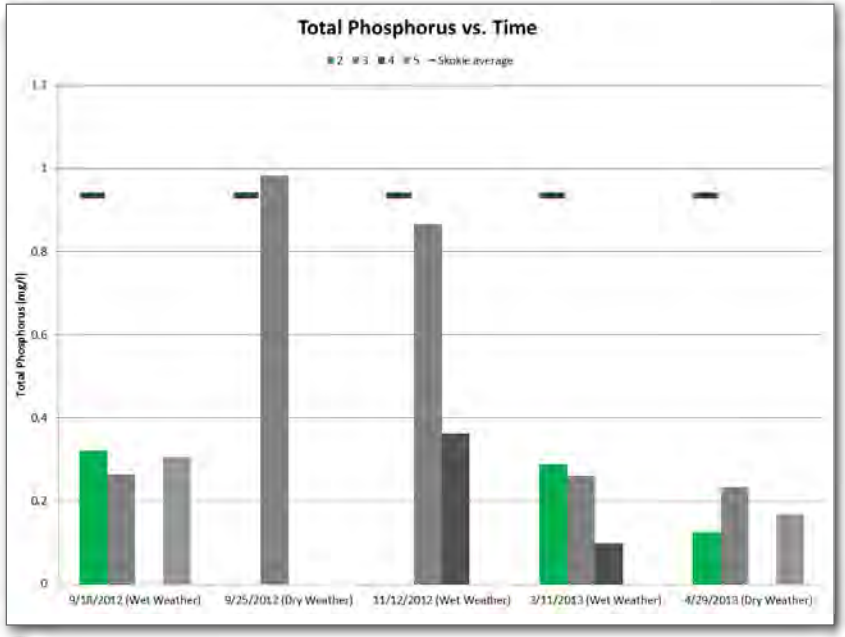

Total Disolved Solids vs. Site
9/18/2012 (Wet Weather)
9/25/2012 (Dry Weather)
11/12/2012 (Wet Weather)
3/11/2013 (Wet Weather)
4/29/2013 (Dry Weather)
Sites 3-5 average
Skokie average
Total Disolved Solids (mg/l)
0
200
400
600
800
1000
1200
2
3
4
5

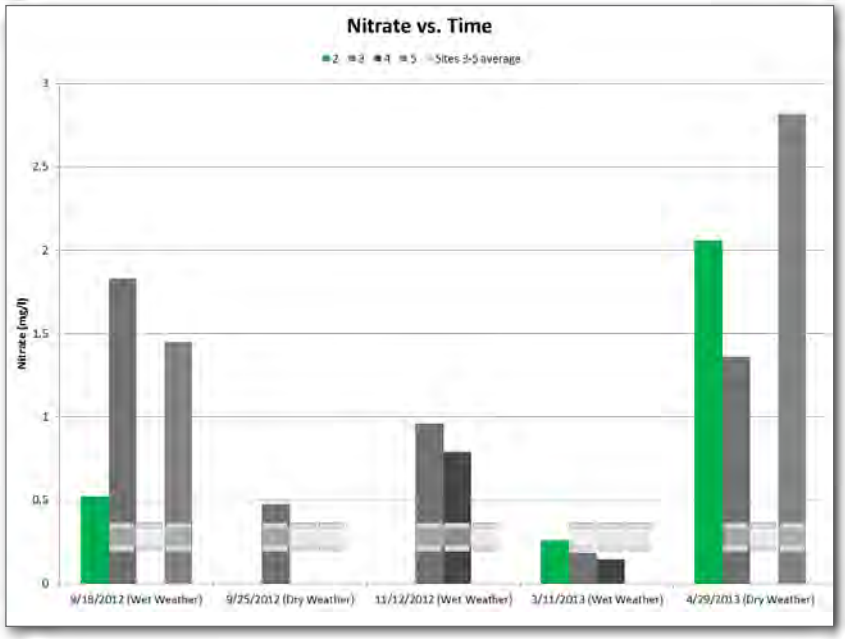

Total Phosphorus vs. Site
9/18/2012 (Wet Weather)
9/25/2012 (Dry Weather)
11/12/2012 (Wet Weather)
3/11/2013 (Wet Weather)
4/29/2013 (Dry Weather)
Skokie average
Total Phosphorus (mg/l)
0
0.2
0.4
0.6
0.8
1
1.2
2
3
4
5

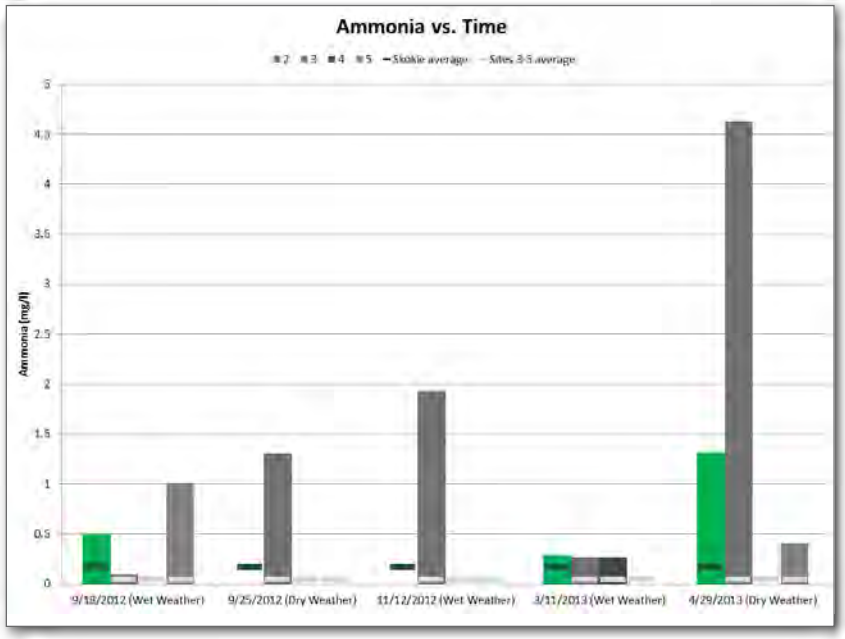

Dissolved Oxygen vs. Time
2
3
4
5
Skokie average
Dissolved Oxygen (mg/l)
0
2
4
6
8
10
12
9/18/2012 (Wet Weather)
9/25/2012 (Dry Weather)
11/12/2012 (Wet Weather)
3/11/2013 (Wet Weather)
4/29/2013 (Dry Weather)

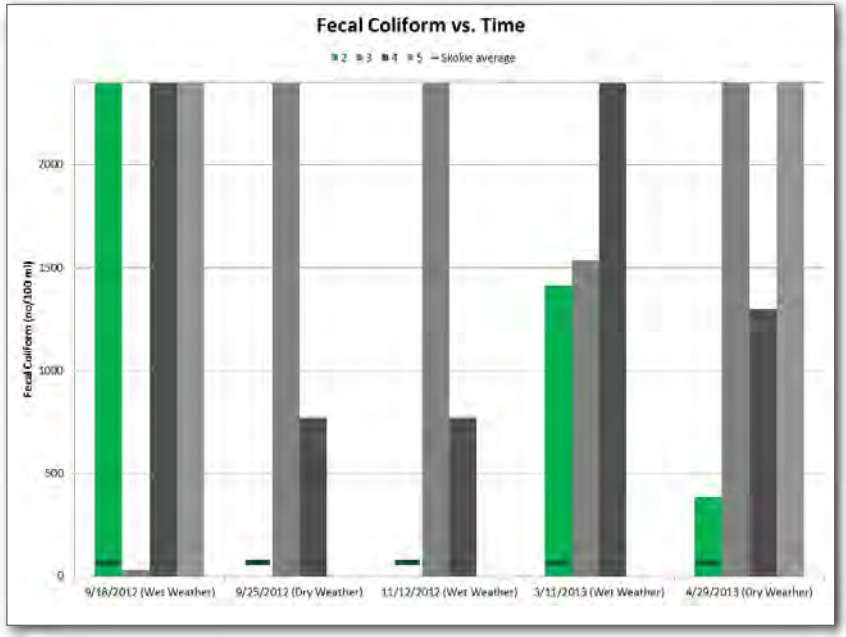

Total Suspended Solids vs. Time
2
3
4
5
Skokie average
Sites 3-5 average
Total Suspended Solids (mg/l)
0
50
100
150
200
250
9/18/2012 (Wet Weather)
9/25/2012 (Dry Weather)
11/12/2012 (Wet Weather)
3/11/2013 (Wet Weather)
4/29/2013 (Dry Weather)

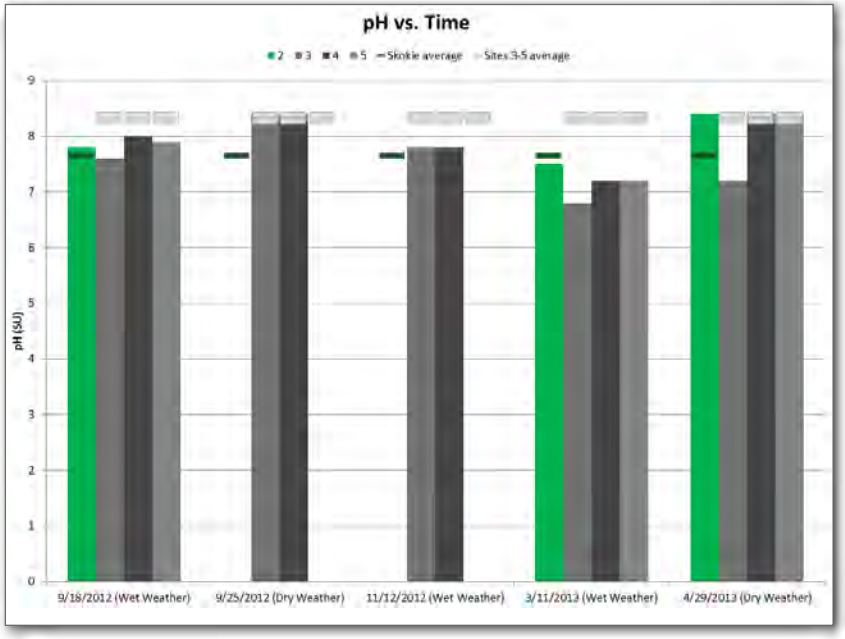

Total Dissolved Solids vs. Time
2 3 4 5 Skokie average Sites 3-5 average
Total Dissolved Solids (mg/l)
1200
1000
800
600
400
200
0
9/18/2012 (Wet Weather)
9/25/2012 (Dry Weather)
11/12/2012 (Wet Weather)
3/11/2013 (Wet Weather)
4/29/2013 (Dry Weather)


Total Phosphorus vs. Time
2 3 4 5 Skokie average
Total Phosphorus (mg/l)
1.2
1
0.8
0.6
0.4
0.2
0
9/18/2012 (Wet Weather)
9/25/2012 (Dry Weather)
11/12/2012 (Wet Weather)
3/11/2013 (Wet Weather)
4/29/2013 (Dry Weather)


Nitrate vs. Time
2 3 4 5 Sites 3-5 average
Nitrate (mg/l)
3
2.5
2
1.5
1
0.5
0
9/18/2012 (Wet Weather)
9/25/2012 (Dry Weather)
11/12/2012 (Wet Weather)
3/11/2013 (Wet Weather)
4/29/2013 (Dry Weather)


Ammonia vs. Time
2 3 4 5 Skokie average Sites 3-5 average
Ammonia (mg/l)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
9/18/2012 (Wet Weather)
9/25/2012 (Dry Weather)
11/12/2012 (Wet Weather)
3/11/2013 (Wet Weather)
4/29/2013 (Dry Weather)


Fecal Coliform vs. Time
2 3 4 5 Skokie average
Fecal Coliform (no/100 ml)
0
500
1000
1500
2000
9/18/2012 (Wet Weather)
9/25/2012 (Dry Weather)
11/12/2012 (Wet Weather)
3/11/2013 (Wet Weather)
4/29/2013 (Dry Weather)


pH vs. Time
2 3 4 5 Skokie average Sites 3-5 average
pH (SU)
0
1
2
3
4
5
6
7
8
9
9/18/2012 (Wet Weather)
9/25/2012 (Dry Weather)
11/12/2012 (Wet Weather)
3/11/2013 (Wet Weather)
4/29/2013 (Dry Weather)

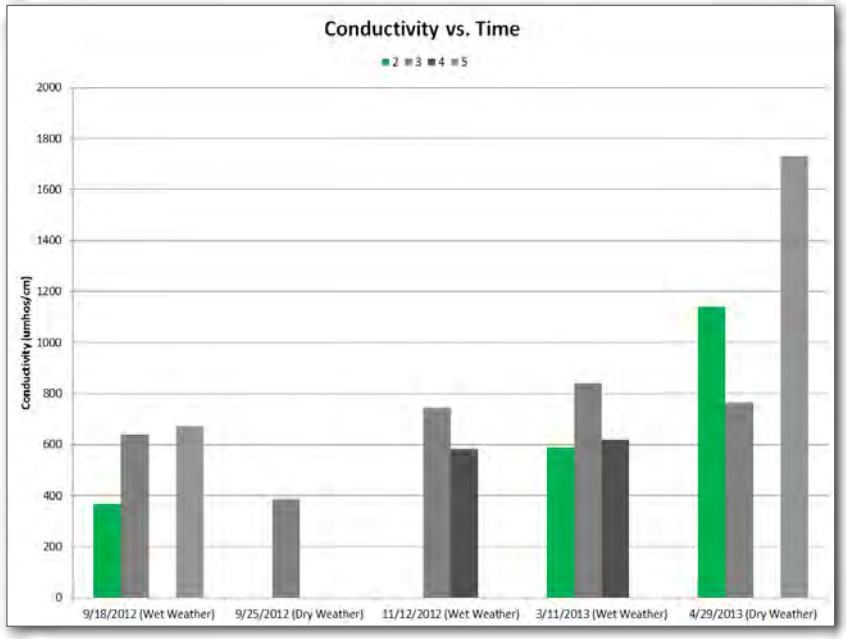

Conductivity vs. Time
2 3 4 5
Conductivity (umhos/cm)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
9/18/2012 (Wet Weather)
9/25/2012 (Dry Weather)
11/12/2012 (Wet Weather)
3/11/2013 (Wet Weather)
4/29/2013 (Dry Weather)

EXHIBIT 7 - SIDE-BY-SIDE COMPARISON OF STORMWATER REGULATIONS

	Village of Winnetka	Cook County Watershed Management Ordinance	Village of Glenview	Lake County Watershed Development Ordinance	Recommendations
Administrative Requirements					
Size of regulated development	Any	Any qualified sewer construction[1], any development in a flood protection area or impacting a wetland, any substantial improvements to buildings in the floodplain, and development disturbing more than 0.5 acre	Excavation or fill, or any combination thereof, will exceed 100 cubic yards or 5,000 square feet; Fill will exceed three feet in vertical height at its highest point, measured from the natural ground surface; Excavation will exceed four feet in vertical depth at its deepest point; removal of more than 5,000 square feet of vegetative cover on sites 10 acres or larger	Any development in a floodplain or impacting a wetland, a public road development creating at least 1.5 ac and 1.5 ac/mile of new impervious area, any development disturbing 5000 square feet	Maintain existing Village regulations, but the submittal requirements should be appropriate for the size and type of development. The Village's existing submittal requirements should remain unchanged for smaller projects outside the floodplain and wetlands. The submittal requirements for projects regulated by the Cook County Watershed Management Ordinance (WMO) would have to match the WMO requirements at a minimum.
Types of regulated development	Any construction activity on any property in the Village	Any human-induced activity or change to real estate	Altering the terrain on a site and/or providing construction on a site and/or providing landscaping on a site.	Completion of a final plat, or man-made change to private or public real estate	Maintain existing Village regulations
Exempted projects	Ordinary repairs	Agriculture or gardening, installation/renovation/replacement of utilities, maintenance of lawns and impervious areas, improvements to buildings in the floodplain which are not a substantial improvement	Excavation or removal of vegetation in public utility easements by public utility companies for the purpose of installing underground utilities; tilling of the soil for fire protection purposes; engaging in certain farming, agricultural, or conservation enterprises[2]	Maintenance of buildings, facilities, and roads, gardening and agricultural practices, minor construction activity outside of floodplains and wetlands that does not affect stormwater runoff rates or volumes	Maintain existing Village regulations
Projects requiring MWRD/County approval	Construction of sewer serving a non-residential building or a residential building with 25 or more units, connection to MWRD facilities, disturbance of an area tributary to an MWRD permitted detention facility, or disturbance of an area subject to an MWRD encumbrance for detention	Development in combined sewer areas, qualified sewer construction[1], connection to MWRD facilities, development draining to waterways or Lake Michigan, development modifying an existing detention basin or the service area of an existing detention basin, new sewer connections for existing non-residential development	Development in combined sewer areas, qualified sewer construction, connection to MWRD facilities, development draining to waterways or Lake Michigan, development modifying an existing detention basin or the service area of an existing detention basin, new sewer connections for existing non-residential development	Public road development, Forest Preserve development, base flood elevation analyses of more than 100 ac. (riverine) or 20 ac. (depressional) tributary area, and local unit of government development in the floodplain	Match new Cook County Watershed Management Ordinance
Allowances for re-development	For improvements to an existing home causing an increase in impermeable lot coverage $\geq$ 25%, detention is required for only the incremental volume of runoff from the new impervious area. For new home construction on a previously developed lot, detention is required for the incremental volume of runoff from the maximum impermeable lot coverage compared to the existing condition. [3]	Reduce the retention requirements[4] and waive the requirements for additional detention[5] under certain circumstances	Additions or structural site changes to existing commercial or multi-family developments may get relief from the full detention requirements based on Village Engineering review of existing site conditions. In no case will the volume be less than 50% of required.	None	Maintain existing Village regulations
Permit term	15 months after the permit is issued	3 years after the permit is issued	1 year after the permit is issued	3 years after the permit is issued and not more than 180 days after modification of NFIP regs, FIRM or FIS	Maintain existing Village regulations

	Village of Winnetka	Cook County Watershed Management Ordinance	Village of Glenview	Lake County Watershed Development Ordinance	Recommendations
Long-term maintenance	Not required	Required for detention ponds, sewer construction, wetland mitigation, and riparian area mitigation	Not required (1-year maintenance bond required)	Required for all stormwater management system components that are part of a major development	Match new Cook County Watershed Management Ordinance (WMO) requirements for projects regulated by the WMO and consider applying these requirements (or a modified version of the requirements) to projects that are not regulated by the WMO
Variances	Village can amend or vary its standards and conditions whenever it is in the best interest of the public health, safety, and welfare	MWRD may issue a variance based on certain criteria[6]	The Village Engineer can grant a variance from the Village standards based on unique conditions and characteristics of a project, when the variance can be shown to benefit the Village.	The County or a Certified Community may issue a variance based on certain criteria[7]	Only the MWRD will be allowed to issue a variance for projects regulated by the new Cook County Watershed Management Ordinance (WMO). The Village should reserve the right to issue variances for all other regulated projects.
Runoff Requirements					
Protection of off-site properties	No new building, structure, or addition is allowed which will result in an increase in runoff onto an adjacent property without making adequate provision for the additional runoff. No grading is allowed which will cause water to be diverted, detained, or concentrated onto an abutting or nearby property.	No increase of flood elevations or decrease flood conveyance capacity upstream or downstream	No adverse impact on adjacent properties	All concentrated discharges must be conveyed into a maintainable outlet with adequate downstream capacity and must not result in an increased flood and drainage hazard	Maintain existing Village regulations
Development requiring detention	Infill development, re-development of individual lots increasing impermeable lot coverage $\geq$ 25%, single family residential subdivisions, multi-family residential development and commercial developments	Residential subdivisions on 5-acres or more, 0.5 acres or more of multi-family residential and non-residential development on 3-acres or more, and right-of-way development totaling 1-acre or more new impervious area	Single family homes in a multi-family development of three or more lots, or comprising an area greater than 1 acre with 2 or more lots, all multi-family developments and all commercial and industrial developments	More than 1 acre of new impervious surface, more than 3 acres of development[8], or an impervious surface area ratio of 50% or greater[8]	Maintain existing Village regulations and consider crediting the storage volume within stormwater best management practices toward the required detention volume
Allowable release rate	Undeveloped 3-year runoff rate	100-year = 0.30 cfs/ac until January 1, 2019 and 0.15 cfs/ac after January 1, 2019	Undeveloped 3-year runoff rate	100-year = 0.15 cfs/ac, 2-year = 0.04 cfs/ac (Squaw Creek Watershed 0.09 cfs/ac and 0.02 cfs/ac)	Match new Cook County Watershed Management Ordinance (WMO) requirements for projects regulated by the WMO and consider applying these requirements to projects that are not regulated by the WMO
Rainfall data	Bulletin 70	Bulletin 70	Bulletin 70	Bulletin 70	Maintain existing Village regulations
Protection of depressional storage	Not required	Required	Required, including for depressional storage areas identified in Village's Flood Risk Reduction Program.	Required for depressional storage greater than 0.75 acre feet	Match new Cook County Watershed Management Ordinance (WMO) requirements for projects regulated by the WMO and consider applying these requirements to projects that are not regulated by the WMO. Small projects that do not require submittal of a grading plan should be exempt from these requirements.

	Village of Winnetka	Cook County Watershed Management Ordinance	Village of Glenview	Lake County Watershed Development Ordinance	Recommendations
Water quality	Design practices required whenever possible	Incorporated into runoff volume reduction requirements	Not required	Incorporated into runoff volume reduction requirements; hydrocarbon removal technology required for parking > 25 stalls and vehicle fueling and servicing facilities	Match new Cook County Watershed Management Ordinance (WMO) requirements for projects regulated by the WMO and consider applying these requirements to projects that are not regulated by the WMO. Small projects that do not require submittal of plans prepared by a professional engineer should be exempt from these requirements.
Runoff volume reduction	Not required	Retain and infiltrate the first inch of runoff from the impervious area of development	Natural measures that reduce runoff are highly encouraged	Incorporate infiltration, evapotranspiration, reuse, or other methods to the maximum extent practicable[9]	Match new Cook County Watershed Management Ordinance (WMO) requirements for projects regulated by the WMO and consider applying these requirements to projects that are not regulated by the WMO. Small projects that do not require submittal of plans prepared by a professional engineer should be exempt from these requirements.
Floodplain Requirements					
Flood protection elevation	100-year flood elevation plus 1 foot of freeboard	100-year flood elevation plus 2 feet of freeboard	100-year flood elevation plus 1 foot of freeboard	100-year flood elevation plus 2 feet of freeboard	Match new Cook County Watershed Management Ordinance (WMO) requirements for all regulated projects
Compensatory storage	1 to 1	1.1 to 1	1 to 1	1.2 to 1 for riverine floodplain; 1.0 to 1 for non-riverine floodplain	Match new Cook County Watershed Management Ordinance (WMO) requirements for all regulated projects
National Flood Insurance Program compliance	Yes	No. The new Cook County Watershed Management Ordinance does not require a permit for every improvement to buildings in the floodplain. Instead it only requires a permit for substantial improvements to buildings in the floodplain.	Yes	Yes	Maintain existing Village regulations
Natural Area Requirements					
Buffer areas	U.S. Army Corps of Engineers requirements	U.S. Army Corps of Engineers requirements and 30- to 100-feet[10] for isolated wetlands	U.S. Army Corps of Engineers requirements	U.S. Army Corps of Engineers requirements and 30-feet to 100-feet[11]	Match new Cook County Watershed Management Ordinance (WMO) requirements for projects regulated by the WMO, but do not apply these requirements to other projects regulated by the Village
Wetland mitigation	U.S. Army Corps of Engineers requirements	U.S. Army Corps of Engineers requirements and 1.5:1 to 3:1[12] for isolated wetlands	U.S. Army Corps of Engineers requirements	U.S. Army Corps of Engineers requirements and 1.5:1 to 6:1 for isolated wetlands[13]	Match new Cook County Watershed Management Ordinance (WMO) requirements for projects regulated by the WMO, but do not apply these requirements to other projects regulated by the Village
Riparian areas	U.S. Army Corps of Engineers requirements	U.S. Army Corps of Engineers requirements and 30-feet to 100-feet[14] for isolated wetlands	U.S. Army Corps of Engineers requirements	Incorporated into buffer area requirements	Match new Cook County Watershed Management Ordinance (WMO) requirements for projects regulated by the WMO, but do not apply these requirements to other projects regulated by the Village

	Village of Winnetka	Cook County Watershed Management Ordinance	Village of Glenview	Lake County Watershed Development Ordinance	Recommendations
Construction Site Requirements					
Inspection frequency	IEPA requirements for construction sites over 1 acre and prior to backfilling a new pipe trench	IEPA requirements for construction sites over 1 acre, after mobilization and installation of initial erosion and sediment control practices, during excavation, and at the completion of the development	IEPA requirements even for construction sites less than 1 acre, at rough grading and final inspection	IEPA requirements even for construction sites less than 1 acre, upon completion of sediment and runoff control measures, after stripping and clearing, after rough grading, after final grading, after seeding and landscaping, after final stabilization, and after removal of sediment and erosion controls	Match new Cook County Watershed Management Ordinance (WMO) requirements for projects regulated by the WMO and consider applying these requirements to projects that are not regulated by the WMO
Site stabilization	Within 30 days of removal of existing vegetation	Within 14 days after construction activities have ceased	Within 14 days after construction activities have ceased	Within 14 days after construction activities have ceased	Adopt both requirements as a dual-performance standard for all regulated development.

Footnotes:

1. Qualified sewer construction includes all public and private new sewers and new sewer connections exterior to a building envelope, except: sewer services serving less than three private single-family homes, storm sewer tributary to a waterway in separate sewer areas, septic system sewers, footing drains, grey water harvesting sewers, and sewers and sewer connections outside MWRD boundaries.
2. Tilling of the soil, or construction of grassed waterways, terraces, surface water diversions, grade stabilization structures, provided that the activity is located on property zoned solely for farming or agricultural purposes.
3. These allowances are not made for redevelopment of a site with a different use (single family to multi-family or commercial)
4. For redevelopment with site constraints that prevent use of retention-based practices to retain the control volume in full, a co-applicant may reduce existing impervious area within the redevelopment area by 5% for every 25% of control volume, however, the co-applicant shall: (1) demonstrate that site limitations prevent the co-applicant from providing the entire control volume onsite; and (2) Provide the control volume onsite to the maximum extent practicable with retention-based practices.
5. Refer to Article 5, Section 505 of the Cook County Watershed Management Ordinance.
6. Refer to Article 11 of the Cook County Watershed Management Ordinance.
7. Refer to Article V, Section A of the Lake County Watershed Development Ordinance.
8. (unless the total new impervious surface area is less 0.5-acre)
9. Refer to Article IV, Section B, Paragraph 1.d of the Lake County Watershed Development Ordinance.
10. Minimum isolated buffer widths are as follows: 30-feet from the boundary of standard isolated wetlands greater than or equal to 0.10-acre and less than 0.5-acre in area; 50-feet for standard isolated wetlands greater than or equal to 0.5-acre in area; or 100-feet for high quality isolated wetlands.
11. Refer to Article IV, Section B, Paragraph 1.i of the Lake County Watershed Development Ordinance.
12. Mitigation impacting an isolated wetland must replace the lost wetland environment as follows: standard isolated wetlands less than 0.10-acre in aggregate do not require mitigation; standard isolated wetlands greater than or equal to 0.10-acre in aggregate at a minimum ratio of 1.5:1 for each acre impacted; high quality isolated wetlands at a minimum ratio of 3:1 for each acre impacted; a greater compensation ratio may be required where unique wetland functions are threatened.

13. Mitigation shall provide for the replacement of the wetland environment lost to development at the following proportional rates: for wetland impacts to areas that are not high-quality aquatic resources under Categories I, II, and III, a minimum of 1.5:1 mitigation ratio shall be required or a minimum 1:1 mitigation ratio for fully certified wetland mitigation bank credits; a minimum of 3:1 for wetland impacts that are high-quality aquatic resources; a minimum of 6:1 for wetland impacts that are high-quality forested wetlands; for wetland impacts to open waters that are not high-quality aquatic resources under Categories I, II, and III, a minimum of 1:1 mitigation ratio shall be required.

14. The boundaries of riparian environments are established as follows: for any jurisdictional Waters of the U.S. that does not qualify as wetlands, the riparian environment shall be 50-feet from the ordinary high water mark (OHWM); for any isolated waters that do not qualify as wetlands, the riparian environment shall be 30-feet from the OHWM; for any jurisdictional Waters of the U.S. or for any isolated waters that do not qualify as wetlands, and which have a Biological Stream Characterization of "A" or "B", the riparian environment shall be 100-feet from the OHWM; for any jurisdictional Waters of the U.S. or isolated waters that do not qualify as wetlands identified as a Biologically Significant Stream, the riparian environment shall be 100-feet from the OHWM.

APPENDICES

"A plan is a vision for a community as expressed by its citizens. The key to creating a vision is effective public participation throughout the plan development process."

A 2020 Vision for Winnetka