



The Metropolitan

Water Reclamation District

of Greater Chicago

**WELCOME
TO THE NOVEMBER EDITION
OF THE 2017
M&R SEMINAR SERIES**

BEFORE WE BEGIN

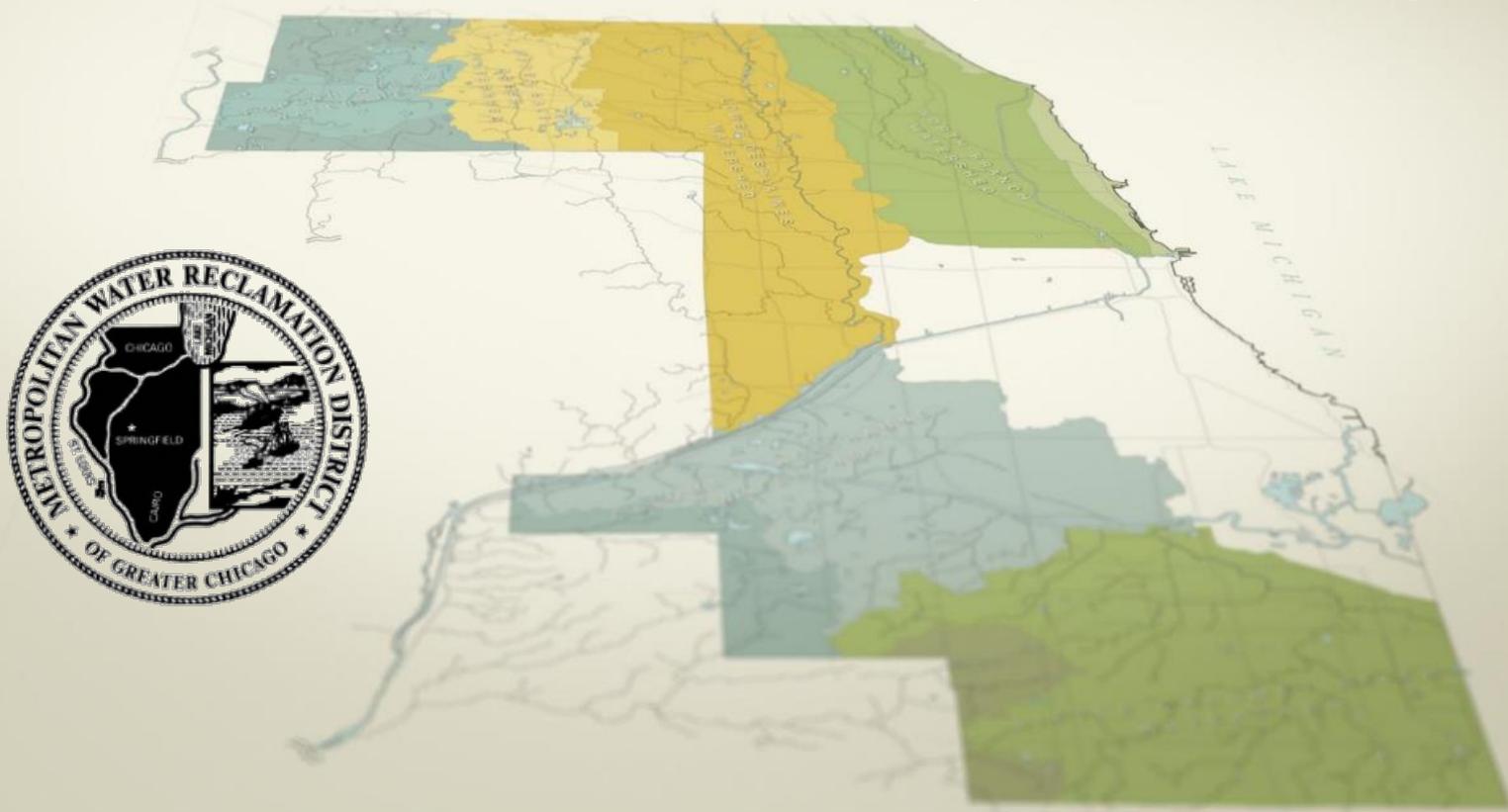
- **SAFETY PRECAUTIONS**
 - PLEASE FOLLOW EXIT SIGN IN CASE OF EMERGENCY EVALUATION
 - AUTOMATED EXTERNAL DEFIBRILLATOR (AED) LOCATED OUTSIDE
- **PLEASE SILENCE CELL PHONES OR SMART PHONES**
- **QUESTION AND ANSWER SESSION WILL FOLLOW PRESENTATION**
- **PLEASE FILL EVALUATION FORM**
- **SEMINAR SLIDES WILL BE POSTED ON MWRD WEBSITE (www.MWRD.org: Home Page ⇒ Reports ⇒ M&R Data and Reports ⇒ M&R Seminar Series ⇒ 2017 Seminar Series)**
- **STREAM VIDEO WILL BE AVAILABLE ON MWRD WEBSITE (www.MWRD.org: Home Page ⇒ MWRDGC RSS Feeds)**

Joseph R. Kratzer, P.E., CFM

- Current:*** Managing Civil Engineer, Stormwater Management and Local Sewers System Sections, Engineering Department, MWRD
- Experience:*** Principal Civil Engineer/Senior Civil Engineer, Stormwater Management Section, managing and developing stormwater management programs; Assistant/Associate Civil Engineer (2003 to 2006), *Planning and Sewer Design Section, Engineering Department, MWRD*; *Design Engineer, Earth Tech (Chicago Water Partners)*; Project Engineer, ENSR Corporation and IT Corporation
- Education:*** B.S. in Civil Engineering, Purdue University, West Lafayette, Indiana
- Professional:*** Registered professional engineer in Illinois
Certified Floodplain Manager
Member of APWA, IAFSM (Illinois Association of Floodplain and Stormwater Managers)
Board Director of Beverly Improvement Association

Metropolitan Water Reclamation District of Greater Chicago

Stormwater Management Program



November 2017 M&R Seminar

November 17, 2017 – Cicero, IL



Stormwater Management Programs

Flooding remains our #1 issue

- Stormwater Phase I (DWP) Projects
 - Design and Construction of Regional Flood Control and Streambank Stabilization Projects
- Stormwater Phase II Projects
 - Funding of Shovel-Ready Projects
 - Design of Conceptual Projects
- Green Infrastructure
 - Partnerships with Local Communities
- Flood-Prone Property Acquisitions
 - Voluntary buyouts where no practical engineered solution exists



Stormwater Management Program

MWRD conveyed authority in November 2004 to plan, manage, implement, and finance activities relating to stormwater management in Cook County

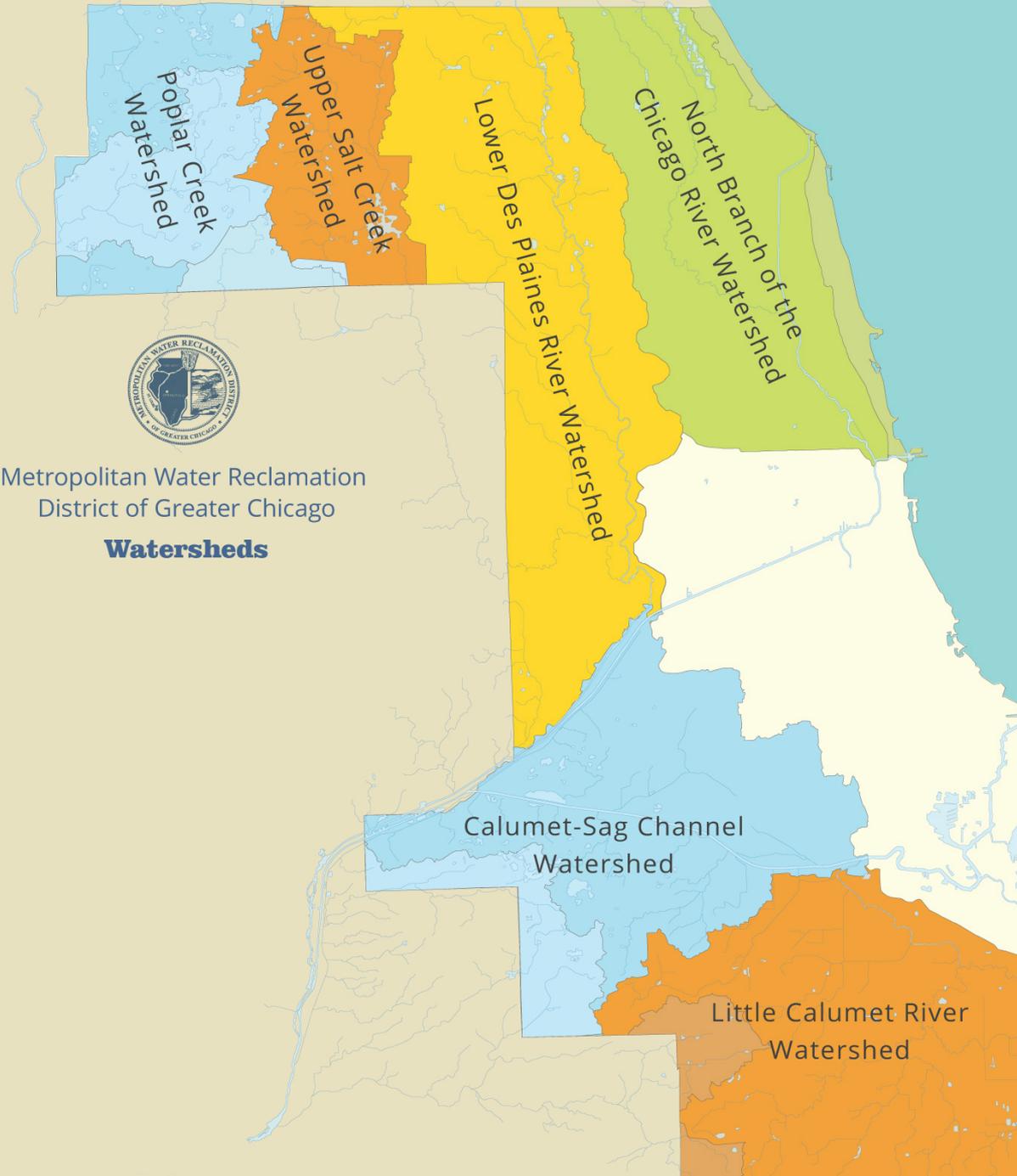
Cook County Stormwater Management Plan (CCSMP) adopted in 2007 establishing program framework

Primary Stormwater Management Activities:

- Develop Capital Improvement Program (CIP) to address REGIONAL stormwater problems
- Comprehensive uniform stormwater regulations to ensure future development and redevelopment does not exacerbate flooding

6 Major Watersheds
Over 900 square miles,
& 125 Communities,

Combined sewer areas
comprise 375 square
miles served by TARP



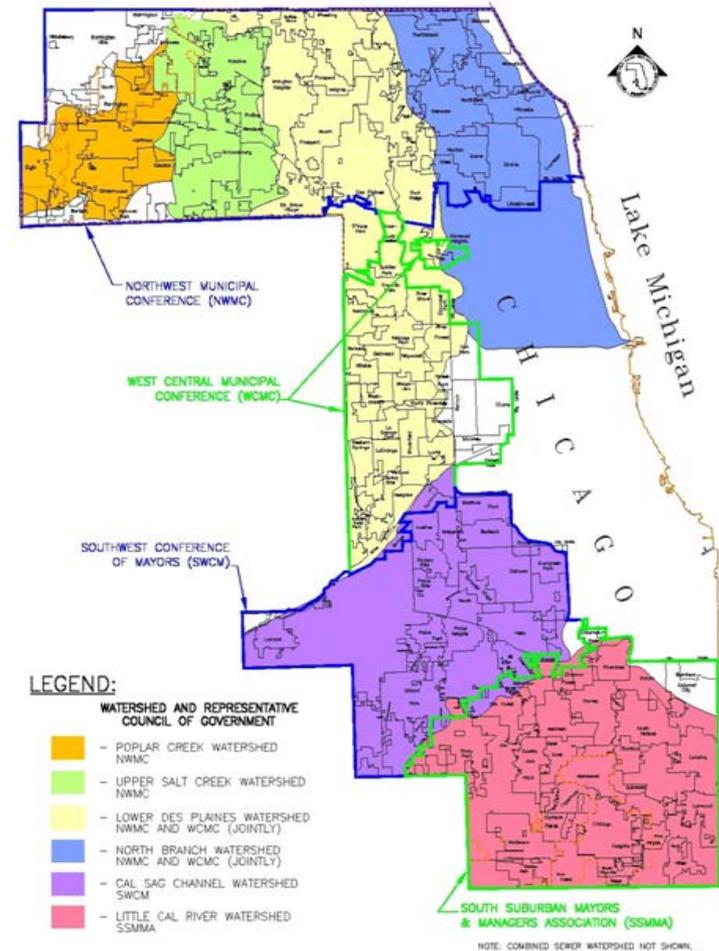
Metropolitan Water Reclamation
District of Greater Chicago

Watersheds



Detailed Watershed Plan Development

- Poplar Creek
- Upper Salt Creek
- Lower Des Plaines River
- North Branch Chicago River
- Calumet-Sag Channel
- Little Calumet River



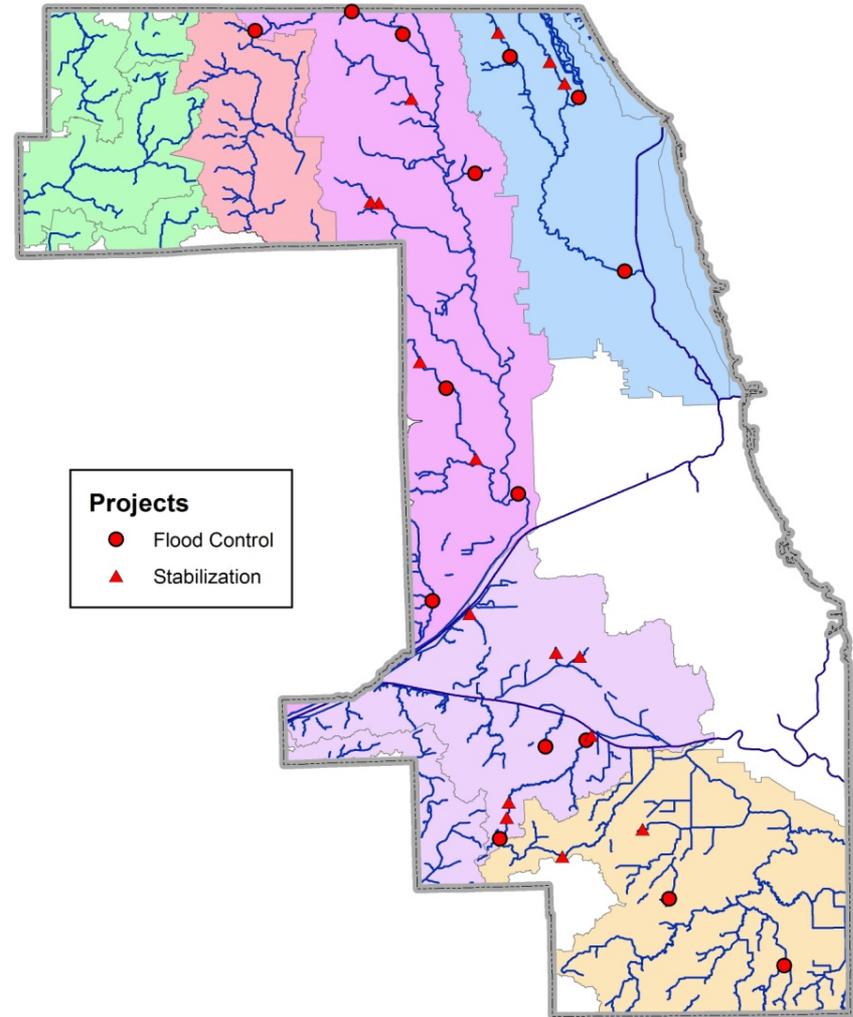


Recommended DWP Projects

15 Flood Control Projects to address overbank flooding

12 Streambank Stabilization Projects to address critical erosion

Prioritized based on Benefit-to-Cost Ratio and Distributed across Cook County





Regional Streambank Projects

Streambank Stabilization Projects

- Address erosion threatening structures, roadways, utilities on regional waterways
- Natural channel design is our goal where practical
- Structural measures when necessary
 - Concrete walls
 - Sheet piles
 - Gabions







Current Stormwater Projects

Project Description

Cost

Flood Control/Streambank Stabilization on Tinley Creek, Crestwood

\$7,222,220

Streambank Stabilization on Tinley Creek, Orland Hills

\$664,000

Streambank Stabilization on West Fork NBCR

\$413,000

Streambank Stabilization on Oak Lawn Creek

\$3,035,000

Flood Control Project on the East Branch of Cherry Creek in Flossmoor

\$3,465,725





Future Stormwater Awards

Project Description

Cost

Streambank Stabilization Project along Midlothian Creek in Palos Heights

\$392,000

Flood Control Project at Arrowhead Lake in Palos Heights

\$1,200,000

Streambank Stabilization Project along Calumet Union Drainage Ditch

\$1,839,000

Buffalo Creek Reservoir Expansion

\$21,130,700





Future Stormwater Awards

Project Description

Cost

Streambank Stabilization Project for Addison Creek

\$995,000

Melvina Ditch Reservoir Improvements

\$14,957,250

Streambank Stabilization Project on Melvina Ditch

\$10,600,000

Flood Control Project for Deer Creek

\$3,440,000





Future Stormwater Awards

Project Description

Cost

Flood Control Project on Farmers and Prairie Creeks

\$14,100,000

Flood Control Project on Natalie Creek

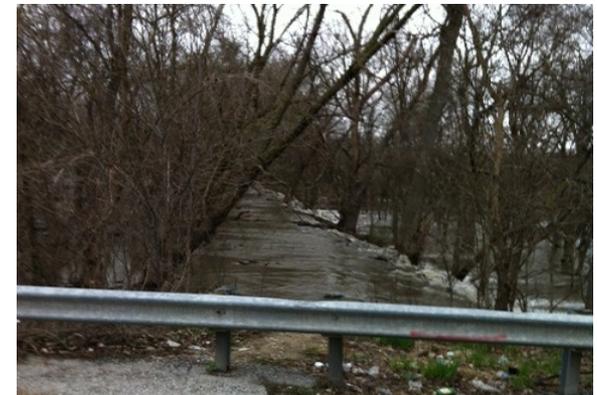
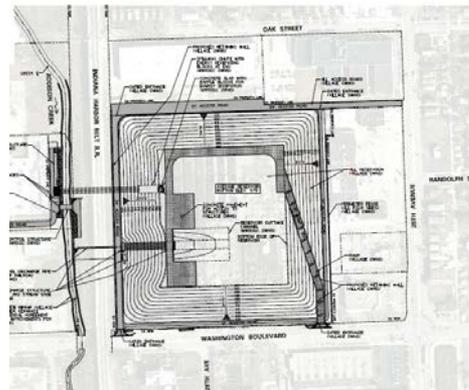
\$8,300,000

Addison Creek Reservoir

\$109,542,000

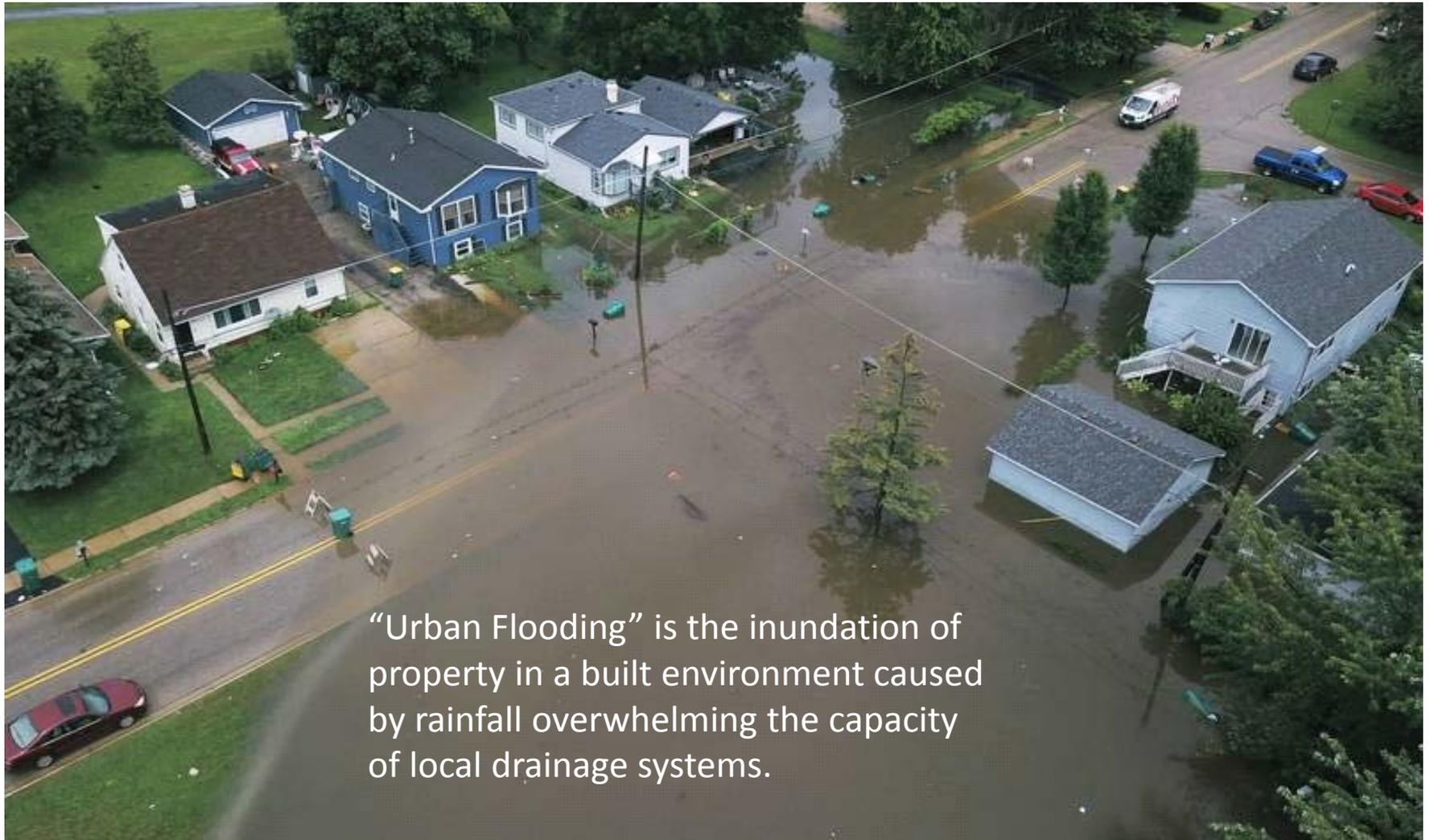
Flood Control Project on the Des Plaines River in Lyons

\$6,500,000





Riverine vs. Urban Flooding



“Urban Flooding” is the inundation of property in a built environment caused by rainfall overwhelming the capacity of local drainage systems.



Riverine vs. Urban Flooding

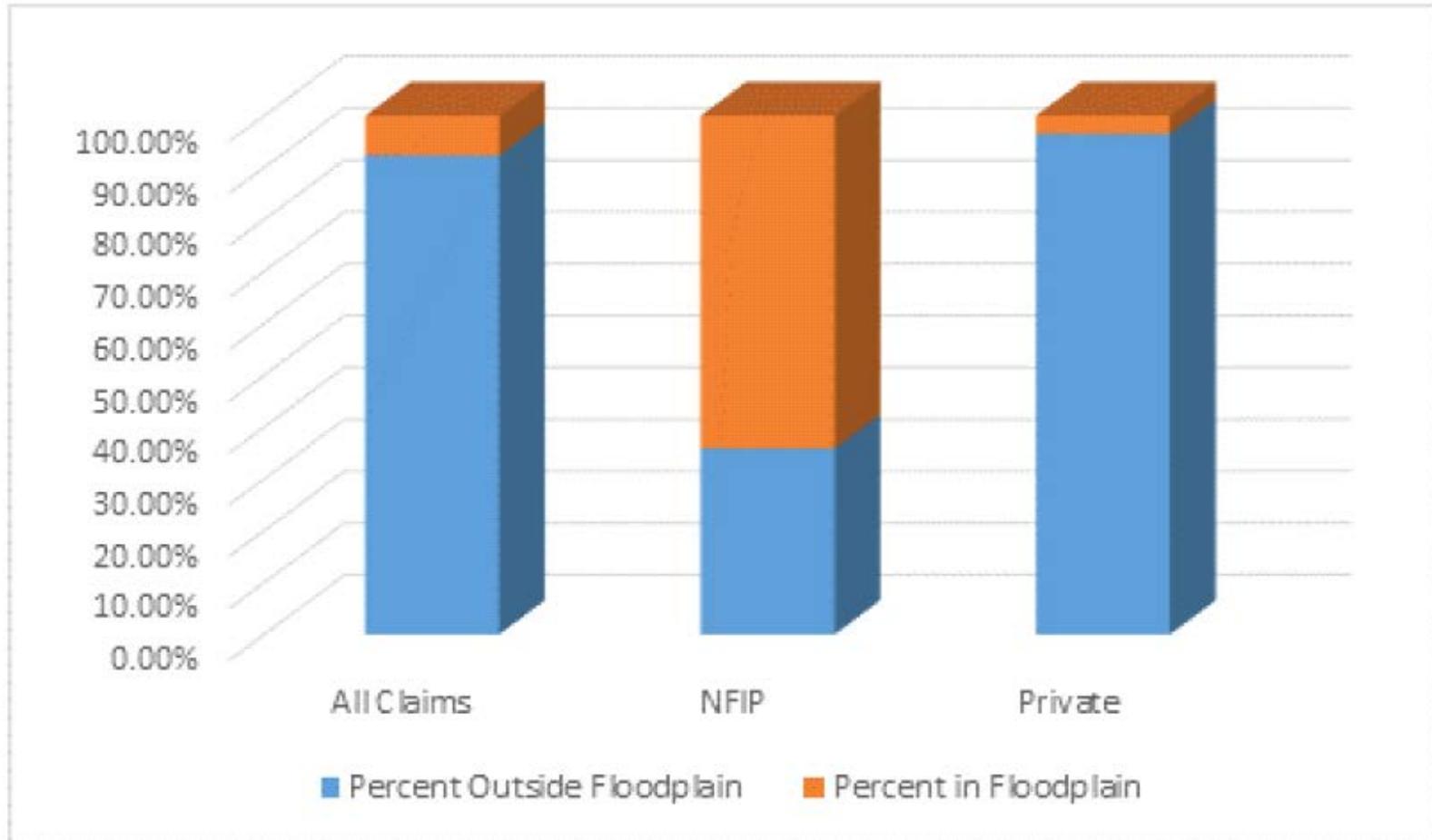


Figure 1.3: Between 2007 and 2014, most (96.5%) of private insurance claims are for structures outside the mapped floodplain; however, a significant number of NFIP claims (35.9%) are outside the mapped floodplain.



Legislative Amendment to MWRD's Stormwater Management Authority

Public Act 98-0652 enacted into Law June 2014

- Allowed the District to move forward on new initiatives under its **Phase II** program including partnering with local communities and agencies to address **local** drainage problems, and setting up a program for purchasing flood prone and flood damaged property on a voluntary basis.
- District-wide call for local projects/problem areas in 2013, future calls to be done annually starting this year
- Application process developed for Phase II, GI and Flood-Prone Property Acquisitions



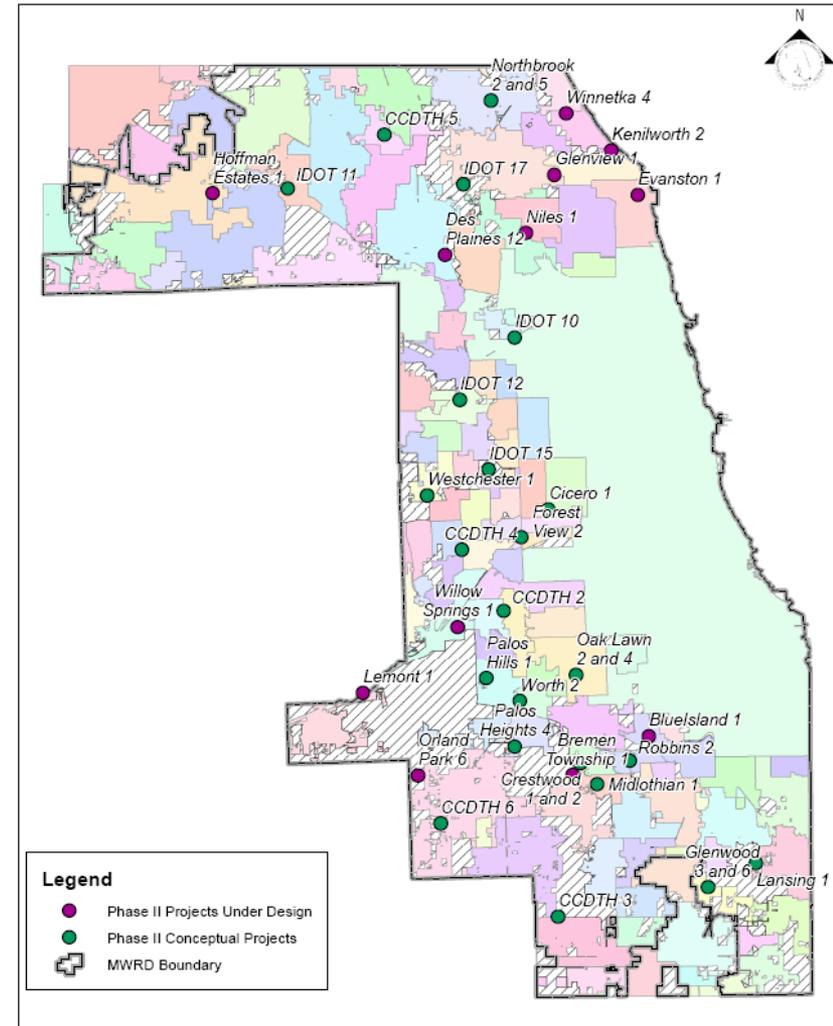
Phase II Projects

Shovel-ready and Conceptual projects

Distributed throughout county

Types of Projects include:

- Green infrastructure
- Localized detention
- Upsizing critical storm sewers/culverts
- Pump stations
- Establishing drainage ways

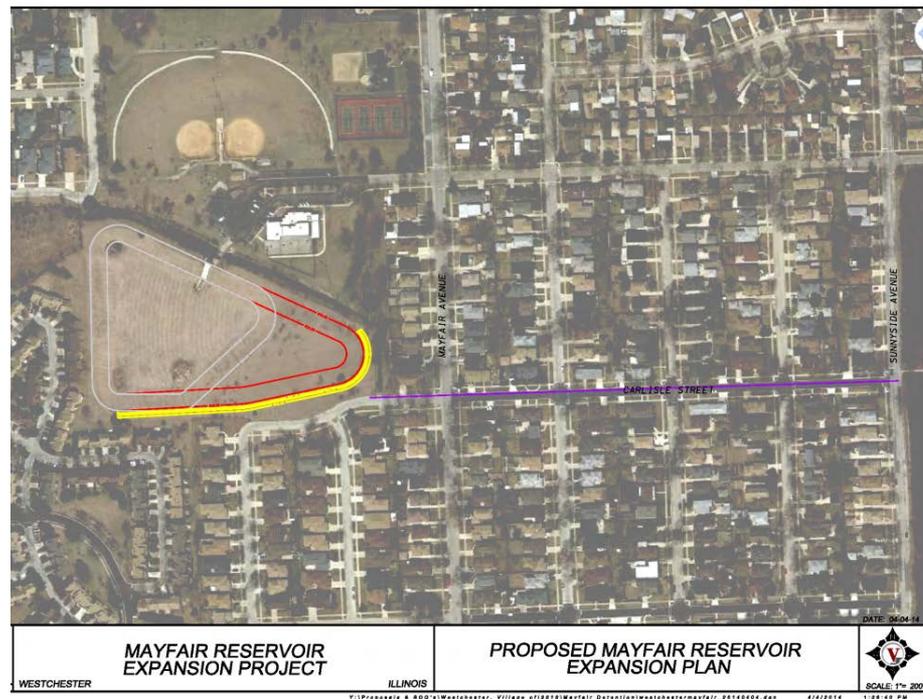




Phase II Projects

Shovel-Ready Example: Mayfair Reservoir Expansion

- 27 Acre-feet of New Stormwater Storage in Westchester
- 60 Structures Protected
- Village responsible for design, construction, and maintenance
- MWRD provided \$2.1M for construction
- Project completed 2015

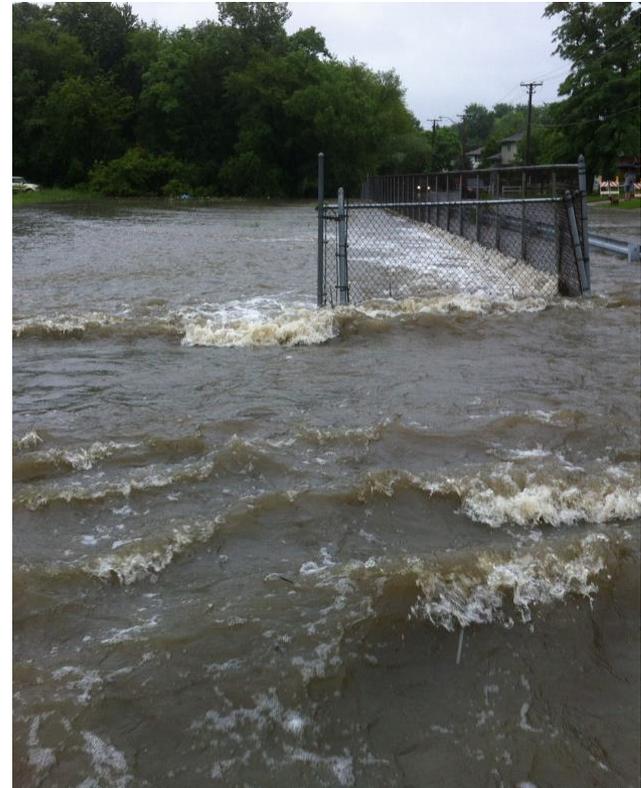




Phase II Projects

Conceptual Example: Natalie Creek Flood Control Proj.

- Conveyance and Storage Improvements in Village of Midlothian (est. \$8.3M)
- 237 structures to be protected
- MWRD to design and construct
- Village to own and maintain all new improvements





Stormwater Project Hurdles

- For local projects to be eligible for MWRD funding assistance, communities must follow MWRD Procurement Rules, Diversity Requirements, and comply with Multi-Project Labor Agreement
- Local communities must own and maintain new improvements
- Locals must provide up-front construction funding (MWRD funding is reimbursement-based)
- Project benefits must be clearly defined and quantifiable
- Socio-economic challenged communities have stormwater issues that go beyond flooding





Flood-Prone Property Acquisition Program

- Policy adopted by Board of Commissioners August 2014 after PA 98-0652
- Three Distinct Components
 1. Local Sponsor Assistance Program
 2. District Initiated Program
 3. Local Government Application



Photo Source: www.rblandmark.com



Flood-Prone Property Acquisition Program

Minimum Criterion

1. Property must be within 100-year floodplain and/or DWP inundation area.
2. The Project's Benefit-to-Cost Ratio must be greater than 1.0.

Factors Applicable to Each Program

1. Local government agency must serve as a local sponsor
2. Duties of local sponsor include:
 - Local Sponsor will be party responsible for direct contact with the private property owners during the acquisition process
 - Accept ownership of acquired property
 - Remove existing structures
 - Place deed restrictions against future development
 - Maintain property upon return to open land
 - Provide regular reports certifying property meets terms and conditions



Flood-Prone Property Acquisition Program

Program Progress

- Glenview - 17 homes purchased
- Des Plaines – City in process of purchasing 62 homes
- Riverside-Lawn – Cook County Land Bank purchasing 39 homes
- Northlake – City purchasing 8 homes
- Finalizing IGAs for acquisition of additional homes in Stone Park, Franklin Park, and Flossmoor,
- Additional funding secured with Cook Co. CDBG-DR





Green Infrastructure

Program Components

- Rain Barrel Program
- Comprehensive Land Use Policy
- Community Assistance and Public Outreach
- Projects and Design Retention Capacity



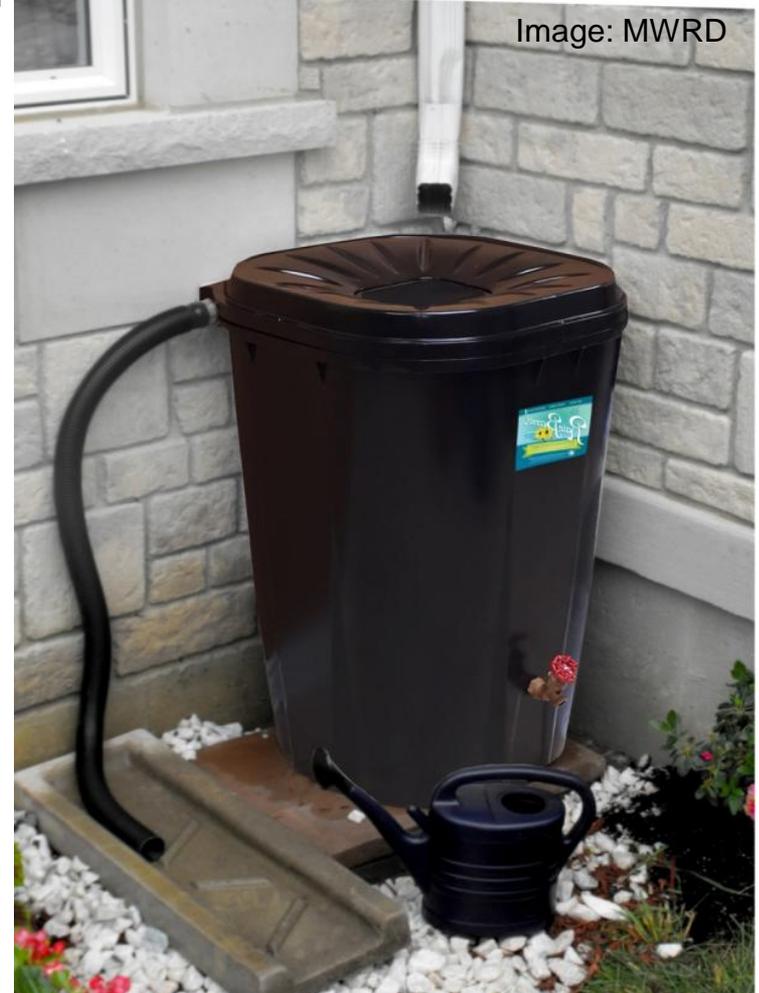


Rain Barrel Program

The District's Rain Barrel Program utilized three distribution networks

- Municipalities
- NGOs and community groups
- campus-type facilities

Through 2016, nearly 110,000 MWRD rain barrels have been distributed in 108 communities across Cook County





Green Infrastructure Requirements

MWRD's Comprehensive Land Use Policy

- Requires public entities leasing MWRD property to provide GI based on the size of the leasehold and the desired use
- Private entities leasing MWRD land are provided incentives to implement and maintain GI. Private entities installing GI receive a credit equal to \$0.50 on the \$1.00 up to 10% of the leasehold cost for GI improvements in excess of WMO requirements.

Watershed Management Ordinance – Volume Control Req'ts

- Capture 1-inch of runoff from impervious surfaces using GI
- Through 2016, ~300 permits requiring nearly 20M Gallons of GI retention volume were issued
- Offsite volume control/detention trading exchange being evaluated

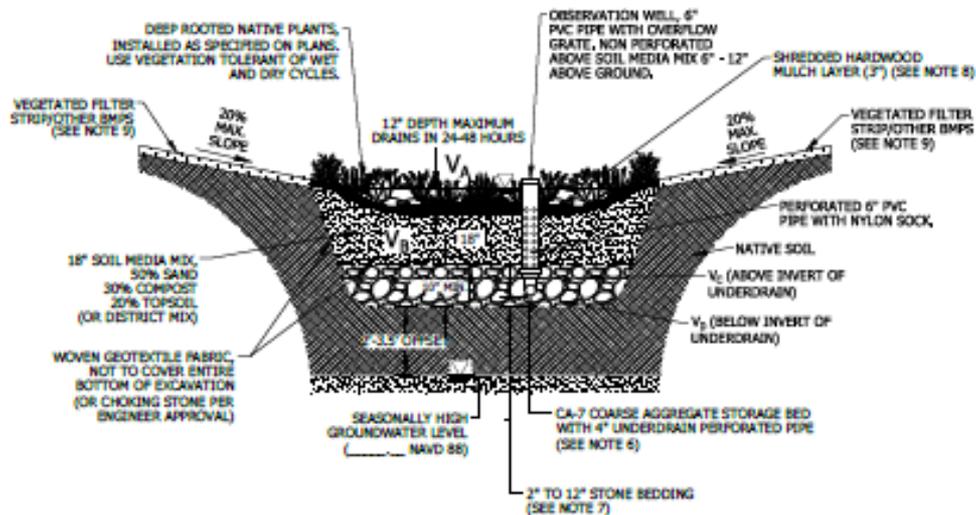


Green Infrastructure Public Outreach

MWRD is committed to promoting the benefits of Green Infrastructure to encourage its use.

GI can provide opportunities for community enhancements

MWRD has worked with numerous entities to share and gain knowledge on the design, installation, and maintenance of GI



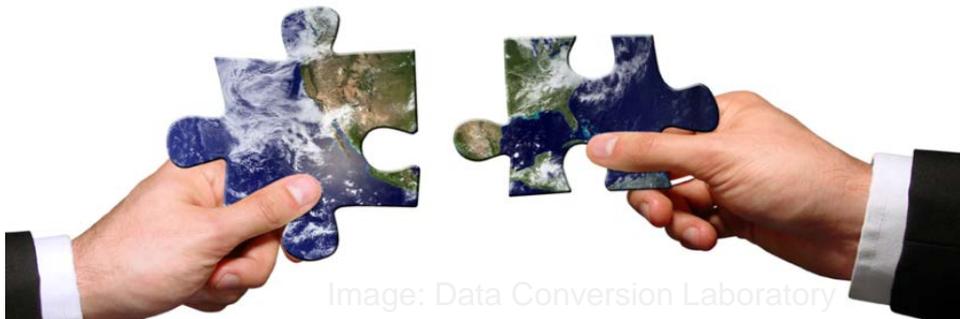


Green Infrastructure Projects

Prioritize projects based on various criteria, including:

- The likelihood of flooding and/or basement backup reduction
- Number of benefitting structures
- Project cost
- Project location with consideration given to maintenance and educational opportunities
- Socio-economic considerations

Develop partnerships





Green Infrastructure Partnerships

Space to Grow

- Managed by Healthy Schools Campaign and Openlands
- Funding and technical assistance from
 - Chicago Public Schools
 - Chicago Dept. of Water Management
 - MWRDGC

Chicago Housing Authority

- Dearborn Homes Rainwater Harvesting

Local Municipalities

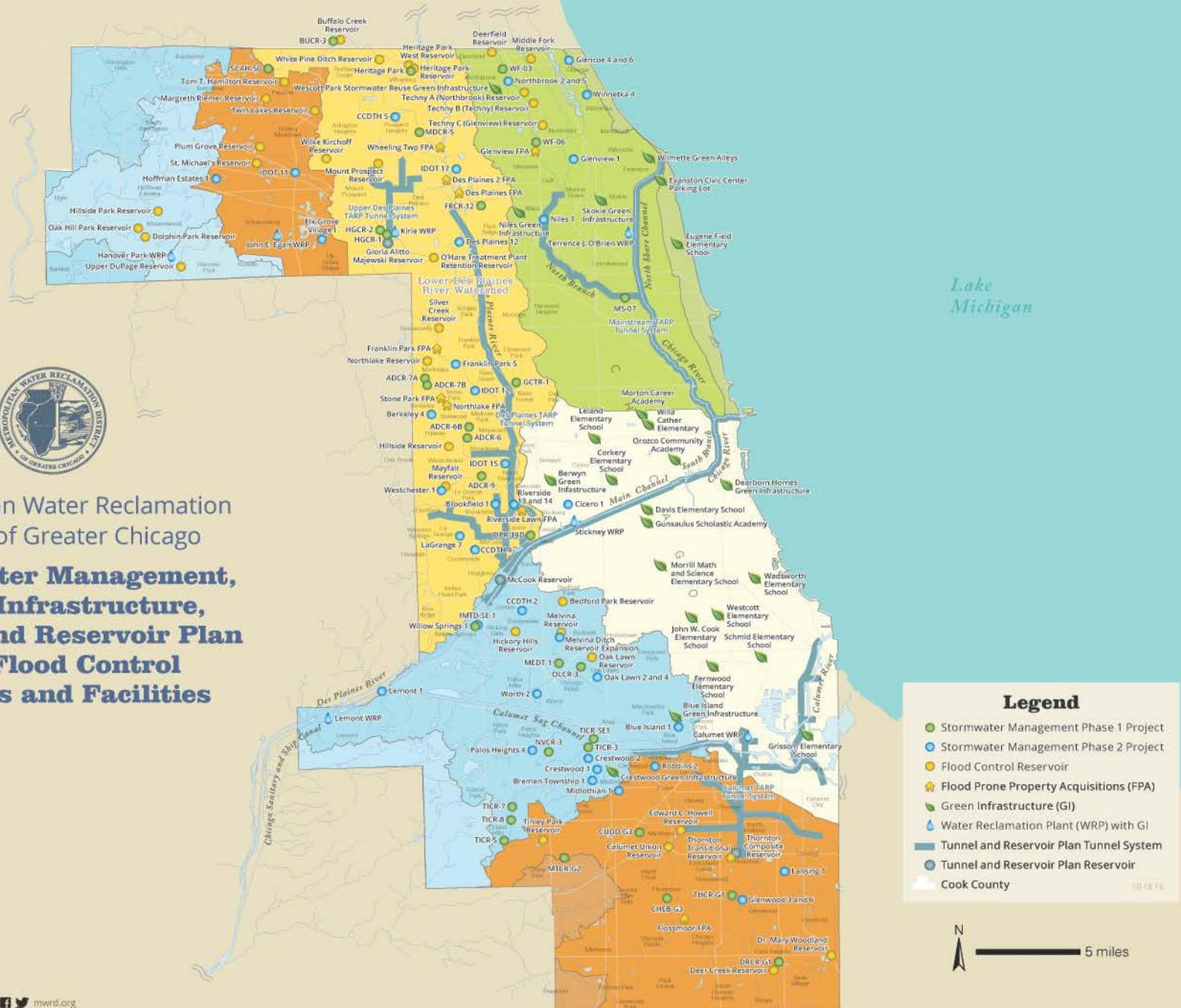
- Evanston, Blue Island, Kenilworth, Wilmette, Northbrook, Niles, and Berwyn (complete)
- Skokie (under design/construction)



Virgil Grissom Elementary School After



Metropolitan Water Reclamation
District of Greater Chicago
**Stormwater Management,
Green Infrastructure,
Tunnel and Reservoir Plan
and Flood Control
Projects and Facilities**





Stormwater Program Summary

Program Component	Current Number of Projects	Structures Protected / Removed	Construction / Acquisition Cost (\$Million)	MWRD Cost (\$Million)
Phase I	27	4,423	\$369	\$315
Phase II Shovel Ready	21	3,146	\$81	\$41
Phase II Preliminary Engineering	13	TBD	TBD	TBD
Green Infrastructure	25	717	\$48	\$13
Flood Prone Property Acquisition	9	201	\$61	\$34
Totals	85	8,487	\$559	\$403



Schedule for MWRD Calls for Projects

2017:

Green Infrastructure: 2nd Quarter

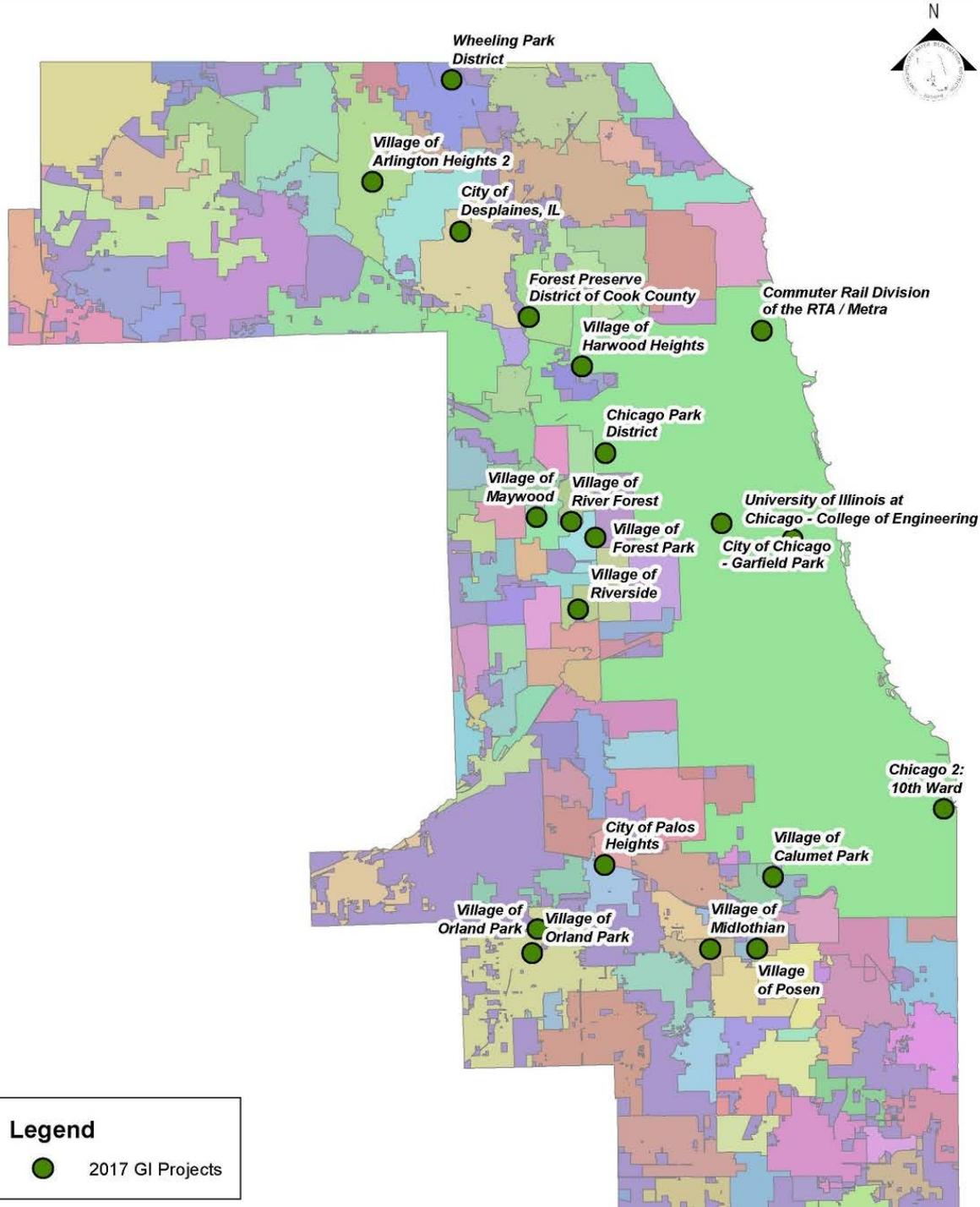
(47 project requests received → 20 approved by BOC)

Flood-Prone Property Acquisitions: 3rd Quarter

(Call for projects currently open through December 1st)

Phase II – Local Stormwater Projects: 4th Quarter

(both conceptual and shovel-ready projects)





Stormwater Project Partnership Opportunities

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- Combined Sewer Communities

Partnership Opportunity - Acquisition of Flood-Prone Properties Program

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Stormwater Project Partnership Opportunity

www.mwrd.org

Acquisition of Flood-Prone Properties Program

The District is currently inviting local governmental entities (i.e. municipalities, townships, and county agencies) to apply for assistance in acquiring flood prone properties. There are two avenues governmental agencies can utilize to participate in the District's program:

1. Local Sponsor Assistance - The District's top priority will be to facilitate the Illinois Emergency Management Agency's (IEMA) federally funded program by assisting Local Sponsor communities in providing their share of the cost for property acquisition. Please note that IEMA is currently accepting applications for this program. Communities interested in applying should contact Mr. Ron Davis, State Hazard Mitigation Officer, at (217) 524-1003 or ron.davis@illinois.gov. IEMA's current application period will be closing October 30th.
2. Local Government Application - This component of the program allows the District to provide assistance for acquisition projects that have not received federal funding through IEMA.



Des Plaines River Flooding

The District is asking all communities with potential flood-prone property acquisition projects to provide some basic summary information:

1. [Pre-application](#)



New Initiatives

Develop Green Book targeting multiple audiences:

- Guide for residents to build rain gardens, etc.
- Enhanced green infrastructure details for developers
- Suite of GI/BMP details for use by municipal engineers

Develop Stormwater Management Master Plans

- Work with local communities to find solutions to stormwater issues using an outcome-based approach
- Deliver results that address stormwater and other community issues at an affordable cost



Stormwater Master Plan Pilot Study

Key Findings

- Traditional and even blended green and grey solutions require exorbitant investments
- In combined sewer areas private property interventions can be more cost effective to address basement backups
- Solutions in separate sewer areas should be examined to identify efficiencies in constructing along with local transportation or other utility improvements
- Outcome Engineering approach reinforced the need to embrace non-traditional approaches to managing stormwater



Stormwater Master Planning Moving Forward

- Evaluate Master Planning needs throughout county
- Develop adaptive approach, centered on managing local stormwater issues with multi-disciplined teams
- Program Managers for separate and combined areas
 - Oversee and coordinate individual planning studies
 - Ensure alignment with community needs
 - Coordinate with other regional planning efforts
 - Develop consistent public outreach materials

“Let’s design a flood control solution that will maximize local assets and spur economic development.”





Watershed Management Ordinance

Establish uniform, minimum, and comprehensive countywide stormwater management regulations

Enabling Legislation

Watershed Management Ordinance (WMO)

“Stormwater management in Cook County shall be under the general supervision of the Metropolitan Water Reclamation District of Greater Chicago.”

“The District may prescribe by ordinance reasonable rules and regulations for floodplain and stormwater management . . . in Cook County.”

Public Act 093-1049



WMO Timeline

- 2004: Public Act 093-1049
 - *MWRDGC (the District) is the stormwater authority for Cook County*
- 2007-2013: Development and Public Review
 - *Technical Advisory Committee*
 - *Public Comments*
 - *Economic Impact Study*
- October 2013: Adoption
 - *Officially adopted by Board of Commissioners*
- May 1, 2014: Effective Date
 - *WMO becomes effective for Cook County*
 - *Projects on Existing Development Plans List (EDPL) are exempt for one year*
- July 10, 2014: Amendment
 - *Infiltration/Inflow Control Program (Article 8) is added*
- May 1, 2015: EDPL Expires
 - *All development now subject to WMO*
- 2016-2017: Development of Proposed Amendment
- **2019: Watershed Specific Release Rates**



WMO Summary of Requirements

- Development (Grading, Paving, Excavation, Etc.)
 - *Disturbances of more than 0.5 acres (some exemptions apply);*
 - *Reconfiguration of existing stormwater systems which alter the service areas of a site detention facility;*
 - *Modifications to a detention facility.*
- Flood Protection Areas (Floodway, Floodplain, Wetlands, Riparian Areas)
 - *Development within a Flood Protection Area;*
 - *Foundation expansion that constitutes a substantial improvement of an existing building located in the regulatory floodplain.*
- Qualified Sewer Construction (Sanitary or Combined Sewers)
 - *Sewers, drainage, or detention in combined sewer areas;*
 - *Qualified sewer construction within MWRD's service area.*
- MWRD Impacts
 - *Direct connections to an MWRD interceptor, reservoir, facility, or TARP;*
 - *New or reconstructed sewers, drainage, or detention outfalls to waterways or Lake Michigan.*

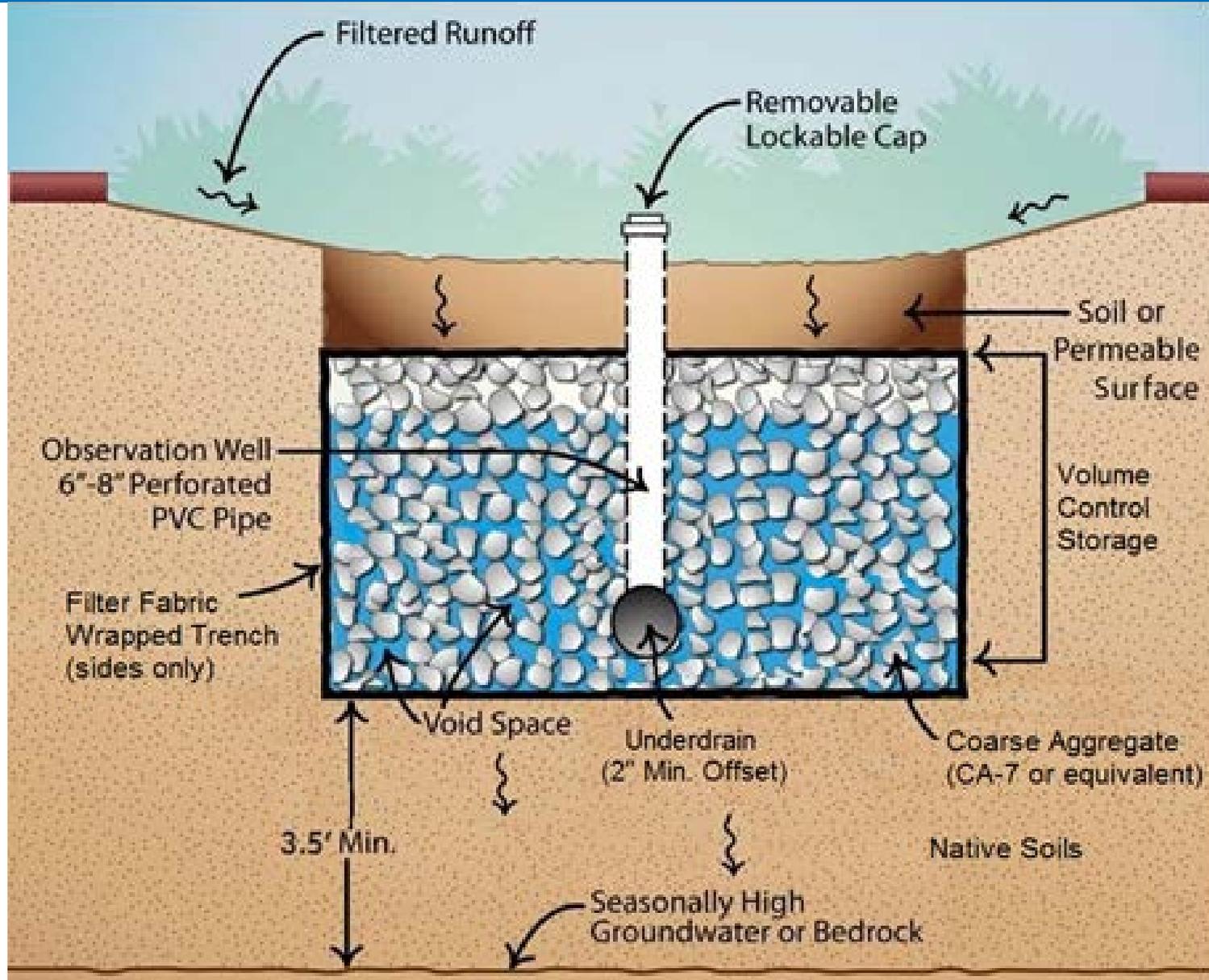


WMO Volume Control Requirements

- One inch of volume over total proposed impervious area
- Retention based practice can be provided in several ways:
 - Infiltration Trenches
 - Infiltration Basins
 - Porous Pavement (storage in the voids below the pavement)
 - Bio-Retention Systems
 - Dry Wells
 - Cisterns
 - Open Channel Practices Fitted With Check Dams
 - Storage Below the Outlet of a Site Detention Facility



Typical Volume Control Cross-section

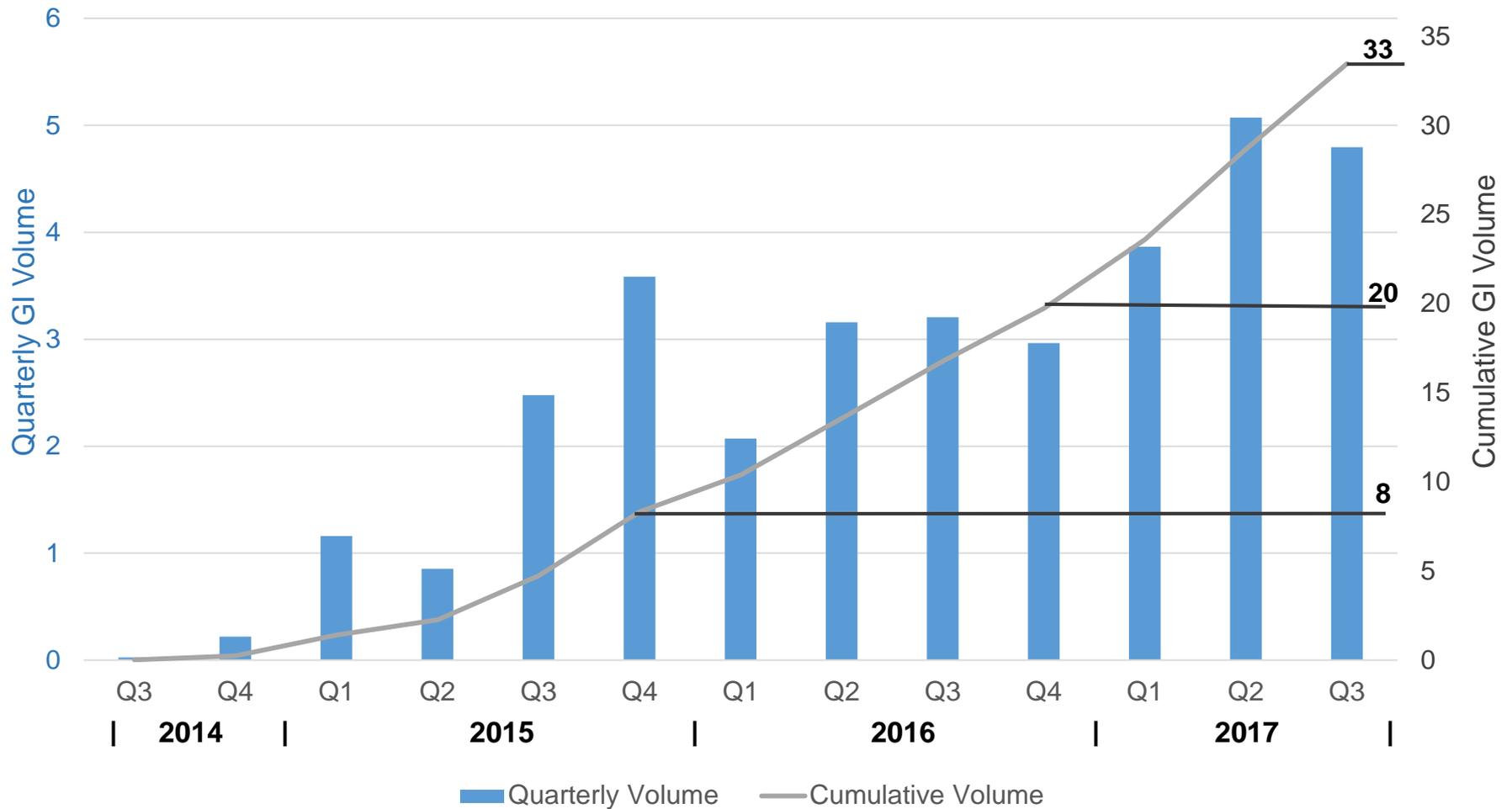




WMO Summary

Total Volume Control Captured

WMO Quarterly Reporting
Total Volume Control (GI) [million gallons]





Pending Ordinance Changes

Clarifications to align with administrative procedures

Noteworthy changes to the WMO

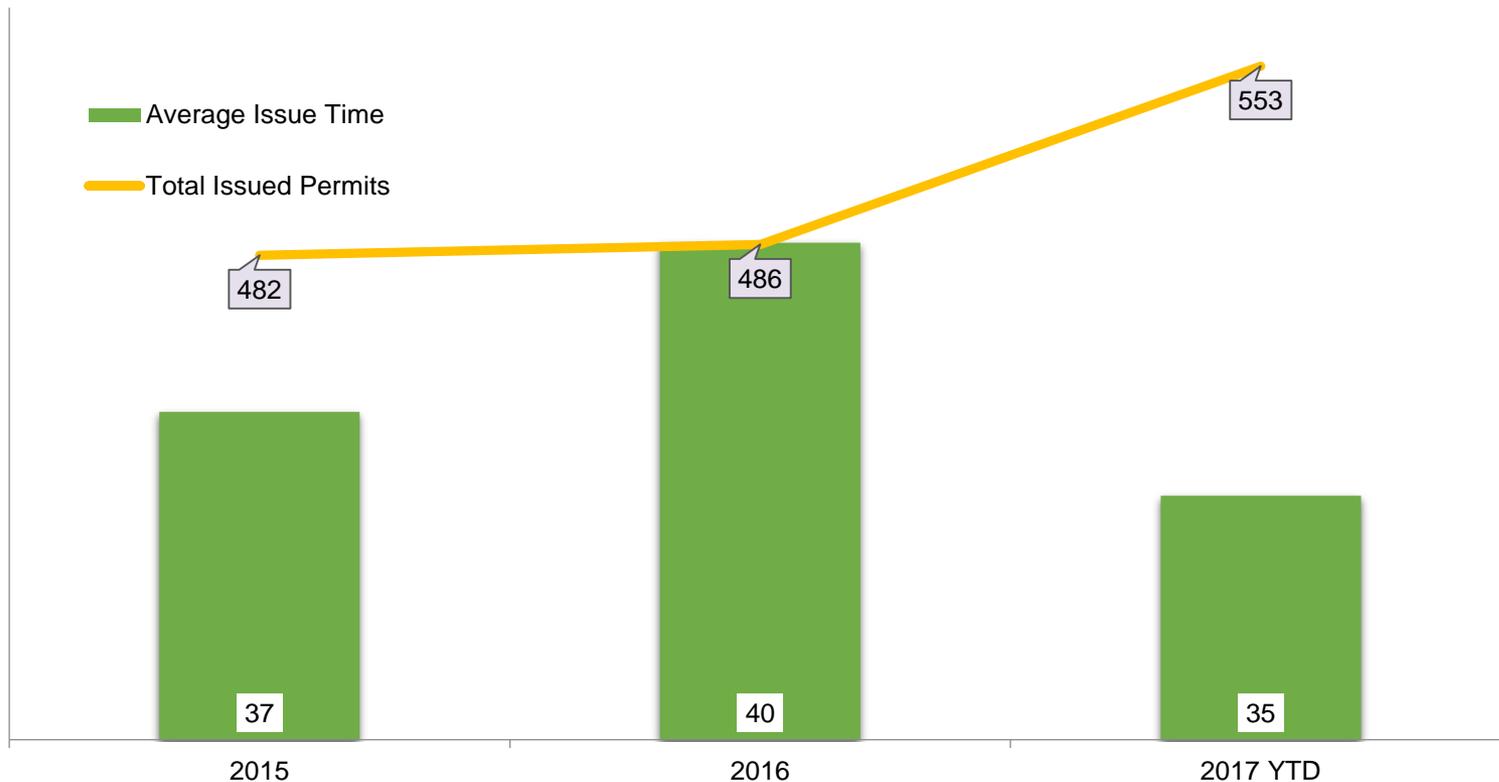
- New Earthwork/Foundation Limited Permit
- Future Volume Control
- Volume Control Trading





WMO Customer Service

- Pre-application meetings
- Permit determinations
- Goal – Issue permits in 30 days





Dedicated WMO Website

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Watershed Management Ordinance

The Watershed Management Ordinance (WMO) applies to all development within the boundaries of Cook County, Illinois, and qualified sewer construction within the District's corporate boundaries or service agreement areas. Components which are regulated under the WMO include qualified sewer construction, drainage and detention, volume control, floodplain management, isolated wetland protection, riparian environment protection, and soil erosion and sediment control. The WMO went into effect on May 1, 2014 and the District's Board of Commissioners most recently amended the WMO on July 10, 2014. The WMO is accessible through the link below.

 [WMO](#) (As amended on July 10, 2014 meeting) (7.2 MB)

» [Draft WMO Amendment](#)

The District developed a Technical Guidance Manual (TGM), which will serve as a technical reference to the WMO. The TGM documents are accessible through the links below.

» [Technical Guidance Manual \(TGM\)](#) (Updated September 2015)

» [Appendix C. Standard Details & Notes](#) (Updated July 2015)

Permit Resources:

» [WMO Permit Application Forms and Fees](#)

» [Permit Flow Charts](#)

» [Permit Checklists](#)

» [Information Pamphlets for Developers and Homeowners](#)

» [WMO Design Calculators](#)

» [WMO Model Templates](#)

» [Authorized Municipalities and Multi-County Municipalities](#)

Other Resources:

» [Watershed Management Ordinance: Short Summary](#)

» [Permit Inquiries \(Request Copies of Past Issued Permits\)](#)

» [Permit Revision Information](#)

» [Frequently Asked Questions \(FAQs\)](#)

» [Presentations](#)



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