

# Green Infrastructure Program Plan

Metropolitan Water Reclamation District  
of Greater Chicago

~~December 18~~June 9, 2014

## **MWRD Green Infrastructure Program Plan**

### **I. Introduction/Purpose of Green Infrastructure Program**

On January 6, 2014, the Metropolitan Water Reclamation of Greater Chicago (MWRD) and the Environmental Protection Agency (EPA) entered into a Consent Decree (CD) concerning ~~combined~~ Combined sewer Sewer Overflows (CSO) discharges. One of the requirements of the CD is the establishment by MWRD of a Green Infrastructure (GI) Program. The purpose of the GI Program is to increase acceptance of and investment in GI measures within MWRD's service area. ~~Other key benefits will be GI's ability and~~ to reduce ~~Combined Sewer Overflows (CSOs)~~ discharges, localized flooding, and stormwater impacts. ~~and flooding.~~ MWRD will implement the GI Program in collaboration with Cook County municipalities, municipal conferences, townships, and other local governments, state and federal agencies, non-governmental organizations, citizens, and private entities. For the purposes of this plan, Green Infrastructure (GI) is defined as a range of stormwater control measures that store, infiltrate, and/or evaporate stormwater with the goal of reducing flows to sewer systems and/or to surface waters. GI may include, but is not limited to, permeable pavement, plant/soil systems such as rain gardens, swales, and extended detention wetland areas, and control measures to harvest and reuse stormwater, such as rain barrels, and cisterns. This GI Plan has been developed to guide MWRD's future activities in sustainable stormwater management.

The MWRD Board of Commissioners convened a public Study Session, ~~which was open to the public,~~ to thoroughly discuss the Green Infrastructure Program Plan on December 11, 2014. A summary of the GI Plan and Comprehensive Land Use Policy was presented to the Board of Commissioners by MWRD staff. After questions posed from the Board of Commissioners were addressed by MWRD staff, members of the public provided comments for the District's consideration. The GI Plan and Comprehensive Land Use Policy, which is a component of the GI Plan, were subsequently revised and presented to the Board of Commissioners at their meeting on December 18, 2014 where approval was ~~sought~~ granted to submit the GI Plan to the EPA and Illinois EPA for approval. Upon approval by the EPA and Illinois EPA, the MWRD will publicize and promote its GI Plan through public outreach, press releases and including will post the GI Plan on the MWRD web site.

#### **II. A. Green Infrastructure Program: Rain Barrel Program**

Rain barrels are a form of GI that capture and allow for reuse of rain water. Rain barrels are attached to roof downspouts that have been disconnected from the sewer system. Roofs comprise 41% of the impervious surface of Cook County and disconnection of downspouts from the sewer system will help reduce basement backups. The District's Rain Barrel Program will utilize three distribution networks: (1) municipalities, (2) non-government, planning organizations, and community groups, and (3) campus-type facilities. The District will provide technical assistance on the proper use of rain barrels via the District's website, public service announcements, press releases, promotion on social media, and distribution of brochures. Further information concerning the Rain Barrel Program can be found in Appendix A.

## **II.B. Green Infrastructure Program: Early Monitoring, Evaluation, and Knowledge Building**

The CD requires MWRD to dedicate a minimum of \$325,000 towards GI projects prior to January 6, 2015, whereby MWRD would evaluate design specifications and installation processes and procedures [and document its findings](#). MWRD embarked on multiple [demonstration](#) projects during the past year to satisfy this requirement.

The first [demonstration](#) project involved collaboration between MWRD, Chicago Public School Systems (CPSS), and the City of Chicago Department of Water Management (DWM). CPSS rehabilitated the grounds of four elementary schools with GI as a major design element of each project. MWRD and DWM each dedicated \$2,000,000 towards GI measures at the schools to reduce local flooding and the amount of rainwater entering the local combined sewer system. The project areas largely consisted of impermeable asphalt surfaces with no opportunity for infiltration of stormwater runoff. Runoff from these asphalt surfaces would enter the combined sewer system and contribute toward CSOs and basement backups. Each project was comprised of various amounts of permeable pavement, rain gardens, native landscaping, stormwater trees, bioswales, and bioretention area greenways to store and infiltrate stormwater generated from the site. The four elementary schools, Virgil I. Grissom Elementary School, 12810 S Escanaba Avenue, George Leland Elementary School, 512 S. LaVergne Avenue, Morrill Elementary School of Math & Science, 6011 S. Rockwell Street, and Schmid Elementary School, 9755 S. Greenwood Avenue, are all in low income areas throughout the City. These schools were prioritized for implementation by CPS, DWM, and MWRD based on flood risk, site suitability, and socioeconomic factors. Numerous community meetings were held to describe project details and benefits. All four projects were completed in the fall of 2014. MWRD and CPSS executed an intergovernmental agreement (IGA) to facilitate this project whereby long term maintenance responsibilities are assigned to CPSS. MWRD has perpetual rights to inspect the GI to ensure it is being properly maintained in accordance with the Operations and Maintenance (O&M) Manual developed for each school. MWRD reviewed and provided comments on the construction drawings and specifications at various intervals during the course of design. During the course of construction, MWRD frequently visited the sites to gain knowledge on the installation of GI. The four sites combine for a Design Retention Capacity (DRC) of approximately ~~900,000~~ [730,000](#) gallons per rain [event](#)<sup>[11]</sup>. <sup>[12]</sup> Educational signage has been placed at the sites to inform students and the surrounding community of the benefits of GI. Ground breaking ceremonies were held at each of the 4 schools and were attended by students, parents, school staff, local residents, and elected officials, including MWRD Commissioners. The collective enrollment at the 4 schools is over 1,400 students. The 4 projects have positively impacted thousands of local residents by providing a safe place for their children to play, educating all to the benefits of GI, and providing much needed relief to localized flooding. Given the success of this project, the MWRD Board of Commissioners authorized expansion of the program to fund GI at 6 schools per year over the next 5 years [with for a total of 30 schools and](#) a total investment by MWRD of \$15,000,000<sup>[13]</sup>. These projects will

not only address localized flooding, but will also serve to educate students, parents, and school staff about the benefits of GI. The 30 schools will be selected out of a list of 100 elementary schools that meet baseline minimum criteria judged from three main categories: flood risk, site suitability (size and logistics) and vulnerable communities (low income and child obesity concerns).

MWRD has also worked with the City of Blue Island (Blue Island) and City of Evanston (Evanston) to develop GI Projects that will be constructed in 2015<sup>[14]</sup>. These projects will address localized flooding, are in areas heavily trafficked by the general public, and will educate the public on the use of GI. MWRD's contribution towards these projects will be approximately \$1,250,000 and the combined DRC will be 300,000 gallons. The projects will consist of permeable pavement, rain gardens, and swales. For Blue Island, MWRD retained a consultant to prepare plans and specifications, which were reviewed and approved by MWRD engineers. MWRD will administer the Blue Island construction contract, and will have an MWRD Resident Engineer oversee the construction. In addition to providing input on the type of permeable pavement to install, MWRD engineers reviewed and commented on the design drawings and specifications of the Evanston project. MWRD staff also participated in meetings with the local public to explain the rationale behind the projects and how the projects will help to alleviate flooding while providing a myriad of other environmental and social benefits. MWRD entered into IGAs with Blue Island and Evanston whereby maintenance responsibilities lie with the municipality and MWRD retains perpetual rights to inspect the facilities to ensure they are being maintained as required by the O&M Manuals of the respective projects.

### **II.C. Green Infrastructure Program: Green Infrastructure Plan**

MWRD has developed this GI Plan to serve as a framework document to guide MWRD in its GI Program and to outline to EPA how MWRD will comply with the requirements of the CD as it pertains to GI. MWRD does not view the Design Retention Capacity requirements stipulated under Section III of this plan as an end goal; MWRD is committed to exceeding the minimum requirements for Design Retention Capacity by working with various stakeholders to install meaningful GI throughout Cook County in the coming years.

#### **II.C.i. Comprehensive Land Use Policy**

MWRD's Comprehensive Land Use Policy requires public entities leasing property at a nominal fee from MWRD to provide GI based on the size of the leasehold and the desired use. For any new/renewed lease, the public lessee must now pay for and include GI on its leasehold. MWRD will collaborate with and provide technical assistance to public entities leasing MWRD land at a nominal fee. by reviewing plans and providing input on the types of GI proposed to be installed by public or private lessees. Technical assistance will include, but not necessarily be limited to, reviewing plans, and providing input on best management practices related to the operation and maintenance of GI and providing input on the types of GI to be installed on specific leaseholds. Private entity or commercial lessees are required to comply with the terms of the MWRD's Watershed Management Ordinance (WMO), which requires use of GI for development projects based on the size and type of use of the property. Private entity or commercial lessees

will receive a credit equal to \$0.50 on the \$1.00 up to 10% of the leasehold cost, capped at 10 years, for GI improvements in excess of WMO requirements. MWRD will seek credit towards the DRC requirements outlined in Section III of this plan for any GI installed by leaseholders of MWRD property due to GI installed as a result of the requirements of the Comprehensive Land Use Policy. The Comprehensive Land Use Policy is attached to this document as Appendix B.

### **II.C.ii. Green Infrastructure Controls**

GI measures employed in conjunction with conventional gray infrastructure measures, such as tunnels and reservoirs, is the most effective way to reduce flooding and CSO's. There are a number of GI controls that serve to reduce stormwater runoff from entering the sewer system. These controls can be broken down into three categories: (1) Plant/soil systems, (2) Stormwater harvest and reuse, and (3) Permeable pavement. The section below introduces each category and discusses ~~the~~ design, performance, and maintenance. Once GI is installed and in use, proper maintenance and operations of the GI ~~is~~are imperative to ensure that the expected benefits are not degraded. MWRD, through intergovernmental agreements, will require that most GI installed under its GI Program be maintained by the benefitting local government, and MWRD will retain monitoring rights along with the ability to perform maintenance and back charge if the benefitting local government fails to maintain the GI. An example of MWRD's Maintenance and Operations Plan is included as Appendix D and each GI project will have its own Maintenance and Operations Plan tailored to its specific needs.

#### **Green Infrastructure Controls: General Design Considerations**

Design considerations to ensure GI performs as expected include available space, soil type, drainage area, adequate separation from buildings and seasonal ground water table, appropriate sediment control measures to prevent sediment-laden construction runoff from entering infiltration areas, and minimizing compaction of soil in infiltration areas by heavy equipment. All design considerations must be taken into account when selecting the appropriate GI measure to implement.

#### **Green Infrastructure Controls: General Performance Expectations**

Performance will be dependent on how well GI is selected, designed, constructed, and maintained. Performance will vary based on the GI technique employed. A more specific summary of how GI is expected to perform is provided below.

#### **Green Infrastructure Controls: General Maintenance Requirements**

As with traditional gray infrastructure, proper maintenance is essential for the long term success of GI. An Operations and Maintenance Plan (OMP) will be developed for all GI projects undertaken by MWRD. All maintenance activities must be documented and to ensure this occurs maintenance checklist(s) based on the OMP will be developed for each GI practice installed at all projects. Owners of the projects will be required to update the maintenance checklists and produce them to MWRD upon request. MWRD will meet with the owner on a yearly basis to inspect each project component and maintenance checklist(s) for completeness. The maintenance checklists will include a list of items to be inspected and for each practice will be developed and include the following: inspection dates, facility components inspected,

and any maintenance performed and repairs made. All inspections and maintenance, both routine and emergency, must be included in the maintenance ~~record~~checklists. Each practice-specific ~~maintenance and operations~~ requirement listed in the OMP will serve as a checklist for design elements that require inspection, the frequency of inspections, ~~(at least yearly)~~, and the conditions that indicate when maintenance is needed.

The owner will be required to perform inspections and maintenance at regular intervals appropriate for the GI Control and as agreed upon by MWRD. MWRD will have the right to perform its own inspections and if it is determined that the owner is not adequately maintaining the site, MWRD will have the right to perform maintenance at the owners' expense.

### **Green Infrastructure Controls: Plant/Soil Systems**

Green infrastructure technologies are designed to store, infiltrate, and/or evaporate stormwater in order to reduce wet weather flows into sewer systems and reduce localized flooding. The goals of GI are to retain stormwater and infiltrate it into the subsoil or release it slowly when conditions subside. Rainwater infiltration recharges the shallow groundwater table, reducing the need for irrigation of deep-rooted vegetation and also provides delayed ecological base flow to natural streams. To accomplish these objectives, MWRD will utilize the following technologies: rain gardens, native plants/landscaping, stormwater trees, bioswales, green roofs, and greenways.

### **Green Infrastructure Controls: Plant/Soil Systems Design Considerations**

In addition to the general considerations, plant/soil systems should include additional criteria, such as owner acceptance due to aesthetics, and underdrain system if appropriate. Native plants are to be hardy, drought, inundation and disease resistant, and deep-rooted.

### **Green Infrastructure Controls: Plant/Soil Systems Performance Expectations**

The table below lists expected design retention capacity (DRC) for each type of plant/soil GI installation:

Technology	Quantity	Unit of Measure	DRC [gallons]
Rain Gardens	100	square feet	200
Native Plants/Landscaping	100	square feet	150
Stormwater Trees	100	Trees	1,000
Bioswales	100	square feet	500
Green Roofs	100	square feet	300
Greenways	100	square feet	63

### **Green Infrastructure Controls: Plant/Soil Systems Maintenance Requirements**

Plant media must consist of native perennial species and be inspected minimally on an annual basis. Any damaged or dead trees, shrubs, ornamental grasses or perennials must be promptly

replaced. ~~Inspect media for clogging at least yearly. Any~~ invasive species ~~should~~must be identified and ~~eradicated upon discovery~~removed. MWRD will develop a handbook outlining best management practices for the establishment and maintenance of native perennial species and the eradication of invasive non-native weed species. Landscaped areas shall be inspected and maintained at least once every season. This includes, but is not limited to: inspection, weeding, trimming, pruning, cultivation, fertilization, watering, pest control and anything else necessary to ensure healthy vigorous plant growth and maintain the area in an aesthetically pleasing manner.

- Shrubs: landscape maintenance contractor to monitor for disease and insect problems, and treat as recommended
- Ornamental grasses and perennials: cut back to 3" above grade in spring, while plants are still dormant.

Rainfall is to be supplemented with water for a total rate of one (1) inch per week during the growing seasons for the first three years.

#### **Green Infrastructure Controls: Stormwater Harvesting and Reuse**

MWRD is exploring innovative ways to harvest and reuse captured stormwater. One potential project involves repurposing an abandoned water tunnel from the City of Chicago to capture water from the downspouts of large buildings that would normally go into the local combined sewer system. The stored water could then be reused to water parks and other areas, and possibly even by local industries. Another project would be to install large cisterns at each residential property in a flood prone area. The captured stormwater could then be used for irrigation rather than be returned to the local system.

#### **Green Infrastructure Controls: Stormwater Harvesting and Reuse Design Considerations**

Projects that include ~~d~~ large-scale stormwater capture are typically unique, and will require different design criteria. The design criteria should investigate structural concerns, detention, and potential reuse applications, appropriate water quality, and code requirements. It is imperative that other agencies and citizens are involved in the design as appropriate.

#### **Green Infrastructure Controls: Stormwater Harvesting and Reuse Performance Expectations**

The most important criteria regarding these projects will be the amount of DRC, to be sized by application and drainage area. Performance of these systems will be contingent on owners understanding the need to reuse the captured stormwater in a timely manner to ensure storage capacity is available for ensuing storms. MWRD will provide outreach materials to property owners emphasizing the need to properly operate these types of systems.

#### **Green Infrastructure Controls: Stormwater Harvesting and Reuse Maintenance Requirements**

Stormwater storage facilities should be drained, cleaned, and disinfected ~~minimally at a~~minimum on a yearly basis.

## **Green Infrastructure Controls: Porous Pavement**

### **Green Infrastructure Controls: Porous Pavement Design Considerations**

In addition to general design considerations listed above, porous pavement systems should include additional criteria such as owner acceptance due to maintenance requirements, underdrain systems (if required), traffic loading, material strength, mix design if concrete or asphalt, and installation by an experienced and credentialed construction contractor.

### **Green Infrastructure Controls: Porous Pavement Performance Expectations**

Porous Pavement systems are expected to hold approximately 10 gallons of DRC per square foot.

### **Green Infrastructure Controls: Porous Pavement Maintenance Requirements**

- Keep landscaped areas well-maintained and prevent soil from being transported onto the pavement.
- Monitor regularly to ensure that the paving surface drains properly after storms.
- Ensure that the surface is free of sediment.
- Remove vegetation established in gravel spaces twice per year.
- Bi-annually vacuum surface to keep free of sediment. Vacuuming should occur in the Fall and Spring by using a vacuum designed for pavement cleaning, such as a Little Wonder walk-behind type or approved equal. If surfaces have severe clogging, use a low-pressure water spray to loosen sediment and follow with a walk behind vacuum.
- Clean out inlet structures within or draining to the subsurface bedding beneath surface once per year.
- Inspect surface for signs of deterioration or settling.
- Inspect void areas.
- Drainage structures and flow restrictor must be inspected and cleaned semi-annually.
- All permeable surfaces shall be inspected semi-annually and after significant rainfall events exceeding 1.5 inches.

## **II.C.iii. MWRD Green Infrastructure Community Assistance**

MWRD is committed to providing administrative and technical assistance to communities within its service area to facilitate the implementation of GI projects. As part of its efforts under Section II.B., Early Monitoring, Evaluation, and Knowledge Building, MWRD worked with numerous stakeholders to share and gain knowledge on the design, installation, and maintenance of GI. MWRD will continue to seek such partnership opportunities as its GI Program evolves. To carry out our community assistance efforts, MWRD has dedicated three full time civil engineers, which exceeds the CD requirement of at least one MWRD full time equivalent position, to work exclusively on MWRD's GI Program and to specifically provide technical and administrative support to ~~MWRD~~-communities, developers, and public and



private lessees of MWRD property. MWRD will look to provide funding assistance for GI projects that achieve MWRD's goals of reducing flooding, basement backups, and CSO dischargess. Other forms of assistance will include review of municipal GI plans and specifications, public outreach via publication and distribution of brochures, development of a Green Infrastructure webpage with information private home owners can use to make simple GI improvements on their property, such as rain gardens and rain barrels, and speaking engagements.

MWRD is initiating 5 pilot studies in 2015 with the intent to ultimately develop a stormwater master plan for Cook County to address 100-year flooding. MWRD views these pilot studies as the cornerstone of its efforts to educate the public about the benefits of GI and to address flooding and basement backups occurring throughout Cook County. The goal of the pilot studies is to identify a solution to 100-year flooding of structures and basement backups with projects involving green and gray infrastructure located in public and privately owned properties. To achieve this ambitious goal, it is vital the general public understands that no agency alone can solve the flooding woes plaguing our region. Through extensive public outreach, MWRD will work to educate the public concerning the size of the issue. The consultants retained by MWRD for the pilot studies have been encouraged to develop creative ways to involve the public in the discussion of how they want their community to address the problem. The pilot study locations were determined by the regional municipal conferences of Cook County and the City of Chicago. The study locations are Little Calumet River corridor, Roberts Road drainage area, Village of Northbrook, Village of Harwood Heights, and the City of Chicago's 8th Ward and surrounding Wards. The community will need to be engaged and become part of the solution by detaining and infiltrating stormwater at their homes and businesses through GI implementation. Building a resilient Chicagoland through a new way to interact with water will be a focal point of the pilot studies. Once completed, the information and lessons learned from the pilot studies will serve as guidance to develop stormwater master plans for the remainder of Cook County.

MWRD will coordinate with the Cook County Land Bank Authority and the South Suburban Land Bank and Development Authority to identify vacant properties with potential for meaningful GI projects to be constructed. In 2014, MWRD received statutory authority to acquire flood prone structures from voluntary sellers. All structures on flood prone property ~~MWRD acquires~~ acquired with MWRD funds will be removed using EPA's On the Road to Reuse Residential Demolition Bid Specification Development Tool handbook and Cook County Demolition Diversion Ordinance as guidelines. The properties will be converted to open space, which may include usage as a park, and may include GI. The credit MWRD will seek towards its DRC obligation will be based on the type of GI installed.

Since 1971, MWRD required stormwater detention in the separate sewer areas of suburban Cook County under the Sewer Permit Ordinance (SPO). In 2014, MWRD adopted a Watershed Management Ordinance (WMO), attached as Appendix C, to regulate development and redevelopment activities in the suburban communities of Cook County. The WMO replaced the SPO and provides comprehensive stormwater management regulations. Although not required

under the SPO, the WMO requires stormwater detention in the combined sewer area. The WMO also explicitly requires the use of GI to treat the first inch of stormwater runoff from impervious surfaces created by development or redevelopment projects over one-half acre in size. Full credit for stormwater detention can be accomplished through GI techniques. Passage of the WMO served as a major milestone for Cook County where GI will become an integral component of future development and redevelopment projects. MWRD permit review staff will interact closely with design engineers during the permit process and provide input and direction on all aspects of a development or redevelopment project's design, including appropriate use of GI. As a result, MWRD will seek credit towards the DRC requirements described in Section III for GI installed due to the requirements of the WMO and the technical assistance provided by MWRD staff during the permit application process.

#### **II.C.iv. Green Infrastructure Projects and/or Collaborations**

The following Sections describe how MWRD will work with stakeholders to identify, develop, and implement GI projects.

##### **II.C.iv.a Establishing Partnerships and collaboration with other stakeholders**

MWRD has extensive experience working with numerous stakeholders on various initiatives, including GI projects. MWRD is committed to maintaining current relationships with various stakeholders, including non-governmental organizations, such as Openlands, Friends of the Chicago River, Sierra Club, Center for Neighborhood Technology, and Metropolitan Planning Council. MWRD will continue to develop partnerships with additional stakeholders, including government entities, businesses, non-governmental organizations, and members of the public, in developing and implementing GI projects throughout the region.

The District, working in conjunction with Cook County municipal conferences (South Suburban Mayors and Managers Association, Southwest Conference of Mayors, Northwest Municipal Conference, and West Central Municipal Conference), established Watershed Planning Councils (WPCs) for the six major watersheds of Cook County in 2005. WPC meetings are open to the public and held quarterly to discuss stormwater management issues. Attendees include mayors, public works directors, consulting engineers, and concerned citizens. MWRD has utilized WPC meetings as a vehicle to educate WPC members and meeting attendees about MWRD's role in wastewater treatment and protecting the environment. MWRD has and will continue to promote use of GI at these meetings. MWRD will also seek out ideas for GI projects and present information regarding planned GI projects within the respective watershed.

##### **II.C.iv.b Public Participation**

The importance of MWRD interacting with the public to explain the benefits of GI projects throughout the region cannot be overstated. Meeting with public agencies, as well as private citizens, will assist in identifying the best potential areas to install GI, while generating understanding and enthusiasm among constituents. ~~For any project MWRD participates in,~~

The public participation process will include ~~at least one public hearing,~~ informal workshops, and canvassing of neighborhoods. ~~MWRD does not intend to will not simply hold formal, traditional workshops where the community is simply told what informed what a project will entail near the end of the design process; rather, t~~The community will be engaged at the onset of a project's design with meaningful and reasonable public input incorporated into the final plans. MWRD believes the solution to Cook County's flooding involves more than simply constructing green and/or gray projects within publicly owned property. To truly solve the flooding problems our region faces, the public's enthusiastic acceptance of public GI projects is a first step to convincing the public of the need for GI improvements on private property. Extensive public outreach will be required to achieve this goal. As discussed in preceding sections above, MWRD will promote the use of GI through WPC meetings, workshops, publications of a webpage dedicated to GI, and development of stormwater master plans for Cook County.

#### **II.C.iv.c Geographic Coverage/Decision Criteria**

MWRD projects will fall into two categories: (1) Demonstration Projects and (2) Prioritized Projects. Demonstration projects will consist of partnership projects similar to the CPSS projects described previously. Demonstration projects will be located in highly visible and easily accessible public areas.

MWRD will periodically solicit public entities (municipalities, townships, school districts, etc.) to provide a list of proposed GI projects and supporting information for MWRD's consideration and prioritization. Projects will be prioritized based on the following criteria in accordance with Appendix E of the CD: MWRD will prioritize projects based on various criteria, including the following:

- a. The likelihood of flooding and/or basement backup reduction by the project
- b. Number of structures benefitting from the project~~structures~~
- c. Cost of the project
- d. Project location and land ownership with consideration given to maintenance and educational opportunities
- e. Socio-economic considerations

MWRD will look to fund GI projects that have the greatest potential to reduce flooding and/or basement backups. The ability to determine a project's effectiveness to reduce flooding and/or basement backups will in part be based on the number of structures directly benefitting from the GI project under consideration. The project's cost will be evaluated in conjunction with the

benefits to be provided and factors such as cost per gallon infiltrated. MWRD will look to fund projects ~~located~~ in highly visible locations where opportunities for public education exist. Socio-economic factors, such as median household income, will also be considered. Multi-purpose stormwater parks that incorporate GI and recreational activities will be sought out. The concept of improving recreational amenities while providing stormwater management via GI was integral to our successful partnership with CPSS and DWM as previously described.

#### **II.C.iv.d Preservation of Constructed Green Infrastructure Projects**

MWRD will work with partners and stakeholders to plan legal, such as conservation easements, and institutional mechanisms to preserve and maintain constructed GI projects that are put in place to ensure that future site or land use changes do not result in the loss of the runoff reduction benefits of constructed GI projects. MWRD shall share with partners and stakeholders best management practices to maintain and preserve GI as they are developed. MWRD will develop Design Guidelines, and Maintenance and Operation standards that will be transmitted to the project administrators, and will follow up by visual inspection to verify that such standards are being upheld. The responsibilities of MWRD and benefitting communities will be memorialized via ~~intergovernmental~~Intergovernmental agreement~~Agreement. The responsibilities of MWRD and non-governmental entities will be documented via Easement~~Agreement. The Intergovernmental and Easement Agreements ~~which~~ will include items such as funding arrangement, maintenance requirements, and the need to preserve GI installed as a means to comply with the CD ~~be perpetually~~in perpetuity.

#### **III. Implementation of the GI Plan**

The CD requires the District to implement GI with a DRC totaling 10 million gallons according to the schedule shown below.

Years after CD Effective Date	Date	DRC (Million gallons)
5	January 5, 2019	2
10	January 5, 2024	5
15	January 5, 2029	10

MWRD is in the process of developing a GIS platform to maintain an inventory of all completed GI projects. The data to be stored will include project location, collaborating partner(s), type of GI, the entity responsible for project maintenance, as-built drawings, and DRC. The MWRD will roll out the GIS platform in stages as it becomes available.

DRC is defined as the maximum available stormwater retention capacity of a GI project in any individual storm as stated in the project plans stamped by a licensed Professional Engineer or, in the absence of such a statement, a project-specific capacity calculated using the following table:

Technology	Quantity	Unit	DRC (gallons)
Rain Gardens	100	Square Feet	200
Native Plants/Landscaping	100	Square Feet	150
Stormwater Trees	100	Trees	1,000
Porous Pavement	100	Square Feet	1,000
Bioswales	100	Square Feet	500
Green Roofs	100	Square Feet	300
Greenways	100	Square Feet	63

MWRD will implement projects to achieve the DRC requirements as described in Section II of this GI Plan.

#### **IV. ~~Additional.~~ Additional Commitment to Green Infrastructure Projects Due to Contingency Event-Related Schedule Delay**

A contingency event occurs if MWRD is unable to complete Thornton Composite Reservoir, McCook Reservoir, Stage 1, and McCook Reservoir, Stage 2 by the dates required in the CD and an extension is approved either by EPA or the Court. If a contingency event occurs, MWRD will provide additional required DRC by the deadlines indicated in the table below and in conformance with this GI Plan.

For Contingency Events in Delay of	Additional DRC requirement <del>(gallons)</del>	Deadline to complete additional DRC
Thornton Composite Reservoir	250,000 <u>gallons</u>	January 5, 2019
McCook Reservoir, Stage 1	250,000 <u>gallons</u>	January 5, 2024
McCook Reservoir, Stage 2	250,000 <u>gallons for each grant, pursuant to Paragraph 24 or 26 of the CD, of an extension of one or more deadlines applicable to McCook Reservoir, Stage 2</u>	5 years after the grant of each such extension

#### **V. Reporting**

MWRD will prepare an Annual GI Report to document progress made on GI Plan and will describe technical assistance given, the implementation of GI projects, the cumulative estimate of DRC volume, and the continuing evaluation of potential future projects.