

Greene County, Missouri

Municipal Separate Storm Sewer System (MS4)

Storm Water Management Plan (SWMP)

Permit # MO-R040014 (2021-2026)



Storm Water Management Plan

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Cover Photo: Greene County, City of Springfield, Watershed Committee of the Ozarks, and James River Basin Partnership staff sample macroinvertebrates on Jordan Creek.

TABLE OF CONTENTS

Contact Information.....	3
Regulatory and Background Information	3
TMDL Information.....	9
Co-Permittee Information.....	10
Stormwater Program Review and BMP Iterative Process	10
MCM 1: Public Education.....	12
MCM 2: Public Participation and Involvement	21
MCM 3: Illicit Discharge Detection and Elimination	24
MCM 4: Construction Site Storm Water Management	31
MCM 5: Post-Construction Storm Water Management	38
MCM 6: Pollution Prevention/Good Housekeeping for Municipal Operations.....	47
 Appendices.....	 59

LIST OF FIGURES

Figure 1: Environmental Priorities Task Force Meeting.....	4
Figure 2: MCDA Identified Pollutant Source Impacts	6
Figure 3: SROI BMP Analysis Results.....	7
Figure 4: Students on a Field Trip at the Watershed Center	12
Figure 5: A Greene County Inspector Instructs an OSW Class.....	14
Figure 6: Outfall Screening Location	25
Figure 7: Vehicle Wash Bay Separator Cleaning	52
Figure 8: Vehicle Repair Bays.....	52
Figure 9: Salt Spreading Equipment Maintenance	52
Figure 10: Greene County Highway Department Facility Utility Map	55
Figure 11: Clifton Facility Petroleum Storage with Secondary Containment	56

LIST OF Tables

Table 1: Target Audiences, Pollutants, and BMPs	16-18
Table 2: MCM 1 Measureable Goals.....	19-20
Table 3: MCM 2 Measureable Goals.....	23
Table 4: MCM 3 Measureable Goals.....	30
Table 5: MCM 4 Measureable Goals.....	37
Table 6: Section 4.5.A Summary	40
Table 7: Section 4.5.C Summary	43
Table 8: MCM 5 Measureable Goals.....	46
Table 9: Greene County Highway Department Employee Training Materials.....	49
Table 10: MCM 6 Measureable Goals.....	57

Contact Information (3.1.B)

Primary Contact and Primary Person Responsible for all MCMs:
Timothy Davis, M.S., CFM
Environmental Compliance Manager
Office: (417) 868-4147
Email: tdavis@greencountymo.gov

Regulatory and Background Information

Greene County has partnered with the City of Springfield (a Phase 1 MS4 permittee) and City Utilities to develop and implement a holistic Integrated Plan framework for protecting our community's environmental resources, including streams and lakes impacted by stormwater. The Springfield-Greene County Integrated Plan for the Environment (Integrated Plan) is the lens through which Greene County views implementation of BMPs and stormwater program elements intended to comply with the MS4 permit. Because it is such an important part of Greene County's stormwater program, a short summary of Greene County's Integrated Plan process is appropriate and necessary in this section of the SWMP. The sustainable return on investment (SROI) process detailed on pages 6-8 is especially important in evaluating the effectiveness of some structural and non-structural BMPs that compose the MS4 program elements.

Because this is a cooperative effort between Greene County, the City of Springfield, and City Utilities, only one entity hosts the Integrated Plan website rather than each partner having their own parallel and redundant integrated planning website. All Integrated Plan documents referenced in this section are hosted on the City of Springfield Integrated Planning website at <https://springfieldintegratedplan.com/>

In June of 2012, EPA released its "Integrated Municipal Stormwater and Wastewater Planning Approach Framework" which emphasized a commitment to work with states and communities to implement an integrated planning approach to address environmental objectives. In response to this opportunity, leaders from the City of Springfield, Greene County and City Utilities developed a local approach to integrated planning titled "A Citizen Focused Approach." This holistic approach uses local knowledge to examine our environmental resources related to wastewater and stormwater as well as solid waste, drinking water, and air quality. The Springfield – Greene County community is working hard to implement an Integrated Plan to protect natural resources by prioritizing solutions to address the most pressing problems that matter most to our community in a manner that is affordable to our citizens. The Springfield-Greene County Integrated Plan is comprised of four phases:

Phase I:

The Assessment Phase and answers the question, "Where are we now?" During this phase, local stakeholder groups gathered data to assess the current status of our environmental resources. We realized that we can't measure success without first establishing a baseline from which to measure. This phase created a comprehensive GIS database that includes everything from stream sampling data and

wastewater infrastructure to land use and geology. By pulling together all the known information we can begin to see where environmental problems are and how they could be connected to potential sources. The database was only the start however. Water quality data can tell us the location of pollution problems and some of the probable sources. They cannot tell us which pollution sources are causing the biggest problem, nor can they tell us how to prioritize possible solutions.

Phase II:

The second phase of our approach is our Vision Phase and answered the question “Where do we want to be?” As a community, we believe we have achieved success when:

- Community resources are directed towards managing environmental issues using the most effective solutions to address the most significant problems in a way that is affordable to our citizens.
- We are in compliance with Federal and State regulations while addressing the specific needs of our community.
- We have the ability to address water, air, and solid waste issues holistically allowing both our community and the regulators to operate more efficiently.
- We have a community culture that understands and supports the goal of high-quality environmental resources and supports these efforts through stakeholder involvement. Our community has a high level of trust that resources are being used to address environmental issues efficiently and effectively.
- Our community has a clear understanding of how funding and other resources will be used to improve environmental quality.

Phase III:

We are currently in step C of Phase III of our Tactical Phase trying to answer the question “How will we get there?” During this phase, input from stakeholder groups is used to prioritize our community’s environmental needs based on four key elements:

A. Capture our **Community’s Priorities**.

The citizens on the Environmental Priorities Task Force (Task Force) were asked to identify the environmental resources (water, air, and land) and resource uses that are the highest priority to the community by answering the question “if you only had one dollar to spend on water, air, and land resources, where would you spend it?” The Task Force was empaneled to help guide decision-making regarding environmental planning for the City of Springfield, City Utilities, and Greene County, Missouri. The citizen’s task force was formed to represent community interests in actions taken by the Greene County, the City of Springfield, and City Utilities in protecting all of our environmental resources, including stormwater.



Figure 1: Environmental Priorities Task Force Meeting

Environmental Priorities Task Force

The Springfield Greene County Environmental Priorities Task Force was convened to identify the environmental priorities the community should address first in an integrated plan

Environmental Priorities Task Force: Community's Watershed Priorities

The following water quality objectives and watersheds, in priority order, were identified by the Environmental Priorities Task Force as the most important:

- Protect our drinking water sources: McDaniel Lake, Fellows Lake, Upper James River, Fulbright Spring Recharge Area, and Upper Little Sac.
- Support aquatic life in waterways where people fish and consume fish they catch: Lower James River, Sac River, Little Sac River, and McDaniel/Fellows Lake.
- Protect water from pollution in Lower James River, Upper James River, Sac River, and Little Sac River in areas where people swim.
- Protect waterways used for irrigation and that support livestock and wildlife.
- Protect Lower James, Wilson's Creek, and Little Sac so people can wade and boat in these waterways.
- Improve the aesthetics of Wilson's Creek. There is an important trail system in this watershed and it is positioned upstream of important recreational uses.

These Task Force priorities are one of the weighted inputs of the Multi-Criteria Decision Analysis (MCDA) tool developed to identify the pollutant sources that most affect the resources determined by the citizens to be the most important, will be addressed first. The input from the Environmental Priorities Task Force is the guiding force behind every step as we move forward with the Integrated Plan. The watershed priorities identified by Environmental Priorities Task Force Final Report are accessible on page 15 of the PDF located at <https://springfieldintegratedplan.com/wp-content/uploads/2018/05/epTaskForceFinalReport020615.pdf>

B. Identify and prioritize the most significant Sources of Pollution:

The Multiple-Criteria Decision Analysis (MCDA) toolset was developed specifically for the Integrated Plan to take a structured look at how different pollutants impact the natural environment and the relative significance of each source. The MCDA toolset was used to identify and prioritize the most significant sources of pollution with the goal of then using the sustainable return on investment (SROI) tool to ultimately identify optimal solutions. By numerically normalizing the impacts of pollutant sources on community identified environmental priorities, we can begin to determine which pollutant sources are contributing the most pollution that is causing the most harm to the resources our community values the most. The MCDA allows us to compare pollution sources on an “apples-to-apples” basis to determine which pollution source has the greatest impact and should be prioritized for action above other pollution sources. The chart below in Figure 2 summarizes the final MCDA findings showing that agricultural runoff, urban runoff, and sanitary sewer exfiltration are the sources of pollution in stormwater that have the greatest impacts on our area's water resources. The results of the MCDA analysis are accessible on pages 22-25 of the PDF at <https://springfieldintegratedplan.com/wp-content/uploads/2018/05/mcdaFinalReport171228.pdf>

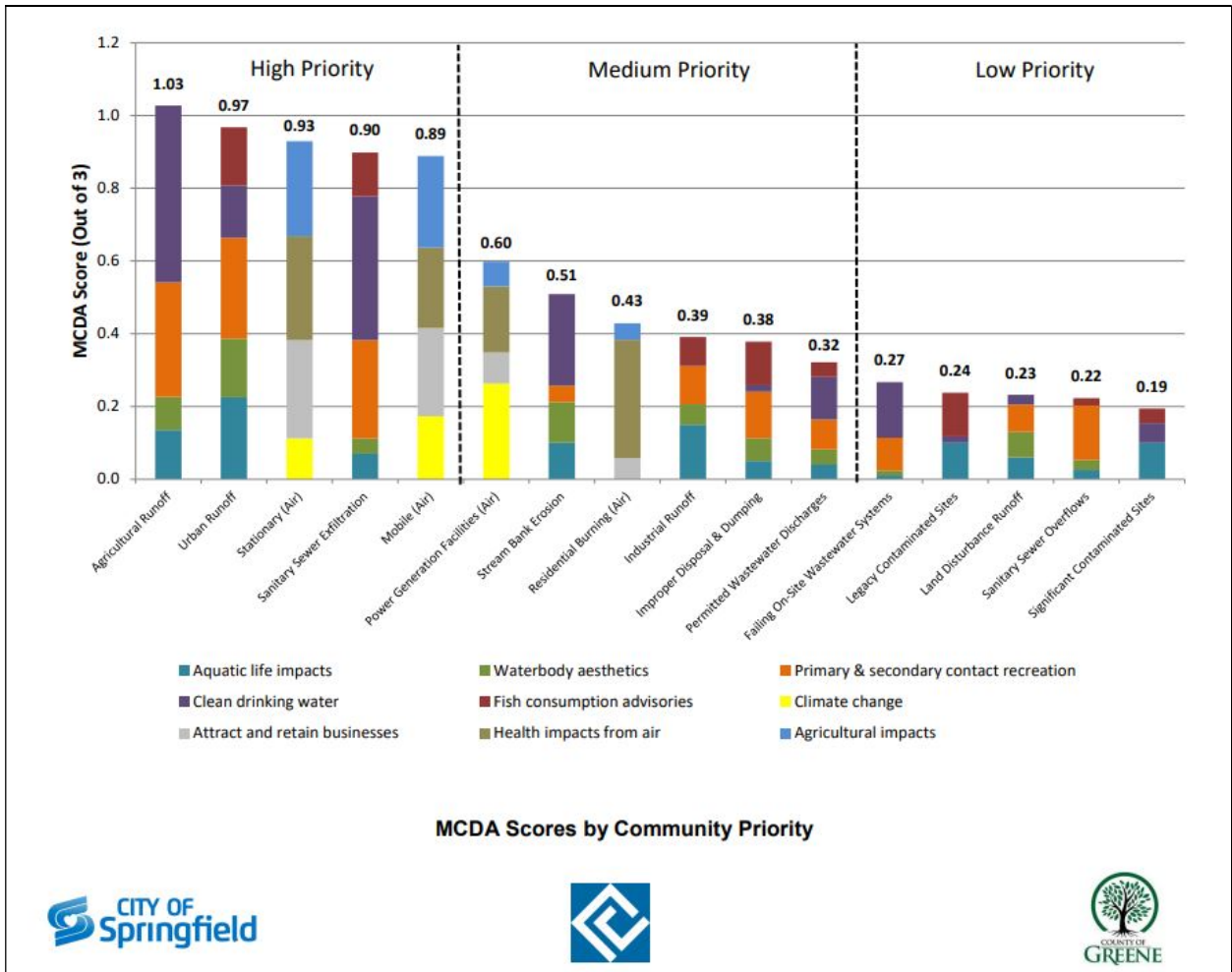


Figure 2: MCDA Identified Pollutant Source Impacts

C. Identify and prioritize the most **Effective Solutions**.

Once the MCDA identified the pollutants having the greatest impact, we can use the Sustainable Return on Investment (SROI) analysis to evaluate various solutions to that specific pollutant and determine which solutions give the most benefit for each dollar spent. By finding the “triple bottom line” considering the environmental, social, and financial costs and benefits of any proposed solution, we can ensure that the most effective solutions are being targeted toward the most serious problems. The SROI allows us to compare on an “apples-to-apples” basis which solutions would have the greatest environmental, social, and financial benefit for each dollar spent. A short summary of the SROI analysis process is accessible at <https://springfieldintegratedplan.com/wp-content/uploads/2019/06/sroiAtGlance.pdf>

The SROI analysis is a critical component of Greene County’s iterative approach to evaluating the effectiveness of MS4 program elements. The SROI process has been used by Greene County and The City of Springfield to evaluate the effectiveness of multiple best management practices either currently used for stormwater quality, or that are being considered for implementation. A comprehensive (environmental, social, and financial) cost/benefit ratio is the final SROI product. The ratio answers the question “How much environmental, social, and financial benefit do we get for every dollar we put into this BMP”? If the SROI ratio is greater than 1 then the monetized triple bottom line benefits are greater than the cost of the BMP. If the ratio is less than one the cost of the BMP outweighs the triple bottom line benefit. For BMPs that address water quality, the environmental benefit component of the SROI analysis is the amount of estimated improvement in EPA’s Water Quality Index (WQI).

The SROI tool has been used to evaluate water quality BMPs that are currently part of Greene County’s and The City of Springfield’s water quality programs as well as practices that could potentially be implemented to improve water quality. Because the Integrated Plan is a cooperative effort between Greene County, the City of Springfield, and City utilities, all SROI BMP analysis results are shared with all partner organizations for each to use/implement as needed. Figure 3 summarizes the SROI cost/benefit results for selected current and potential water quality program elements. Those BMPs shown in Figure 3 that are applicable to Greene County’s program are detailed on page 8 of this SWMP document.

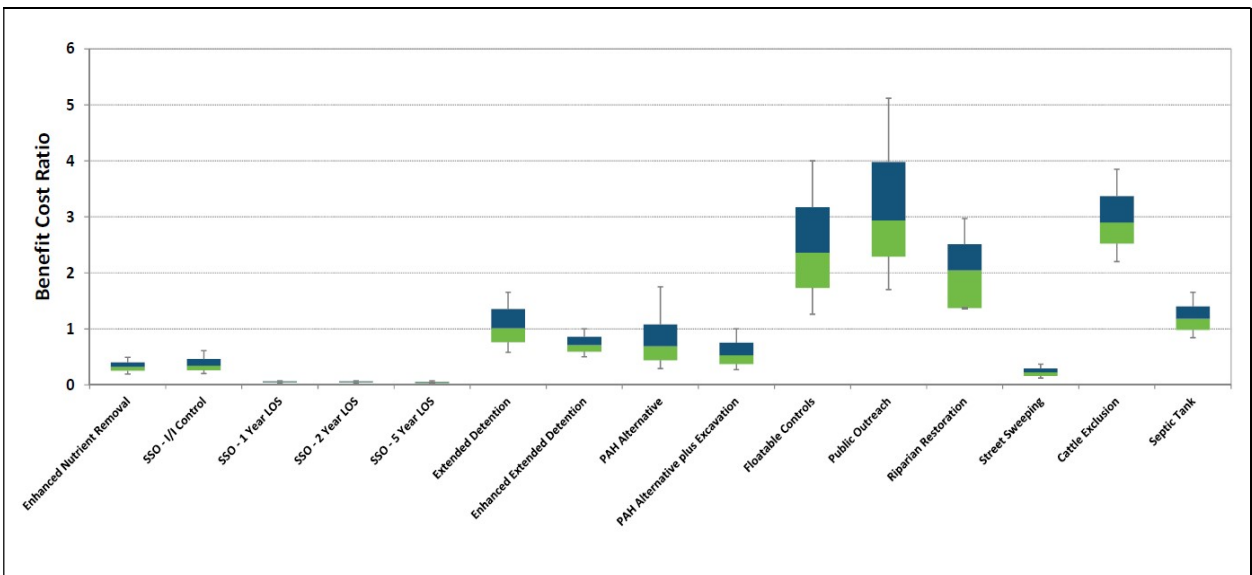


Figure 3: SROI BMP Analysis Results

Each of the BMPs from Figure 3 listed on page 8 are either currently being implemented by Greene County as part of the stormwater program to comply with the MS4 permit and were analyzed to determine effectiveness, or have been analyzed through the SROI process to determine if implementation would provide a benefit. Each BMP is listed with the triple bottom line cost benefit ratio and the link to the SROI report PDF. Because this is a

cooperative effort between Greene County, the City of Springfield, and City Utilities, only one entity hosts the Integrated Plan website rather than each partner having their own parallel and redundant integrated planning website.

The elements of Greene County's MS4 program currently being implemented that have been evaluated through the SROI process are:

- Extended Detention retrofitting (**Cost/Benefit Ratio 1.0**)
https://springfieldintegratedplan.com/wp-content/uploads/2020/06/SpringfieldSROI_DetentionBasins191115.pdf
- Public Education and Outreach (**Cost/Benefit Ratio 2.9**)
https://springfieldintegratedplan.com/wp-content/uploads/2020/06/SpringfieldSROI_PublicOutreach200603.pdf
- Street Sweeping (**Cost/Benefit Ratio 0.2**)
https://springfieldintegratedplan.com/wp-content/uploads/2020/06/SpringfieldSROI_StreetSweep191115.pdf
- Removal of septic systems with connection to sanitary sewer (**Cost/Benefit Ratio 1.2**) https://springfieldintegratedplan.com/wp-content/uploads/2020/06/GreeneCoSROI_SepticTanksDRAFT191118.pdf

The elements of Greene County's MS4 program that have been evaluated through the SROI process for potential implementation include:

- Enhanced Extended Detention Retrofitting (**Cost/Benefit Ratio 0.69**)
https://springfieldintegratedplan.com/wp-content/uploads/2020/06/SpringfieldSROI_DetentionBasins191115.pdf
- Floatable Controls (**Cost/Benefit Ratio 2.3**)
https://springfieldintegratedplan.com/wp-content/uploads/2020/06/SpringfieldSROI_FloatableControls200603.pdf
- Voluntary alternative watering and livestock (cattle) fencing from riparian zones (**Cost/Benefit Ratio 2.9**) https://springfieldintegratedplan.com/wp-content/uploads/2020/06/GreeneCoSROI_CattleExclusionDRAFT191122.pdf

It is important to note that Public Education and Outreach shows the highest cost/benefit ratio of 2.9 dollars of environmental, social, and financial benefits for each dollar we invest in public education and outreach. The other BMPs evaluated so far that show a positive cost/benefit ratio greater than 1 include extended detention, floatable controls, riparian restoration, providing alternative watering sources to enable fencing livestock from streams, and replacing septic systems with sanitary sewer.

Phase IV:

The fourth phase of our approach is the Adaptive Management phase. As we achieve success and learn more, the target will continue to move. We must continually refine our analysis, check the effectiveness of our solutions, and constantly reprioritize.

TMDL Information

Section 6.1A *“Any regulated MS4 identified in an EPA approved or established TMDL with an applicable Wasteload Allocation (WLA) shall implement steps toward the attainment of applicable WLAs in accordance with 40 CFR 122.44(k)(2) and (3).”*

Some of the storm water discharge from the regulated urbanized areas of Greene County does enter water bodies for which there is an EPA approved TMDL. These water bodies include:

- James River
- Little Sac River

However, neither of these TMDL’s contain WLA’s for non-point sources or regulated MS4 communities. Greene County is therefore not required to develop and submit a TMDL Assumptions and Requirements Attainment Plan (ARAP).

Even though Greene County is not required to develop an ARAP for the two EPA-approved TMDL’s we are certainly still concerned about the quality of water in our local streams, especially in the James River and one of its main urban tributaries, Pearson Creek. The confluence of Pearson Creek with the James River is just upstream of the drinking water intake for City Utilities’ Blackman Treatment Plant. This intake location on the James River supplies nearly 40% of the annual drinking water for residents of Greene County and the City of Springfield who are City Utilities Customers. The quality of water in Pearson Creek has a particularly important influence on our community since drinking water protection is the highest priority for the Integrated Plan. In 2011 EPA issued a draft TMDL for Pearson Creek naming an unknown pollutant as the cause of water quality impairment. Although that TMDL was withdrawn, Pearson Creek remains on the 303(d) list of impaired waters for E.Coli presumed to be from non-point source runoff and Aquatic Macroinvertebrate Bioassessments reflecting the effects of an unknown pollutant source(s). Since 2017 Greene County has contracted with the Ozarks Environmental and Water Resources Institute (OEWRI) at Missouri State University to perform water quality sampling on Pearson Creek. Greene County’s monitoring consists of water quality samples collected at one site every 14 days regardless of weather or flow conditions. Samples are analyzed for nitrogen, phosphorus, E. Coli, and several additional water quality parameters. With enough data we will be able to construct flow duration curves and estimate pollutant loading. The data collected will inform not only any future TMDL, but will also help Greene County implement the most effective BMPs in the Pearson Creek watershed. Monitoring results will be included in each annual report.

In addition to the bi-weekly sampling, Greene County also contracted with OEWRI to perform a one-time E.coli source tracking study to determine the presence or absence of human and bovine genetic markers in bacteria samples from Pearson Creek. The first step in knowing what actions should be taken to reduce bacteria concentrations in Pearson Creek is determining the specific bacteria sources. Sampling was conducted in 2018. Both human and bovine genetic markers were detected at sample sites on Pearson Creek. However, neither human, nor bovine markers were detected at the same site on different sample dates. The final report on bacteria source tracing in Pearson Creek is accessible on the OEWRI website at

https://oewri.missouristate.edu/Assets/OEWRI/Final_Report_2019_PearsonCreek_BacteriaSourceTracking.pdf

Co-Permittee Information (3.2)

Not Applicable. Greene County does not share responsibility for permit implantation with another permittee.

Stormwater Program Review and BMP Iterative Process (3.3)

Greene County conducts a review of the stormwater management program at least once per year in the process of preparing the required annual report.

Minimum Control Measures:

MCM 1: Public Education and Outreach on Stormwater Impacts

“The permittee shall implement a public education program to distribute educational materials to the community and/or conduct equivalent outreach activities about the impacts of storm water discharges on waterbodies and the steps the public can take to reduce pollutants in storm water runoff”.

Greene County’s strategy to incorporate public education into our storm water management program relies heavily on partnering with and supporting existing education/conservation organizations such as the Watershed Committee of the Ozarks and the James River Basin Partnership. Greene County can best utilize our limited fiscal and human resources by financially supporting and partnering with these groups whose sole focus is increasing public awareness of water quality and quantity issues confronting our community. The watershed organizations that we support provide education programs and information of higher quality and greater quantity than Greene County could provide without such partnerships.

Even before being required to do so by the MS4 permit, Greene County has been active in efforts to educate the public on their contribution to stormwater pollution and what steps they can take to improve our water resources. From the inception of both organizations Greene County has helped partially fund both the Watershed Committee of the Ozarks (WCO) and the James River Basin Partnership (JRBP). Both of these organizations were formed with the mission of informing the public about water resources and how to protect them. In addition to Greene County’s independent education efforts, it is our cooperation with these two organizations that is the most effective tool utilized to inform the public about storm water issues.

Watershed Committee of the Ozarks

As part of Greene County’s commitment to ensuring the permanence of the Watershed Committee of the Ozarks (WCO) mission Greene County contributes \$65,000 annually to the WCO’s operating budget for education and outreach activities. The funding from the three founding sponsor agencies, Greene County, City Utilities, and the City of Springfield allows the WCO to leverage those funds to receive grants allowing them to administer much larger programs than sponsor funding alone. The programs developed for the Watershed Center at Valley Water Mill Park provide place-based, hands-on water education for kindergarteners through engineers to learn about how to protect or water resources and why it’s important.

The Watershed Center at Valley Water Mill Park is utilized as an outdoor classroom for elementary, middle, and high school students from Springfield Public Schools and many surrounding school districts. Field Trips are facilitated by Watershed Center staff Since Valley Water Mill is part of Springfield’s drinking water supply, the lessons are taught within the over-arching framework of drinking water protection.



Figure 4: Students on a field trip at the Watershed Center

Public Education and Outreach
Greene County provides significant financial support to our partner organizations The Watershed Committee of the Ozarks and James River Basin Partnership to support their mission of protecting our local water resources through public education.

Depending on the age of the students, field trips focus on problems that can be associated with stormwater and the connection between healthy land and healthy water. Specific topics include the definition of a watershed, pollution sources that affect water, the difference between point and non-point pollution, connectivity of surface water to groundwater in our karst topography, the importance of native vegetation and healthy riparian zones, as well as steps each student can take to prevent water pollution.

The WCO has coordinated with SPS to include a hydrology unit in the general earth science class taken by SPS high school students. This unit is designed to build on what students learned in the Greener Greenspaces program. This problem-based learning unit asks students to study and learn about current water quality issues in the Springfield/Greene County area and then are evaluated on the solutions they come up with for those problems. Students participate in a field trip to tour an urbanized stream, Jordan Creek, where they perform water quality analyses for phosphates, nitrates, turbidity, temperature, dissolved oxygen, and pH to get a first-hand look at how urbanization can impact water quality and are then asked to develop a plan to address one water pollution problem they encounter.

Lesson plans and evaluation rubrics for these programs are available upon request during an audit of the MS4 program.

The Watershed Committee of the Ozarks also conducts tours of Jordan Creek for members of the public, has informational booths at community events, hosts grazing schools for ranchers at the Sac River Grazing Center, and provides opportunities for volunteer activities at the Watershed Center. The monthly meetings provide a forum for professionals and the public to learn about water quality related topics.

In addition to monetary funding, Greene County works closely with The WCO through:

- Active participation in the annual sponsor meeting with the WCO, City of Springfield, and City Utilities. These annual sponsor meetings give an opportunity to review the WCO's annual report of programs and activities as well as make any program changes that are deemed necessary
- The Greene County Stormwater Engineer attends the monthly WCO board meetings
- Representatives from the Greene County Environmental Division attend the monthly WCO meetings and have several times provided the featured speaker
- Greene County Environmental Division staff volunteer time for projects and field trips at the Watershed Center
- Greene County Environmental Division staff sit on various advisory committees for grants administered by the WCO
- Greene County provides technical review and editing of fact sheets under development
- Greene County Environmental Division engineers occasionally provide engineering design and technical support for 319 and other grant projects administered by the WCO.

The Watershed Committee's educational activities, resources, and publications can be found at <https://watershedcommittee.org/our-publications/>

James River Basin Partnership

Greene County provides \$10,000 in annual base funding to the James River Basin Partnership (JRBP) for watershed education and outreach within the James River watershed. The 2021-2022 funding agreement between Greene County and the JRBP requires the JRBP to provide educational information at five local events per year and to post a minimum of twelve posts on social media such as Facebook, Twitter, Instagram, and YouTube in addition to at least 2 postings in their newsletter. Through the funding agreement, Greene County also partners with the JRBP to provide a rebate incentive program for rain barrel purchases at certain stores in the area. The agreement includes additional funds for the JRBP's "Right as Rain" rain barrel rebate program which reimburses property owners up to \$0.50 per gallon of capacity (up to \$300) to install rainwater harvesting practices on their property. The agreement also includes funds to expand the yard soil testing and nutrient management plan program for residential homeowners in certain urbanized Greene County watersheds, to develop an educational brochure for animal waste, and to expand the septic tank pump-out program to certain urbanized watersheds within Greene County. The JRBP also provides opportunities for Greene County citizens to participate in clean water through several stream clean-up events per year such as the annual River Rescue on the James River and the Earth Day clean up on Springfield Lake. The funding agreement is available upon request during any audit of Greene County's MS4 program.

The James River Basin Partnership makes regular posts on these social media platforms:

- Facebook: www.facebook.com/jamesriverbasin
- Instagram: www.instagram.com/jamesriverbasin
- Twitter: www.twitter.com/jamesriverbasin
- YouTube: [Jamesriverbasin – YouTube](https://www.youtube.com/jamesriverbasin)
- Blog: "River Ramblings" <https://www.jamesriverbasin.com/river-ramblings>



Figure 5: A Greene County inspector instructs an OSW certification class at the training center at Valley Water Mill

On-Site Wastewater Training Center at Valley Water Mill

The On-Site Wastewater Training Center (Training Center) is located at the Park Department's Valley Water Mill Equestrian Center and was constructed using 319 grant funding acquired by the WCO. The Training Center provides a hands-on outdoor classroom for Greene County to train on-site wastewater treatment system installers as well as the general public on correct installation and maintenance of different on-site wastewater systems. The center has many different types of on-site wastewater treatment systems built above-ground, or partially buried so that OSW installers can view the correct installation and function of each type of system. Proper installation and maintenance of these systems is the first step in ensuring that untreated sewage effluent does not reach our waterways either as surface runoff or in groundwater that recharges the areas many springs. Contractors are not allowed to install OSW systems in Greene County unless they have been licensed by the Missouri State Department of Health and Senior Services (HSS) and successfully completed the certification training conducted by Greene County staff

at the Training Center. Installer certification lasts for three years at which time the installer must take a re-certification training conducted by Greene County staff in order to maintain their ability to install OSW systems in Greene County. Greene County conducts two certification classes each year at the Training Center for new OSW installers (one in the spring and one in the fall) and also conducts two re-certification classes each year (one in the spring and one in the fall). Certification/re-certification class training materials (power point slides, code books, permit examples) are available to view upon request during audits of Greene County's MS4 program.

The County also utilizes educational brochures that are given to every homeowner when a septic system is installed, repaired, or expanded. These brochures are particularly effective when given to homeowners who have experienced a failure of their septic system and must have it repaired.

Homeowner brochures are specific to each type of OSW system. The brochures were developed by the Watershed Committee of the Ozarks in partnership with Greene County. The brochures are accessible on both the Greene County Environmental Web page and on the WCO website at the following links:

- Maintaining OWTS – https://watershedcommittee.org/wp-content/uploads/2011/11/Maintaining-OWTS_updated.pdf and <https://greenecountymo.gov/files/PDF/file.pdf?id=1547>
- Maintaining Low Pressure Pipe – https://watershedcommittee.org/wp-content/uploads/2011/11/Maintaining-Low-Pressure-Pipe_updated.pdf and <https://greenecountymo.gov/files/PDF/file.pdf?id=1545>
- Pump to Gravity – https://watershedcommittee.org/wp-content/uploads/2011/11/Pump-to-Gravity_updated.pdf and <https://greenecountymo.gov/files/PDF/file.pdf?id=1546>
- Maintaining Drip System – https://watershedcommittee.org/wp-content/uploads/2011/11/Maintaining-Drip-System_updated.pdf and <https://greenecountymo.gov/files/PDF/file.pdf?id=1548>

Other Educational Efforts

Greene County also conducts pre-construction meetings to educate contractors and developers about proper erosion control measures for land disturbance sites (discussed in detail in Section 4.4.G on pages 33-34 of this SWMP document). Educational training is conducted at least two times per year for employees of the Greene County Highway Department as discussed in detail in Section 4.6.A on pages 44-47 of this SWMP document. We have also posted several educational videos available 24 hours a day on the Greene County Environmental Division's web page at https://greenecountymo.gov/resource_management/environmental/

4.1.A *Identify target audiences and explain why the target audiences are likely to have significant stormwater pollution impacts in the SWMP;*

See Table 1 on pages 16-18 of this SWMP document for a list of target audiences and why each target audience was chosen. Greene County will evaluate the target audiences annually as part of the annual report process. Any new target audiences identified will be added to the SWMP and any new BMPs.

4.1.B *Identify target pollutants and/or sources of pollution that the permittee’s education program is designed to address and how those pollutants/ sources relate to the specific target audience(s); and*

See Table 1 on pages 16-18 of this SWMP document for a list of pollutants targeted by Greene County’s stormwater program and how they relate to each target audience. Greene County will evaluate the target pollutants and pollutant sources annually as part of the annual report process. Any new target pollutants or pollutant sources identified will be added to the SWMP and any new BMPs.

4.1.C *Develop or utilize appropriate educational BMPs (materials, events, activities, etc.) to be used in conjunction with the target pollutants and target audiences. Explain opportunities about the BMPs and how the BMPs inform and educate target audiences to reduce pollutants in stormwater runoff.*

See Table 1 on pages 16-18 of this SWMP document for a listing of the educational BMPs utilized for each target pollutant and target audience.

<u>Target Audiences:</u>	<u>Explanation of Why Audience Was Chosen:</u>	<u>Target Pollutants:</u>	<u>Sources of Pollution:</u>	<u>Educational BMP(s) Materials, Events, Activities, etc.</u>	<u>Goal of BMP</u>
Residential Homeowners	On-site wastewater system failure in areas not served by sanitary sewer can contribute bacteria and nutrients to receiving waters	Bacteria (particularly E. Coli) and nutrients	Effluent from failing on-site wastewater systems	JRBP rebate for septic system pump outs in the James River watershed	Inform homeowners on the need for on-site wastewater system maintenance and reduce bacteria and nutrients in runoff and low-flow
	On-site wastewater system failure in areas not served by sanitary sewer can contribute bacteria and nutrients to receiving waters	Bacteria (particularly E. Coli) and nutrients	Effluent from failing on-site wastewater systems	Educational handout given by Greene County to each new home constructed with an on-site wastewater treatment system	Ensure homeowners are educated on the need for on-site wastewater system maintenance and reduce bacteria and nutrients in runoff and low-flow
	Increased impervious area from driveways, roofs, and patios alters natural hydrology and can accelerate streambank erosion	Sediment	Bank erosion from altered hydrology	JRBP rebate for rain barrels installed for rainwater harvesting	Educate homeowners on the benefits of capturing rain water for later re-use
On-Site Wastewater System Installation Contractors	On-site wastewater system failure in areas not served by sanitary sewer can contribute bacteria and nutrients to receiving waters	Bacteria (particularly E. Coli) and nutrients	Effluent from failing on-site wastewater systems	Greene County conducts annual certification and re-certification classes for all contractors that install on-site wastewater systems in Greene County	Ensure correct installation of all new on-site wastewater systems to minimize the risk of failure and prevent bacteria and nutrients in effluent from reaching waterways

Developers and Excavating Contractors	Uncontrolled runoff from construction sites can carry large volumes of sediment into receiving waterways along with chemicals, oil, and trash/floatables	Sediment, chemicals, oil, trash/floatables	Construction site runoff	Pre-construction meetings required with developer/owner and/or contractor before land disturbance can begin	Educate developers and contractors on the application of BMPs in their SWPPP to reduce sediment, chemicals, oil, and trash associated with their site
Agricultural Livestock Producers	Traditional grazing practices can reduce infiltration, increase runoff, and contribute additional bacteria and nutrients in runoff	Bacteria, sediment, and nutrients	Runoff from continuous grazing practices	Grazing schools at Watershed Committee of the Ozarks Little Sac Grazing Center at Fellows Lake and pet waste brochure distributed by the JRBP	Educate ranchers and cattle producers on the economic and environmental benefits of rotational grazing systems
Greene County Highway Department and Resource Management Staff	Improper housekeeping practices at county facilities can contribute oil, herbicides, paint, chlorides, sediment and trash/floatables into the stormwater system	Oil, chlorides, sediment, herbicides, sediment, and trash/floatables	Road maintenance activities such as vehicle maintenance, de-icing, herbicide use, road surfacing, lane striping	Annual training of Highway staff utilizing training videos and materials available online. Annual Integrated Planning Day for Resource Management	Reduce pollutants of concern from any Greene County road maintenance project or facility
Elementary, Middle, and High School Students	The kids of today will be the policy makers, business leaders, homeowners, ag producers, and developers of tomorrow.	Bacteria, sediment, trash/floatables , nutrients, chemicals	Pet waste, septic system effluent, littering, lawn fertilization, salt, pesticides	Field trips to the Watershed Center for hands-on demonstration of water quality protection principles	Educate students on how pollutants impact streams and the steps they can take to reduce pollution
High School Earth Science Hydrology Unit	The kids of today will be the policy makers, business leaders, homeowners, ag producers, and developers of tomorrow.	Bacteria, trash/floatables nutrients, chemicals, Nutrients	Urban runoff, lawn fertilizers, animal waste	High School curriculum written in cooperation with the WCO and Springfield Public Schools to incorporate water quality into science units for Earth Science students	Challenge students to think creatively to solve real-world problems that arise from a variety of human impacts on water quality
Greene County Commissioners	Commissioners make policy decisions for Greene County environmental regulations and set the budget for programs that comply with the MS4 permit. Keeping them informed is critical	Bacteria, trash and floatables, nutrients, sediment, oil, chemicals, chlorides.	Pet waste, septic system effluent, littering, lawn fertilization, salt, pesticides	Weekly briefing of Commissioners by the Resource Management Department Director	Update and educate Commissioners so they can enact policies and budgets that continue to improve water quality.

Table 1 (Continued): Target Audiences, Pollutants and BMPs

<u>Target Audiences:</u>	<u>Explanation of Why Audience Was Chosen:</u>	<u>Target Pollutants:</u>	<u>Sources of Pollution:</u>	<u>Educational BMP(s) Materials, Events, Activities, etc.</u>	<u>Goal of BMP</u>
General Public	Improperly disposed trash eventually washes into storm drains and into streams	Trash and floatables	Littering, illegal dumping, improper disposal of solid waste	JRBP stream clean up events	Provide the public with an opportunity to learn how trash affects local waterways and see the difference volunteer efforts can make in improving stream health
	Improperly disposed trash eventually washes into storm drains and into streams and urbanization alters hydrology and contributes chemicals, all of which are detrimental to urban stream quality	Trash and floatables, chemicals, temperature	Littering and improper solid waste disposal, illicit discharges	Tours of Jordan Creek conducted by the Watershed Committee of the Ozarks	Make the general public aware of the impacts of urbanization on natural streams by taking tour groups along the underground stream
	Passive education through the use of permanent educational signage allows visitors to the Watershed Center to better understand the feature they are seeing at the park	Nutrients, Bacteria, Sediment, chemicals, floatables	Littering, fertilizers, pesticides, animal waste, stream and construction site erosion	Interpretive signs at the Watershed Center	Citizens who are aware how their activities impact water quality are more likely to take steps to reduce their impact
	May people do not understand that stormwater is not treated before it enters streams, or that those same streams provide the water they drink	Trash and floatables, bacteria, nutrients, oils	Pet waste, fertilizer, petroleum products, littering	Video links on Greene County Environmental Division web page	Educate citizens on where their stormwater goes and how their actions can affect waterways and drinking water
	Reaching the broadest audience possible is important to educate the largest number of people about their impact on stormwater quality.	Bacteria, floatables, trash, hydrologic change	Failing septic systems, microplastics, residential and commercial development	JRBP social media postings on Facebook, Twitter, YouTube and Instagram	Provide a broad audience with information accessible 24 hours a day so they can learn how to make small changes in their lifestyle to help improve water quality

Table 1 (Continued): Target Audiences, Pollutants and BMPs

MCM 1 Measureable Goals and Iterative Process:

The public education and outreach BMPs selected to reach each of the target audiences in Table 1 are included in Table 2 below with measureable goals and evaluation criteria. Public education and outreach efforts are evaluated each year when the funding agreements for the WCO and JRBP are evaluated. Greene County works with staff from both WCO and JRBP to identify and implement any changes that need to be made. The effectiveness of the overall public education strategy has been evaluated by the SROI tool as part of the Integrated Planning Process and found to have a benefit to cost ratio of 2.9 to 1. For every dollar spent on educational efforts the citizens of the Springfield-Greene County area receive \$2.90 in environmental, social, and economic benefit.

BMP Description	BMP Purpose	Goal/Expected Result of BMP	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	BMP Evaluation
			Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5	
1 JRBP's Social Media Postings on Facebook, Twitter, YouTube, and Instagram	Keep a steady stream of educational material available to over 4,000 social media followers	People will change their daily behavior when they understand the direct impact they have on the water resources they use	Make at least 12 posts on social media related to water quality management practices	Make at least 12 posts on social media related to water quality management practices	Make at least 12 posts on social media related to water quality management practices	Make at least 12 posts on social media related to water quality management practices	Make at least 12 posts on social media related to water quality management practices	Hope to see an upward trend in social media following for these postings
2 JRBP's Septic Tank Pump out Rebate in the James River Watershed	Educate homeowners about the need for proper OSW system maintenance and provide an incentive to pump the septic tank	Reduce bacteria and nutrients in baseflow and groundwater	Assist at least 10 Greene County residential homeowners pump out their septic systems every year	Assist at least 10 Greene County residential homeowners pump out their septic systems every year	Assist at least 10 Greene County residential homeowners pump out their septic systems every year	Assist at least 10 Greene County residential homeowners pump out their septic systems every year	Assist at least 10 Greene County residential homeowners pump out their septic systems every year	Track the number of septic systems pumped per year
3 Septic System Maintenance Handouts from Greene County to For Each New Home Constructed with an OSW system	Ensure homeowners are educated on proper maintenance of their specific type of OSW system	Reduce bacteria and nutrients in baseflow and groundwater	Mail the appropriate septic system handout to the property owners for 100% of building permits issued for new homes not connected to sanitary sewer	Mail the appropriate septic system handout to the property owners for 100% of building permits issued for new homes not connected to sanitary sewer	Mail the appropriate septic system handout to the property owners for 100% of building permits issued for new homes not connected to sanitary sewer	Mail the appropriate septic system handout to the property owners for 100% of building permits issued for new homes not connected to sanitary sewer	Mail the appropriate septic system handout to the property owners for 100% of building permits issued for new homes not connected to sanitary sewer	utilize Greene County's permit software to track the number of permits issued for new single family homes with septic systems
4 Rebate Given for Homeowners to Install Rainwater Harvesting Units on Their Property	Educate homeowners of the hydrologic benefits of capturing rainwater for later use	To reduce peak runoff from impervious surfaces at a catchment scale to reduce erosion in first order streams	Provide rebates for a minimum of 2,000 gallons of rainwater storage annually	Provide rebates for a minimum of 2,000 gallons of rainwater storage annually	Provide rebates for a minimum of 2,000 gallons of rainwater storage annually	Provide rebates for a minimum of 2,000 gallons of rainwater storage annually	Provide rebates for a minimum of 2,000 gallons of rainwater storage annually	Annual reimbursements to citizens for rainwater harvesting storage volume
5 On-Site Wastewater System Installer Certification and Re-certification Classes Conducted by Greene County	Ensure the correct installation and function of all new and replacement OSW systems	Reduce septic system failure by ensuring that all OSW installers in Greene County have an adequate knowledge of OSW design and installation	Teach two certification classes and two re-certification classes. One each in the spring and fall.	Teach two certification classes and two re-certification classes. One each in the spring and fall.	Teach two certification classes and two re-certification classes. One each in the spring and fall.	Teach two certification classes and two re-certification classes. One each in the spring and fall.	Teach two certification classes and two re-certification classes. One each in the spring and fall.	Installers must pass an exam at the end of each certification or recertification class
6 Pre-construction Meetings With Owners/developers and Contractors before Land Disturbance Activities Begin	Inform contractors and owners of permit requirements and correct erosion control BMP installation	Minimize the sediment loading from active construction sites in receiving waters	Conduct a pre-construction meeting for all land disturbance projects that require a Greene County Grading Permit	Conduct a pre-construction meeting for all land disturbance projects that require a Greene County Grading Permit	Conduct a pre-construction meeting for all land disturbance projects that require a Greene County Grading Permit	Conduct a pre-construction meeting for all land disturbance projects that require a Greene County Grading Permit	Conduct a pre-construction meeting for all land disturbance projects that require a Greene County Grading Permit	Decreasing trend in corrective notices from Greene County Inspection staff
7 Grazing Schools Conducted at the Watershed Committee of the Ozarks' Little Sac Grazing Center at Fellows Lake	Provide an opportunity for agricultural producers to learn rotational grazing practices for economic and environmental benefit	Reduce bacteria and nutrients from livestock having access to streams	Conduct at least one grazing school in October at the Little Sac Grazing Center	Conduct at least one grazing school in October at the Little Sac Grazing Center	Conduct at least one grazing class in the permit cycle	Conduct at least one grazing class in the permit cycle	Conduct at least one grazing class in the permit cycle	WCO staff solicit feedback surveys from attendees
8 Annual Training of Greene County Highway Department and Resource Management Department staff	Give Greene County Employees the knowledge to incorporate best management practices into their routine work and teach them to recognize illicit discharges	Reduce chlorides, petroleum, chemicals, trash/floatables, and sediment associated with Greene County Highway Department activities	Hold at least two video training sessions per year in conjunction with monthly safety training at the Greene County Highway Department	Hold at least two video training sessions per year in conjunction with monthly safety training at the Greene County Highway Department	Provide at least two training opportunities for Greene County staff each year.	Provide at least two training opportunities for Greene County staff each year.	Provide at least two training opportunities for Greene County staff each year.	Have a total of at least 50 employees attend the stormwater training sessions

Table 2: MCM 1 Measureable Goals

	BMP Description	BMP Purpose	Goal/Expected Result of BMP	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	BMP Evaluation
				Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5	
9	Elementary, middle, and high school students field trips to the Watershed Center at Valley Water Mill Park	Watershed Center field trips focus on teaching students concepts such as a watershed, water pollution sources, drinking water protection and the link between healthy land and clean water	Educate students on how pollution impacts streams and steps they can take to reduce pollution	Teach students what a watershed is. Teach students the definition of point, and non-point source pollution and examples of how pollutants impact watersheds	Teach students what a watershed is. Teach students the definition of point, and non-point source pollution and examples of how pollutants impact watersheds	Conduct 55 field trips or have 3,000 field trip attendees per year at the Watershed Center	Conduct 55 field trips or have 3,000 field trip attendees per year at the Watershed Center	Conduct 55 field trips or have 3,000 field trip attendees per year at the Watershed Center	Track number of field trips and field trip participants at the Watershed Center
10	High School Earth Science Hydrology Unit Curriculum Developed by the WCO for Springfield Public Schools	Give Students a deeper understanding of water quality impacts of urbanization so that they can think critically to identify potential solutions	Encourage students to take actions that improve water quality	Teach students to evaluate the chemical and physical changes affecting an urban stream and critically come up with proposals for effective solutions	Teach students to evaluate the chemical and physical changes affecting an urban stream and critically come up with proposals for effective solutions	Teach students to evaluate the chemical and physical changes affecting an urban stream and critically come up with proposals for effective solutions	Teach students to evaluate the chemical and physical changes affecting an urban stream and critically come up with proposals for effective solutions	Teach students to evaluate the chemical and physical changes affecting an urban stream and critically come up with proposals for effective solutions	Students give a final presentation of their solution to a specific water quality issue of their choice. Presentations are evaluated by their classroom teacher based on evaluation rubric
11	JRBP Stream Clean Up Events	Make the public aware of the impacts of trash and dumping and provide volunteers the opportunity to improve water body aesthetics	Reduction of trash in area waterbodies	Hold at least two clean-up events on area water bodies	Hold at least two clean-up events on area water bodies	Hold at least two clean-up events on area water bodies	Hold at least two clean-up events on area water bodies	Hold at least two clean-up events on area water bodies	Decreasing trend in trash collected from the clean up events
12	Jordan Creek Tours Conducted by the WCO	Provide the public with an opportunity to learn about the impact of urbanization on stream hydrology, and water quality	Those citizens with a greater understanding of the problems will be less likely to engage in behaviors that generate pollution	Conduct at least 10 Jordan Creek tours for any professional, school, or civic group that schedules a tour	Conduct at least 10 Jordan Creek tours for any professional, school, or civic group that schedules a tour	Conduct at least 10 Jordan Creek tours for any professional, school, or civic group that schedules a tour	Conduct at least 10 Jordan Creek tours for any professional, school, or civic group that schedules a tour	Conduct at least 10 Jordan Creek tours for any professional, school, or civic group that schedules a tour	Upward or downward trend in number of tours given
13	Informational Signs at the Watershed Center	Provide passive information to Watershed Center visitors about each of the BMPs and features they are seeing as they walk around the building, lake, and trails	Inform Watershed Center visitors about the importance of the area's drinking water source and practices to protect that resource	Watershed Center field trip participants can be counted, but it is very difficult to get a count of visitors to the park or measure how many visitors stop to read the informational signs, or how many of the signs each visitor reads	Watershed Center field trip participants can be counted, but it is very difficult to get a count of visitors to the park or measure how many visitors stop to read the informational signs, or how many of the signs each visitor reads	Watershed Center field trip participants can be counted, but it is very difficult to get a count of visitors to the park or measure how many visitors stop to read the informational signs, or how many of the signs each visitor reads	Watershed Center field trip participants can be counted, but it is very difficult to get a count of visitors to the park or measure how many visitors stop to read the informational signs, or how many of the signs each visitor reads	Watershed Center field trip participants can be counted, but it is very difficult to get a count of visitors to the park or measure how many visitors stop to read the informational signs, or how many of the signs each visitor reads	It is very difficult to get a count of visitors to the park or measure how many visitors stop to read the informational signs, or how many of the signs each visitor reads
14	Video Links on the Greene County Environmental Division Web Page	Provide 24 hour a day access to water quality videos on the Greene County Environmental Division web page	Educate citizens on where stormwater goes and how their actions affect water quality	The links were only recently posted so we hope to see some utilization by web page visitors	We hope to see an increase in views from year one and to add information as sources become available	We hope to see an increasing trend in view of the video links	We hope to see an increasing trend in view of the video links	We hope to see an increasing trend in view of the video links	Views of video links are trackable by Greene County Information Systems and reported to the Environmental Compliance Manager
15	Animal Waste Brochure Developed by JRBP and Greene County	Educate homeowners and agricultural livestock producers about the affect of animal waste on water quality	Inform pet owners and livestock owners of how to minimize water quality impacts of their animals			Distribute brochures at 5 community events per year	Distribute brochures at 5 community events per year	Distribute brochures at 5 community events per year	Presence of JRBP staff at five community events per year where brochures are distributed
16	Weekly Briefing of Greene County Commissioners by the Resource Management Department Director	Keep elected officials informed of the water quality projects, programs, and partnerships Greene County is engaged in	Give Commissioners the information needed to enact policies and regulations protective of water quality				Conduct weekly briefings at least twice per month	Conduct weekly briefings at least twice per month	Was the target met Y/ N
17	Watershed staff presence at a table/booth at community events to distribute educational material	Educate the general public on a wide variety of water quality concerns and measures they can take to improve water quality	People will change their daily behavior when they understand the direct impact they have on the water resources they use				Attendance by Watershed staff at 5 community events per year	Attendance by Watershed staff at 5 community events per year	Presence of Watershed staff at five community events per year where brochures are distributed

Table 2 (Cont.): MCM 1 Measureable Goals

MCM 2: Public Involvement/ Participation

“The permittee shall implement a public involvement/participation program that reaches out and engages the public in the development and implementation of the permittee’s Stormwater Management Program”.

4.2.A *The permittee shall hold a public notice period for a minimum of thirty (30) days on the draft SWMP. The permittee shall respond to public comments received during the public notice period. The permittee shall retain copies of any public comments and responses, for a minimum of three years.*

Greene County holds the required 30-day public notice period if a significant change is made to the SWMP. Greene County places the SWMP and the advertisement of the 30-day public notice period on the Environmental Division web page link at the end of this paragraph. Public comments can be submitted via email message through the message link found on the Environmental Division web page. All public comments received are evaluated for applicability to the permit requirements and appropriateness to the SWMP. All comments submitted during the 30-day public notice period are retained by Greene County for the 5 year MS4 permit cycle.

https://greenecountymo.gov/resource_management/environmental/

The final draft of Greene County’s Stormwater Management Plan was posted for public comment from March 1 through April 1, 2021 on the Environmental section webpage to solicit any input from the Greene County Citizens. This 30 day public notice period satisfies the SWMP public notice requirement. No comments were received. The Greene County Environmental Division web page is accessible at (https://greenecountymo.gov/resource_management/environmental/).

4.2.B *The permittee shall hold a public hearing regarding the proposed Stormwater Management Program and Plan within the MS4 service area. Public notice of the public hearing shall be given at least thirty (30) days before the hearing. Public notice of the hearing may be given at the same time as public notice of the draft SWMP and the two notices may be combined.*

Greene County holds the required public hearing for the proposed stormwater Management Program and Plan. Public notice of the hearing is posted on the Greene County Environmental Division web page link at the end of this paragraph for the entire 30-day period prior to the public meeting. Links to the current SWMP, the current MS4 permit, and the new MS4 permit are also included with the public notice on the Environmental Division web page. Additional notice is posted in the local *Daily Events* publication until the public hearing date is past.

https://greenecountymo.gov/resource_management/environmental/

Greene County held a public meeting on January 19, 2021. The proposed SWMP was an agenda item on the monthly Planning Board meeting that is open to the public. Public notice of the hearing was posted on the Greene County Environmental web page on December 18, 2020 and remained until the Planning Board meeting date was past. Because the County had only recently received SWMP comments from DNR, the SWMP document was still being revised at the time of the public hearing so now new SWMP draft was available. The public notice included a copy of the previous SWMP, the previous MS4 permit and a copy of the current draft MS4 permit. In addition to posting on the Greene County Environmental

Division web page, the January 19, 2021 Planning Board Hearing agenda item announcing solicitation for comments on the SWMP was posted in the *Daily Events* on December 30, 2020 and was posted on the Greene County Planning and Zoning web page at

https://greenecountymo.gov/resource_management/planning_and_zoning/

During the Planning Board Meeting the Greene County Environmental Compliance Manager gave a brief description of the MS4 program and the role of the SWMP. No public comments on SWMP development were received. The January 19, 2021 Planning Board Meeting agenda is available in Appendix A.

4.2.C *The permittee shall have a publicly available method to accept public inquiries or concerns, and to take information provided by the public about stormwater and stormwater related topics. This method, or a combination of methods, shall cover all MCMs.*

Greene County has a link on the Environmental Division web page for accepting comments, concerns, and inquiries from Greene County citizens regarding any stormwater related issue. The web link generates an email that is automatically sent to the Stormwater Engineer, Water Quality Field Operations Manager, and the Environmental Compliance Manager. The Greene County Environmental Division Phone number is also listed for any inquiries or concerns citizens may have. It is the goal of the Environmental Division to respond to comments and inquiries within five business days. The email link is located at

https://greenecountymo.gov/resource_management/environmental/

4.2.D *If the permittee utilizes a stormwater management panel or committee, the permittee shall provide opportunities for citizen representatives on the panel or committee.*

Greene County does not utilize a stormwater management panel/committee, however the Springfield-Greene County Integrated Planning (IP) process relies on the input of the community to set the priorities for programs and actions that protect the environmental resources that are most important to citizens. The Springfield-Greene County Integrated Plan, and the specific role of the Citizen Priorities Task Force in providing input is described in detail on pages 4-5 of this SWMP.

MCM 2 Measureable Goals and Iterative Process:

Greene County's goal is to meet the MS4 permit requirements by having at least a 30-day public notice period prior to any public meeting for a new SWMP, or if any significant changes are made to the current SWMP. Throughout the permit cycle, if any significant revisions are made to the SWMP Greene County will hold a public meeting and post public notice of the meeting for 30 days prior as required in the MS4 permit to seek public input.

BMP Description	BMP Purpose	Goal/Expected Result of BMP	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	BMP Evaluation
			Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5	
SWMP Public Notice for Public Meeting	Enable members of the public to have input in writing the SWMP	Provide a means for citizens to be involved in the development of the stormwater program so they are invested in water quality protection	Hold a public meeting for any significant changes that might be made to the SWMP and post notice of the meeting at least 30 days in advance	Hold a public meeting for any significant changes that might be made to the SWMP and post notice of the meeting at least 30 days in advance	Hold a public meeting for any significant changes that might be made to the SWMP and post notice of the meeting at least 30 days in advance	Hold a public meeting for any significant changes that might be made to the SWMP and post notice of the meeting at least 30 days in advance	Hold a public meeting for any significant changes that might be made to the SWMP and post notice of the meeting at least 30 days in advance	Did we meet the 30 day notice requirement? Yes or No
Link on the Greene County Environmental Division Page to Report Illicit Discharges	Provide a means for citizens to submit concerns, inquiries, or information about stormwater and stormwater related topics that is available 24 hours a day	Enable Greene County to respond to issues that we would otherwise be unaware of	Respond to any inquiries received within 2 business days	Respond to any inquiries received within 2 business days	Respond to any inquiries received within 2 business days	Respond to any inquiries received within 2 business days	Respond to any inquiries received within 2 business days	Track contact from citizens via web-link generated email

Table 3: MCM 2 Measureable Goals

MCM 3: Illicit Discharge Detection and Elimination

“The permittee shall develop, implement, and enforce a program to detect and eliminate illicit discharges as defined in 10 CSR 20-6.200 and 40 CFR 122.34(b)(3), into the permittee’s regulated MS4”.

4.3.A *Develop, and maintain an up to date storm sewer system map, show the location of all outfalls, the names and location of all waters of the state that receive discharges from those outfalls, and the boundary of the regulated MS4 area.*

- 1. A description of the sources of information or procedures used for the map(s), how the permittee plans to verify the outfall locations with field surveys, and how the map will be regularly updated shall be included in the SWMP.*
- 2. The permittee shall make the map and any accompanying necessary information available to the Department upon request.*

Greene County has completed a very detailed map of the storm water management system. This map shows the location of all inlets, pipes, open channels, detention basins, and outlets of storm systems in the regulated MS4 as well as certain portions of unincorporated Greene County that do not fall under MS4 regulation. The map also contains the locations and names of all waters of the State and their tributaries, including those that receive stormwater discharge from the MS4. The LiDAR (light detection and ranging) data that was collected in 2010-2011 allows us to have very detailed 1-ft contour interval topography which enables us to determine the path of runoff both before and after it enters the regulated MS4 stormwater system. The stormwater system map was built in, and is accessed through ESRI’s ArcMap GIS program. To develop the map, the locations of all components of the stormwater system (detention basins, pipes, inlets, open swales, junction boxes, culverts, and bridges) were field verified by County cartography staff. Pipe diameters were catalogued to enable query by size. The stormwater system is just one of many layers accessible in the County GIS system allowing for the simultaneous viewing of other infrastructure or natural features that can influence the stormwater system. The GIS map of the stormwater management system is updated in several ways. As plans for new developments are approved, the final plans are digitized and the stormwater improvements for each individual project are added to the overall system map. Additionally, as errors and omissions in the map are discovered through routine maintenance or inspection the corrections are forwarded to the GIS technician who can then update the map. The map data is kept on internal servers, but is accessible to view upon request during audits of Greene County’s MS4 program.

4.3.B. *To the extent allowable under state, or local law, through ordinance(s), or other regulatory mechanism(s), the permittee shall effectively prohibit, unauthorized non-storm water discharges into the storm sewer system and implement appropriate enforcement procedures and actions. Identify in the SWMP the regulatory mechanism(s) the permittee will use to effectively prohibit illicit discharges into the MS4 by including a link to or a copy of the relevant sections.*

Illicit discharges into Greene County’s MS4 are prohibited by Article IV, Section 25 (C) of the Greene County Zoning Regulations. The ordinance is reviewed annually as part of the required annual report and updates can be made as needed. The illicit discharge prohibition ordinance is located specifically on pages 30-32 of the PDF accessible on Greene County’s Planning and Zoning web page at <https://greenecountymo.gov/files/PDF/file.pdf?id=1571>

Enforcement and penalties for violations of any article in the Greene County Zoning Regulations is found in Sections 5 and 6 of Article XXV. Section 5 allows for fines to be imposed for violations. Section 6, Paragraph B, allows the Resource Management Department to enforce all zoning regulations through any legal means available. Article XXV of the Greene County Zoning Regulations is available on the web page at <https://greenecountymo.gov/files/PDF/file.pdf?id=1593>

4.3.C *Develop and implement a plan to detect and address unauthorized non-storm water discharges, including illegal dumping, to the system. An explanation of these strategies shall be included in the SWMP with:*

1. *Applicable response timelines;*
2. *Procedures for tracing the source of an illicit discharge, including specific techniques used to detect the location of the source;*
3. *Procedures for removing the illicit discharge; and*
4. *Other practices that are a part of this plan.*

Greene County has identified 188 outfalls that discharge to waters of the state. All outfalls are screened at least once per permit period for illicit discharges. Our target goal is to screen at least 38 outfalls (20%) per year to ensure that all outfalls are screened during the permit period. Since many parts of the stormwater systems (pipes, detention basins, etc.) are located on private property, County staff do not have right of access to many points where the storm system enters waters of the state. As such, inspections are conducted at the point in the system where the pipe or channels either leaves Greene County right-of-way, or leaves property owned by the County to enter waters of the State. Screening logs and field notebooks are available upon request during audits of Greene County's MS4 program.

Dry Weather Field Screening procedures:

1. In order to meet the criteria of "dry weather screening", inspections are to take place no sooner than 72 hours following the end of the most recent rain event.
2. Inspection information must include outfall number, date of inspection, and if any discharge was found.
3. If discharge is found the initial assessment will be for visual and olfactory indications of pollutants such as an oily sheen or soap suds on the water, or a petroleum or sewage smell.
4. If none of the above indicators are present, a sample is to be collected and tested with free and total chlorine field indicator strips to determine if the source is a leaking or broken drinking water line. If the result is positive for drinking water indicators, the drinking water utility will be contacted to fix their broken line. The presence of chlorine can indicate either drinking water or swimming pool discharge. If chlorine is detected above 1 ppm as indicated by the field test, pool owners upstream of the discharge location can be located via aerial photographs and contacted in writing to educate them about DNR's pool discharge requirements in MO-G760000.



Figure 6: Outfall screening location

Dry Weather Screening

Greene County has identified 188 major outfalls that meet the definition found in 10 CSR 20-6.200. These outfalls are screened for evidence of illicit discharges at least once a year following a period of at least 72 hours with no measureable precipitation.

5. If the water sample is negative for drinking water indicators then the inspector is to follow the discharge toward the source as far as legally possible and collect a sample for analysis of common pollution indicators as listed in DNR Publication 2209. The specific pollutants to be analyzed for will be determined based on the suspected pollution source. For example, if leaking sewage is suspected, then bacterial and/or fluorescence analysis would be the best action. If oil is the suspected pollutant (from a visible sheen noted during inspection), then testing for volatile organic carbon (VOC) and BTEXN would be appropriate. If a pollutant source can be identified, the case will be referred to the Code Compliance Officer. Enforcement will be in accordance with Sections 5 and 6 of Article XXV of the Greene County Zoning Regulations as detailed in Section 4.3.B of this SWMP document.
6. If pollutants are present in elevated concentrations and no source can be found, the inspector will consult with the Stormwater Engineer on how to proceed. Options can include written notification to property owners asking for permission to access the property, or notification of DNR. If no pollutant or chemical indicator can be found in the discharge water it may be presumed to be groundwater. The Springfield Plateau is a heavily karst area with many caves, sinkholes, and springs. Groundwater can enter the stormwater system through inflow and infiltration. In such a case no further action by the County would be required.

These procedures are reviewed annually as part of the required annual report and updates can be made as needed.

Although dry weather screening may find some illicit discharges, reports from Greene County Citizens are the most effective tool for finding illicit discharges. As discussed in Section 4.2.C, Greene County has a link on the Environmental Division web page for accepting comments, concerns, and inquiries from Greene County citizens regarding any stormwater related issue. The web link generates an email that is automatically sent to the Stormwater Engineer, Water Quality Field Operations Manager, and the Environmental Compliance Manager. Citizens can use this link to report illicit discharges. When illicit discharge reports are received it is Greene County's goal to respond within 24 hours given the mobility of pollutants such as oil, concrete wash out, paint, chemicals, trash dumping, and other pollutants that can be reported by citizens. Reports of illicit discharges from citizens are investigated with the same screening procedures outlined in items 1-6 above.

Sewage effluent is a non-stormwater discharge that is a priority for Greene County's illicit discharge detection efforts. Although most on-site waste water system failures are not within the urbanized area boundaries, and thus not under MS4 permit regulation, there are many homes in the urbanized area not yet connected to sanitary sewer and sewage effluent can enter the regulated MS4 stormwater system if these systems fail, or are incorrectly installed. Failing on-site wastewater systems (OSW) pose a pollution threat to human health, and to surface and/or groundwater with pathogens such as E.Coli.

In addition to reactive investigations of reported sewage surfacing, Greene County takes a number of proactive steps to prevent eliminate discharges of wastewater from failing on-site wastewater treatment (OSW) systems both inside and outside the urbanized MS4 area. On-site wastewater program activities designed to prevent wastewater discharges into the stormwater drainage system include:

1. Review of soils reports and design plans for new and replacement OSW systems [Chapter 2, Section B(1) and B(2)]*
2. Inspect installation of all new and replacement OSW systems (Chapter 2, Section H)*
3. Education and certifications for OSW system installers as part of MCM 1 discussed on page 14 of this SWMP. The County provides certification and re-certification training classes every year for OSW system installers.
4. Inspect all new connections to sanitary sewer
5. Investigate failing OSW systems (failure being defines as the discharge of raw effluent to the ground surface or to groundwater or effluent backing up into the structure) and ensure the proper repair of the failing OSW system [(Chapter 2, Section A(3)-A(6)]*
6. Investigation of illegally installed OSW systems [(Chapter 2, Section A(3)-A(6)]*

*Citations are from the Greene County Regulations and Standards for On-Site Wastewater Systems accessible at <https://greenecountymo.gov/files/files.php?id=1493>

4.3.D *The permittee shall inform public employees, businesses, and the general public of hazards associated with illegal discharges and the improper disposal of waste. The SWMP shall include a description of how this plan will coordinate with all other minimum control measures, monitoring, Integrated Planning (where applicable), and TMDL implementation (where applicable).*

Greene County informs the public about the hazards of illicit discharges through a variety of methods including:

- On-site wastewater system installer training
- Watershed Center Field Trip activities such as the Enviroscape lesson plan (available upon request during any DNR audit of Greene County’s MS4 program)
- Informational signs at the Watershed Center’s Valley Water Mill Park
- Training videos for Greene County Highway Department employees on illicit discharges, how to spot them, and how they can be harmful
- Jordan Creek Tours conducted by the WCO for the public discuss and demonstrate the effects of illicit discharges
- Educational video links available 24 hours on the Greene County Environmental Division website

The illicit discharge information will coordinate with the other MCMs as follows:

- MCM 1 – All of the materials and activities that address illicit discharge elimination are also materials used for MCM1
- MCM 2 – Jordan Creek tours and the video links on the Greene County Environmental Division web page, and the signs at Valley Water Mill Park are freely available to the public which satisfies MCM 2
- MCM 4 – Discharge of sediment laden waters into the storm system is an illicit discharge. By Educating developers and contractors at the pre-construction meeting the illicit discharge of sediment can be reduced.
- MCM 5 – Post-construction BMPs that are well maintained are more effective at removing pollutants found in a potential illicit discharge. The requirement to record a maintenance agreement for long term maintenance of BMPs is new to Greene County’s program. The coordination of MCM 5 with MCM 3 will be addressed in this permit cycle by the development

of a maintenance guidance letter for the specific BMPS used on the property given to each property owner when the Maintenance Agreement is recorded.

- MCM 6 – Training videos for Greene County Highway Department staff include videos on the hazards of illicit discharges and how to spot them during their daily work duties.

Training materials are reviewed each year and updated as needed to keep trainings relevant and interesting to County employees as new, or updated materials are found/become available.

4.3.E *Implement a dry weather field screening strategy for unauthorized non-stormwater flows. The SWMP shall include a description of diagnostic monitoring procedures, including procedures for visual screening, sampling, or field analyzation and what parameters are sampled for to be used as indicators of discharge sources.*

Greene County's dry weather field screening procedures are detailed in Section 4.3.C on pages 24-25 of this SWMP.

4.3.F *Maintain and describe procedures to identify priority areas likely to have illicit discharges such as, but not limited to, any area where there is ongoing evidence of illicit discharges, or dumping; areas with higher likelihood of illicit connections such as neighborhoods with onsite sewage; or regions with a high percentage of directly connected impervious areas.*

Most commercial and industrial areas have been annexed by the surrounding Cities so the vast majority of land use in Greene County's MS4 area is residential houses. Because of this unique land use situation residential wastewater systems are a priority in Greene County's illicit discharge detection program. Greene County has identified priority areas likely to have illicit discharges by using our GIS data to overlay the City of Springfield's sanitary sewer system with the parcel boundary data to determine which properties in Greene County's urbanized MS4 area that do not have access to sanitary sewer. It is the older areas not served by sanitary sewer where discharges of sewage are most likely to enter the storm system. When conducting dry weather field screening Greene County screens each mapped outfall at least once during each permit cycle. Outfalls located in areas identified as priority areas without sanitary sewer are screened twice per permit cycle. Only 3 mapped outfalls discharge from areas not served by sanitary sewer. This low number is a function of the age of the residential developments. Those developments built before the extension of sanitary sewer, were also built before there was any kind of stormwater drainage requirements. Consequently, those areas without sanitary sewer rarely have any stormwater drainage infrastructure either. The outfall locations overlain on map of areas still needing sanitary sewer is include in Appendix B. When dry weather screenings are performed, staff also look for any evidence of dumping near stormwater inlets or channels. Dumping is referred to the Code Compliance Officer for enforcement. Dumping is most easily addressed as a violation of Article 4, Section 35 (B)(19) of the Greene County Zoning Regulations which can be accessed on page 74 of the PDF at <https://greenecountymo.gov/files/PDF/file.pdf?id=1571>. Enforcement will be in accordance with Sections 5 and 6 of Article XXV of the Greene County Zoning Regulations as detailed in Section 4.3.B of this SWMP document.

In addition to dry weather screening in priority areas and investigation of reported concerns from citizens, Greene County utilizes a proactive approach to prevent illicit discharges of septic system

effluent to stormwater. Greene County works with residents to facilitate the formation of sanitary sewer districts to construct sanitary sewer infrastructure and connect these properties to the new sanitary sewer thus eliminating the OSW for each lot. Residents of a subdivision within the urban services area initiate a petition effort and have at least 50% of the property owners in the sewer district boundary sign expressing their approval in order for the Greene County Commission to form the sewer district. Greene County then helps develop an engineering plan and per-lot cost estimate of construction. If the cost is acceptable to the residents the County proceeds to secure financing for the project and administer the construction of the project. Upon completion the residents can choose to pay their share of the construction and engineering costs at once, or over a period of ten years via assessment on their property tax bill.

Replacing on-site wastewater systems with sanitary sewer where it is available has been evaluated through the SROI tool as part of the Integrate Planning Process and found to have cost/benefit ratio of 1.2 which indicates that for every dollar spent to connect to sanitary sewer, citizens realize \$1.20 in environmental, social, and economic benefit.

4.3.G *Provide procedures to ensure the permittee's illicit discharge ordinance (or other regulatory mechanism) is implemented by means of appropriate enforcement procedures, including fines, and actions. A description of these enforcement procedures shall be included in the SWMP.*

Enforcement begins when the steps outlined in 4.3.C have identified the source of a reported, or detected illicit discharge. Greene County first contacts the property owner suspected of causing the illicit discharge, educating them about the harmful effects of the discharge they are causing and asking for cooperation in eliminating the discharge carrying pollutants. If voluntary compliance is not achieved, we can refer the violation to the Greene County Planning and Zoning Code Compliance Officer for enforcement. The Code Compliance Officer also can begin with an attempt to persuade the property owner to voluntarily comply with Article IV, Section 25 of the Greene County Zoning Regulations. If these efforts are not successful the Code Compliance Officer can refer the property owner to the Prosecuting Attorney's (PA) office. The PA will seek a judgement in court which would allow Greene County to hire a contractor to enter the property and abate the violation. Once the violation is abated, the County can seek to recoup the abatement expenses by assessing a property tax bill to the property owner.

Article XXV, Sections 5 and 6 of the Greene County Zoning Regulations does give Greene County the authority to impose fines for violations, but that option has never been utilized. Court orders have sufficed to abate previous violations of other zoning regulations and would be the preferred method of addressing any pollutant carrying illicit discharges found in the future. Article XXV, Sections 5 and 6 of the Greene County Zoning Regulations is located specifically on pages 2-3 of the PDF accessible on Greene County's Planning and Zoning web page at <https://greenecountymo.gov/files/PDF/file.pdf?id=1593>

MCM 3 Measureable Goals and Iterative Process:

The procedural steps for dry-weather screening are evaluated annually and the outfall map updated as new outfalls are constructed or discovered.

The effectiveness of replacing on-site wastewater systems with sanitary sewer where it is available has been evaluated through the SROI tool as part of the Integrate Planning Process and found to have cost/benefit ratio of 1.2 which indicates that for every dollar spent to connect to sanitary sewer, citizens realize \$1.20 in environmental, social, and economic benefit.

BMP Description	BMP Purpose	Goal/Expected Result of BMP	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	BMP Evaluation
			Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5	
GIS mapping of outfalls	Quickly identify storm system draining to an outfall in the event an illicit discharge is found	Quickly locate storm inlets leading to a mapped outfall if an illicit discharge is found	Annual review of mappig process with GIS staff at the beginning of the year in preparation for the annual report	Annual review of mappig process with GIS staff at the beginning of the year in preparation for the annual report	Annual review of mappig process with GIS staff at the beginning of the year in preparation for the annual report	Annual review of mappig process with GIS staff at the beginning of the year in preparation for the annual report	Annual review of mappig process with GIS staff at the beginning of the year in preparation for the annual report	Annual map review with GIS staff to ensure map accuracy
Regular update of storm sewer map when site plans are approved	Quickly identify storm system draining to an outfall in the event an illicit discharge is found	Quickly locate storm inlets leading to a mapped outfall if an illicit discharge is found	Add all new storm system lements to the GIS map at the time development plans are reviewed and approved by the Stormwater Engineer	Add all new storm system lements to the GIS map at the time development plans are reviewed and approved by the Stormwater Engineer	Add all new storm system lements to the GIS map at the time development plans are reviewed and approved by the Stormwater Engineer	Add all new storm system lements to the GIS map at the time development plans are reviewed and approved by the Stormwater Engineer	Add all new storm system lements to the GIS map at the time development plans are reviewed and approved by the Stormwater Engineer	Annual review of updtce procedures with GIS staff
Illicit discharges are effectively prohibited by Article IV, Section 25, Paragraph C	Effectively prohibit unauhtorized non-stormwater discharges in the the storm sewer system.	Reduction in non-stormwater pollutant loads	Annual review of ordinance at the beginning of the year in preparation fot the annual report	Annual review of ordinance at the beginning of the year in preparation fot the annual report	Annual review of ordinance at the beginning of the year in preparation fot the annual report	Annual review of ordinance at the beginning of the year in preparation fot the annual report	Annual review of ordinance at the beginning of the year in preparation fot the annual report	Annual review of ordinance language to determine if program changes are needed
Dry Weather Screening	Detect any ongoing illicit discharges to the MS4	Reduce pollutants entering the MS4 in illicit discharges	Screen at least 20% of the mapped outfalls in each year of the permit cycle	Screen at least 20% of the mapped outfalls in each year of the permit cycle	Screen at least 20% of the mapped outfalls in each year of the permit cycle	Screen at least 20% of the mapped outfalls in each year of the permit cycle	Screen at least 20% of the mapped outfalls in each year of the permit cycle	Tracking dry weather screening per year
Link on the Greene County Environmental Division Page to Report Illicit Dscharges	Provide a means for citizens to report illicit discharges that is available 24 hours a day	Enable Greene County to respond to reports of illicit discharges tht would be missed by dry weather screening	Respond to any reports of illicit discharges within 2 business days	Respond to any reports of illicit discharges within 2 business days	Respond to any reports of illicit discharges within 2 business days	Respond to any reports of illicit discharges within 2 business days	Respond to any reports of illicit discharges within 2 business days	Track illicit discharge reports and response actions

Table 4: MCM 3 Measureable Goals

MCM 4: Construction Site Storm Water Runoff Control

“The permittee shall develop, implement, and enforce a program to reduce pollutants in any storm water runoff to their regulated small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre shall be included in the program if that construction activity is part of a larger common plan of development or sales that would disturb one acre or more”.

4.4.A *The permittee shall have an ordinance and/or other regulatory mechanism to require construction site operators to implement erosion and sediment control BMPs at construction/land disturbance sites.*

- 1. The ordinance or regulatory mechanism shall include sanctions which are designed to ensure compliance, to the extent allowable under state, or local law.*
- 2. The SWMP must contain a copy of or a link to the relevant ordinance or regulatory mechanism.*

Article IV, Section 27 of the Greene County Zoning Regulations addresses land disturbance activities in Greene County. The ordinance is reviewed annually as part of the required annual report and updates can be made as needed. The land disturbance requirements and procedures are located specifically on pages 32-39 of the PDF accessible on Greene County’s Planning and Zoning web page at <https://greenecountymo.gov/files/PDF/file.pdf?id=1571>. Enforcement procedures and penalties to ensure compliance are found in paragraph F on pages 36-37 of the same document. Enforcement and penalties for violations can also be found in Sections 5 and 6 of Article XXV. Section 5 allows for fines to be imposed for violations. Section 6, Paragraph B, allows the Resource Management Department to enforce all zoning regulations through any legal means available. Article XXV of the Greene County Zoning Regulations is available on the web page at <https://greenecountymo.gov/files/PDF/file.pdf?id=1593>

Section 114 of the Greene County Stormwater Design Standards provides greater detail on requirements that construction site owners and operators must follow to comply with Article IV, Section 27. Section 114 of the Greene County Stormwater Design Standards is accessible on Greene County’s Planning and Zoning web page at <https://greenecountymo.gov/files/files.php?id=1560>

4.4.B *The permittee shall maintain requirements for construction site operators to:*

- 1. Implement appropriate erosion and sediment control best management practices; and*
- 2. Control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality.*

Article IV, Section 27 (A) of the Greene County Zoning Regulations on page 32 of the PDF accessible at the link included in section 4.4.A of this SWMP requires a grading permit from Greene County for all developments within the County. Section 114.3.1 of the Greene County Stormwater Design Standards on page 3 of the PDF accessible at the link included in section 4.4.A of this SWMP contains the grading permit requirement for all non-agricultural land disturbance in Green County as detailed below.

All non-agricultural land disturbance activities in Greene County require a Greene County grading permit regardless of area disturbed. The county can use discretion in waiving this requirement for sites disturbing less than one acre that do not pose a threat to a stream, sinkhole, spring or other sensitive natural feature. Before a grading permit is issued for any construction project the Greene County Environmental Section requires the following:

1. Application for a Greene County Grading Permit and the associated application fee. The grading permit application is accessible on the Greene County Environmental Division web page at <https://greenecountymo.gov/files/PDF/file.pdf?id=1538>
2. A site grading plan reviewed by the Greene County Stormwater Engineer for compliance with the Greene County Stormwater Design Standards including detention, storm system conveyance, water quality capture volume, and erosion/sediment control management practices.
3. A completed SWPPP for review and approval by Greene County. Greene County's SWPP template is based on EPA's example SWPPP and is available as a Microsoft Word document on Greene County's website at https://greenecountymo.gov/resource_management/environmental/
4. A refundable security bond in the amount of \$2,000 per disturbed acre deposited with the Greene County Treasurer's office for re-vegetation and BMP installation. This bonding requirement is found in Article IV, Section 27 (B)(1) of the Greene County Zoning Regulations accessible on page 32 of the PDF at <https://greenecountymo.gov/files/PDF/file.pdf?id=1571>
The bond is returned once final stabilization has been approved. For subdivisions and commercial projects a security agreement is also accepted. The security agreement for a Greene County grading permit is accessible on the Greene County Environmental Division web page at <https://greenecountymo.gov/files/PDF/file.pdf?id=1541>
5. A copy of the State of Missouri Land Disturbance Permit MOR-A00000 if the site is disturbing greater than one acre.
6. A maintenance agreement is required to ensure long term maintenance of the flood control and water quality structures. The maintenance agreement must be recorded in the Greene County Recorder's Office prior to permit issuance as required in Article IV, Section 25 (A)(3) of the Greene County Zoning Regulations. This section is accessible on page 29 of the PDF document at <https://greenecountymo.gov/files/PDF/file.pdf?id=1571>
The maintenance agreement is accessible on the Greene County Environmental Division web page at <https://greenecountymo.gov/files/files.php?id=36483>
7. A pre-construction meeting on site with the grading contractor and general contractor/owner of the site is required before grading may commence. The preconstruction meeting is a requirement of Section 101.12.1 (A) and 101.12.2 (A) of the Greene County Stormwater Design Standards. Those sections are located specifically on pages 5 and 6 respectfully of the PDF document accessible at <https://greenecountymo.gov/files/files.php?id=1551>

The SWPPP needed for issuance of the Greene County grading permit requires developers and contractors to address non-sediment pollutants including, but not limited to: trash, fertilizers, pesticides,

sanitary waste, concrete wash out, and petroleum products in Section 5 (pages 14-15) of Greene County's SWPPP template. SWPPP developers are required to list potential pollutants on site and describe the best management practices that will be implemented to reduce the potential for stormwater pollution. MDNR's Publication 212: Response to Small Fuel Spills is also requested to be included in this section as guidance for petroleum product spills.

4.4.C *The permittee shall maintain and apply procedures for review of all pre-construction site plans for consideration of potential water quality impacts.*

All proposed developments and re-development projects in Greene County are required to submit site plans for review by the Stormwater Engineer and/or Assistant Stormwater Engineer to ensure conformity with all sections of the Greene County Stormwater Design Standards. Section 101.7.1 of the Greene County Stormwater Design Standards requires review and approval of all plans and the issuance of a grading permit for any project in Greene County. Section 101.7.1 is accessible on page 2 of the PDF document found at <https://greenecountymo.gov/files/files.php?id=1551>

As part of the review process, the Greene County Stormwater Engineer reviews development plans for conformance with Section 114, particularly Sections 114.3.2 and 114.5.2-114.5.5, of the Greene County Stormwater Design Standards which address water quality by requiring erosion and sediment controls on each site during construction and requires a Greene County grading permit to be issued. Section 114 of the Greene County Stormwater Design Standards is accessible at the link provided in section 4.4.A of this SWMP. Section 103 of the Greene County Stormwater Design Standards outlines the checklist of review items for submitted plans with Section 103.1.3 (M) providing specific guidance on review procedures for the Sediment and Erosion Control Plan. Section 103.1.3 (M) is accessible on page 7 of the PDF document found at <https://greenecountymo.gov/files/files.php?id=1552>

4.4.D *The permittee shall maintain and apply mechanisms for receipt and consideration of information submitted by the public.*

Before any proposed development can submit a preliminary plat they must present their proposal to the Greene County Planning Board at a public hearing. Zoning hearings are posted 15 days in advance and adjoining landowners are contacted by personal courtesy letter. The hearings are a forum for the public to express their sentiment for, or against the proposed development. As required by Missouri Revised Statutes Chapter 64, the Greene County Planning Board is required to hold public meetings when considering preliminary plat approval.

While land disturbance activities are ongoing, any citizen with a concern about erosion or runoff from the site can contact the Greene County Environmental Division directly via the website link on the Environmental Division's web page. The web link sends an email report directly to the Stormwater Engineer, the Environmental Compliance Manager, and the Water Quality Field Operations Manager. Any of these staff members can inspect, or direct one of the field inspectors to inspect the construction site. The website for reporting is at the link in Section 4.2.C of this SWMP document.

4.4.E *The permittee shall maintain and apply procedures for site inspection and enforcement of control measures, this shall include prioritization of site inspection processes; AND*

4.4.F *The permittee shall inspect (or require inspection of) any structure that functions to prevent pollution of stormwater or to remove pollutants from stormwater and ensure that all BMPs are implemented and effective. This shall include a monitoring plan and/or documentation with implementation schedules described in the SWMP.*

Section 101.12.2 (B) of the Greene County Stormwater Design Standards requires inspection by Greene County Resource Management personnel of the sediment and erosion control measures on a construction site. Section 101.12.2 (B) is accessible on page 7 of the PDF document found at <https://greenecountymo.gov/files/files.php?id=1551>

By applying for the required grading permit, the applicant consents to Greene County staff inspecting the proposed development site and all work in progress as stated in Article IV, Section 27(F)(1) of the Greene County Zoning Regulations found on page 36 of the PDF document accessible at <https://greenecountymo.gov/files/PDF/file.pdf?id=1571>

The applicant must complete all the steps listed in section 4.4.B above before a grading permit will be issued. Once a grading permit has been issued there are two stormwater inspectors on Greene County staff who perform site inspections to ensure compliance with the SWPPP and associated erosion control plan. All weekly inspections required by the MOR-A00000 Land Disturbance Permit in the interim are the responsibility of the contractor and/or property owner. Site inspections by County staff are documented by entry into Greene County's *Eden™* permitting software which tracks all inspections for all permits issued including building permits, floodplain development permits and grading permits. This digital system allows us to maintain a permanent record of all site inspections performed. Inspectors are issued laptops which utilize wireless internet to connect to the County's server and provide the option to document their inspections while still on site. Photographs are also taken during most inspections to document the condition of the site, the location of any problem areas, and allow comparison with past conditions. All photographs are stored in digital format on the County's secure server. Previously, site inspections were documented by completing a hard-copy checklist. This checklist is still provided to contractors and site owners as a means of fulfilling the weekly inspection requirement in the MOR-A00000 Land Disturbance Permit and is used as a guide for County staff. The weekly inspection checklist is accessible on the Greene County Environmental Division website at <https://greenecountymo.gov/files/PDF/file.pdf?id=36494>

BMP's on the approved site plan and in the SWPPP are inspected on a regular basis by Greene County staff with a target schedule of at least three site visits throughout the life of the project (one inspection when initial BMPs are installed, one inspection to verify re-establishment of vegetation, and at least one during construction. Some project sites may be inspected more frequently depending on factors such as size of disturbed area, proximity to sensitive features (stream, floodplain, sinkholes, spring, etc.), or if the site is high profile/controversial. However, even the small sites are routinely inspected. Therefore Greene County's prioritization is to include all sites on a regular basis.

4.4.G *The permittee shall maintain and apply a plan designed to ensure compliance with the permittee's erosion and sediment control regulatory mechanism, this shall include the sanctions and enforcement mechanisms to be used to ensure compliance.*

Preventing violations before they occur is the best enforcement measure at our disposal. Greene County's policy is to conduct a preconstruction meeting held on site with the contractor and/or owner prior to earth disturbance activities (see item 7 on the grading permit requirements listed in Section 4.4.B). The preconstruction meeting gives Greene County the opportunity to educate each site owner and grading contractor about the requirements of Greene County's grading permit and the State of Missouri Land Disturbance Permit. The preconstruction meeting coordinates with MCM 1 by giving site specific BMP education to each contractor responsible for a land disturbance site in Greene County. Each pre-construction meeting includes, but is not limited to:

- Posting the permit(s) and SWPPP at the site entrance
- Weekly and post-rainfall inspection procedures for compliance with MORA00000
- Perimeter erosion control installation and maintenance
- Construction entrance installation and maintenance and road cleaning
- Detention/sediment basin installation priority and as-built survey requirement to ensure proper function
- Seeding and site stabilization requirements for site completion
- Any conditions specific to the site such as steep slopes, off-site run on, sensitive features (sinkholes, springs, caves, etc.) that require extra attention during construction

If violations occur during construction, enforcement of erosion and sediment control measures is achieved through a variety of means that progress in formality and severity. Formalized penalties and civil enforcement for non-compliance with County sediment and erosion control regulations are in Article IV, Section 27 (F)(4) of the Greene County Zoning Regulations referenced in Section 4.4.A of this SWMP document. However, formal penalties are rarely needed to achieve compliance. Greene County staff visit construction sites often enough that there is usually a good working relationship between staff and most contractors. If deficiencies or non-compliance issues are found during a site inspection Greene County staff can generally issue a verbal request to the site superintendent or general contractor either in person or via a phone call to have the deficiency corrected. Written notification can be sent through email if there is no one on site at the time of the inspection. In almost all cases, the contractor corrects the problem after the first verbal or email notification and the more formal steps outlined below are not needed. Should the noted deficiency not be resolved within the seven calendar days required by the SWPPP, written notice can be sent to the property owner informing him/her that they are in violation of their grading permit and listing the corrective action that needs to be taken. A stop-work-order can also be posted on the site and work must cease until the deficiency is corrected. For subdivisions requiring a final plat to be recorded, the County can withhold acceptance of public improvements and does not record the final plat until all disturbed area has been stabilized with vegetation or other permanent cover. This prevents the developer from obtaining building permits for the newly formed lots until the development is stabilized with vegetative cover. In the event this step does not elicit the desired response, Greene County can utilize the money (security agreement, letter of credit, or cash) that is required as a performance bond as listed above in item number 4 in section 4.4.B

of this SWMP document. For commercial building sites that do not have platted lots the verbal and written communication and stop work orders can be utilized, but instead of withholding the final plat The Greene County Environmental Division can request the Greene County Building Regulations Division to withhold the final inspection and certificate of occupancy for the building. Since both of these divisions are within the Resource Management Department they work very closely together to enforce County regulations. On commercial projects, the Environmental Division must approve the site improvements, including final stabilization, before a final inspection is performed by Building Regulations and the Environmental Division must have a grading permit ready (if one is required for a site) before Building Regulations will issue a commercial building permit. Conversely, the Environmental Division will not issue a grading permit for a commercial building site until Building Regulations is ready to issue the building permit. This coordinated approach allows for efficient enforcement of permitting requirements. Because of our ability to halt building inspections and deny building permits, or building inspections, it is very rare not to achieve compliance at this level for residential and commercial developments. If all else fails, the County can take the violation of the Zoning Regulations to court through the Greene County Counselor to obtain a court judgement. However, the multiple layers of enforcement options and the many enforcement tools available to gain compliance means that we have not yet had to utilize bond money or take a project developer to court in order to enforce our construction site runoff control regulations. Any land disturbance violation observed by staff or reported by a citizen in the county outside the MS4 urbanized boundary, is also investigated and if necessary, corrective action is taken.

MCM 4 Measureable Goals and Iterative Process:

Greene County's measureable goals for construction site stormwater runoff control are summarized below and detailed in Table 5.

- Review all site plans to ensure they include the sediment and erosion control plan required by Section 114 of the Greene County Stormwater Design Standards.
- Issue a grading permit for all non-agricultural land disturbance sites after review of the sediment control plan and the SWPPP.
- Inspect all site receiving a Greene County grading permit at least three times during the period of active land disturbance.

Plan review and grading permit issuance procedures are reviewed each year as part of the annual report to identify any needed changes.

BMP Description	BMP Purpose	Goal/Expected Result of BMP	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	BMP Evaluation
			Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5	
Land Disturbance Ordinance in Article IV, Section 27 of the Greene County Zoning Regulations	Reduce sediment discharged into the stormwater system from land disturbance sites	reduction in sediment discharge from active land disturbance sites	Annual review of ordinance at the beginning of the year in preparation for the annual report	Annual review of ordinance at the beginning of the year in preparation for the annual report	Annual review of ordinance at the beginning of the year in preparation for the annual report	Annual review of ordinance at the beginning of the year in preparation for the annual report	Annual review of ordinance at the beginning of the year in preparation for the annual report	Annual review of ordinance language to determine if changes are needed to improve program effectiveness
Review All Plans Submitted for Proposed Improvements at Residential and Commercial Construction Sites	Ensure land disturbance sites meet the erosion control requirements in Section 114 of the Greene County Stormwater Design Standards	Reduce the amount of sediment entering waterways from land disturbance sites	Review all plans for non-agricultural land disturbance sites >1 acre for compliance with Section 114 of the Greene County Stormwater Design Standards	Review all plans for non-agricultural land disturbance sites >1 acre for compliance with Section 114 of the Greene County Stormwater Design Standards	Review all plans for non-agricultural land disturbance sites >1 acre for compliance with Section 114 of the Greene County Stormwater Design Standards	Review all plans for non-agricultural land disturbance sites >1 acre for compliance with Section 114 of the Greene County Stormwater Design Standards	Review all plans for non-agricultural land disturbance sites >1 acre for compliance with Section 114 of the Greene County Stormwater Design Standards	Letter of Approval from the Stormwater Engineer indicates that the site plan meets the ordinance standards
Issue a Greene County Grading Permit for All Non-Agricultural Land disturbance >1 Acre	Ensure that land disturbance sites implement effective BMPs and are open for inspection by Greene County staff.	Reduce the amount of sediment entering waterways from land disturbance sites	Issue a grading permit for all non-agricultural land disturbance sites after review of the SWPPP and erosion control plan	Issue a grading permit for all non-agricultural land disturbance sites after review of the SWPPP and erosion control plan	Issue a grading permit for all non-agricultural land disturbance sites after review of the SWPPP and erosion control plan	Issue a grading permit for all non-agricultural land disturbance sites after review of the SWPPP and erosion control plan	Issue a grading permit for all non-agricultural land disturbance sites after review of the SWPPP and erosion control plan	Issuance of a Grading Permit for the site
Inspect all Sites for Which a Greene County Grading Permit Has Been Issued	Ensure that sediment and erosion control BMPs on the approved plans are implemented and maintained throughout the project	Reduce the amount of sediment entering waterways from land disturbance sites	Inspect all land disturbance sites for which a Greene County Grading Permit has been issued at least three times during active land disturbance activities	Inspect all land disturbance sites for which a Greene County Grading Permit has been issued at least three times during active land disturbance activities	Inspect all land disturbance sites for which a Greene County Grading Permit has been issued at least three times during active land disturbance activities	Inspect all land disturbance sites for which a Greene County Grading Permit has been issued at least three times during active land disturbance activities	Inspect all land disturbance sites for which a Greene County Grading Permit has been issued at least three times during active land disturbance activities	Documentation of inspections in Greene County's permitting software and with photo logs
Pre-construction Meetings With Owners/developers and Contractors before Land Disturbance Activities Begin	Educate contractors and owners of permit requirements and correct erosion control BMP installation	Minimize the sediment loading from active construction sites in receiving waters	Conduct a pre-construction meeting for all land disturbance projects that require a Greene County Grading Permit	Conduct a pre-construction meeting for all land disturbance projects that require a Greene County Grading Permit	Conduct a pre-construction meeting for all land disturbance projects that require a Greene County Grading Permit	Conduct a pre-construction meeting for all land disturbance projects that require a Greene County Grading Permit	Conduct a pre-construction meeting for all land disturbance projects that require a Greene County Grading Permit	Decreasing trend in corrective notices from Greene County Inspection staff
Link on the Greene County Environmental Division Page for citizens to report land disturbance violations	Provide a means for citizens to submit concerns, inquiries, or information about stormwater and stormwater related topics that is available 24 hours a day	Enable Greene County to respond to unpermitted land disturbance sites, or address concerns between regular inspections	Respond to any inquiries received within 2 business days	Respond to any inquiries received within 2 business days	Respond to any inquiries received within 2 business days	Respond to any inquiries received within 2 business days	Respond to any inquiries received within 2 business days	Track contact from citizens via web-link generated email
Enforcement procedures for violations as outlined in Article IV, Section 25, Paragraph F	Ensure adequate compliance with sediment and erosion control ordinance	Reduction in sediment loads from active construction sites	Number of Stop-Work Orders, fines levied, or security bonds used	Number of Stop-Work Orders, fines levied, or security bonds used	Number of Stop-Work Orders, fines levied, or security bonds used	Number of Stop-Work Orders, fines levied, or security bonds used	Number of Stop-Work Orders, fines levied, or security bonds used	Review number of stop work notices in proportion to permits issued and inspection performed.

Table 5: MCM 4 Measureable Goals

MCM 5: Post - Construction Storm Water Management in New Development and Redevelopment

“The permittee shall develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the permittee’s regulated small MS4. The permittees program shall ensure that controls are in place that have been designed and implemented to prevent or minimize water quality impacts”.

4.5.A *The permittee shall develop, and implement strategies which include a combination of structural and/or non-structural best management practices (BMPs) appropriate for the community, including, but not limited to the assessment of site characteristics at the beginning of the construction site design phase to ensure adequate planning for stormwater program compliance. The goal of this approach is to arrive at designs that protect sensitive areas, minimize the creation of stormwater pollution, utilize BMPs that effectively remove stormwater pollution, and attempt to maintain predevelopment runoff conditions.*

- 1. Details of these strategies to minimize water quality impacts shall be included in the SWMP.*
- 2. The SWMP shall include a link to or copy of standards developed or adopted.*

Section 4.4C of this SWMP document details the review procedures used by the Greene County Stormwater Engineer for all proposed developments and re-development projects in Greene County to ensure conformity with all sections of the Greene County Stormwater Design Standards. The review by the Stormwater Engineer ensures site design elements are in place to address post-construction water quality through conformance with Sections 107, 112, and 115 of the Greene County Stormwater Design Standards. The applicable portions of sections 107, 112, and 115 that address protection of sensitive areas, BMPs that effectively remove pollutants, and maintenance of pre-development hydrology are detailed in the following paragraphs.

Greene County is located in a heavily karst area with many caves, springs, and sinkholes that directly connect surface water with the groundwater. Section 107 of the Greene County Stormwater Design Standards protects these sensitive areas by requiring setbacks and water quality management measures for any development near these sensitive areas. Section 107.8.3 requires a vegetated buffer around the sinkhole flooding area and/or requires concentrated discharge into a sinkhole be directed through an extended dry detention basin before entering the sinkhole depending on the groundwater contamination hazard as defined in Section 107.8.2. Section 107.10 prohibits new construction within 100 feet of a spring, or cave alignment without a geotechnical study on the impacts to these sensitive features. Sections 107.8.3 and 107.10 are found respectively on pages 10 and 13 of the PDF document accessible at <https://greenecountymo.gov/files/files.php?id=1554>

Section 115.2 of the Greene County Stormwater Design Standards provides design guidance to minimize the creation of stormwater pollution through minimizing the amount of runoff, maximizing contact with vegetation, maximizing settling time, designing for small storms, and utilizing BMPs in a series. Section 115.2 is found on page 2 of the PDF document accessible at <https://greenecountymo.gov/files/files.php?id=1554>

Section 115.4 requires sites to utilize BMPs that effectively remove stormwater pollution through the use of vegetative filter strips, and/or grass swales, and/or extended dry detention basin, and/or extended wet detention basins, and/or sand filters. Section 115.3 requires that runoff from any development with a total impervious area greater than 10% of the total land developed must be directed through an extended wet or dry detention basin. Runoff from areas with a high contamination potential must be directed to a sand filter. Section 115.3 of the Greene County Stormwater Design Standards is accessible on page 4 of the PDF document at <https://greenecountymo.gov/files/files.php?id=1561>

Section 115.4.1 requires water quality BMPs “be designed to capture the runoff from the 90th percentile rainfall for Greene County as well as to capture the first flush of pollutants from directly connected impervious areas within the proposed development”. For Springfield/Greene County the 90th percentile rainfall event defined as 1.0 inch of rainfall in Section 115.2.4. Sections 115.4 and 115.4.1 of the Greene County Stormwater Design Standards are accessible on page 4 of the PDF document at <https://greenecountymo.gov/files/files.php?id=1561>

Greene County’s Post Construction management practices attempt to maintain the pre-development runoff conditions through the use of several regulatory tools. Section 112.1 of the Greene County Stormwater Design Standards requires all non-agricultural construction to provide storm water detention to match pre-existing runoff conditions. This paragraph is located on page 2 of the PDF accessible at <https://greenecountymo.gov/files/PDF/file.pdf?id=1559>

Section 112.5.3 of the Greene County Storm Water Design Standards requires the extended dry or wet detention basin to limit post-construction peak discharges to the pre-construction rate or lower in an effort to match as closely as possible the pre-development discharge of the site. Discharge rates may not increase for the post development condition for the 50% (2-year), 10% (10-year), and 1% (100-year) annual exceedance probability (AEP) storm. Computations are required with plan submittal for review by the Greene County Stormwater Engineer to verify that this condition is met. These runoff calculations are required by Section 112.5.4 for the Pre-project (existing) conditions, post-project conditions, and fully urbanized conditions throughout the entire drainage basin. The peak flow rates from the post-project condition cannot exceed the pre-project condition for any of the analyzed storms in Section 115.5.3. Section 112.5.3 and 112.5.4 of the Zoning Regulations are located on page 6 of the PDF accessible at <https://greenecountymo.gov/files/PDF/file.pdf?id=1559>

In addition to matching pre-development runoff rates as specified in Section 112.5.3, Section 115.4.1 requires water quality treatment volume for extended wet or dry detention basins. These basins must capture and detain the first ½ inch of runoff from DCIA or the runoff from 1 inch of rain over the entire site in 24 hours, whichever volume is greater. Section 115.4.5 of the Greene County Storm Water Design Standards specifies the water quality volume from Section 115.4.1 can be released from the extended wet or dry detention basin over a period of no less than 40 hours and no more than 72 hours. This increases settlement of suspended solids and removal of sediment borne pollutants. The dry detention basin outlet designs that meet this requirement reduce sediment and suspended solids by increasing settling time, and filter out trash and floatables by keeping them in the basin. Sections

115.4.1 and 115.4.5 are accessible on pages 4 and 6 respectively of the PDF at <https://greenecountymo.gov/files/files.php?id=1561>

When written in in 1999, the water quality requirements in Section 115 of the Greene County Stormwater Design Standards only applied to the Fulbright Spring and Pearson Creek watersheds since they are the drinking water source for much of the City of Springfield. On January 3, 2006 the Greene County Commission approved Planning Board Case 1625 amending the Greene County Stormwater Design Standards to require permanent water quality practices on all developments in Greene County. A copy of Planning Board Case 1625 is available upon request during any audit.

Ordinance	Summary	Purpose	Location
Section 107.8.3 and 107.10 of the Greene County Stormwater Design Standards	Places restrictions on construction in and around sensitive karst features such as sinkholes, springs, caves	Prevent groundwater pollution from runoff generated after construction is complete	https://greenecountymo.gov/files/files.php?id=1554 Pages 10 and 13
Section 115.2 of the Greene County Stormwater Design Standards	Design guidance to minimize the creation of stormwater pollution through non-structural BMPs	Encourage site designers to incorporate a series of BMPs into their design	https://greenecountymo.gov/files/files.php?id=1554 Page 2
Section 115.3 of the Greene County Stormwater Design Standards	Post construction runoff from any site with greater than 10% impervious area must be directed through an extended dry detention basin (a sand filter may be required for some sites)	Imitate the pre-construction hydrology as closely as possible	https://greenecountymo.gov/files/files.php?id=1561 Page 4
Section 115.4.1 of the Greene County Stormwater Design Standards	Post-construction water quality BMPs must be designed to capture the runoff from the 90 th percentile rainfall for Greene County as well as to capture the first flush of pollutants from directly connected impervious areas within the proposed development	Maximize hold time and pollutant removal through settlement of solid particles	https://greenecountymo.gov/files/files.php?id=1561 Page 4
Section 112.5.3 of the Greene County Storm Water Design Standards	Extended dry or wet detention basin is required to limit post-construction peak discharges to the pre-construction rate or lower in an effort to match as closely as possible the pre-development discharge of the site	Imitate the pre-construction hydrology as closely as possible	https://greenecountymo.gov/files/PDF/file.pdf?id=1559 Page 6
Section 115.4.1 and 115.4.5 of the Greene County Stormwater Design Standards	Sites must capture the first ½ inch of runoff from DCIA or the runoff from 1 inch of rain over the entire site in 24 hours, whichever volume is	Maximize hold time and pollutant removal through settlement of solid particles	https://greenecountymo.gov/files/files.php?id=1561 Pages 10 and 13

	greater and release it over no less than 40 hours		
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Table 6: Section 4.5.A Summary

Penalties and enforcement for violations of any of the above described sections of the Greene County Zoning Regulations is found in Sections 5 and 6 of Article XXV. Section 5 allows for fines to be imposed for violations. Section 6, Paragraph B, allows the Resource Management Department to enforce all zoning regulations through any legal means available. Article XXV of the Greene County Zoning Regulations is available on the web page at <https://greenecountymo.gov/files/PDF/file.pdf?id=1593> Additionally, the Maintenance Agreement required for all post-construction BMPs grants Greene County the authority to enter the property and make repairs to the BMP if the owner does not do so within 30 days of being notified of a maintenance failure. The maintenance agreement also specifies that the owner must reimburse Greene County for any maintenance work performed by the County.

4.5.B *To the extent allowable under state, or local law, through ordinance, or other regulatory mechanism, the permittee’s Stormwater Management Program shall address post-construction runoff from new development and redevelopment projects. The regulatory mechanism the permittee will use shall be identified in the SWMP by including a link to or a copy of the ordinance(s) or regulatory mechanism(s). If the permittee needs to develop a mechanism, the schedule for implementation shall be described in the SWMP.*

The regulatory mechanisms in place to address post-construction runoff for Greene County’s Stormwater Program are detailed in Section 4.5.A of this SWMP document.

4.5.C *The permittee shall maintain a plan to ensure adequate long-term operation and maintenance of Post-Construction BMPs, both structural and non-structural. Descriptions of and/or examples of agreements between the permittee and other parties such as post-development landowners or regional authorities shall be included in the SWMP.*

Long-term functioning of post-construction BMPs such as extended dry detention basins begins with ensuring that the BMPs are constructed in accordance with the reviewed and approved plans. As detailed in Section 4.4F of this SWMP, Greene County has two stormwater inspectors to inspect active land disturbance sites to meet the requirements of MCM 4. When on site for erosion and sediment control inspections, Greene County staff members also inspect all stormwater infrastructure including detention basins, storm pipes, inlet boxes, and grading for conformance with the approved plans in addition to inspecting the sediment and erosion controls. When a project is nearing completion, Section 101.12.1C of the Greene County Stormwater Design Standards requires an as-built survey of the stormwater detention and/or water quality BMP, conducted by a qualified surveyor or engineer, be submitted to the Greene County Stormwater Engineer for analysis to ensure that flow rates, detention volume, and hold time are in accordance with the approved plans. For residential subdivisions, the final plat is not recorded until the as-built survey has been approved. For commercial sites, Section 101.12.2C specifies that the occupancy permit for the structure will be withheld until the as-built survey has been approved. Field inspections by Greene County Environmental Division staff are also conducted on all sites to ensure the BMP is stabilized and constructed according to the approved plans. The as-

built survey combined with field inspections ensures that the water quality BMPs are initially constructed and functional according to the approved plans. Sections 101.12.1C and 101.12.2C of the Greene County Stormwater Design Standards are accessible on pages 6 and 7 respectively of the PDF at <https://greenecountymo.gov/files/files.php?id=1551>

Article IV, Section 25 (A)(4) of the Greene County Zoning Regulations requires all structures designed for detention and/or water quality be put into common area for residential subdivisions. The stormwater BMPs must be contained within a drainage easement either located adjacent to right of way or to have an access easement to allow for inspection. This ensures that there is access to the BMP for any future inspection and/or maintenance. Article IV, Section 25 (A)(4) is accessible on page 29 of the PDF at <https://greenecountymo.gov/files/PDF/file.pdf?id=1571>

Once correctly constructed, in order to ensure long-term maintenance of post construction BMPs Article IV, Section 25(A)(3) of the Greene County Zoning Regulations requires the recording of a maintenance agreement by the developer. The maintenance agreement must be signed by the property owner and recorded with the Greene County Recorder prior to issuance of a grading permit (see item 6 in Section 4.4.B of this SWMP document). The maintenance agreement gives Greene County the authority to require self-inspection of the BMP by the property owner and grants right of access and inspection to Greene County. The maintenance agreement also states that the owner and all subsequent owners shall operate and maintain the stormwater control facility in accordance with the approved plans. In the event the owner fails to maintain the stormwater control structure, the maintenance agreement gives Greene County the authority to perform the necessary work and then seek reimbursement from the property owner. A copy of the required maintenance agreement is accessible on the Greene County Environmental Division web page at <https://greenecountymo.gov/files/files.php?id=36483> Article IV, Section 25 (A)(3) is accessible on page 29 of the PDF at <https://greenecountymo.gov/files/files.php?id=1571>

Article IV Section 10(G)(7) of the Greene County Missouri Subdivision Regulations requires restrictive covenants to be filed for all new subdivision developments governing the maintenance of the common areas, including detention basins. The restrictive covenants specify that the common areas and drainage easements that contain the post-construction stormwater control BMP are the maintenance responsibility of the homeowner's association. This requirement is found on page 26 of the PDF accessible at <https://greenecountymo.gov/files/PDF/file.pdf?id=2198>

The covenants and restrictions are reviewed by the County Counselor prior to recording the final plat and must conform to Article XXIV, Section 4 of the Greene County Zoning Regulations which require the covenants to specify the methods of maintenance and responsibility for maintenance of the common area containing the stormwater BMP. Article XXIV, Section 5 requires formation of a homeowner's association (HOA) and conveyance of common area to HOA before the final plat is recorded. This ensures a legally responsible entity exists for maintenance of the post-construction stormwater control BMP. Both Sections 4 and 5 of Article XXIV, Section 4 are located on page 1 of the PDF accessible at <https://greenecountymo.gov/files/PDF/file.pdf?id=1591>

The requirement for formation of an HOA and transfer of common area ownership to the HOA is also

located in Article IV, Section 11 (F) of the Subdivision Regulations on page 24 of the PDF accessible at <https://greenecountymo.gov/files/PDF/file.pdf?id=2198>

This ensures a legally responsible entity exists for maintenance of the post-construction stormwater control BMP.

Ordinance	Summary	Purpose	Location
Greene County Stormwater Design Standards, Section 101.12.1C and 101.12.2C	An as-built survey of all post-construction stormwater control BMPs must be submitted and approved by the Greene County Stormwater Engineer prior to recording the final plat, or issuing a certificate of occupancy for a commercial building	Ensure stormwater BMPs are initially built and function in accordance with the approved plans	https://greenecountymo.gov/files/files.php?id=1551 Page 6
Article IV, Section 25 (A)(4) of the Greene County Zoning Regulations	Any stormwater BMP in a residential subdivision must be located within platted common area and a drainage easement that provides access to the BMP	Ensures access for future inspection and or maintenance on the BMP	https://greenecountymo.gov/files/PDF/file.pdf?id=1571 Page 29
Article IV, Section 25(A)(3) of the Greene County Zoning Regulations	A maintenance agreement is required for all new developments binding all future property owners to maintain the BMPs and giving authority for Greene County to perform inspections and/or to require self-inspections	Ensure functionality of the stormwater through self-inspection by the owner and/or Greene County	https://greenecountymo.gov/files/PDF/file.pdf?id=1571 Page 29
Article IV Section 10(G)(7) of the Greene County Missouri Subdivision Regulations	Requires restrictive covenants for residential subdivisions	Detail the maintenance and ownership of the common areas that contain the BMP(s)	https://greenecountymo.gov/files/PDF/file.pdf?id=2198 Page 26
Article XXIV, Sections 4 and 5 of the Greene County Zoning Regulations	Restrictive covenants for subdivisions must specify the method of maintenance. An HOA must be formed and ownership of the common area containing the BMP must be transferred to the HOA prior to recording a final plat	Ensure there is a future responsible party for maintenance of BMPs contained within common areas and drainage easements	https://greenecountymo.gov/files/PDF/file.pdf?id=1591 Page 1

Table 7: Section 4.5.C Summary

4.5.D *The permittee shall maintain and apply an inspection plan with implementation schedules for post-construction BMPs.*

As detailed in Section 4.5.C of this SWMP document, Greene County staff inspect stormwater quality BMPs as they are constructed, and an as-built survey is required to ensure initial functionality. The

maintenance agreement required by Article IV, Section 25(A)(3) of the Greene County Zoning Regulations gives authority to require self-inspection of the BMPs by property owners and gives Greene County rights of access for inspection. Article IV, Section 25 (A)(3) was adopted by Order of the Greene County Commission on June 3, 2019. The ordinance was so recently adopted that Greene County currently only has 12 sites for which maintenance agreements have been recorded, and most are still under construction. As maintenance agreements are recorded, the BMP is going to be entered into a separate GIS layer being developed for maintenance agreements so that the location and status can be tracked, similar to the process used for updating the outfall map as described in Section 4.3.A of this SWMP document. The GIS software gives us the ability to hyperlink the maintenance agreement to the data layer for quick reference. Beginning in June 2022 (two years after project completion for the first site with a recorded maintenance agreement), Greene County's goal is to inspect 20% of the completed sites each year for which we have maintenance agreements recorded. Initially this will allow Greene County to inspect all the BMPs during the MS4 permit cycle. As the number of maintenance agreements grows this goal may need to be revised in future SWMPs down to 10% per year. Greene County staff inspections will utilize using the inspection checklist in Appendix C. Greene County has currently chosen to conduct all inspections of post-construction BMPs and not require self-inspection of post-construction BMPs by property owners. As Greene County goes through this, and the next permit cycle, if Greene County staff cannot adequately inspect a sufficient percentage of water quality BMPs we will have the legal authority to require self-inspections for those developments with maintenance agreements.

Greene County owns two water quality basins currently under construction at the Greene County jail facility. These basins will be inspected annually by Greene County Environmental Division staff using the checklist in Appendix C. Any deficiencies will be corrected by Greene County.

4.5.E *The permittee shall inspect or require the inspection of post-construction stormwater BMPs to ensure all BMPs are implemented and effective.*

See discussion of post-construction BMP inspections in Section 4.5.D

MCM 5 Measureable Goals and Iterative Process:

The ordinances that collectively compose Greene County's post-construction stormwater management requirements (See Tables 6 and 7 for summary) are reviewed annually to determine if any changes need to be made. This review process has resulted in the implementation of several changes in the last permit cycle, including the requirement for an HOA to be formed and common area transferred to the HOA prior to recording the final plat as well as the requirement of a maintenance agreement for stormwater BMPs on new developments. The requirement for a maintenance agreements found in Article IV, Section 25 (A)(3) cannot be retroactively applied to existing developments constructed before maintenance agreements were required. Therefore Greene County has no legal authority to require self-inspection of post-construction BMPs on these properties. Likewise, without the authority granted in the maintenance agreement, Greene County staff cannot enter private property to perform post-construction BMP inspections without permission; to do so would be trespassing. However, Greene County does have a program to proactively address some older detention basins through voluntary retrofitting to meet current water quality volume and drain down time requirements. As part of the

Integrated Planning process, the SROI tool has been used to analyze the effectiveness of retrofitting older detention basins to meet current design criteria. Retrofitting these basins shows a cost/benefit ratio of 1.0 for extended dry detention. Simple changes to the outlet structure and some re-grading can provide approximately \$1.00 in environmental, social, and economic benefits for every \$1.00 spent. The SROI report for detention basin retrofitting can be accessed at

https://springfieldintegratedplan.com/wp-content/uploads/2020/06/SpringfieldSROI_DetentionBasins191115.pdf

In 2019 Greene County began acting on the SROI results by issuing a request for qualifications (RFQ) from local civil engineering consultants for analysis and design of detention basin retrofits. Throughout 2020 Greene County utilized GIS to identify an initial ten privately-owned detention basins for potential retrofitting. Basins were identified based on age of the development and watershed size. The owners of these basins were contacted via certified letter to ascertain interest and seek permission to access the property for study. Greene County received permission to study three of these basins and have contracts with three local engineering firms to perform the analysis to determine if retrofitting to improve water quality is possible. Once these analyses are complete Greene County will work with the property owners to obtain permission to perform the identified water quality retrofits utilizing Greene County stormwater program funding.

Greene County's post-construction stormwater runoff program incorporates a retrofitting program with a goal of implementing one retrofit in each permit cycle on voluntary basis for owners of detention basins who wish to participate. The status of this effort will be included in each annual report.

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BMP Description	BMP Purpose	Goal/Expected Result of BMP	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	BMP Evaluation	
			Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5		
1 Combination of Ordinances that meet the requirements of 4.5A, 4.5B, and 4.5C in Tables 6 and 7	Ensure adequate maintenance of detention and water quality structures to protect downstream water bodies	Decreased pollutant loads from developed sites	Annual review of at the beginning of the year in preparation for the annual report	Annual review of at the beginning of the year in preparation for the annual report	Annual review of at the beginning of the year in preparation for the annual report	Annual review of at the beginning of the year in preparation for the annual report	Annual review of at the beginning of the year in preparation for the annual report	Annual review of at the beginning of the year in preparation for the annual report	Annual review of all ordinance language to determine if additions are needed to improve enforcement
2 Review of site plans to ensure	Ensure post-construction conditions match pre-construction hydrology as closely as possible	Reduction in pollutants carried from the site in excess runoff generated by additional impervious surfaces	Review plans for 100% of development sites for compliance with Sections 107 and 115 of the Greene County Stormwater Design Standards	Review plans for 100% of development sites for compliance with Sections 107 and 115 of the Greene County Stormwater Design Standards	Review plans for 100% of development sites for compliance with Sections 107 and 115 of the Greene County Stormwater Design Standards	Review plans for 100% of development sites for compliance with Sections 107 and 115 of the Greene County Stormwater Design Standards	Review plans for 100% of development sites for compliance with Sections 107 and 115 of the Greene County Stormwater Design Standards	Review plans for 100% of development sites for compliance with Sections 107 and 115 of the Greene County Stormwater Design Standards	Letter of Approval from the Stormwater Engineer indicates that the site plan meets the ordinance standards
3 As-built survey is required prior to final plat recording, or certificate of occupancy issuance	More closely match pre-development hydrology and increase settlement time	Ensure BMPs are constructed according to the approved plans	Review as built survey for 100% of post-construction BMPs	Review as built survey for 100% of post-construction BMPs	Review as built survey for 100% of post-construction BMPs	Review as built survey for 100% of post-construction BMPs	Review as built survey for 100% of post-construction BMPs	Review as built survey for 100% of post-construction BMPs	Review and approval of as-built survey by Greene County Stormwater Engineer
4 A maintenance agreement for the long term maintenance of post-construction BMPs	Bind all future owners to maintain the BMP and grants authority for inspection and self-inspection	Continued functioning of BMPs to control stormwater and associated pollutants	Receive recorded maintenance agreements before issuing grading permits for 100% of sites with post-construction BMPs	Receive recorded maintenance agreements before issuing grading permits for 100% of sites with post-construction BMPs	Receive recorded maintenance agreements before issuing grading permits for 100% of sites with post-construction BMPs. Inspect 20% of completed BMPs under a maintenance agreement	Receive recorded maintenance agreements before issuing grading permits for 100% of sites with post-construction BMPs. Inspect 20% of completed BMPs under a maintenance agreement	Receive recorded maintenance agreements before issuing grading permits for 100% of sites with post-construction BMPs. Inspect 20% of completed BMPs under a maintenance agreement	Receive recorded maintenance agreements before issuing grading permits for 100% of sites with post-construction BMPs. Inspect 20% of completed BMPs under a maintenance agreement	Inspection by Greene County staff
5 Detention basin retrofit to add water quality capture volume	More closely match pre-development hydrology and increase settlement time	Increase pollutant removal from existing detention basins	Contact at least 3 property owners for permission to survey and analyze existing post-construction BMPs	Initiate one retrofit (contact owner, or conduct survey and/or design) in the permit cycle	Initiate one retrofit (contact owner, or conduct survey and/or design) in the permit cycle	Initiate one retrofit (contact owner, or conduct survey and/or design) in the permit cycle	Initiate one retrofit (contact owner, or conduct survey and/or design) in the permit cycle	Initiation of one retrofit project	Was one project initiated Y/N?
6 Post Construction Inspection of Detention/Water Quality Structures by Greene County Staff	Ensure adequate maintenance of	Increase pollutant removal from existing detention basins	Develop Inspection Checklist and Procedures	Inspect 20% of completed BMPs under a maintenance agreement	Inspect 20% of completed BMPs under a maintenance agreement	Inspect 20% of completed BMPs under a maintenance agreement	Inspect 20% of completed BMPs under a maintenance agreement	Inspect 20% of completed BMPs under a maintenance agreement	Number of water quality structures failing inspection in relation to the total number of facilities inspected.

Table 8: MCM 5 Measureable Goals

MCM 6: Pollution Prevention/Good Housekeeping for Municipal Operations

“The permittee shall develop and implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations”.

Municipal Operations Summary

The Greene County Highway Department (Highway Department) is responsible for all aspects of transportation network maintenance within the unincorporated areas of Greene County. Maintenance responsibilities include paving, culvert and bridge installation, street sweeping, snow removal, mowing and spraying along Greene County right of way and maintenance of stormwater infrastructure located within the right of way. The Highway Department maintains over 1,500 miles of paved road. The Highway Department is also responsible for maintaining the fleet of vehicles owned by the County including operation of a fueling station and a vehicle washing facility. The 14 acre Greene County Highway Department operations facility is located at 2065 N. Clifton Ave.

The Greene County Highway Department is under the authority of the Greene County Commission. Park facilities in Greene County are operated by the Springfield-Greene County Park Board, which functions as a department of the City of Springfield which has its own Phase I MS4 permit. Therefore parks maintenance is not included in Greene County’s MS4 Phase II permit. The Greene County Highway Department facility at 2065 N. Clifton, and governmental campus at 940 Boonville Ave. constitute the only developed property currently owned by the County. Within this permit cycle, the new Greene County Jail will be operational with two water quality basins on the site. All other County-owned property is undeveloped green space thus it does not contain potential pollution sources from operational activities.

4.6.A *An employee training program for municipal operations staff who work with material handling, at municipal vehicle or equipment maintenance areas, storage yards, and material storage facilities. The training shall be used to prevent and reduce stormwater pollution from activities such as, but not limited to, park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance. The SWMP shall include:*

- 1. A description of any existing, available training material the permittee plans to use such as those available from EPA, the state, or other organizations. Include the frequency of training and topics covered.*
- 2. A description of how this training will coordinate with all other MCMs.*
- 3. A description of how this training will coordinate with monitoring, integrated planning, and TMDL implementations where applicable.*

As stated above, maintenance of parks facilities is the responsibility of the Springfield-Greene County Park Board which is a department of the City of Springfield and therefore is not included in Greene County’s MS4 permit. All other open space is undeveloped (held for future right of way) and therefore is neither maintained, nor a source of pollutants. Vehicle maintenance, material storage, and other maintenance activities are the responsibility of the Greene County Highway Department. Greene County Highway Department crews receive regular safety training through monthly education sessions with the Greene County Highway Department Safety Officer. The Environmental Compliance Manager and

Safety Officer coordinate to include training on stormwater pollution prevention/good housekeeping in County operations in two of these training sessions per year (approximately once every 6 months) for Greene County Highway Department staff. The Safety Officer utilizes video-based training materials for safety training so video resources are also utilized as much as possible for training staff in stormwater pollution prevention measures. There are multiple videos available online on a wide variety of topics. A sample of identified videos is included in Table 9. This is not an exhaustive list of training videos available for use. Sign-in sheets are kept for each training session to document attendance by crew members.

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Topic	Video Title	Source	Website
Municipal Good Housekeeping	Good Housekeeping Strategies	San Diego County	https://www.youtube.com/watch?v=UxOam2GEVgQ
Illicit Discharge Detection	On the Lookout for Illegal Discharges	YouTube	https://www.youtube.com/watch?v=Z09Yz_qS1f4
MS4 Permit	What is an MS4?	Penn State Extension	https://www.youtube.com/watch?v=JAqV4dPpAT8
Illicit Discharge	NPDES Refresher Training: Illicit Discharge Detection & Elimination	Water Atlas	https://www.youtube.com/watch?v=prvMamQyYqA
Construction Site Erosion and sediment Control	NPDES Refresher Training: Erosion & Sedimentation Control	Water Atlas	https://www.youtube.com/watch?v=J1Sb9h4JOTM
General Stormwater Pollution Prevention	Where Does Stormwater Go?	Practical Engineering	https://www.youtube.com/watch?v=wdcXmerZWdc
Erosion and Sediment Control	Stormwater Strategies: Erosion and Sediment Control	San Diego County	https://www.youtube.com/watch?v=Kdm-Z-_AGnU&list=PLm6gLSYrseHkqgXbL0jLUE_co1fbCT3fi&index=4
Street Maintenance	TMACOG Good Housekeeping & Pollution Prevention for Municipal Crews – Street Sweeping	TmacogTube	https://www.youtube.com/watch?v=YvrWRibYyjU
Spill Response	TMACOG Good Housekeeping & Pollution Prevention for Municipal Crews – Spill Response	TmacogTube	https://www.youtube.com/watch?v=nAyiU9lBig
Material Storage	TMACOG Good Housekeeping & Pollution Prevention – Materials Storage, Handling, and Clean Up	TmacogTube	https://www.youtube.com/watch?v=l2Dy_oKYJ_E
Municipal Good Housekeeping	Stormwater Academy	City of Reno	https://www.youtube.com/watch?v=8HK575I2D9M
Post-Construction Stormwater Controls	LID Stormwater Construction Practices	Center for Watershed Protection	https://www.youtube.com/watch?v=efu1LfF1rio

Table 9: Greene County Highway Department Employee Training Materials

Good applicable videos may not be available for all topics related to Good housekeeping. In such cases, the Greene County Operation and Maintenance for Pollution Prevention/Good Housekeeping in Municipal Operations Manual will serve as a training guide. This document is accessible on the Greene County Environmental Division web page at <https://greenecountymo.gov/files/PDF/file.pdf?id=36485> This document will be supplemented with materials available from such sources as:

The Minnesota Stormwater Manual

https://stormwater.pca.state.mn.us/index.php?title=Employee_training

IWLA Road Salt Best Practices

<https://www.iwla.org/water/stream-monitoring/winter-salt-watch/road-salt-best-practices>

The staff training will coordinate with the other MCMs as follows:

- MCM 1 – By providing education and training to County staff this training coordinates with MCM1
- MCM 2 – Municipal staff participate in training which satisfies MCM 2
- MCM 3 – One of the training topics is illicit discharge detection which coordinates with the MCM 3 requirement to train staff on the hazards of illicit discharges
- MCM 4 – Project Managers/Inspectors are trained on land disturbance site management
- MCM 5 – Training topics include the importance of post-construction BMPs and long-term maintenance
- MCM 6 – Training topics focus on stormwater pollution prevention measures at Greene County facilities.

Training materials are reviewed each year and updated as needed to keep trainings relevant and interesting to County employees as new, or updated materials are found/become available.

Education of Greene County employees directly coordinates with the Springfield-Greene County Integrated Plan through the annual Integrated Planning Field Day that brings staff from the Integrated Planning Partners (The City of Springfield, Greene County, and City utilities) for refresher training on macroinvertebrate sampling, stream health, stream dynamics, and Stream Team monitoring.

4.6.B *The permittee shall maintain an updated list of all municipal operations/facilities that are impacted by this operation and maintenance program.*

Greene County currently has three facilities impacted by the MS4 operation and maintenance program.

- The Greene County Highway Department facility at 2065 N. Clifton Ave., Springfield, MO 65803
- The Greene County Jail detention basins at 5100 W. State Hwy EE, Springfield, MO 65802
- The Greene County Highway Department storage facility at 4625 E. Shelby Rd. Fair Grove, MO 65648

The Greene County Jail became operational in 2022 and has two detention basins on site that fall under the post-construction requirements of this permit. The Greene County facility on Shelby Road is un-

manned and is used only for storage of fill and salt. It was previously a MoDOT maintenance facility. Salt is kept covered buildings. The list of facilities is reviewed annually and updated as needed.

4.6.C *The permittee shall maintain an updated list of industrial facilities that the permittee owns or operates that are subject to NPDES permits for discharges of stormwater associated with industrial activity that ultimately discharge to the permittee's MS4. The permittee shall include the permit number or a copy of the No Exposure Exemption Certification (if applicable) for each facility in the SWMP. NPDES permitted facilities not owned or operated by the permittee are not required to be part of the list, however the permittee should be familiar with all such facilities in their MS4 service area as they may signify a priority area for the IDDE (MCM #3) program.*

The Greene County Highway Department does not own or operate any industrial facilities that are subject to NPDES permits for discharges of stormwater that are associated with industrial activity that ultimately discharge into the County's MS4. Greene County therefore has no permit numbers nor No Exposure Exemption Certification. If Greene County ever owns such a facility the SWMP will be updated to comply with the MS4 permit.

4.6.D *The permittee shall develop or maintain controls for reducing or eliminating the discharge of floatables and pollutants from municipal parking lots, maintenance and storage yards, waste transfer station, fleet or maintenance shops with outdoor storage areas, salt/sand storage locations, snow disposal areas owned or operated by the permittee, or other locations expected to contribute floatables and/or pollutants.*

The Pollution Prevention/Good Housekeeping in Municipal Operations: Operation and Maintenance manual developed by Greene County details the operational procedures that are followed to reduce the risk of stormwater pollution from activities associated with all aspects of road maintenance. Best management practices are outlined for Greene County Highway Department staff to follow. The Pollution Prevention/Good Housekeeping in Municipal Operations: Operations and Maintenance manual is accessible on the Greene County Environmental Division Web page at <https://greenecountymo.gov/files/PDF/file.pdf?id=36485>

Each paragraph below summarizes the details of the operational procedures that can be found on the listed page number of the Pollution Prevention/Good Housekeeping in Municipal Operations: Operation and Maintenance manual.

De-Icing Operations/Salt Storage and Use (Page 7)

The Greene County Highway Department utilizes an enclosed salt storage building to store approximately 1,300 tons of salt at the Clifton Ave. facility protected from exposure to rainfall and runoff. Calcium Chloride is stored in above-ground containers at the Highway Department's Clifton Ave. facility. All salt spreading equipment is inspected and tested during the fall readiness drills to ensure functionality and spreading speed so that salt is spread evenly and not concentrated in one area. Salt spreading equipped trucks are stored in covered bays to prevent contact with rainfall. At the beginning of spring, salt equipment is washed to remove the salt (wash water enters the sanitary sewer system, See next paragraph and Figure 11) and stored in covered bays to prevent contact with rainfall.

Vehicle and Equipment Washing (Page 11)

Trucks, and heavy equipment are washed at the Highway Department Complex. All wash water from the vehicle wash at the Highway Department facility first enters a buried concrete separator tank with baffles for separation of floatable and settleable pollutants from the wash water. Effluent water is then sent into the Springfield sanitary sewer system and is not discharged into any stormwater conveyance system. Separated solids are periodically cleaned out (usually necessary once per year) and disposed of at the landfill. Water from the heavy equipment wash-down pad likewise enters a settlement tank and is then discharged into the the sanitary sewer system.

Vehicle Fleet Maintenance (Page 4)

All vehicle maintenance is performed in covered garages with a total of 14 repair bays. All waste oil from vehicle maintenance operations is collected and pumped into a 1,000 gallon double walled storage tank and then purchased by a recycling company every two weeks on average. Engine coolant/anti-freeze is likewise collected for recycling. Machine parts are washed in hot baths with citrus solvent after which the wash water enters the sanitary sewer system.

Petroleum and Fuel Storage and Dispensing (Page12)

Greene County has four FRP Clad Steel underground storage tanks (USTs) with a total capacity of 40,000 gallons of diesel fuel and 26,000 gallons of unleaded gasoline. The fuel system services all County vehicles. Fuel tanks and distribution lines are regularly checked for leaks in compliance with the Missouri Petroleum Storage Tank Insurance Fund requirements and the facility Spill Prevention Control and Countermeasures (SPCC) Plan. Measures taken to prevent pollution of stormwater from petroleum products in above ground storage tanks (ASTs) are found in the SPCC Plan accessible on the Greene County Environmental Division web page at <https://greenecountymo.gov/files/PDF/file.pdf?id=36486>

Herbicides and Chemicals (Page 13)

All herbicides, pesticides and other liquid chemicals are stored indoors in a locked, fire resistant cabinet protected from exposure to storm water runoff. When chemicals are mixed, the containers are triple-rinsed into the receiving tank. Empty containers are disposed of in accordance with the label directions. Granular, clay based, absorbent material is kept on hand at several stations around the facility for clean up of accidental spills of pesticides or petroleum products.

Street Sweeping and Trash Removal (Page 10)

All residential curbed streets in the County (the bulk of those located in the regulated MS4 urbanized



Figure 7: Vehicle wash bay separator cleaning



Figure 8: Vehicle repair bays



Figure 9: Salt Spreading Equipment Maintenance

area) are routinely swept to reduce trash and floatables from entering the storm water system. All swept material is taken to the landfill. Each street is swept on a rotation that takes about four to six weeks. Trash from the County's two street sweepers is emptied daily into a dump truck and hauled to the landfill for proper disposal. Any trash found in roadside ditches is also collected and hauled to the landfill by highway department crews. Any unidentified material, or material suspected to be hazardous are removed by a hazardous waste contractor.

Road Paving (Page 17)

The Greene County Highway Department operates a cold mix asphalt plant for road repair and improvement. The operation runs in the summer months and is located on Conco properties just east of Willard, Missouri. Oil at the site is trucked in each day of operation only for the amount of cold mix needed. No cold mix, or cold mix oil is stored at the mill site or at the Greene County Highway Department's Clifton Ave. facility.

4.6.E *The permittee shall maintain and apply maintenance procedures, maintenance schedules, and long-term inspection schedules for controls to reduce floatables and other pollutants to the permittee's regulated MS4.*

As summarized in Section 4.6.D above, Greene County has maintenance procedures, maintenance schedules, and long term inspection schedules in place to reduce floatables and other pollutants from the MS4. The page numbers for each bullet item below correspond to the page number in the Pollution Prevention/Good Housekeeping Operation and Maintenance manual on the Greene County Environmental Division Web page at <https://greenecountymo.gov/files/PDF/file.pdf?id=36485>

Floatables include:

- Road side trash (Page 9) collected from the right of way by the Greene County Highway Department and disposed of in the sanitary landfill.
- Trash and debris in street gutters (Page10) swept by street sweeper trucks which sweep all residential streets in unincorporated Greene County on an approximately four to six week rotation. All street sweeper debris is transferred directly into a dump truck at the Clifton Facility and taken to the City of Springfield's sanitary landfill for disposal.
- Fuel from vehicle fueling operations (Page12) with spill prevention outlined in both the Operation and Maintenance Manual and monthly inspection of fuel dispensers detailed in Sections 3.3.1 and 3.3.2 on pages 15 and 16 of the SPCC Plan.
- Floatables also include petroleum products from above ground petroleum storage units at the Clifton facility. Petroleum storage facilities are protected from exposure to stormwater and have secondary containment and are inspected monthly as specified in Section 3.3.1 and 3.3.2 of the SPCC Plan. Sections 3.3.1 and 3.3.2 of the SPCC plan are accessible on page 15 and 16 of the PDF document at <https://greenecountymo.gov/files/PDF/file.pdf?id=36486>

Other Pollutants include:

- Road salt from de-icing operations (Page 7) with all salt and salt spreading equipment stored in enclosed buildings and all salt spreading equipment inspected and maintained annually each autumn to ensure proper functionality.

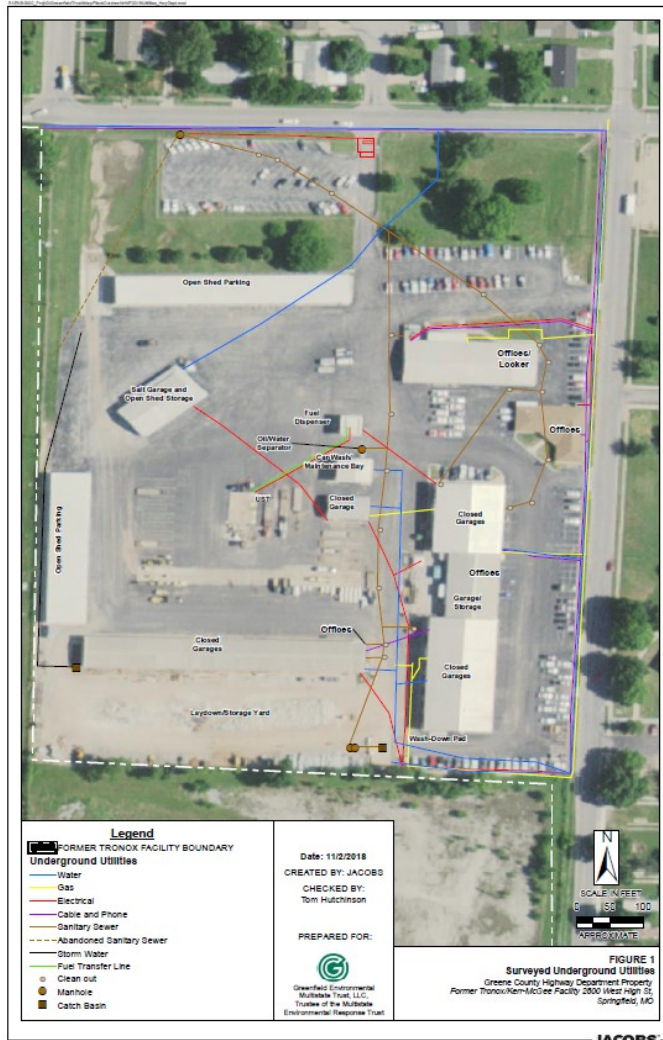
- Soap, sediment, metals, oils from vehicle washing (Page 11) pass through a separator to remove settleable solids before wash water is discharged to the City of Springfield’s sanitary sewer. Solids are removed from the separator on an as-needed basis which usually results in one cleaning per year. Removed solids are taken to the City of Springfield’s sanitary landfill for proper disposal.
- Herbicides used in right of way maintenance (Page 13) stored, mixed, applied, and disposed of as directed by the product label
- Paint used in road striping operations (Page 15) stored in weatherproof totes and all pain equipment rinse water is discharged into the sanitary sewer

4.6.F *The permittee shall utilize procedures for the proper disposal of waste removed from the separate storm sewers and areas of jurisdiction, including dredged material, accumulated sediments, floatables and other debris.*

Disposal of waste and floatables is addressed in sections 4.6.D and 4.6.E of this SWMP document as well as the Operation and Maintenance Manual and the SPCC Plan. The Greene County Highway Department does not remove dredged material or sediments from the MS4 area. Waste from the controls listed above is taken to the City of Springfield’s sanitary landfill for proper disposal.

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- 4.6.G** The permittee shall utilize procedures for the washing of municipal vehicles and equipment.
1. Use of any soap or detergent shall only be where there is connection to sanitary sewer or equivalent; and
 2. Any wash water that contains pollutants such as salt, oils, grease, sediment, grass clippings, lawn chemicals, or pesticides shall not be discharged to waters of the state or the MS4 system without appropriate treatment to ensure the discharged effluent is in compliance with Missouri Water Quality Standards.



Vehicle washing is addressed in detail on page 11 of the Pollution Prevention/Good Housekeeping in Municipal Operations manual. Passenger vehicles and dump trucks are washed in a covered wash bay. The wash water passes through a settlement tank to remove settleable solids and then is discharged into the City of Springfield sanitary sewer system. Heavy equipment (backhoes, excavators, road graders, etc.) is washed in the heavy equipment wash-down pad on the south end of the facility. Wash water from the heavy equipment wash-down pad is also connected to a settlement tank to remove settleable solids prior to discharging into the City of Springfield sanitary sewer system. A map of the underground utility locations for the Greene County Highway Department’s Clifton Ave. facility is included in Figure 11 showing both the car wash bay and the heavy vehicle wash-down pad connected to the sanitary sewer.

Figure 10: Greene County Highway Department Facility Utility Map

4.6.H *All paints, solvents, petroleum products and petroleum waste products (except fuels) under the control of the permittee shall be stored so that these materials are not exposed to stormwater.*

- 1. Sufficient practices of spill prevention, control, and/or management shall be provided to prevent any spill of these pollutants from entering waters of the state.*
- 2. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater.*

Petroleum Product Spill Prevention, Control, and Countermeasures (SPCC) Plan

The petroleum products stored above ground at the Greene County Highway Department's Clifton Facility are subject to SPCC plan requirements found in 40 CFR 112.7. The SPCC Plan developed for the Clifton Facility addresses storage volumes and locations, flow paths, inspections and maintenance, as well as training, and emergency countermeasures procedures.



Figure 11: Clifton Facility petroleum storage indoors with secondary containment

Page 15 of the Pollution Prevention/Good Housekeeping Operation and Maintenance Manual provides details on the storage, use, and disposal of paint used for road striping. Greene County stores paint for road striping either indoors, or outside in weatherproof containers during the peak summer season. Herbicides used in road maintenance are likewise stored indoors in fireproof lockers. Procedures for storage, use, and disposal of herbicides are detailed on page 13 of the Pollution Prevention/Good Housekeeping Operation and Maintenance Manual. Solvents used in vehicle maintenance are likewise stored and used indoors then collected for recycling as detailed on page 4 of the document available on the Greene County Environmental Division Web page at <https://greenecountymo.gov/files/PDF/file.pdf?id=36485>

Because the Greene County Highway Department's Clifton facility has above ground petroleum storage in aggregate greater than 1,320 gallons it is subject to 40 CFR 112 which requires the development of a Spill Prevention Control and Countermeasures (SPCC) Plan. The SPCC plan developed for the County's Highway Department facility details the policies, secondary containment, and spill prevention procedures for petroleum products. Petroleum products are stored indoors or otherwise protected from exposure to precipitation and runoff. Inspections of petroleum storage areas, including fuel dispensers, are conducted monthly and the inspection reports are kept for a period of at least three years (SPCC plan Section 3.3 on page 15 of the SPCC Plan). An example of

a monthly inspection report is included on page 27 of the SPCC plan accessible at

<https://greenecountymo.gov/files/PDF/file.pdf?id=36486>

4.6.I *If the permittee has new flood management projects (projects developed or designed to reduce flooding), the permittee shall utilize procedures to assess all flood management projects for impacts of water quality, incorporating water quality protection devices or practices.*

All flood management projects that might be undertaken by Greene County would be reviewed by the Storm Water Engineer to ensure consideration of water quality impacts. Review procedures are the same as described in Section 4.4.C of this SWMP for private development projects. The floodplains in

Greene County have been regulated for many years and we do not anticipate any flood management projects during this permit cycle.

MCM 6 Measureable Goals and Iterative Process:

Greene County staff will conduct annual reviews of the Pollution Prevention/Good Housekeeping in Municipal Operations: Operation and Maintenance Manual as well as the Spill Prevention Control and Countermeasures Plan. These reviews will be used to assess the current procedures used to fulfill this MCM and recommend any changes, or corrections that might be needed to improve the effectiveness of the County’s program.

BMP Description	BMP Purpose	Goal/Expected Result of BMP	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	Measurable Goals, Milestones, and Dates	BMP Evaluation
			Permit Year 1	Permit Year 2	Permit Year 3	Permit Year 4	Permit Year 5	
1 Highway Department and Resource Management employe stormwater education	Give Greene County employees the knowledge to incorporate pollution prevention best practices in their daily work and to recognize illicit discharges	Reduction in chlorides, trash/floatables, and sediment associated with Greene County Highway Department activities	Hold at least two video training sessions pr year in conjunctionwith the monthly safety training at the Greene County Highway Department	Hold at least two video training sessions pr year in conjunctionwith the monthly safety training at the Greene County Highway Department	Provide at least two training opportunities for Greene County staff each year.	Provide at least two training opportunities for Greene County staff each year.	Provide at least two training opportunities for Greene County staff each year.	At least 50 Highway Department and Resource Management employees received training during the year through the trainign sessions
2 List of County-owned facilities that discharge stormwter and are subject to MCM 6	Coordination of MCM 6 compliance prgram if Greene County ever has more than one facility	Organize and coordinate BMPs if a new facility is ever added	Update list as needed during preparation for annual reporting	Update list as needed during preparation for annual reporting	Update list as needed during preparation for annual reporting	Update list as needed during preparation for annual reporting	Update list as needed during preparation for annual reporting	Addition of a new facility Y/N?
3 Annual fall readiness drills	Ensure all salt spreadingequipment is calibrated and functioning correctly	Prevent over-application of salt during winter de-icing to reduce excess chlorides in stormwater	Conduct an annual fall readiness drill in October to inspect all salt spreadingequipment	Conduct an annual fall readiness drill in October to inspect all salt spreadingequipment	Conduct an annual fall readiness drill in October to inspect all salt spreadingequipment	Conduct an annual fall readiness drill in October to inspect all salt spreadingequipment	Conduct an annual fall readiness drill in October to inspect all salt spreadingequipment	Inspection and repair of any faulty equipment
4 Street sweeping and road side trash removal	Remove trash, dirt, and debris from curbed streets and road-side ditches	Reduce the floatable pollutants and trash reaching water bodies	Tons of trash removed from County rights of way	Tons of trash removed from County rights of way	Tons of trash removed from County rights of way	Tons of trash removed from County rights of way	Tons of trash removed from County rights of way	Hopefully a decreasing trend is seen as a result of education efforts in MCM 1.
5 Connection of vehicle wash bays to sanitary sewer	Prevent soap, salt, sediment, oils, and other pollutants in vehicle wash water from reaching water bodes without treatment	Reduction in pollutants discharged from the Greene County Highway Dept. Clifton Facility	Inspection and cleaning of settlement tank as needed (uually annually)	Inspection and cleaning of settlement tank as needed (uually annually)	Inspection and cleaning of settlement tank as needed (uually annually)	Inspection and cleaning of settlement tank as needed (uually annually)	Inspection and cleaning of settlement tank as needed (uually annually)	Was cleaning performed in the calendar year Y/N?
6 Spill Prevention, Contol and Countermeasures Plan	Ensure proper storage, use and disposal of petroleum products stored above ground	Prevent or minimize releases of petroleum from the Greene County Highway Dept. Clifton Facility	Conduct monthly inspections of oil containers and fuel pumps in accordance iwththe SPCC plan	Conduct monthly inspections of oil containers and fuel pumps in accordance iwththe SPCC plan	Conduct monthly inspections of oil containers and fuel pumps in accordance iwththe SPCC plan	Conduct monthly inspections of oil containers and fuel pumps in accordance iwththe SPCC plan	Conduct monthly inspections of oil containers and fuel pumps in accordance iwththe SPCC plan	Inspection records and repair of any faulty equipment found

Table 10: MCM 6 Measureable Goals

As part of the Integrated Planning process, the SROI tool was utilized to analyze the effectiveness of street sweeping as a BMP to prevent pollution of stormwater. Street sweeping has long been used by Greene County to remove trash, leaves, sediment, and other pollutants from street gutters before it is washed into the stormwater drainage system. The SROI tool analyzed the environmental, social, and economic benefits of street sweeping versus the cost. The SROI analysis shows that the benefit cost ratio is only 0.2 indicating that for every \$1.00 spent on street the return is only \$0.20 in environmental, social, and economic benefit. The SROI analysis for street sweeping can be accessed at https://springfieldintegratedplan.com/wp-content/uploads/2020/06/SpringfieldSROI_StreetSweep191115.pdf

APPENDIX A: MCM 2 Public Meeting Agenda

- January 19, 2021 Planning Board Meeting Agenda

AGENDA
GREENE COUNTY PLANNING BOARD
(VIRTUAL MEETING INFORMATION BELOW)
JANUARY 19, 2021
7:00 PM

- A. CALL TO ORDER**
- B. ROLL CALL**
- C. MINUTES**
- D. COMMUNICATIONS**
- E. CONSENT AGENDA**
- F. OLD BUSINESS**

- 1. Request Rezoning, Planning Board Case Number 2127, Horses of Hope-Missouri, Inc, c/o Michele K. McColm, applicant.

G. NEW BUSINESS

- 1. Call for Public Comment: Greene County Stormwater Management Plan (SWMP)
- 2. Request Rezoning, Planning Board Case Number 2128, Leron and Mona Wagner Trust c/o Mona Wagner, applicants.
- 3. Request Rezoning, Planning Board Case Number 2129, Thomas Masteller, applicant.
- 4. Request Rezoning, Planning Board Case Number 2130, Thomas Masteller, applicant.
- 5. Request Rezoning, Planning Board Case Number 2131, Vitaly Zagoruyko, Irina Zagoruyko, Vadim Verbetskiy, and Zarina Verbetskiy, applicants.
- 6. Request Rezoning, Planning Board Case Number 2132, James Michael and Lee A. Hunter, applicants.
- 7. Request Rezoning, Planning Board Case Number 2133, Samson and Kathryn Pleasant, applicants.
- 8. Request Rezoning, Planning Board Case Number 2134, Dulin Family Trust c/o Tadd Buchanan, applicants.
- 9. Request Rezoning, Planning Board Case Number 2135, 199-60, LLC, c/o Lindell Campbell, applicant.
- 10. Request Amendment to CUP Board of Adjustment Case Number 1058, Board of Adjustment Case Number 1886, Phenix Quarry, LLC, c/o David Karr, applicant.

H. OTHER BUSINESS

I. ADJOURNMENT

To request information, please call 417-868-4005 or visit greenecountymo.gov/resource_management.
M:\data\wp51\Min & Agendas\2021\PB Agenda 2021\PB agenda 1-19-2021 - Amended.docx

The meeting information below will also be on Greene County's website on the Planning & Zoning page:

https://greenecountymo.gov/resource_management/planning_and_zoning/

You may need to download the Cisco WebEx app on your mobile device or PC to fully utilize the meeting features.

Meeting Information

Meeting link: <https://qcmo.webex.com/qcmo/j.php?MTID=macde0e14eb6ec2d22d99738156b0e486>

Meeting number: 146 813 4807

Password: GCPB19Jan21

More ways to join

Join by video system

Dial 1468134807@qcmo.webex.com

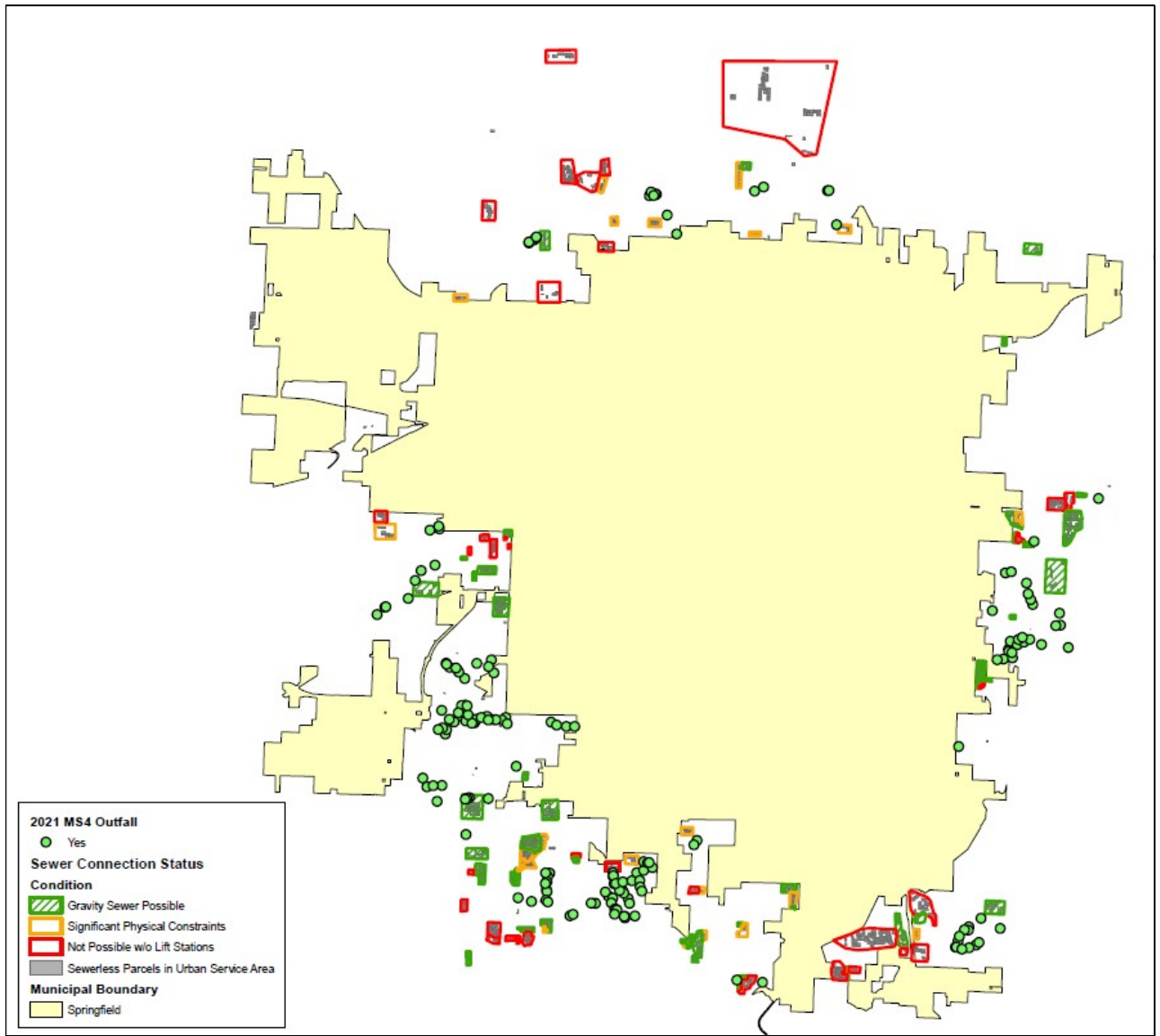
You can also dial 173.243.2.68 and enter your meeting number

Join by phone: +1-415-655-0001 United States Toll

Access code: 146 813 4807

To request information, please call 417-868-4005 or visit greenecountymo.gov/resource_management.

**APPENDIX B:
MCM 3 Illicit Discharge Priority Areas**



APPENDIX C:
MCM 5 Post Construction Inspection Checklist



Detention Basin Operation and Maintenance Inspection Checklist

Greene County Zoning Regulations: Article IV, Section 25(A)(3)

Greene County Environmental Division
940 Boonville Ave. Springfield, MO 65802 (417) 868-4147

Date of Inspection:		Location:		Inspector Name:	
Owner Name:			Owner Address:		
Owner Phone:			Owner Email:		
Reason for Inspection:		<input type="checkbox"/> Bi-Annual Self Inspection <input type="checkbox"/> Routine Inspection by County <input type="checkbox"/> Observed Problem <input type="checkbox"/> Complaint			
Inspection Rating System 0 = Good condition. Well maintained, no action required. Satisfactory performance. 1 = Moderate condition. Should monitor. Satisfactory performance. 2 = Degraded condition. Routine maintenance and repair needed. Unsatisfactory performance. 3 = Serious condition. Immediate need for repair or replacement. Unsatisfactory performance.					
Inspection Checklist		Rating		Corrective Action Needed (for ratings of 2 or 3)	
Inlets (pipes or overland flow into basin)					
Are areas where stormwater enters the basin stable with minimal erosion?		<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
Excessive trash/debris/sediment accumulation in inlet areas?		<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
Detention Basin					
Adequate access for maintenance?		<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
Evidence of standing water longer than 48 hours (ponding, odors, algae)?		<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
Condition of structural components such as concrete channel?		<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
Excessive trash, debris, sediment accumulation in basin area?		<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
Condition of berms/embankments?		<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
Evidence of erosion?		<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
Vegetation covers at least 70% of the basin and is uniform (i.e. no large bare areas)?		<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
Condition of trees or shrubs (if present)?		<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
Outlet Structure					
Trash/debris/sediment accumulation causing blockage?		<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
Evidence of erosion around outlet?		<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
Complaints					
Current complaints from neighbors or the general public? (describe if any)		<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
For self-inspections, please note the date that corrective actions will be completed by:					
Please attach photographs, with descriptions, showing current condition and any deficiencies that need corrective action.					
Photo 1:		Photo 2:		Photo 3:	