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WATER PROTECTION PROGRAM

**STORMWATER
MANAGEMENT PLAN
MARSHALL, MO**

June 2013-June 2018

Prepared By:



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FOR MARSHALL, MO

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**PART I
CITY OF MARSHALL
BACKGROUND**

City of Marshall Background

Information on the Permittee:

Name of the Permittee: City of Marshall, Missouri
Type of Entity: City – Municipality
Total Area (acres): 10.28 sq. miles
Mailing Address: 1277 South Odell Avenue, Marshall, MO 65340
Primary Contact: Bill Anderson – Director of Municipal Services
Phone Number: 660-886-3945
Secondary Contact: Marie Fowler – Assistant Director of Municipal Services
Phone Number: 660-886-3945
Population (2010): 13,065

Information on the Municipal Separate Storm Sewer System:

MS4 System Location: Marshall, Missouri
Name of Organization: City of Marshall, Missouri
County Permittee Resides: Saline County
The major receiving waters within the permitted area include: North Fork of Finney Creek and Salt Fork
None of the receiving waters are on the latest CWA's list of impaired waters.

Information on Adjacent Waterways:

The Permittee is within 100 feet of: North Fork of Finney Creek and Salt Fork
The Permittee discharges to waters classified as major reservoirs: None
The Permittee has some area defined as wetlands as identified by the National Wetland Inventory. See attached map.
Stormwater from Marshall does not discharge to a sinkhole.

**PART II
MINIMUM
CONTROL
MEASURES**

1. Public Education and Outreach

1.1 Regulatory Requirement

40 CFR 122.34 (b)(1) – Implement a public education program to distribute educational materials to the community of contact, equivalent outreach activities about the impacts of stormwater discharges on water bodies and the steps the public can take to reduce pollutants in stormwater runoff.

Section 4.2.1.1 of the Missouri general permit for small municipal separate storm sewer systems ("Permit") requires that the City implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and steps the public can take to reduce pollutants in storm water runoff. This section describes the program elements intended to meet this requirement.

1.2 Target pollutants

Section 4.2.1.1.1 of the Permit requires that the public outreach and education program identify the target pollutant sources the City's public education program is designed to address. The following is a list of the target pollutants for the public education and outreach program. The pollutants are expected to be found in the permitted area based on research of typical substances found in municipal stormwater:

1. Suspended solids
2. Oil and grease
3. Pesticides/Herbicides
4. Bacteria/Nutrients/Oxygen-depleting substances
5. Habitat alterations
6. Salinity (salt)
7. Litter/Trash

1.3 Target audiences

Section 4.2.1.1.2 of the Permit requires that the public outreach and education program identify the target audiences for the City's education program who are likely to have significant storm water impacts (including commercial, industrial and institutional entities). During the development of the proposed education program, Marshall identified the sources of stormwater pollutants that needed to be reduced to improve overall water quality. The target audiences were selected because changing their behavior would have a significant stormwater quality impact on the target pollutants. The target audiences for the public education program are:

1. Citizens (Homeowners)
2. Developers and Home Builders
3. Business Owners
4. Children
5. Elected Officials
6. City Staff

1.4 Selected BMPs for Public Education and Outreach

Sections 4.2.1.1.3 through 4.2.1.1.5 of the Permit requires that the public outreach and education program include a plan to inform individuals and households about steps they can take to reduce storm water pollution, how to become involved in the SWMP (with activities such as local stream and lake restoration activities) and describe the outreach strategy, including the mechanisms (e.g., printed brochures, newspapers, media, workshops, etc.) to reach target audiences, and how many people expected to be reached over the permit term. The following Best Management Practices were selected to meet these requirements:

1.4.1 Stormwater Web Page

The City of Marshall has selected the use of a web page for implementation as part of this Stormwater Management Program. The City maintains a web page with stormwater education information on the City's web site. The page includes general stormwater information, conveys actions citizens can take to improve stormwater quality, solicits input on the program plan, and has direct links to the stormwater ordinances and guidance documents. The website will be reviewed annually to determine if any updates are needed.

1.4.2 Brochures

The City of Marshall has selected brochures for implementation as part of this Stormwater Management Program.

The City developed a general information brochure on stormwater management. These educational materials are available at various municipal locations including Municipal Services and City Hall. They will be replenished as needed. The approximate number of brochures printed and distributed will be reported annually.

1.4.3 Public Presentations

The City of Marshall has selected the use of public presentations for implementation as part of this Stormwater Management Program. This will allow the message to be tailored to specific audiences. It will be integrated into the program through coordination with various schools, civic organizations, service clubs and other

opportunities as they arise. The City will complete at least one public presentation annually.

The number of presentations, approximate number of attendees and the topic of each presentation will be reported annually.

1.4.4 Public Access Televisions (Channel 10)

The City of Marshall has selected posting information on the public access cable television station for implementation as part of this Stormwater Management Program. This will allow the messages to reach a wider variety and volume of people. The City will run information on the channel at least twice each year. Staff will tailor messages to tie into different seasons and/or outreach activities.

The number of times information is posted and the topic of each posting will be reported annually.

1.4.5 Press Release/Advertisements

The City of Marshall has selected issuing press releases or including stormwater information on paid advertisements for implementation as part of this Stormwater Management Program. This will allow the messages to reach a wider variety and volume of people. The City will include stormwater information on paid advertisements and/or issued in press releases at least three times each year. Staff will tailor messages to tie into different seasons and/or outreach activities.

The number of times press releases issued or advertisements purchased and the topic of each will be reported annually.

1.4.6 Utility Bill Announcements/Inserts

The City of Marshall has selected inserting information in utility bills for implementation as part of this Stormwater Management Program. This will allow the messages to reach a wider variety and volume of people. The City will include stormwater information with utility bills at least twice each year. Staff will tailor messages to tie into different seasons.

The number of times information is included and the topic of each message will be reported annually.

1.4.7 Chamber of Commerce Correspondence

The City of Marshall has selected distributing information through the Chamber of Commerce weekly email updates and quarterly reports for implementation as part of this Stormwater Management

Program. This will allow the City to distribute to the widest audience possible.

Staff will put stormwater education information in the Chamber correspondence regularly. The number of stormwater tips or articles published will be reported annually.

1.4.8 Distribute Educational Materials at Community Event

The City of Marshall has selected distributing educational materials at a community event for implementation as part of this Stormwater Management Program. This will allow the City to distribute to the widest audience possible. Staff will distribute stormwater education materials at least twice per year at community events. Historically, this has occurred at the spring Home Show and the Santa Fe Trail Days in the fall.

The annual report will indicate at which event(s) staff distributed information, the approximate number of attendees at the event and the type of information distributed.

1.4.9 Door Hangers

The City of Marshall has selected door hangers for implementation as part of this Stormwater Management Program. This will allow the City to distribute to the widest audience possible. At this time, door hangers are distributed in relation to the storm drain marking program and grass/leaf ordinance enforcement.

At least until all storm drains are marked, door hangers will continue to be utilized as part of this program. After this program is completed, the use of door hangers will be reviewed to determine if it is feasible to continue their use in another capacity. The approximate number of door hangers distributed will be reported annually.

1.4.10 Maintain Dog Waste Disposal Signage in Parks

The City of Marshall has selected maintaining educational signage regarding dog waste disposal within the Parks system for implementation as part of this Stormwater Management Program. This provides a direct message of desired actions to reduce stormwater pollution.

These stations and their associated signage will be regularly inspected to ensure that they have not been vandalized or removed. Additional signs will be added if additional stations are installed.

1.4.11 Storm Drain Stenciling/Marking

The City of Marshall has selected storm drain stenciling/markings for implementation as part of this Stormwater Management Program. This provides a direct message of desired behavior (i.e. "No Dumping").

The number of storm drains marked or stenciled with the anti-dumping message will be reported annually.

1.4.12 Distribution of Children's Activity Books and Other NPS Pollution Reduction Message "Doo Dads"

The City of Marshall has selected the distribution of children's activity books and other NPS pollution reduction message "doo dads" for implementation as part of this Stormwater Management Program. The City has an active Stream Team and utilizes the various giveaway products provided by this program to encourage NPS pollution reduction.

The number and types of giveaway items distributed will be reported annually.

2. Public Involvement in Stormwater Management Program Development

2.1 Regulatory Requirement

40 CFR 122.34 (b)(2) -At a minimum, comply with state, tribal, and local public notice requirements when implementing a public involvement/participation program. EPA recommends that the public be included in developing, implementing, and reviewing your stormwater management program and that the public participation process should make efforts to reach out and engage all economic and ethnic groups.

Section 4.2.2.1 of the Missouri general permit for small municipal separate storm sewer systems ("Permit") requires that the City implement a public participation/involvement program that complies with State and local public notice requirements, and involves the public in the development and oversight of the SWMP, policies and procedures. This section describes the program elements intended to meet this requirement.

2.2 Public Notice/Target Audiences

The City of Marshall will comply with state and local public notice requirements when implementing the public involvement/participation program. The public will be included in reviewing and implementing the stormwater management program as much as possible. The target audiences for the public involvement program are the same as those listed in Section 1.3.

2.3 Selected BMPs for Public Involvement

Section 4.2.2.1.3 requires the City to describe the types of public involvement activities included in the program. Specific BMPs selected for this minimum control measure include:

2.3.1 Existing Public Meetings

The City of Marshall has selected inviting public input through existing meetings for implementation as part of this Stormwater Management Program. There is an open public comment period at each City Council meeting where citizens are allowed input on any City issue. Additionally, development and redevelopment issues as they relate to stormwater are discussed at the Planning and Zoning hearings. The City Council typically has meetings twice a month and the Planning and Zoning hearings are typically held monthly. The number of meetings where stormwater input is received will be reported annually. Also, new and re-developments are reviewed in an open public meeting by the Subdivision Advisory Board.

2.3.2 Public Input on SWMP

The City of Marshall has selected requesting public input on this SWMP for implementation as part of this Stormwater Management Program. This BMP allows for direct public involvement and participation in the development of the SWMP.

The draft SWMP was made available at City Hall. It was then presented at an advertised public hearing prior to a City Council meeting on May 6, 2013 and public comment invited at that time. No comments were received from the public. The Council then adopted the plan by resolution. The final draft of the SWMP will be posted on the City web site for the public to make further comment on the program at any time within the permit cycle.

2.3.3 Community Group Activities

The City of Marshall will continue to work with various community groups to perform implementation of the Stormwater Management Plan. In the past, these volunteer groups have included Missouri Valley College students, Cargill employees, etc. These groups have worked on storm drain stenciling, litter pick-up, etc. Several hundred people typically volunteer each spring for the "Take Pride in Marshall" litter pickup event.

Staff will continue to work with these groups to leverage their man power to implement the stormwater program. A summary of the types of activities completed and approximate number of people involved will be provided in the annual report.

3. Illicit Discharge Detection and Elimination

3.1 Regulatory Requirement

40 CFR 122.34 (b)(3) -Develop, implement, and enforce a program to detect and eliminate illicit discharges into your small MS4. Develop a storm sewer system map, showing the location of all outfalls and the names and locations of all water of the U.S. that receive discharges from those outfalls. To the extent allowable under state, tribal or local law, effectively prohibit, through ordinance, or other regulatory mechanism, non-stormwater discharges into your storm sewer system and implement appropriate enforcement procedures and actions. Develop and implement a plan to detect and address non-stormwater discharges including illegal dumping to your system. Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste. Address categories listed in 122.34(b)(3)(D)(iii) if you determine they are significant contributors of pollutants to MS4.

Section 4.2.3.1 of the Missouri general permit for small municipal separate storm sewer systems ("Permit") requires that the City develop, implement and enforce a program to detect and eliminate illicit discharges (as defined in 10 CSR 20-6.200) into the City's regulated small MS4.

3.2 Storm Sewer System Map

Section 4.2.3.1.1 of the Permit requires the City of Marshall to develop a storm sewer map, showing the location of all outfalls and the names and locations of all water of the U.S. that receive discharges from those outfalls. The City has developed this map. It is evolving from a paper map to a GIS-based map that integrates additional GIS data such as aerial photography, etc. that is available. The data was collected by city staff on paper and is being incorporated into the GIS.

The map is updated as the system expands (as-builts received) or as discrepancies with field information are discovered.

3.3 Illicit Discharge Detection and Elimination Ordinance

Section 4.2.3.1.2 of the Permit requires the City of Marshall to effectively prohibit, through ordinance, or other regulatory mechanism, non-storm water discharges into their storm sewer system and implement appropriate enforcement procedures and actions. The City of Marshall passed an illicit discharge detection and elimination ordinance on December 1, 2008. This ordinance can be found in Article III of Chapter

33 in the City Code. A copy of the entire stormwater ordinance is included in Appendix A. The ordinance will be reviewed at the end of the permit cycle to determine if any updates are needed.

3.4 Plan to Detect and Address Illicit Discharges

Section 4.2.3.1.3 of the Permit requires the City of Marshall to develop a plan and implementation schedule to detect and address non-storm water discharges, including discharges from illegal dumping and spills, to the City's system. The plan must include dry weather field screening for non-storm water flows and field tests of selected chemical parameters as indicators of discharge sources. The plan shall also address on-site sewage disposal systems that flow into the City's storm drainage system.

The City of Marshall has identified priority areas for investigations, developed a methodology and determined locations for dry weather field screening, performed dry weather field screening, developed written procedures and techniques to detect and investigate sources of illicit discharges, prepared a written IDDE response plan, and evaluated the effectiveness of the IDDE program. See additional details below:

3.4.1 Procedure for Locating Priority Areas for Screening (per Section 4.2.3.1.3.1 of the Permit)

The City of Marshall inspects all outfalls negating the need for prioritization of the screening. If prioritization is ever needed due to limited resources, a desktop exercise can be completed to review the subdrainage areas and determine those most likely to produce illicit discharges. Alternatively, past inspection records could be reviewed to prioritize based on historical evidence.

3.4.2 Dry Weather Field Screening

The City of Marshall will conduct dry weather field screening of all outfalls each year. These outfall inspections may be coordinated with the community group activities discussed in Section 2.3.4. The number of outfall inspections completed and any findings of illicit discharge evidence will be reported annually.

3.4.3 Investigate cross-connection of sanitary and storm sewer systems

The City of Marshall will continue to investigate cross-connection of the sanitary sewer system through CCTV inspection. This work will be coordinated with the City's wastewater inflow and infiltration (I&I) reduction program. The lineal feet of sanitary and/or storm sewer lines inspected will be reported annually.

3.4.4 On-Site Sewage Treatment

The City of Marshall has identified 79 on-site sewage treatment systems within its jurisdictional limits. These sites will be visually inspected to determine if any pose a risk of pollution due to insufficient wastewater treatment prior to discharge to the MS4. A list of these locations and a summary of any inspections conducted will be included in the annual report.

3.4.4 Procedures for Tracing Source
(per Section 4.2.3.1.3.2 of the Permit)

The City of Marshall will continue to utilize its storm sewer system map to trace the source of any illicit discharges that are discovered.

3.4.5 Procedures for Removing Source

The City of Marshall will utilize the enforcement mechanisms within its adopted ordinance to remove the source of any illicit discharges discovered where the responsible party can be identified. Municipal Services or Public Safety staff (depending on the nature of the source) will remove the source of any illicit discharges discovered where the responsible party cannot be identified.

3.4.6 Plan to Ensure Enforcement
(per Section 4.2.3.1.3.3 and 4.2.3.4.3.4 of the Permit)

The City of Marshall will develop a written Enforcement Response Plan in the first permit year. This plan will document the exact work process from the receipt of information from the public or discovery of an illicit discharge through investigation and the removal of the source. It will include identification of the responsibilities of any staff involved in the process. It will also include enforcement escalation as necessary.

The number of illicit discharges detected, investigated and eliminated will be reported annually.

3.4.7 Public/Employee Education
(per Section 4.2.3.1.3.5 of the Permit)

The City of Marshall has developed a public education effort to inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste. This has included distribution of informational door hangers during storm drain marking events (in addition to the marking itself). This information is also included in the stormwater education brochures and on the web site. This BMP also addresses the minimum control measure for public education. See Section 1 for additional details.

3.4.8 Household Hazardous Waste (HHW) Collection Program

The City of Marshall will continue to encourage its citizens to participate in the HHW collection program in order to prevent these materials from becoming illicit discharges. The public education program will further advertise these options for proper disposal of HHW. Generally, at least one HHW collection event will be held during the permit cycle.

3.5 Non-Stormwater/Incidental Flows

3.5.1 Addressing Non-Stormwater Flows (per Section 4.2.3.1.4 of the Permit)

The City of Marshall does not currently see the need to address the following non-stormwater flows into their MS4: landscape irrigation, rising ground waters, uncontaminated ground water infiltration, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, springs, water from crawl space pumps, footing drains, lawn watering, flows from riparian habitats and wetlands, flows from street wash water, and flows from emergency fire- fighting activities. These flows are not considered significant contributors of pollutants to the MS4.

3.5.2 Addressing Incidental Non-Stormwater Flows (per Section 4.2.3.1.5 of the Permit)

The City of Marshall does not currently see the need to address incidental non-stormwater flows into their MS4 (such as non-commercial or charity car washes). These flows are not considered significant contributors of pollutants to the MS4.

3.6 Industrial/Commercial Facilities

Section 4.2.3.1.6 of the Permit states that the City "should inventory, inspect and have enforcement authority for industries and commercial enterprises within their boundary that may contribute pollutants via storm water to the MS4." The City of Marshall is not currently required to inventory and inspect industrial or commercial facilities. However, the illicit discharge ordinance gives them the authority to do so if this becomes a permit requirement.

4. Construction Site Stormwater Controls

4.1 Regulatory Requirement

40 CFR 122.34 (b)(4) -Develop, implement and enforce a program to reduce pollutants in any stormwater runoff to your small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Program must include: the development and implementation of (at a minimum) and ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, requirements for construction site operators to implement appropriated erosion and sediment control BMPs, requirements for construction site operators to control waste at the construction site, procedures for site plan review which incorporate consideration of potential water quality impacts, procedures for receipt and consideration of information submitted by the public.

Section 4.2.4.1 of the Missouri general permit for small municipal separate storm sewer systems ("Permit") requires that the City 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 sale that would disturb one acre or more.

4.2 Selected BMPs for Construction Site Stormwater Controls

4.2.1 Construction Site Runoff Control Ordinance (per Section 4.2.4.1.1)

The City of Marshall adopted an erosion and sediment control ordinance on December 1, 2008. The ordinance can be found in Article IV of Chapter 33 of the City Code. A copy of the ordinance is included in Appendix A.

The ordinance was recently reviewed and updates will need to be made to more specifically identify when a Stormwater Pollution Prevention Plan (SWPPP) is required. This, and any other related amendments, will be made in the first year of the permit cycle.

5. Post Construction Stormwater Management for New Development/ Redevelopment

5.1 Regulatory Requirement

40 CFR 122.34 (b)(5) –Develop, implement and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects that are less than one acre that are part of a larger common plan of development or sale, that discharge into your small MS4. Develop and implement strategies which include a combination of structural and/or non-structural BMPs appropriate for your community. Use an ordinance or other regulatory mechanism to address post-construction runoff. Ensure adequate long-term operation and maintenance of BMPs.

Section 4.2.5.1 of the Missouri general permit for small municipal separate storm sewer systems ("Permit") requires that the City develop, implement, and enforce a program to address the quality of long-term 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 City's regulated small MS4. The City's program shall ensure that controls are in place that have been designed and implemented to prevent or minimize water quality impacts by reasonably mimicking pre-construction runoff conditions on all affected new development projects and by effectively utilizing water quality strategies and technologies on all affected redevelopment projects, to the maximum extent practicable. The City shall assess site characteristics at the beginning of the construction design phase to ensure adequate planning for storm water program compliance. The purpose for this approach is to arrive at designs and practices that provide for most effective water quality treatment through infiltration, flow rates and similar site-design opportunities.

5.2 Priority Areas for Post-Construction Program

Section 4.2.5.1.4 of the Permit requires the City of Marshall to specify priority areas for this program. The City considers any area that may be developed or re-developed a "priority area" for the post-construction stormwater management program. However, in the entire last permit cycle (possibly longer), there was only one small (3 lot) subdivision and two stand-alone sites developed.

The ordinance will be reviewed again at the end of the permit cycle to determine if any additional changes are needed. Also, the ordinance will be modified if any changes in the federal or state general permits for construction occur during the period of this permit (i.e. numeric limits).

4.2.2 Construction Site Waste Control (per Section 4.2.4.1.2)

The City of Marshall recently reviewed its stormwater ordinance and discovered that it did not address construction site waste other than sediment. The City will amend its stormwater ordinance to include construction waste control measures within the first year of the permit. A copy of the ordinance revisions will then be added to Appendix A. The ordinance will be reviewed again at the end of the permit cycle to determine if any changes are needed.

4.2.3 Pre-Construction Plan Review

Section 4.2.4.1.3 of the Permit requires the City to develop procedures to consider and review all pre-construction site plans for potential water quality impacts. All development and re-development projects disturbing greater than one acre will be evaluated for the potential impact to water quality and comments provided to minimize the potential for discharge of pollutants from the site.

The number of plans reviewed for water quality impacts will be reported annually.

4.2.4 Receive Public Input on Construction Projects

Section 4.2.4.1.4 of the Permit requires the City to develop procedures to receive and consider information submitted by the public, including coordination with the City's public education program. This BMP coordinates with MCM #2 and can be integrated into existing activities through receipt of information from the public at the existing Subdivision Advisory Board meetings, Planning and Zoning hearings and City Council meetings. Additional input can be received less formally through the City web site and at the designated phone number and mailing address.

Information about construction site runoff control will be integrated into the public education program as feasible. This may increase the input received from the public on construction projects.

A summary of the input from the public on construction projects will be included in the annual report.

4.2.5 Construction Site Inspections

Section 4.2.4.1.5 of the Permit requires the City to develop procedures to inspect sites and enforce control measures, including prioritization of site inspections. Inspection procedures were developed during the previous permit cycle. All development and re-development projects disturbing greater than one acre (other than those which are infrastructure construction projects) will be inspected at least six times during the construction process. The inspection records are kept in the Building Inspector's office at City Hall. Inspection records on infrastructure projects are kept in the Director's office at Municipal Services.

The number of construction site inspections completed will be reported annually.

4.2.6 Ensuring Compliance (Enforcement)

Section 4.2.4.1.6 of the Permit requires the City to develop a plan to ensure compliance with the ordinance, including the sanctions and enforcement mechanisms the City will use to ensure compliance and procedures for when certain sanctions will be used. The City of Marshall's stormwater ordinance has a detailed outline of the process that will be followed for enforcement including escalation as necessary. It includes the use of verbal and written notifications, stop work orders, permit revocations, and deeming the violation a nuisance if abatement is necessary.

The number of construction site runoff control enforcement actions taken will be reported annually.

5.3 Selected BMPs for Post Construction Stormwater Management for New Development/Redevelopment

Per Section 4.2.5.1.1 of the Permit, the City of Marshall is developing a strategy to minimize water quality impacts of new and redevelopment (disturbing greater than one acre) by reasonably mimicking pre-development condition to the maximum extent practicable. This plan includes the following structural and non-structural Best Management Practices:

5.3.1 Ordinance to address post-construction management

Section 4.2.5.1.2 of the Permit requires the City of Marshall to develop an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, or local law. The City of Marshall adopted a post-construction stormwater management ordinance on December 1, 2008. This code can be found in Chapter 33 (primarily Article II) of the City Code. A copy of this ordinance is included in Appendix A. This ordinance included provisions for stormwater quantity.

However, the ordinance did not require developers to mimic the pre-development hydrology to the maximum extent practicable. Therefore, during the first permit year, the ordinance will be updated to require capture and treatment of 90% of the average annual runoff ("water quality volume") for all new developments disturbing greater than one acre. The ordinance will also be revised to reflect requirements for addressing water quality in redevelopment projects that disturb greater than an acre through incremental structural and non-structural improvements/retrofits.

The revisions of the ordinance will likely require a revamping of the pre-construction plan review process. It may also require the revision of ordinances and standards that may conflict with the post-construction stormwater requirements (ie. weed ordinance, street widths). The City of Marshall will utilize information in the Missouri Guide to Green Infrastructure to ensure that the permit requirements are met by these revisions to the ordinance, design standards and plan review process.

5.3.2 Plan for Long Term Operation and Maintenance of Post-Construction BMPs

Section 4.2.5.1.3 of the Permit requires the City of Marshall to have a plan to ensure adequate long-term operation and maintenance of selected BMPs, including types of agreements between the City and other parties such as the post-development landowners or regional authorities.

The City of Marshall recently reviewed its stormwater ordinance and discovered that it did not include specific requirements for long term operation and maintenance of post-construction stormwater BMPs. The ordinance does have provisions to authorize the inspection of post-construction stormwater BMPs. It also included enforcement mechanisms if violations are found.

The City will amend its stormwater ordinance to include long term operation and maintenance of stormwater BMPs within the first year of the permit. A copy of the ordinance revisions will then be added to Appendix A. The ordinance will be reviewed at the end of the permit cycle to determine if any changes are needed.

Also during the first permit year, the City will develop an inventory of post-construction BMPs and identify the responsible parties for each. Post-construction BMPs will be inspected annually. Results of these inspections and a summary of enforcement actions taken will be reported annually.

5.3.3 Non-structural BMPs

Per Permit requirement 4.2.5.1.5, the City of Marshall will utilize its planning and development codes to direct growth to identified areas, maintain or increase open space, minimize impervious surfaces, minimize soil/vegetation disturbance, encourage infill development, encourage the redevelopment of brownfield and grayfield sites, and improve site design for overall water quality impact.

The stormwater management ordinance passed on December 1, 2008 included stream buffer requirements. A buffer of 25 feet is required along all streams (indicated by blue lines on the USGS quadrangle maps) for all new and redevelopments (where feasible) disturbing more than one acre.

The number of new and redevelopments submitted for review utilizing these non-structural BMPs will be reported annually.

The public education and outreach program will include elements of post-construction stormwater management and source control/good housekeeping where feasible. Any specific educational efforts will be reported annually.

5.3.4 Structural BMPs

The City of Marshall adopted a stormwater management ordinance on December 1, 2008. At the same time, the City adopted by reference APWA 5600 design standards for stormwater management structures. The APWA 5600 standards currently address quantity control practices such as detention and retention.

Permit section 4.2.5.1.6 requires the City to identify any structural BMP's that may be implemented as part of the program including practices that provide infiltration, evapotranspiration or re-use (section 4.2.5.1.6.1) and redevelopment/retro-fit practices (section 4.2.5.1.6.2). While developers will be required to install quantity and quality control BMPs, they will be allowed to select from industry-accepted BMPs that meet these objectives such as bioretention, grass swales, cisterns, green roofs, planter boxes, pervious pavements and proprietary treatment devices.

During the first year of the permit cycle, the ordinance and associated design standards will be reviewed and amendments made to better address water quality objectives as it relates to structural BMPs. The City may choose to adopt existing water quality BMP design guidance (such as the APWA/Mid-America Regional Council Manual for Stormwater Quality BMPs) or draft their own manual. A copy of the revised ordinances will be added to Appendix A upon completion.

The number of new and redevelopments submitted for review utilizing these structural BMPs will be reported annually.

6. Pollution Prevention/Good Housekeeping for Municipal Operations

6.1 Regulatory Requirement

40 CFR 122.34 (b)(6) 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.

Section 4.2.6.1 of the Missouri general permit for small municipal separate storm sewer systems ("Permit") requires that the City 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.

6.2 List of Municipal Operations

Section 4.2.6.1.1 of the Permit requires the City to list of all municipal operations that are impacted by this operation and maintenance program. The City shall also include a list of industrial facilities the City owns or operates that are subject to NPDES permits for discharges of storm water associated with industrial activity that ultimately discharge to their MS4. The City shall include the permit number or a copy of the industrial application form for each facility.

The City of Marshall's municipal operations as they relate to the MS4 permit and program include the management and maintenance of:

- Parks and Open Space
- Other Municipally-Owned Recreational Facilities
- Roads and Streets
- Municipal Fleet (Vehicles and Equipment)
- Vehicle and Equipment Yards
- Municipal Buildings
- Municipal Parking Lots
- Storm Sewer System
- Salt/Sand Storage Areas
- Solid Waste Collection
- Wastewater Collection and Treatment Systems*
- Drinking Water Treatment and Distribution Systems*
- Electric Production and Distribution Systems*
- Natural Gas Distribution Systems*
- Internet Service Distribution Systems*

* Operations managed by Marshall Municipal Utilities (MMU) which is a municipally owned and operated entity which is quasi-separate from the City of Marshall corporate entity.

Additionally, any construction or land disturbance undertaken by City crews or by contractors to the City would be considered "municipal operations".

Note: Marshall Municipal Utilities holds a NPDES permit (#MO-0032883) for their WWTP located at 2232 Watermill Road. This site has 3 permitted outfalls listed in the permit. A copy of this list of outfalls is included in Appendix B. Also included in Appendix B is a copy of the outfall map and list for the MS4 permit (#MO-40062).

6.3 Selected BMPs for Municipal Operations

6.3.1 MS4 Maintenance (including proper management of waste removed from MS4)

Section 4.2.6.1.2 of the Permit requires the City of Marshall to identify maintenance BMPs, maintenance schedules, and long-term inspection procedures for controls to reduce floatables and other pollutants to the City's regulated small MS4.

The City of Marshall will operate and maintain its municipal separate storm sewer system (MS4) in order to reduce pollutants discharged from the MS4 to the maximum extent practicable. Municipal Services staff will inspect storm sewers and inlets/catch basins as they conduct their other routine duties. They will clean out pipes and structures from debris and any other pollutants discovered during these inspections. Litter removed from the MS4 will be disposed of in dumpsters. Other floatables and grit will be disposed of according to solid waste management standards.

Metrics related to the operation and maintenance of the MS4 will be collected (i.e. Number of catch basins inspected and/or cleaned, lineal feet of pipe inspected and/or cleaned, man hours spent cleaning ditches, etc) and reported annually.

6.3.2 Streets/Parking Lot Pollution Control

Section 4.2.6.1.3 of the Permit requires the City of Marshall to implement controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots.

The City of Marshall will operate and maintain its street system and municipally owned parking lots in a manner to reduce pollutants discharged to the MS4 to the maximum extent practicable. Municipal

Services staff will perform regular street and parking lot sweeping. Litter will be picked up as staff and volunteer resources are available.

Metrics related to the streets/parking lot pollution control will be collected (i.e. Number of hours spent street sweeping, number of times parking lots are cleaned, number of man hours spent picking up litter, etc) and reported annually.

6.3.3 Pollution Control for Maintenance/Storage Yards

Section 4.2.6.1.3 of the Permit also requires the City of Marshall to implement controls for reducing or eliminating the discharge of pollutants from maintenance and storage yards.

The City of Marshall will operate and maintain its municipal maintenance and storage yards in a manner to prevent and/or reduce pollutants discharged from the sites to the MS4 to the maximum extent practicable.

The following is a list of these maintenance and storage yards:

- Municipal Services: 1277 S. Odell Avenue
- Municipal Services: 875 W. North Street
- Municipal Utilities: NW corner of Hwy 65/Hwy 20
- Municipal Utilities: NE corner of Eastwood/Grant
- Municipal Utilities: 200 Block N. Benton
- Parks and Recreation: 1538 East Vest Street
- Municipal Golf Course (managed by Parks and Recreation): 1536 E. Watermill Road

These sites will follow general Good Housekeeping practices related to outdoor storage. They will be inspected annually to review the need for additional site specific BMPs. The results of these inspections will be included in the annual report.

6.3.4 Pollution Control for waste transfer stations

Section 4.2.6.1.3 of the Permit also requires the City of Marshall to implement controls for reducing or eliminating the discharge of pollutants from waste transfer stations.

The City of Marshall provides solid waste collection. Currently, there is not a waste transfer station within the MS4 jurisdictional boundary.

However, there is one that is in the planning stages to be located at 505 S. Hemlock Avenue. Pollution control will be incorporated into this facility's plan. Once this location is in use, it will be inspected regularly for stormwater pollution. A summary of these inspections will be included in the annual report.

6.3.5 Pollution Control for Fleet and Maintenance Shops

Section 4.2.6.1.3 of the Permit also requires the City of Marshall to implement controls for reducing or eliminating the discharge of pollutants from fleet and maintenance shops.

The City of Marshall will operate and maintain its municipal fleet and maintenance shops in a manner to prevent and/or reduce pollutants discharged from these sites to the MS4 to the maximum extent practicable.

Fleet maintenance shops are located at:

- Municipal Services: 1277 S. Odell Avenue
- Municipal Utilities: NW corner of Hwy 65/Hwy 20
- Parks and Recreation: 1538 East Vest Street
- Fire Station: 471 W. Arrow (in truck bay)

Note: Police Department utilizes commercial vehicle maintenance shops for their fleet.

These sites will follow general Good Housekeeping practices. They will be inspected annually to review the need for additional site specific BMPs related to fleet maintenance. The results of these inspections will be included in the annual report.

6.3.6 Pollution Control for Salt/Sand Storage

Section 4.2.6.1.3 of the Permit also requires the City of Marshall to implement controls for reducing or eliminating the discharge of pollutants from salt/sand storage areas.

The City of Marshall will operate and maintain its salt/sand storage area in a manner to prevent and/or reduce pollutants discharged from the sites to the MS4 to the maximum extent practicable. Deicing materials are kept at the Municipal Utilities storage yard at Grant/Eastwood. Currently, the materials are stored uncovered.

However, a containment berm minimizes the discharge of pollutants from this storage area.

The site will follow general Good Housekeeping practices throughout the year. Additionally cleanup and inspections of the storage area will be conducted after snow events. These sites will be reviewed annually to determine the need for additional site specific BMPs. The results of these inspections will be included in the annual report.

6.3.7 Solid Waste Control

Section 4.1.5 of the Permit requires the City of Marshall to implement good housekeeping practices at facilities under their control in order to keep solid waste from entry into waters of the state to the maximum extent practicable.

The City of Marshall will manage solid waste on and within municipally owned facilities to prevent and/or reduce pollutants discharged from these sites to the MS4 to the maximum extent practicable. This will include trash removal from City rights-of-way, buildings, open space, etc. Solid waste will be properly stored in dumpsters with lids until it can be disposed of by Municipal Services.

6.3.8 Pollution Control for Fueling Operations

Section 4.1.6 of the Permit requires the City of Marshall to adhere to applicable federal and state regulations concerning underground storage, above ground storage, and dispensers, including spill prevention, control and counter measures at all fueling facilities under their control.

The City of Marshall will operate and maintain its municipal fueling facilities in a manner to prevent and/or reduce pollutants discharged from these sites to the MS4 to the maximum extent practicable. The following is a list of all locations where there are fuel storage tanks greater than or equal to 55 gallons:

- Municipal Services - 1275 Odell Avenue
- Airport - 1945 Odell Avenue
- Municipal Service Storage - 875 W. North Street
- Park Maintenance Shed (by Osage Field)
- Golf Maintenance Shed (by #7 Tee Box)
- Golf House - 1536 E. Watermill Road

- Parks Equipment Shop – behind 1538 E. Eastwood
- Fire Department - 471 W. Arrow
- Marshall Municipal Utilities (MMU) – Power Plant
- MMU Wastewater Treatment Plant
- MMU Water Treatment Plant

Smaller fuel cans are also stored at many of these locations for use in fueling smaller equipment. A complete list of all tanks greater than or equal to 55 gallons is listed in Appendix C.

City staff will follow general Good Housekeeping practices as they relate to storage and dispensing of fuel. Fuel storage and dispensing locations will be inspected annually to determine if any additional BMPs are necessary. The results of these inspections will be included in the annual report.

6.3.9 RCRA/CERCLA Substance Management

Section 4.1.7 of the Permit requires the City of Marshall to manage all substances regulated by federal law under the Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) that are transported, stored, or used for maintenance, cleaning or repair by the City according to the provisions of RCRA and CERCLA. The City of Marshall will manage hazardous substances that fall under the RCRA/CERCLA regulations.

6.3.10 Paints/Solvents Management

Section 4.1.8 of the Permit requires the City of Marshall to store all paints and solvents under their control so that these materials are not exposed to storm water. Sufficient practices of spill prevention, control, and/or management will be provided to prevent any spills of these pollutants from entering a water of the state. 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.

The City of Marshall will manage paints and solvents in a manner to prevent and/or reduce pollutants discharged to the MS4 to the maximum extent practicable. This will apply to any area where these products are stored (maintenance shops) or used.

City staff will follow general Good Housekeeping practices in the storage and use of these products. Paint and solvent storage areas will be inspected annually to determine if any additional BMPs are necessary. The results of these inspections will be included in the annual report.

6.3.11 Petroleum/Petroleum Waste Products Management

Section 4.1.8 of the Permit also requires the City of Marshall to store all petroleum products and petroleum waste products under their control so that these materials are not exposed to storm water. Sufficient practices of spill prevention, control, and/or management will be provided to prevent any spills of these pollutants from entering a water of the state. 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.

The City of Marshall will manage petroleum and petroleum waste products in a manner to prevent and/or reduce pollutants discharged to the MS4 to the maximum extent practicable. This will apply to any area where these products are stored or used including the various locations where fleet maintenance activities occur and transformers throughout the MMU service area. A list of all petroleum and petroleum product locations is included in Appendix C.

City staff will follow general Good Housekeeping practices in the storage and use of petroleum and petroleum waste products. Storage areas will be inspected annually to determine if any additional BMPs are necessary. The results of these inspections will be included in the annual report. Approximate quantities of used oil that is recycled (burned to heat Municipal Services maintenance shop) will also be reported annually.

6.3.12 Water Quality Impacts of Flood Control Projects

Section 4.2.6.1.6 of the Permit requires the City of Marshall to adopt procedures to ensure that new flood management projects are assessed for impacts on water quality and existing projects are assessed for incorporation of additional water quality protection devices or practice.

The City of Marshall will ensure new flood management projects are assessed for impacts on water quality and existing projects are assessed for incorporation of additional water quality protection devices or practices. New flood management projects completed by private developers must follow the post-construction stormwater management ordinance which requires the treatment of the water quality storm. The City of Marshall rarely completes new flood management projects. However, in the event that one is scheduled on the capital projects list, the City will review the plans to determine if the water quality storm has been effectively treated. Any information related to new or retrofitted flood management projects will be included in the annual report.

6.4 Employee Training

Section 4.2.6.1.7 of the Permit requires the City of Marshall to implement a government employee training program to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance. The City shall describe any existing, available materials it plans to use such as those available from EPA, State or other organizations. The City shall describe how this training program will be coordinated with the outreach programs developed for the public information minimum measure and the illicit discharge minimum measure.

The City of Marshall will provide training to employees related to Good Housekeeping in Municipal Operations at least once each year. Historically, stormwater tips have been included in the safety meetings with one safety meeting each year dedicated to stormwater quality protection topics. Stormwater quality protection "tips" are also included with employee paychecks approximately three times each year. This reaches all of the approximately 125 City employees.

In the first year of the permit cycle, the City will develop information to be provided to all new employees related to stormwater quality management. This information will be provided to all new employees at their orientation.

A summary of the number of employees trained and the topics discussed will be included in the annual report.

7. General Rationale

7.1 Decision Process

Section 4.1.9 of the Permit requires the City to document the decision process for each minimum control measure and include rationale statements for each BMP and measurable goal defined. The City of Marshall reviewed the General Permit requirements and selected each of the BMPs after reviewing research from notable sources such as the EPA and the Center for Watershed Protection. Programs from other communities were also examined. Various BMPs were selected based on the evidence that they will have a positive impact on targeted pollutants. City staff also examined each BMP for how it could fit into existing activities and mechanisms. The SWMP will be made available for public inspection and comment upon completion.

7.2 Responsible Person

Section 4.1.3 of the Permit requires the City to identify the person primarily responsible for the SWMP, and the person(s) responsible for each minimum control measure if different from the primary responsible person. The person responsible for the overall management and implementation of the permittee's stormwater management program is the City Administrator. Others will be involved in the execution of each of the individual activities in the program.

7.3 Evaluation

The City of Marshall will report annually on the level of achievement toward all measurable goals. Where applicable, metrics will be documented. Qualitative anecdotal evidence will also be documented where possible.

7.4 Modifications and Updates

The City of Marshall understands that this plan is intended to be a "living document" with measurable goals and objectives. However, it is difficult to speculate the resources that will be available from year to year. Therefore, the annual report will provide an opportunity to improve the specificity of the goals and objectives set forth in more general terms within this plan. Each year, the annual report will include details of the progress made under each minimum control measure as well as details of the proposed activities for the coming year towards each goal. The annual reports will be added as appendices to this plan and act as interim updates as such.



NSW Permit 2007-1
Jefferson City, MO 65101
573-060-6567

July 3, 2013

Missouri Department of Natural Resources
Water Protection Program
Attn: Ruth Wallace
Jefferson City, Missouri 65101

Re: Revised SWMPs for Excelsior Springs, Marshall and Holts Summit

Dear Ms. Wallace:

Please find enclosed the revisions to the above referenced Stormwater Management Plans. Each has been amended to more completely reference the permit requirements. Additionally, areas of program deficiencies were more fully addressed or clarified. I did not reprint the appendices to the Marshall plan so I would appreciate it if you would simply swap out the enclosed plan with the body of the original plan.

I also worked with Liberty to amend their plan. Brian Hess indicated he would be sending you the revised plan in an email later today.

Thank you for your time and consideration of these revisions. Please let me know if you need any additional information.

Sincerely,

A handwritten signature in cursive script that reads "Christina L. Luebbert".

Christina L. Luebbert, P.E., CFM, LEED AP
Owner/Principal Engineer

Enclosures

**PHASE II MS4 PROGRAM REVIEW AND ASSESSMENT
Small Separate Storm Sewer System (Small MS4)**

Date(s) of Review May 23, 2013

Permittee Marshall Small MS4
Permit # MOR040062

Reviewer(s) Ruth Wallace

Document(s) Reviewed:

- PERMIT(s) DATED _____
 SWMP(s) DATED June 2013-June 2018
 Annual Report(s) with/without Monitoring Data DATED _____
 TMDL Monitoring Plan(s) DATED _____

General Comments: The June 2013-June 2018 Stormwater Management Program Plan (SWMP) was written without regard to permit conditions for which the application is being made. Each minimum control measure outlined in the SWMP simply references the supporting federal regulation language. The Clean Water Act and federal regulation, as well as the Missouri Clean Water Law and state regulation provide the foundation for development of NPDES permits. The nature of NPDES Permitting involves the inclusion of numeric and narrative limits as determined through policy and best professional judgment as a means to address regulatory requirements.

The inclusion of narrative best management practices (BMPs) is particularly important in MS4 permits where the Department is obligated under 40 CFR Part 125 to incorporate best management practices into permits as a means to guide MS4s toward the narrative Maximum Extent Practicable (MEP) standard. Without baseline best management practices, it is difficult to make any assumptions about MS4 program progress toward MEP, especially in the absence of numeric limits at outfalls.

By disregarding permit conditions, your MS4 is at risk of non-compliance. While several of the outlined activities in your SWMP may address permit requirements by default, it is evident in a few areas that certain permit conditions may be ignored.

While this review could include permit requirements throughout, discussion will be limited to the post-construction runoff control requirements for demonstration purposes.

1. Public Outreach & Education

- Adequate Somewhat Adequate Inadequate

Comments:

While the 2008 permit requirements (carried over to the 2013 permit draft) are not included. Permit requirements are stated as follows:

- 4.2.5 **Post-Construction Storm Water Management in New Development and Redevelopment**
- 4.2.5.1 *Permit requirement.* The permittee shall develop, implement, and enforce a program to address the quality of long-term 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 permittee's program shall ensure that controls are in place that have been designed and implemented to prevent or minimize water quality impacts by reasonably mimicking pre-construction runoff conditions on all affected new development projects and by effectively utilizing water quality strategies and technologies on all affected redevelopment projects, to the maximum extent practicable. The permittee shall assess site characteristics at the beginning of the construction design phase to ensure adequate planning for storm water program compliance. The purpose for this approach is to arrive at designs and practices that provide for most effective water quality treatment through infiltration, flow rates and similar site-design opportunities. As part of the SWMP document, the post-construction runoff control program shall include the following information, at a minimum:
- 4.2.5.1.1 A strategy to minimize water quality impacts, by reasonably mimicking pre-construction runoff conditions in affected new development and incorporating water quality protection in affected redevelopment projects to the maximum extent practicable, and include a combination of structural and/or non-structural BMPs appropriate for the permittee's community;
- 4.2.5.1.2 An ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, or local law. If the permittee needs to develop a mechanism, the permittee shall describe the plan and a schedule for implementation. If the permittee's ordinance or regulatory mechanism is already developed, the permittee shall include a copy of the relevant sections with the SWMP document;
- 4.2.5.1.3 A plan to ensure adequate long-term operation and maintenance of selected BMPs, including types of agreements between the permittee and other parties such as the post-development landowners or regional authorities;
- 4.2.5.1.4 Specific priority areas for this program; and
- 4.2.5.1.5 Any non-structural BMPs in the permittee's program, including, as appropriate:
- 4.2.5.1.5.1 Policies and ordinances that provide requirements and standards to direct growth to identified areas, protect sensitive areas such as wetlands and riparian areas, maintain and/or increase open space (including a dedicated funding source for open space acquisition), provide buffers along sensitive water bodies, minimize impervious surfaces, and minimize disturbance of soils and vegetation;
- 4.2.5.1.5.2 Policies or ordinances that encourage infill development in higher density urban areas, and areas with existing storm sewer infrastructure, and redevelopment of Brownfield sites or grayfields which may include abandoned malls or similar properties;

provide reasonable incremental improvement to runoff quality in all regulated redevelopment projects. The City needs to ensure assessment of site characteristics at the beginning of the construction design phase to ensure adequate planning for storm water program compliance. The city will need to ensure that existing codes and ordinances do not conflict with the new criteria to be established; i.e. weed ordinances, mandatory street widths, etc.

RECOMMENDATIONS:

1. The Department views maximum extent practicable in post-construction runoff quality control to mean capture/treat the 90th percentile storm event in new development. This is the basis for the “mimicking” requirement as determined by stormwater industry in numerous manuals and programs. The Department strongly recommends the City set forth a similar standard for regulated development projects, especially for new development projects and a reasonable MEP performance objective for redevelopment projects in a manner that encourages infill and redevelopment. It is necessary for the City to establish standards and performance criteria. The greatest opportunity for cost-benefit is on the front end of the design and with the employment of State-of-the-Practice site design criteria (often referred to as green infrastructure and low impact development.)
2. It is recommended the City should refer to the Department’s stormwater information clearinghouse post-construction page located at <http://dnr.mo.gov/env/wpp/stormwater/sw-local-gov-programs.htm#mcm5> for resources on developing a meaningful post-construction runoff management program, including:
 - a. *Missouri Guide to Green Infrastructure: Incorporating Water Quality into Municipal Stormwater Management*, May 2012;
 - b. *Banking on Green A Look at How Green Infrastructure Can Save Municipalities Money and Provide Economic Benefits Community-wide*. April 2012; http://www.asla.org/uploadedFiles/CMS/Government_Affairs/Federal_Government_Affairs/Banking%20on%20Green%20HighRes.pdf; and
 - c. *The Value of Green Infrastructure: A Guide to Recognizing Its Economic, Social and Environmental Benefits*. A Center for Neighborhood Technology valuation guide <http://www.cnt.org/repository/gi-values-guide.pdf>
 - d. *Managing Stormwater in Redevelopment and Greenfield Development Projects Using Green Infrastructure – Economic Factors that Influence Developers’ Decisions*. June 2011. ECONorthwest. <http://www.americanrivers.org/newsroom/resources/managing-stormwater-using-green-infrastructure.html>
 - e. *The Prevalence and Cost of Urban Flooding, A Case Study of Cook County, IL, Phase One (May 2013)* <http://bit.ly/UrbanFlooding> (Impervious relevance.)
 - f. Ordinance templates and additional information located on the Missouri Stormwater Information Clearinghouse located at <http://www.dnr.mo.gov/env/wpp/stormwater/sw-local-gov-programs.htm#mcm5>