



**LEBANON**

**M I S S O U R I**

*Friendly people. Friendly place.*

**STORMWATER  
MANAGEMENT PLAN**

CITY OF LEBANON  
P O BOX 111  
LEBANON MO 65536  
SEPTEMBER, 2007  
Permit NO. MO-R040081

## **OVERVIEW**

This Storm water Management Plan is prepared for the City of Lebanon, Missouri as part of EPA and MDNR requirements. It addresses the following six key control measures:

- Public Participation and Involvement
- Public Education and Outreach
- Illicit Discharge Detection and Elimination
- Pollution Prevention and Good Housekeeping
- Construction Site Runoff Control
- Post-Construction Runoff Control

The City of Lebanon, Missouri has been designated by the EPA/MDNR as a small MS4 community and must meet and comply with Phase II Storm water Final Rule.

The City of Lebanon plans to utilize the six key control measures as a means to reduce pollutants in the water ways of the City of Lebanon, surrounding area, State of Missouri and the United States.

Each control measure has goals associated with that control measure, specific target dates for implementation and completion dates for each goal. Lebanon will update goals for these key control measures so that each control measure is effective to reduce pollutants into the water ways.

This Storm water Management Plan is a part of Lebanon's NPDES, Phase II, MS4, Storm water permit application.

Joe Knapp, city Administrator is responsible for the entire MS4 Program. other persons have been designated and listed as a responsible person for each separate control measure, with their names being listed under their responsible control measure.

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SEP 28 2007  
WATER PROTECTION PROGRAM

**CITY OF LEBANON, MISSOURI**  
**STORMWATER MANAGEMENT PLAN ELEMENTS**

Lebanon will implement and enforce a Storm Water Management Plan designed to reduce discharge of pollutants from the municipal separate storm sewer system to the “maximum extend practicable” to protect water quality. Six key control measures, listed below, are required under Phase II regulations:

- Public Participation and Involvement
- Public Education and Outreach
- Illicit Discharge Detection and Elimination
- Pollution Prevention and Good Housekeeping
- Construction Site Runoff Control
- Post-Construction Runoff Control

Information about the City of Lebanon, its government, population, departments, and other information, along with identifying specific goals that will be implemented for each of the control measures listed above are submitted with the Plan.

Lebanon, Missouri is located in the center of Laclede County, State of Missouri. Lebanon is also located in the center of the Ozarks. Major highways serving the area include Interstate 44, Missouri State Highways 5, 32, and 64, Lebanon is located approximately 163 miles southwest of St. Louis, 58 miles southwest of Rolla, and 49 miles northeast of Springfield.

The topography of the area is diverse and includes farmland and pastures spreading through gentle valleys and over rolling, wooded terrain, to more precipitous and rugged forested hills. The topography within Lebanon is characterized by gentle, sloping terrain, excellent for urban development. The area is drained by 3 intermittent creeks that flow to the northwest. Goodwin Hollow, Dry Auglaize and Cobbs Creek.

The average annual rainfall for Lebanon is approximately 42 inches and average annual snowfall for Lebanon is approximately 18 inches. Temperatures rarely exceed 100 degrees Fahrenheit in the summer and rarely fall below 0 degrees Fahrenheit in the winter.

Major employers in the City of Lebanon are:

- Copeland Corporation
- Detroit Tool
- Durham Company
- G-III Boats
- Independent Stave Company

- Justice Furniture
- Marathon Electric
- Marine Electric
- Tracker Marine
- DOWCO
- Lowe Boats
- Lebanon Public Schools
- St. Johns Regional Medical Center

## **WATERSHEDS**

The drainage basins and watersheds in Lebanon generally drain from a Southeast direction to a Northwest direction. The highest point within the corporate limits of the City of Lebanon is on or near the hospital area (1350). The lowest point is Goodwin Hollow Lift Station Area (1150). Approximately 200 feet of relief occurs from the high point to the low point.

The watersheds which make up Lebanon's drainage maps and a brief description are: Goodwin Hollow (Northwest of Lebanon), Dry Auglaize (North of Lebanon), and Cobbs Creek (Southeast of Lebanon).

### **A. Goodwin Hollow**

Goodwin Hollow with its drainage area of approximately 3600 acres connects with drainage ditches and drains via Goodwin Hollow into Lake of the Ozarks. Goodwin Hollow lies in the west portion of Lebanon and parts of the watershed are developed residential, commercial and industrial. Other sections are undeveloped at this time.

### **B. Dry Auglaize**

Dry Auglaize with its drainage area of approximately 3850 acres connects with drainage ditches and drains via Dry Auglaize into Lake of the Ozarks. Dry Auglaize lies in the North portion of Lebanon and parts of the watershed are developed residential, commercial, and industrial. Other sections are undeveloped at this time.

### **C. Cobbs Creek**

Cobbs Creek with its drainage area of approximately 2500 acres connects with drainage ditches and drains via Cobbs Creek. Cobbs Creek lies in the Southeast portion of Lebanon and parts of the watershed are developed residential, commercial, and industrial. Other sections are undeveloped at this time.

A map showing the various watersheds throughout Lebanon is included with the Plan. Outlets are identified on the map and legal descriptions for the outlets are included.

## **303d LISTED WATERS**

Dry Auglaize is on the Clean Water Commission approved 303d list dated 2004/2006.

The City of Lebanon has developed this Plan to safeguard the citizens of the city and help protect the waterways within the City, surrounding area, and the State of Missouri.

The City of Lebanon, Missouri Phase II NPDES management plan consists of the following six minimum control measures. Each control measure has associated goals, or best management practices, that will be implemented during the course of the permit. The City of Lebanon will implement and evaluate the best management practices to insure that all the objectives of the Phase II NPDES program are met.

### **PUBLIC PARTICIPATION/INVOLVEMENT**

To satisfy this control measure, the City of Lebanon, as operator of a regulated MS4 will:

1. Comply with applicable State and local public notice requirements; and
2. Determine the appropriate best management practices and measurable goals for this minimum control.

The public is a valuable resource for this control measure. An active and involved community is crucial to the success of Lebanon's plan.

### **GOALS AND DESCRIPTIONS ARE AS FOLLOWS:**

**Goal:** The City Council will conduct public hearings to discuss storm water.

#### **Measurable**

**Goal:** The City Council will discuss storm water requirements annually during permit period. The City of Lebanon will notify citizens of the public meetings in the newspaper and by placing flyers around Town 15-20 days before the meetings.

**Goal:** The City of Lebanon, with citizen groups will Support cleanup of local streams annually.

#### **Measurable**

**Goal:** The City of Lebanon, with the citizen groups will Support stream cleanups by disposing of the refuse collected Free.  
The City will use days like the first day of spring, Earth Day, May Day, and Flag Day to publicize awareness of community stream Clean-up and encourage individuals to do their part.

**Goal:** The City will form a Storm Water Committee to discuss storm water issues and make suggestions for improvements.

**Measurable**

**Goals:** The City will establish the Storm Water Committee by March 10, 2008. The committee will meet 1 time before May 1, 2008.

**Person**

**Responsible:** Joe Knapp, City Administrator is responsible for all Goals of the control measure Public Participation/Involvement.

**PUBLIC EDUCATION AND OUTREACH**

This control measure will be handled by the operator, the City of Lebanon and will:

1. Implement a public education program to distribute educational materials to the community.
2. Determine the appropriate best management practices and measurable goals for this control measure.

A well informed community is vital to the success of the Plan because:

1. Support for the Plan and why it is necessary give the public a greater understanding of storm water issues and/or problems.
2. As the public becomes aware of personal responsibilities that are expected of them the City of Lebanon will have greater compliance with the Plan.

**GOALS**

**Goal:** Develop an informational resource to support public education.

**Goal**

**Description:** Develop brochures to support the Plan.

Create a storm water hotline for information and for citizen reports  
On polluters.

Train educators to be used for Public Education.

Develop school curricula used to educate students about storm water  
issues.

**Measurable**

**Goal:** Develop brochures advising citizens of storm water issues and distribute them to each household annually beginning 2008.

Establish a storm water hotline by December 31, 2008.

Meet with local school officials no later than Fall 2008 to set up Schedule to distribute storm water curricula to students annually beginning 2008.

**Person**

**Responsible:** Shelby Maddux is responsible for the control measure Public Education and Outreach.

**ILLICIT DISCHARGE DETECTION AND ELIMINATION**

In order for the City of Lebanon to be in compliance, as operator, with the MS4 final rule The City must development, implement and enforce an illicit discharge detection and Elimination program. The program must include:

1. A storm sewer map, showing the location of all outfalls and the names and location of all waters of the United States that receive discharges from those outfalls. Lebanon is in the process of developing this map.
2. An ordinance must be adopted prohibiting non-storm water discharges into the MS4, and appropriate enforcement procedures and actions.
3. A plan to detect and address non-storm water discharges, including illegal dumping.
4. Education of public employees, business, and the general public about the hazards associated with illegal discharges and improper disposal of waste; and
5. The determination of appropriate best management practices and measurable goals for this control measure.

Lebanon recognizes that discharges from MS4s may sometimes include wastes and/or wastewater from non-storm water sources. Lebanon recognizes that waters not attributable to precipitation runoff could be from illicit or inappropriate discharges and connections to the MS4. Illicit discharges could enter the system through either direction connections (i.e. Wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (ie. Infiltration into the MS4 from cracked sanitary systems, spills collected by drain outlets, or paint or used oil dumped directly into a drain). The result is high levels of pollutants into the waters of the State of Missouri and the United States. Studies have shown that this could significantly degrade receiving water quality and threaten aquatic, wildlife, and human health.

**Goal:** Implement an Information Management System for Tracking Illicit Discharges

**Goal**

**Description:** An information management system will be used to document all important information gathered concerning illicit discharge detection,

elimination and actions taken. This information will be included in annual reports and will detail various pertinent information such as:

1. The number of outfalls screened.
2. The number of illicit discharges discovered during outfall screening
3. The number of illicit discharges discovered as a result of citizen complaints.
4. The number of illicit discharges that were resolved.

This Goal will be implemented by January 1, 2010.

**Goal:** Storm Sewer System Map

**Goal**

**Description:** The storm sewer system map is a means to demonstrate a basic awareness of the intake and discharge areas of the system. It is needed to help determine the extent of discharged dry weather flows, the possible sources of the dry weather flows, and the particular water bodies these flows may be affecting. An existing map, such as a topographical map, on which the location of major pipes and outfalls can be clearly presented, demonstrates such awareness.

City staff is working on preparing the storm sewer system map with the target date for completion being December 31, 2008.

**Goal:** Initial Identification of Illicit Discharge Sources

**Goal**

**Description:** Lebanon will implement a plan to detect and address non-storm water discharges. Methods used for detection will include on-site visual inspections and public watch and report programs with established hotlines.

The City of Lebanon, through the guidance of the EPA, conducted a rigorous system evaluation of the sanitary sewer system. This comprehensive study of the sanitary sewer system was also known as an inflow and infiltration (I&I) study. The purpose of the study was to identify and eliminate extraneous sources of storm and ground water into the sanitary sewer system. At that time it was found that no cross connections between the storm and sanitary sewer systems existed, however, a number of downspouts and similar drains into the sanitary sewer system were eliminated. Also, several broken sewer lines allowed for some cross communication between the storm and sanitary sewer lines but those have been eliminated.

Lebanon will continue the I&I program and will begin visual inspections of storm sewers by January 1, 2009. Also, the hotline will be set up no later than January 1, 2009 for the public water and report program.

**Goal:** Storm Water Ordinance

**Goal**

**Description:** Lebanon will develop a Storm Water Ordinance that will prohibit, to the extent allowable, all non-storm water discharges into the MS4. The ordinance will include appropriate enforcement procedures and action such as:

Fines and/or penalties

Lebanon will adopt a Storm water Ordinance no later than January 1, 2009.

**Goal:** Train Employees

**Goal**

**Description:** Design and administer a training program to employees that will inform them how to identify illicit discharges and report any and all suspend discharges to the property authorities.

This goal will be implemented by January 1, 2009

**Goal:** Detection and Elimination

**Goal**

**Description:** The illicit discharges that are detected will be eliminated. Detection and elimination efforts will be documented so that an end of year report will detail all illicit discharges that were found, which ones were eliminated and what remedial actions were taken.

**Person**

**Responsible:** Richard Shockley, Public Works Director is responsible for the control measure Discharge Detection and Elimination.

## **POLLUTION PREVENTION/GOOD HOUSEKEEPING**

1. Lebanon will develop and implement a storm water operation and maintenance program with the ultimate goal of preventing or reducing pollutant runoff from municipal operations into the storm sewer system;
2. Lebanon will include employee training on how to incorporate pollution prevention/good housekeeping techniques into municipal operations such as fleet and building maintenance, new construction and land disturbances, and storm water maintenance.
3. Lebanon will determine the appropriate best management practices and measurable goals for this minimum control measure.

**Goal:** Training

### **Goal**

**Description:** Utilizing training material from EPA and State of Missouri, Lebanon will include employee training. Training will be primarily in the areas of hazardous material handling, pesticide application, vehicle maintenance and street maintenance including snow removal operations.

Training will be provided annually beginning 2009 to all employees of the Public Works Department.

**Goal:** Develop Pollution Prevention Plan

### **Goal**

**Description:** Lebanon will review all municipal operations which effect storm water runoff. A written plan will be developed to ensure municipal operations do not contribute to pollution. A Pollution Prevention Plan will be developed using BMPs. This will be completed by February 1, 2009.

**Goal:** Maintenance Activities and Schedules.

### **Goal**

**Description:** Various Maintenance activities schedules will be developed no later than January 1, 2009. Examples of these are: city parking lot sweeping, street sweeping and developing a schedule for storm sewer cleaning and maintenance

### **Person**

**Responsible:** Richard Shockley, Public Works Director is responsible for the control measure Pollution Prevention/Good Housekeeping.

## **CONSTRUCTION SITE RUNOFF CONTROL**

The Phase II Final Rule requires the City of Lebanon, as a MS4 operator, to develop, implement, and enforce a program to reduce pollutants in storm water runoff to their MS4 from construction activities that result in a land disturbance of greater than or equal to one acre.

The City of Lebanon, Missouri will:

1. Develop an ordinance requiring the implementation of proper erosion and sediment control, and controls for other wastes, on applicable construction sites;
2. Develop procedures for site inspection and enforcement of control measures;
3. Develop sanctions to ensure compliance.
4. Determine the appropriate best management practices for this minimum control measure.

Polluted storm water runoff from construction sites often flows and ultimately is discharged into local creeks, rivers, and streams. Sediment is usually the main pollutant of concern. Construction sites can contribute more sediment to streams than can be deposited naturally. Contribution of pollutant from construction sites can cause physical, chemical, and biological harm to our waters. Excess sediment can fill rivers and lakes, required dredging and destroying aquatic habitats.

Pollutants Commonly Discharged from Construction Sites:

- Sediment
- Solid and Sanitary wastes
- Phosphorous (fertilizer)
- Nitrogen (fertilizer)
- Pesticides
- Oil and grease
- Concrete truck washout

**Goal:** Ordinance

**Goal**

**Description:** An ordinance will be put in place that will provide the City of Lebanon the Ability to regulate polluted runoff from construction sites.  
This will be adopted by December 31, 2008

**Goal:** Begin Inspection Program

**Goal**

**Description:** Random inspections of construction sites will be performed to determine Overall compliance rate that is being achieved by construction operators.  
Random inspections will begin January 1, 2009.

**Goal:** Information Management System

**Goal**

**Description:** An information management system designed to track information from the public and record staff inspections of construction sites will be put in place.

Develop site inspection procedures that will be used by staff in the performance of construction site inspections.

This will be developed no later than January 1, 2009.

**Goal:** Train Staff

**Goal**

**Description:** Staff will be trained in inspection procedures.  
Training will take place no later than January 1, 2009.

**Person**

**Responsible:** The responsible person for the minimum Construction Site Runoff Control Is Cathy Mustard, Building and Zoning Administrator.

## **POST-CONSTRUCTION RUNOFF CONTROL**

The City of Lebanon, as an operator of a MS4 under the Phase II Final rule, will develop, implement, and enforce a program to reduce pollutants in post-construction runoff from new development and redevelopment projects that result in land disturbance of greater than or equal to 1 acre. Lebanon's Post-Construction Runoff Controls will:

1. Develop and implement strategies which include a combination of structural and/or non-structural best management practices;
2. Have an ordinance requiring the implementation of post-construction runoff controls to the extent allowable under State and local laws.
3. Ensure adequate long-term operation and maintenance of post-construction runoff controls;
4. Determine the appropriate best management practices and measurable goals for this post-construction runoff control measure.

Post-construction storm water management in areas undergoing new development or redevelopment is necessary because runoff from these areas has been shown to significantly effect receiving waters. Prior planning and design for the minimization of pollutant in post-construction storm water discharges is the most cost-effective approval to storm water quality management.

There are 2 forms of substantial impacts of post-construction runoff.

- An increase in the type and quantity of pollutants in storm water runoff. As runoff flows over areas altered by development, it picks up harmful sediment and chemicals such as oil and grease, pesticides, heavy metals, and nutrients. The pollutant becomes suspended in runoff and is carried to receiving waters. The pollutant can enter the food chain through small aquatic life.
- The second kind of post-construction runoff impact occurs by increasing the quantity of water delivered to the water body during storms. Increased impervious surfaces interrupt the natural cycle of gradual percolation and water through vegetation and soil. Instead, water is collected from surfaces such as asphalt and concrete and routed to drainage systems where large volumes of runoff quickly flow to the nearest receiving water.

**Goal:** Identification of Best Management Practices

### **Goal**

**Description:** Identify and develop a mix of Structural and Non-Structural BMPS that are appropriate for the City of Lebanon. This BMP list will include BMPs Suited for both redevelopment and new development. These BMPs will Also be used in the Construction site Runoff Control.

**Goal:** Publication of BMPs

**Goal**

**Description:** Codify the BMPs identified through an ordinance. Publish the list of BMPs and make them available to developers, citizens and staff.

This minimum control will be completely implemented no later than January 1, 2009.

**Person**

**Responsible:** Mike Moore is responsible for this minimum control measure