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October 19, 2011

**RECEIVED**

OCT 24 2011

WATER PROTECTION PROGRAM

Missouri Department of Natural Resources  
Attention: Ms. Ruth Wallace  
Water Protection Program  
PO Box 176  
Jefferson City, MO 65102-0176

RE: City of Kirksville MS4 Permit MO-R040078 Storm Water Management Program

Dear Ms. Wallace:

The City of Kirksville contracted with Bartlett & West Engineers of Jefferson City to assist us in completion of the Stormwater Management Program (SWMP) required under our Municipal Separate Storm Sewer System operating permit. The program has been completed, and was adopted by motion by the Kirksville City Council at their regular meeting on October 17, 2011. A copy of the adopted program is enclosed.

The City recognizes that the program prepared by Bartlett & West is a starting point for effective stormwater management and pollution control. Goals and an implementation schedule for meeting the six minimum control measures are outlined on pages 12 through 14 of the program, and will serve as the initial milestones as implementing policies and design guides are developed and documented.

I want to thank you for your patience and support, thus far, and for your assistance as we move forward in development of this program. If you have any questions, or wish to meet to discuss our Program, please email me at [mmacomber@kirksvillecity.com](mailto:mmacomber@kirksvillecity.com) or call 660-627-1225.

Sincerely,

Mari E. Macomber  
City Manager

Enclosure:

PC: John Buckwalter, PE, Public Works Director

# **STORMWATER MANAGEMENT PROGRAM**

**City of Kirksville, Missouri**



**October 2011**

**BARTLETT & WEST**

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PN 16996.003

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## **I. GENERAL**

### **Introduction**

Kirksville Missouri, hereinafter referred to as the "City", is located in Adair County. This document presents the City's Storm Water Management Program (SWMP) designed to reduce discharges of pollutants from urban storm water runoff, and to comply with the Clean Water Act - Storm Water Phase II requirements. This document provides a detailed set of goals that the City has identified to address the six minimum control measures (MCM).

The SWMP summarizes the City's intentions to reduce the amount of pollution in its stormwater runoff by addressing the six minimum control measures listed on the MS4 General Permit No. MOR040078. These MCMs are as follows:

1. Public education and outreach
2. Public involvement and participation
3. Construction site runoff control
4. Illicit discharge detection and elimination
5. Post-construction site runoff control
6. Pollution prevention/good housekeeping

Each MCM in this report addresses the overall purpose of the measure, discussion of existing activities related to this measure, proposed goal(s) with frequencies or timelines, and where required, a method of enforcement.

### **Background**

#### **A. Watersheds**

Kirksville is situated on the divide between two major drainage basins. The portion of the City east of Highway 63 is in the Upper Mississippi-Salt River Basin. The part of the City west of Highway 63 is in the Lower Missouri – Grand – Chariton River Basin. See Figure 1 at the end of this section.

The drainage system for the City is comprised of storm sewers and open unimproved channels which drain to one of five creeks. Maps of the watersheds are found in Appendix A. The creeks are:

- Floyd Creek
- Steer Creek
- Bear Creek
- Rye Creek
- Big Creek

#### **B. Water Quality**

The City has been aggressively working on the sanitary sewer system to prevent sanitary sewer overflows (SSOs).

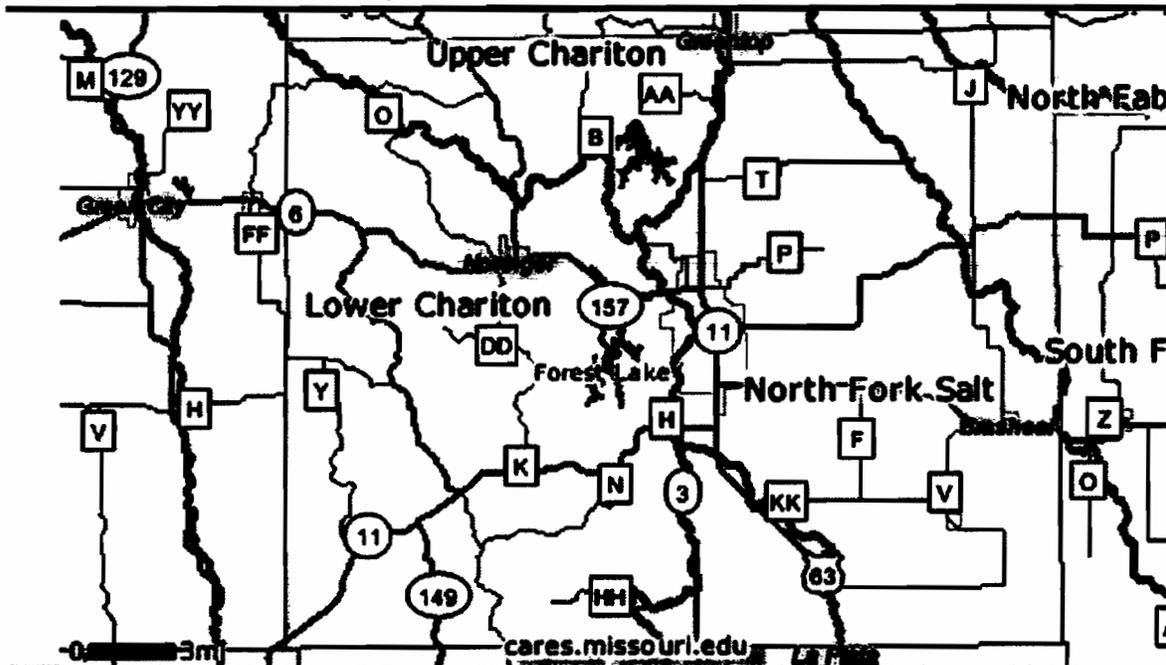
1. An infiltration/inflow study is currently in progress in the Steer Creek Watershed.
2. Recent total reconstruction of the sanitary sewer pumping station in the Big Creek Watershed with the capability to connect to a portable generator make a sanitary sewer overflow (SSO) remote. This is extremely important, since a majority of the water supply is from the Big Creek Watershed.
3. An unclassified segment of Bear Creek is listed on the Missouri 303d list of impaired waters. The segment begins at the headwater of Bear Creek in the City. The study

identified the Total Maximum Daily Load (TMDL) for total suspended solids, total nitrogen, and total phosphorus. A study on this watershed has been recently completed under USEPA Region 7 Report MO\_0115U-01.

In addition to sanitary sewer studies and improvements, Adair Foods located in the Floyd Creek Watershed has a wastewater pretreatment facility. Samples are periodically taken at the Hospital for heavy metals, and Truman State for BOD. NPDES industrial discharge permits have been issued to Perfect Metals and MFA.

Under the current MS4 permit, the City has identified seven outfall points at the City limits as shown in the map in Appendix A.

Figure 1 – Adair County Watershed Map



## **II. MINIMUM CONTROL MEASURES**

### **Measure 1 – Public Education & Outreach**

Public education is a key to any effective stormwater management program. The intent of this MCM is to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of stormwater discharges. The program material should inform individuals and households about the impacts of stormwater discharges on water bodies and the steps that the public can take to reduce pollutants in stormwater runoff.

#### **A. Watershed Management Commission**

The Watershed Management Commission was established to:

- Make recommendations concerning the implementation of the goals of the Watershed Management plans for Hazel Creek and Forest Lake.
- Serve as a liaison between the community and the Missouri Department of Natural Resources to insure that the Watershed Management Plans comply with DNR.
- Serve as liaison between the community and the Missouri Department of Conservation to insure compatibility with conservation practices and resource uses

There is an existing commission that is developing a source watershed plan for Hazel Creek Watershed and Forest Lake. The Watershed Plan is expected to be completed in 2013. The commission is comprised of stakeholders and members from local business, Truman State University, residents at large, and City Staff.

The Commission conducts annual watershed awareness events and volunteer cleanups. Under this measure, the goal is for the City to assist the Commission and promote active participation.

#### **B. Public Information**

##### ***Informational Brochures***

The City has and will continue to provide residents with information related to household waste and how it relates to water quality in the streams. Under this measure, the goal is for the City Engineer and Public Information Officer to prepare brochures for household hazardous waste, grass disposal, and the dumping of oil in sewers. The brochures will be made available to the public at City Hall, and the Community Center. In addition the City will include information in its Kirksville Connection, a monthly publication sent to all water customers throughout the city.

##### ***Local Media***

Several times a month, the City has a segment on the local radio station KIRX called "Area Scene". The goal is to use that time slot once a month to keep the public informed on events, public input, or discuss a specific aspect of the SWMP.

##### ***Local Newspapers***

The goal is to have news releases at a minimum of twice a year in the Kirksville Daily Express and Index Newspapers related to a particular aspect of the SWMP for Citywide coverage.

## **Measure 2 – Public Involvement/Participation**

The public should be included in developing, implementing, and reviewing the City's stormwater management program and that the public participation process should make efforts to reach out and engage all economic and ethnic groups. Opportunities should be available for the public to participate in program development and implementation of citizen representatives serving on a local stormwater management panel, attending public hearings, assisting with other pre-existing programs, and participating in volunteer monitoring efforts.

### **A. 4H Club and Citizen Participation**

The City will work with the local 4H Club in educating their members on proper disposal of household hazardous waste and grass clippings, and the dumping of oil in sewers. In addition, the goal is to ask the 4H Club along with citizen volunteers to participate in a stream cleanup once a year.

### **B. 7-12 Grade Students**

The City will involve the local junior high school and high school in stenciling sewer inlets and manholes. The goal is to stencil the entire City system in a 5-year period. The City Engineering Department will create the stencils needed for this task, and determine each year's stenciling areas.

### **C. Stream Team**

The "Stream Team" is comprised of Truman State students under the direction of Dr. Cooper, and will be involved in the cleanup of different reaches of streams throughout the City. The goal is to organize two stream cleanups each year.

### **D. Water Quality Monitoring**

The Truman State Biology students in the Environmental Science Department are performing stream monitoring and water quality sampling. The goal is to have the City coordinate with that Student Group in identifying sampling locations, and the storing of the data.

### **E. Community Strategic Plan**

The Adair-Kirksville Community Strategic Plan is a community planning tool that is developed through the collaborative efforts of many organizations including the leadership of the City, County and Kirksville Area Chamber of Commerce. The document is developed through a public input process. Periodic updates are provided to the community on the progress of the Plan. The Plan will include metrics to inform and educate the public on the local stormwater management program.

### **Measure 3 – Construction Site Stormwater Runoff Control**

To develop, implement, and enforce a program to reduce pollutants in any stormwater runoff from construction activities that result in a land disturbance of greater than or equal to one acre. The enforcement program requires an ordinance or other regulatory mechanism to:

- Require construction site operators to use appropriate erosion and sediment control best management practices (BMP) to minimize erosion and sediment leaving the construction site.
- Require construction site operators to 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.
- Procedures for site plan review which incorporate consideration of potential water quality impacts.
- Procedures for site inspection and enforcement of control measures including forms of monetary and non-monetary penalties.

#### **A. Existing Stormwater Runoff Control Ordinance**

The City's inspection and enforcement of erosion and sediment control for land disturbance greater than or equal to one acre is in City Ordinance 11367. In addition, under Section 22 of the City's municipal code, the Codes Department is responsible for reviewing, approving and inspecting construction plans and construction activities. The Department enforces the subdivision regulations ordinance, water and sewer connection inspections, flood plain management, subdivision platting, and subdivision plan reviews.

Currently, the subdivision regulations identified in City Ordinance 11367 has a storm water pollution prevention plan (SWPPP) submittal requirement for developments one acre and above. However, the ordinance does not address the construction inspection of the SWPPP, a checklist for the plan review, inspection forms for compliance with the SWPPP, and monetary and non-monetary penalties for non-compliance.

#### **B. Revisions and Additions to City Ordinances for Erosion and Sediment Control**

Administrative changes to City Ordinance 11367 will provide authority for:

1. Institution of a Land Disturbance Permit for purposes of controlling land disturbance activities. The permitting process allows for Plan Review, inspection and revocation of the permit.
2. Authorizing plan review and inspection of land disturbance activities under the Public Works Department.
3. Authorizing enforcement under the Codes Department with ability to impose fees and penalties.

The goal is to revise Ordinance 11367 in 2012 and be adopted in 2013. The ordinance would include requirements identified below.

#### **C. Plan Review Requirements**

With the creation of a plan review requirement for erosion and sediment control (ESC), the Ordinance would include:

1. Listing of plan submittal requirements for erosion and sediment control.
2. Reference guidelines for acceptable erosion and sediment control Best Management Practices (BMPs). As manufacturers provide new ESC products, the design

engineer and construction contractor are able to satisfy the ordinance requirements with reasonable BMPs. All available ESC products will be considered in plan review.

3. It is the intent that the American Public Works Association (APWA) Section 5100 be adopted with modification tailored to City design criteria in the form of a design manual. The design manual would define specifically items such as design storm events, impervious factors, estimated sediment per acre and erodibility factors.
4. Formal storm water pollution prevention plan (SWPPP) review requirements and process in order to issue a Land Disturbance Permit.

#### **D. Inspection Requirements**

The authority given to the Public Works Department for inspection of erosion and sediment control during construction will identify:

1. Required inspection times and reporting times for the Contractor responsible for installing and maintaining the BMPs, and for the City to make an inspection.
2. Reporting forms for Contractor and City inspections.
3. Procedures for correcting problems found during inspections.
4. Timelines for Contractor compliance after a violation has been determined.

#### **E. Forms Needed for Implementation**

In order to implement the ordinance, City Staff need to be able to identify if the ordinance is being satisfied. Checklists are the best way to determine if every aspect of the ordinance has been met. Forms will be needed throughout the administrative and inspection processes. Checklists and forms will be created as following:

1. Plan Review Checklist
2. Land Disturbance Permit Application Form
3. Land Disturbance Permit
4. Construction Inspection Form for Contractor
5. Construction Inspection Form for City Inspector
6. Post Construction Checklist

A draft plan review checklist and SWPPP inspection checklist are shown in Appendix B.

#### **F. Fees and Enforcement Requirements**

In order to enforce the ordinance fees and penalties are required.

Fees related to administering the new plan review and inspection requirements would be established in the existing Municipal Code with other similar fees. The City would have to establish the criteria for charging various amounts for the services rendered. The issuance of a land disturbance permit by the City could be the method of approving plans and for the stoppage of work by revoking the permit.

Non-monetary and monetary penalties are the best method for upholding the ordinance. The ordinance would have to identify such penalties for violations and timelines for compliance. The administration of penalties would have to be established whereby the Public Works Department inspects the land disturbance site and determines if there is a violation. If there are violations, the Codes Department by ordinance will issue penalties and/or fines.

## **Measure 4 – Illicit Discharge Detection and Elimination**

To develop, implement and enforce a program to detect and eliminate illicit discharges effectively. The detection of illicit discharges can be accomplished in two ways; citizen reporting of illicit discharges, and City inspections to find illicit discharges. Once violators have been found penalties and fines must be invoked through an ordinance, or other regulatory mechanism.

Components of a successful detection and elimination program are as follows:

- Have a procedure for locating illicit discharges.
- Procedures for tracing the source of an illicit discharge and removing the source of the discharge. The development of a storm sewer system map and watershed map will be needed for this purpose.
- Ordinance prohibiting illicit discharges into the drainage courses with the ability to fine violators.

### **A. Locating Illicit Discharges**

#### ***Citizen Reporting***

Currently the City's web site has a method for reporting illicit discharges. Appendix C shows the web page for reporting this to the City by clicking on "Citizen Service Request Tracker" and some of the following screen captures. By this method of reporting, the citizen can remain anonymous if desired. Citizens also can call the City offices to report illicit discharges. In either case, the problem is placed on a database reporting system called "Citizen Response Tracking". The problem is assigned to the proper department with the generation of a Work Order. The Work Order remains open until the problem has been addressed.

This system of locating and in many cases eliminating an illicit discharge is quite successful. With additional education of the public through items discussed in Measure 1, citizens reporting will increase.

The goal for this illicit discharge reporting is part of Measure 1 – Public Education and Outreach.

#### ***City Staff Inspection***

There is no set operating procedures to inspect the drainage system for illicit discharges. The goal would be to inspect 20% of the storm sewer outfalls annually by public works staff either throughout the year or at prescribed times during the year. The method of recording the inspection will require the establishment of a database for such an inspection.

### **B. Tracing Illicit Discharges**

Procedures for tracing the source of the illicit discharge require knowledge of the storm sewer and drainage system. The City has an existing storm sewer map and an overall watershed map. The maps will allow the City staff to trace the illicit discharge upstream to the source. Training of staff to identify illicit discharges and to trace them back to the source will be required.

#### ***Storm Sewer Map***

The City has developed a storm sewer atlas overlaid to the City street map with a GIS database. This map identifies locations of pipes, manholes, inlets, and outfalls. The GIS database attached to the storm sewer features identify pipe sizes and pipe material. The map shows the watershed boundaries, streams, and bodies of water along with their names.

***Watershed Map***

The Watershed Map shows the watershed boundaries overlaid with the USGS Kirksville Quadrangle. The map shows the main creek systems and the outfalls under the NPDES permit at the City Limits. The map depicts seven (7) outfalls at the City Limits and seven (7) minor outfalls within the City that were approved under the current MS4 permit.

***Training and Procedures***

Training employees to look for illicit discharges is needed. City staff needs to be aware of potential discharges, so they can be on the alert. Whether they are a building inspector or motor grader operator, the Staff should be looking for illicit discharges.

Procedures need to be established to follow up with determining the source of the discharge and who to fine, once an illicit discharge has been found.

The goals are to have an annual training session with Code and Public Works Staff always look for illicit discharges as they perform their normal duties, and to set up an administrative procedure to follow up on finding the source of the discharge and the responsible party.

**C. Ordinance to Prohibit Illicit Discharges**

***City Ordinances***

City Code Article II "Sanitary Sewers" Section 25-120 prohibits illicit discharges into the sanitary sewer.

City Code Article III "Stormwater" for the control of the stormwater system has been reserved for adding wording to prevent illicit discharges into storm sewers and drainage courses.

***Proposed Ordinance***

The goal is to prepare an ordinance within Section 25 Article III of the City Code to address this measure with a method of fining violators in 2012 with adoption of the ordinance in 2013.

**D. Public Education**

Through Measures 1 and 2, public education will have a major impact on citizens reporting illicit discharges and educating the public on illegal dumping. The goals for public education are addressed in Measures 1 and 2.

## **Measure 5 – Post-Construction Stormwater Management**

To develop, implement, and enforce a program to ensure that controls are in place that would prevent or minimize water quality impacts caused by stormwater 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. For this measure, the City needs to:

1. Develop and implement a combination of structural and/or non-structural best management practices (BMPs).
2. Adopt an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects. It is the intent that the American Public Works Association (APWA) Section 5100 be adopted with modification tailored to City design criteria in the form of a design manual.
3. Implement methods to ensure adequate long-term operation and maintenance of BMPs.
4. Develop land use regulations and zoning changes that would create buffers to streams, detention basins to reduce stream degradation to receiving streams, and green designs.

### **A. Post Construction BMPs**

Prepare a design manual that will establish runoff controls to minimize creek degradation. The design manual will identify long-term stormwater controls, such as detention basins for the control of the discharge of subdivision runoff for both erodible stormwater discharge velocities and transport of sediment off of the development into the drainage system.

The goal is to prepare a design manual in 2014 that establishes performance standards for runoff controls, and the required long-term BMPs that need to be built during the construction of new developments and redevelopments. These performance standards might limit runoff volumes and rates by the use of detention basins; require maximum embankment slopes in developments; the use of buffers strips and grasses swales and other "green" solutions. The design manual will be adopted with the stormwater ordinance discussed below.

### **B. Stormwater Ordinance**

The ordinance will be written to match the performance standards identifies in the design manual discussed in Item 1. The goal is to prepare the ordinance in 2013 and adopt the ordinance in 2014. Part of the ordinance will identify City and private maintenance responsibility.

The ordinance will refer to changes in development regulations for the inclusion of permanent BMPs, such as detention basins. As a goal in 2014 and in conjunction with the Stormwater Ordinance, a checklist for Plan Review will be created to ensure all aspects of the ordinance are followed.

### **C. Inspection of Structural Stormwater Controls**

The goal is to have an inspection of the structural post construction BMPs in a 3 year cycle. In order to do this, a listing of these permanent BMPs throughout the City must be identified.

The goals are to:

- In 2012, a layer of the City Storm Sewer Map will be created to identify permanent BMPs that are to be inspected.

- In 2013, the list of permanent BMPs for inspection will be placed on a database and scheduled for inspections on a 3 year cycle.
- In 2013, a post-Construction checklist will be created for the inspections with the first year inspections performed.

## **Measure 6 - Pollution Prevention/Good Housekeeping for Municipal Operations**

Under this measure, the City will develop and implement an operation and maintenance program that includes the following:

- A training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations that includes employee training to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet and building maintenance, and stormwater system maintenance.
- Controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards, fleet or maintenance shops with outdoor storage areas, salt/sand storage locations, and snow disposal areas operated by the City.
- Procedures for properly disposing of waste removed from the storm sewers and areas listed above, such as dredge spoil, accumulated sediments, floatables, and other debris.
- Component included in the City's risk management program to assess the City's operations, policies and procedures to insure good internal stormwater management practices are implemented and adhered to by the City's workforce.

### **A. Staff Training**

Beginning in 2013, an annual pollution prevention workshop for the Parks Department and Public Works Department will be held to discuss the standard operating procedures that could introduce pollutants to the drainage system. The areas of emphasis would be on the proper use of fertilizers for grounds keeping, maintenance operations for the two ball fields, use of chemicals and salt for snow and ice removal, disposal of sludge and other solid waste from the water treatment plant, wastewater treatment plant and public works activities.

Starting in 2014, standard procedures will be updated for the annual pollution prevention workshop.

### **B. Review of Chemical Handling**

In 2013, all chemicals handled and used by the City will be reviewed for prevention of spills and the possible reduction of chemical discharges into the drainage system. Proper procedures for handling chemicals will be discussed with Staff once a year in conjunction with the Staff Training identified above.

### **C. Spill Prevention Plan**

In 2014, a spill prevention plan will be developed to identify procedures for spill containment, and proper handling of hazardous chemicals. The plan will include who will be on the response team, and who will be notified of the spill outside of the City, such as EPA. This Plan will be incorporated into the Emergency Management Plan for the City.

### III. MEASURABLE GOALS AND SCHEDULES

This section summarizes the goals for each minimum control measure described in the report in a table with the timeline for implementation.

#### MEASURABLE GOALS AND IMPLEMENTATION SCHEDULE

Minimum Control Measure Goal	Description	Implementation Schedule
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#### Measure 1 - Public Education & Outreach

Watershed Commission Liaison	Continue as a member of the Commission, assisting the Commission, and promoting active participation	On-going
Informational Brochures	Prepare brochures for household hazardous waste, grass disposal, and the dumping of oil in sewers. The brochures will be made available to the public at City Hall, and the Community Center. One brochure will be prepared every 4 months.	February 2012
Local Media	Once a month use the hour segment on radio station KTTR called "Area Scene" to keep the public informed on events, public input, or discuss a specific aspect of the SWMP	March 2012
Local Newspaper	Twice a year have a news release in the Kirksville Daily Express related to a particular aspect of the SWMP for Citywide coverage	April 2012

#### Measure 2 - Public Involvement/Participation

Stream Cleanups	Organize two stream cleanups a year	On-going
Stencil Sewer Manholes/Inlets	Involve local junior high school and high school students in stenciling sewer inlets and manholes. The goal is to stencil the entire City system in a 5-year period. The City Engineering Department will create the stencils needed for this task, and determine each year's stenciling areas.	April 2012
WQ Monitoring Assistance with Truman State	City to coordinate with Truman State Biology students in the Environmental Science Department in performing stream monitoring and water quality sampling. City will help identify sampling locations, and store the data	On-going

#### Measure 3 - Construction Site Stormwater Runoff Control

Modify City Ordinances	Modify ordinance to include the institution of a Land Disturbance Permit; authorizing plan review and inspection; and enforcement to impose fees and penalties	Draft 2012 Adopt 2013
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**MEASURABLE GOALS AND IMPLEMENTATION SCHEDULE**

<b>Minimum Control Measure Goal</b>	<b>Description</b>	<b>Implementation Schedule</b>
Design Requirements for ESC	Adopt BMP design guidelines	September 2012
Plan Review Checklist	Create a plan review checklist to be used for reviewing and approving plans in order to issue a Land Disturbance permit	December 2012
Inspection Forms	Create inspection forms to be used for inspecting land disturbance sites for ordinance compliance	December 2012
Other Forms and Checklists	Make other forms and checklists that will be used in conjunction with the ordinance wording	December 2012

**Measure 4 - Illicit Discharge Detection and Elimination**

Citizen Reporting	The City currently has a method for citizens to report illicit discharges called "Citizen Service Request Tracker". This system allows for the tracking of a problem until it is abated	On-going
City Staff Inspection	Inspect 20% of the storm sewer outfalls annually by public works staff. Establish a database for recording the inspection.	February 2012
Storm Sewer Map & Watershed Map	Have mapping that shows the storm sewer system in order to trace the source of an illicit discharge	Currently have these maps
Training & Procedures	Have an annual training session with Staff on recognizing and looking for illicit discharges as they perform their normal duties, and to set up an administrative procedure to follow up on finding the source of the discharge and the responsible party	January 2013
Modify City Ordinance	Prepare an ordinance within Section 25 Article III of the City Code to address illicit discharges into the drainage system with a method of fining violators	Draft 2012 Adopt 2013

**Measure 5 - Post-Construction Stormwater Management**

Design Manual for permanent runoff control	Prepare a design manual that establishes performance standards for runoff controls, and long-term BMPs that need to be built during the construction of new developments and redevelopments	March 2014
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**MEASURABLE GOALS AND IMPLEMENTATION SCHEDULE**

<b>Minimum Control Measure Goal</b>	<b>Description</b>	<b>Implementation Schedule</b>
Permanent BMP Map and Database	The ordinance will identify City and private maintenance responsibility for the maintenance of permanent BMPs. Once the ordinance is adopted, a map and database will be created to identify those permanent BMPs.	October 2012
Subdivision Ordinance Modifications for permanent BMPs	Have an ordinance that establishes performance standards for runoff controls, and the required long-term BMPs for new developments and redevelopments	Draft 2013 Adopt 2014
Plan Review Checklist for Permanent BMPs	Add to the plan review checklist in Measure 3, items for permanent BMPs.	2013
Permanent BMP Inspection Checklist	The ordinance will identify City and private maintenance responsibility for the maintenance of permanent BMPs. Once the ordinance is adopted, a map and database will be created to identify those permanent BMPs.	2013

**Measure 6 - Pollution Prevention/Good Housekeeping for Municipal Operations**

Staff Training	Conduct an annual pollution prevention workshop for the Parks Department and Public Works Department to discuss the standard operating procedures that could introduce pollutants to the drainage system.	January 2013
Chemical Handling Procedures	Proper procedures for the handling of chemicals by Staff will be discussed at the annual pollution prevention workshop	January 2013
Spill Prevention Plan	A spill prevention plan will be developed to identify procedures for spill containment, and proper handling of hazardous chemicals	January 2014

#### **IV. FUNDING ABILITY**

Many of the goals identified are on-going activities, which are covered in the current City budget. Several new goals will be performed by City Staff by reallocating their time to those activities.

New goals will be funded from one of three sources.

##### **A. Capital Improvement Sales Tax**

The Capital Improvement Sales Tax generates approximately \$600,000 per year. Prior to the adoption of this tax, voters were informed of an annual allocation plan and promised that the City would adhere to this plan. As a result of this plan, the Capital Improvement Sales Tax allocates \$50,000 per year toward stormwater. The revenue from this tax can be used for any stormwater related cost.

##### **B. Stormwater Fee**

A stormwater fee was established two years ago to pay for structural improvements to the storm water/drainage system. This fee is a \$2.20 assessment fee per month to every property. This fee generates approximately \$21,000 annually.

##### **C. Transportation Sales Tax**

The community supports a ½ cent Transportation Sales Tax which is used for street improvements, including construction of curb, gutter, and storm drainage. Traditionally this funding source is used for storm drainage improvements within the public right of way. With adoption of the SWMP innovative stormwater management practices within public right of way will be considered along with traditional concrete and pipe solutions.

**APPENDIX A**

**WATERSHED MAPS**

# North Fork Salt

8-Digit Hydrologic Unit: 07110005

571,543 Acres (893.04 Sq. Miles)



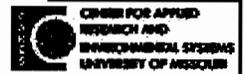
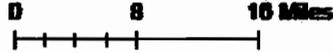
- Hydrologic Unit Boundary
- Streams
- Water
- Cities and Towns
- County Boundary

- Highways**
- Interstate
- U.S. Highway
- Missouri Highway

Map Date: Jan 26, 2010



Sources: 8-Digit Hydrologic Units - NRCS, 2000; Streams, Water - USGS NHD, 2000; Cities, Counties - U.S. Census Bureau, 2000; Highways - MoDOT, 2008.



# Lower Chariton

8-Digit Hydrologic Unit: 10280202

652,049 Acres (1,018.83 Sq. Miles)



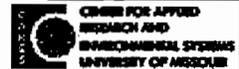
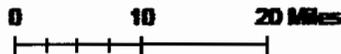
- Hydrologic Unit Boundary
- Streams
- Water
- Cities and Towns
- County Boundary

- ### Highways
- Interstate
  - U.S. Highway
  - Missouri Highway

Map Date: Jan 26, 2010



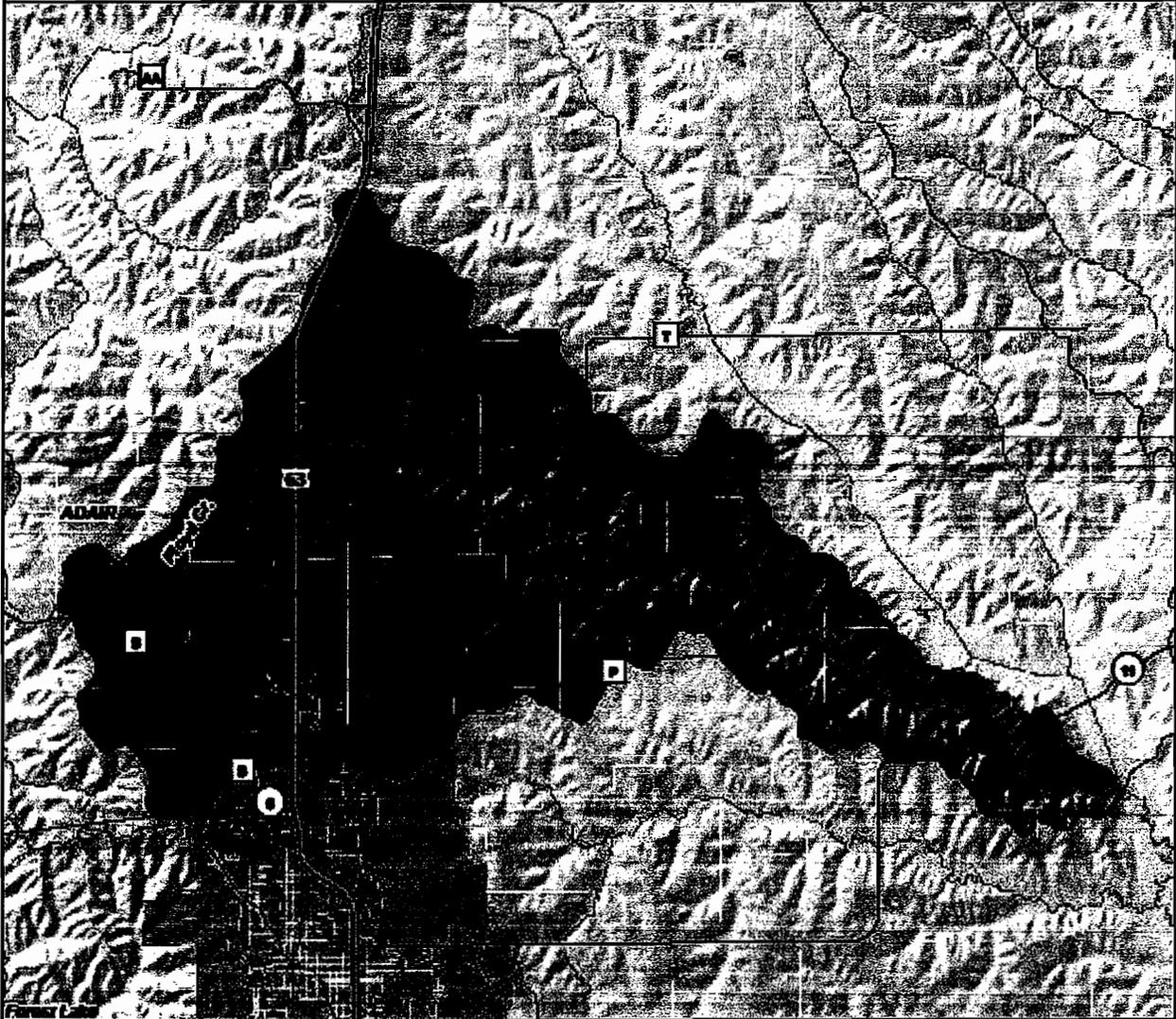
Sources: 8-Digit Hydrologic Units - NRCO, 2009;  
Streams, Water - USGS NHD, 2009; Cities, Counties -  
U.S. Census Bureau, 2009; Highways - MoDOT, 2009.



# Floyd Creek

12-Digit Hydrologic Unit: 071100050101

15,963 Acres (24.94 Sq. Miles)

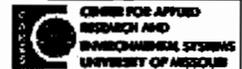
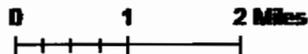


-  Hydrologic Unit Boundary
-  Streams
-  Water
-  Cities and Towns
-  County Boundary
-  Interstate
-  U.S. Highway
-  State Highway
-  Missouri Lettered Route
-  Other Principle Route

Map Date: Jan 27, 2010



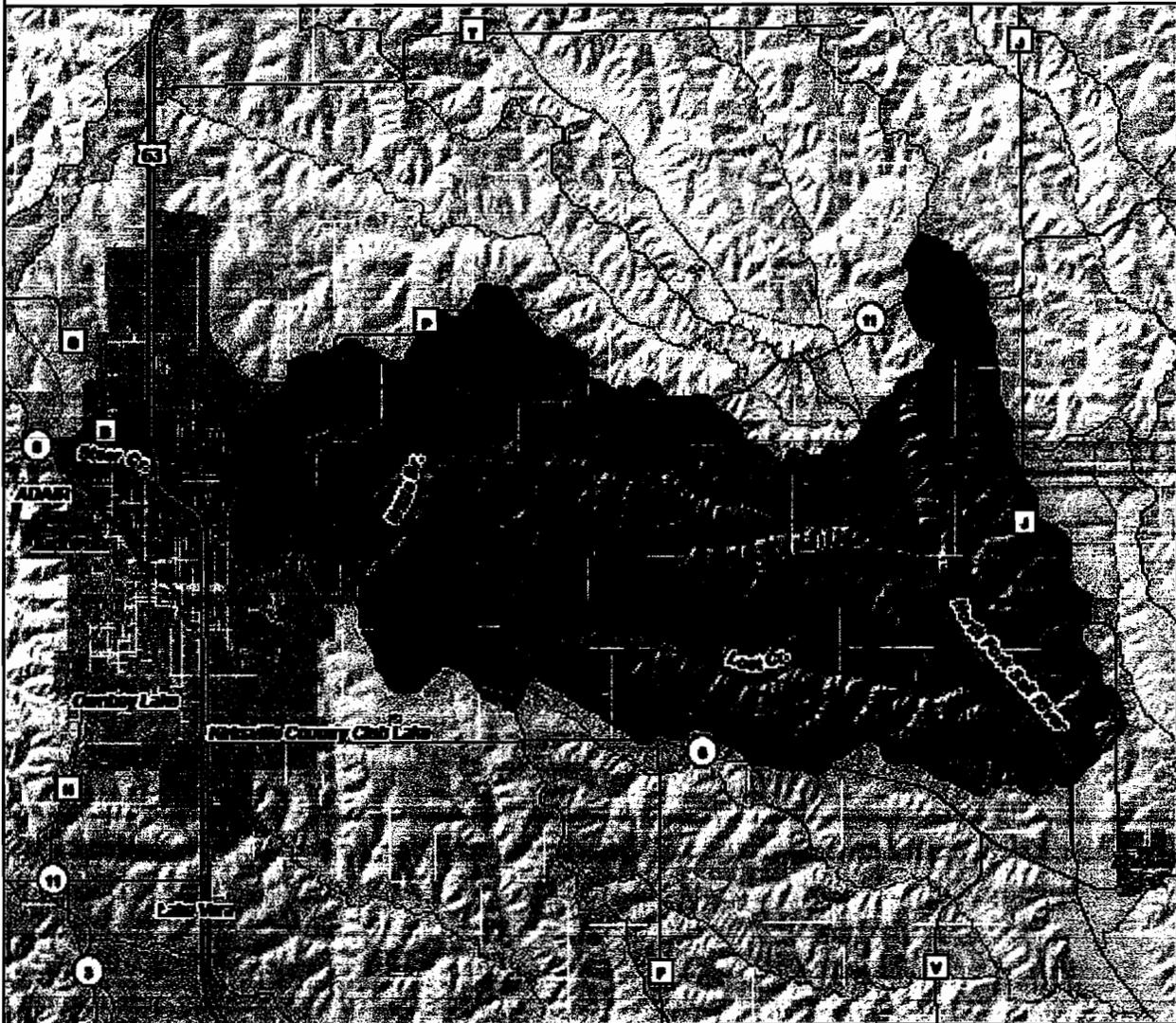
Sources: 12-Digit Hydrologic Units - NRCS, 2000; Streams, Water - USGS NHD, 2002; Cities, Counties - U.S. Census Bureau, 2000; Highways - MoDOT, 2008.



# Steer Creek-North Fork Salt River

12-Digit Hydrologic Unit: 071100050103

23,500 Acres (36.72 Sq. Miles)

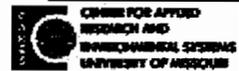
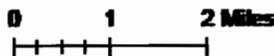


- |                          |                         |
|--------------------------|-------------------------|
| Hydrologic Unit Boundary | Interstate              |
| Streams                  | U.S. Highway            |
| Water                    | State Highway           |
| Cities and Towns         | Missouri Lettered Route |
| County Boundary          | Other Principle Route   |

Map Date: Jan 27, 2010



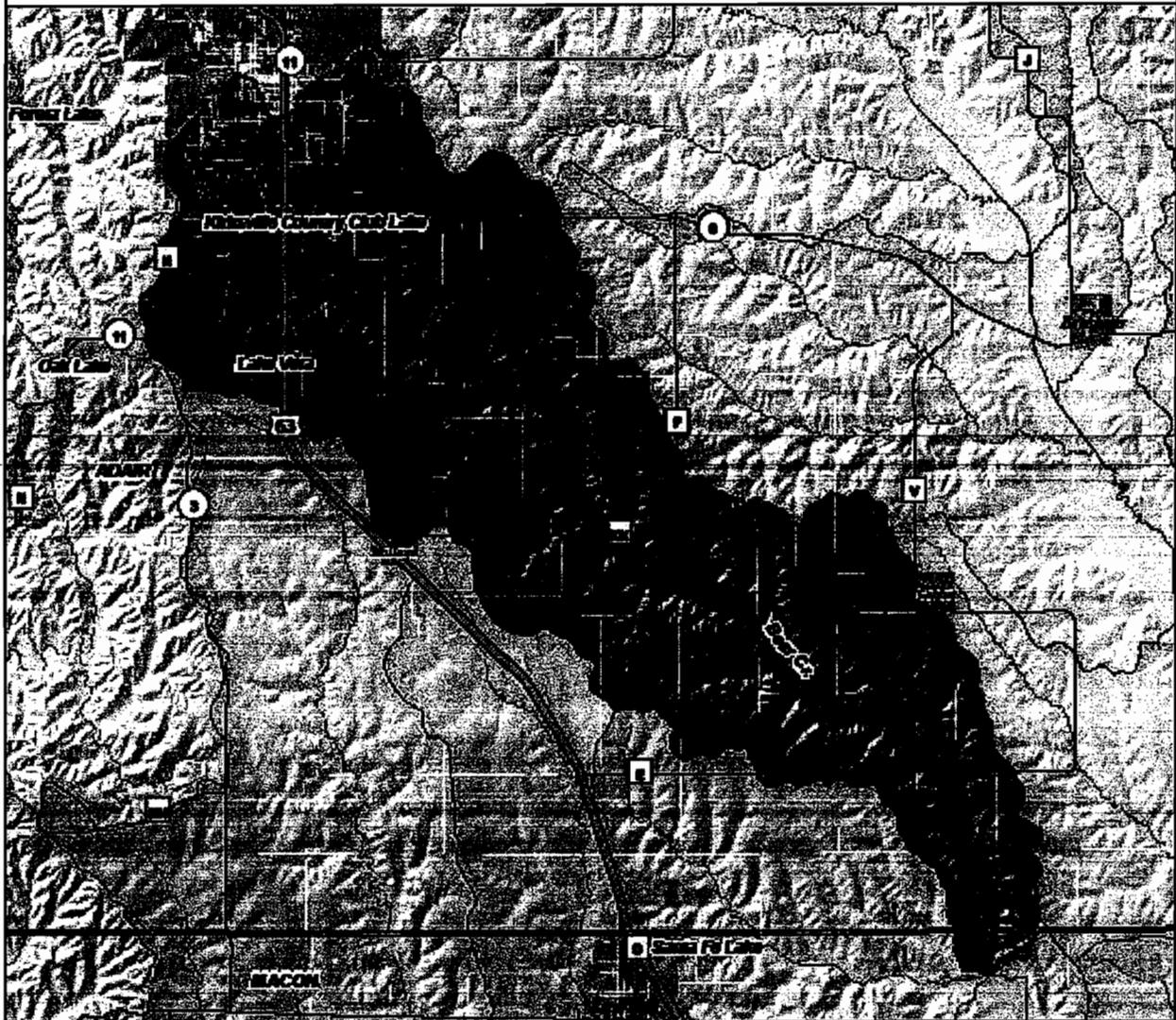
Sources: 12-Digit Hydrologic Units - NRCS, 2005;  
Streams, Water - USGS NHD, 2005; Cities, Counties -  
U.S. Census Bureau, 2000; Highways - MoDOT, 2008.



# Upper Bear Creek

12-Digit Hydrologic Unit: 071100050108

28,890 Acres (45.14 Sq. Miles)

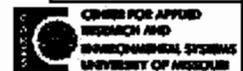
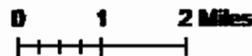


- |                          |                         |
|--------------------------|-------------------------|
| Hydrologic Unit Boundary | Interstate              |
| Streams                  | U.S. Highway            |
| Water                    | State Highway           |
| Cities and Towns         | Missouri Lettered Route |
| County Boundary          | Other Principle Route   |

Map Date: Jan 27, 2010



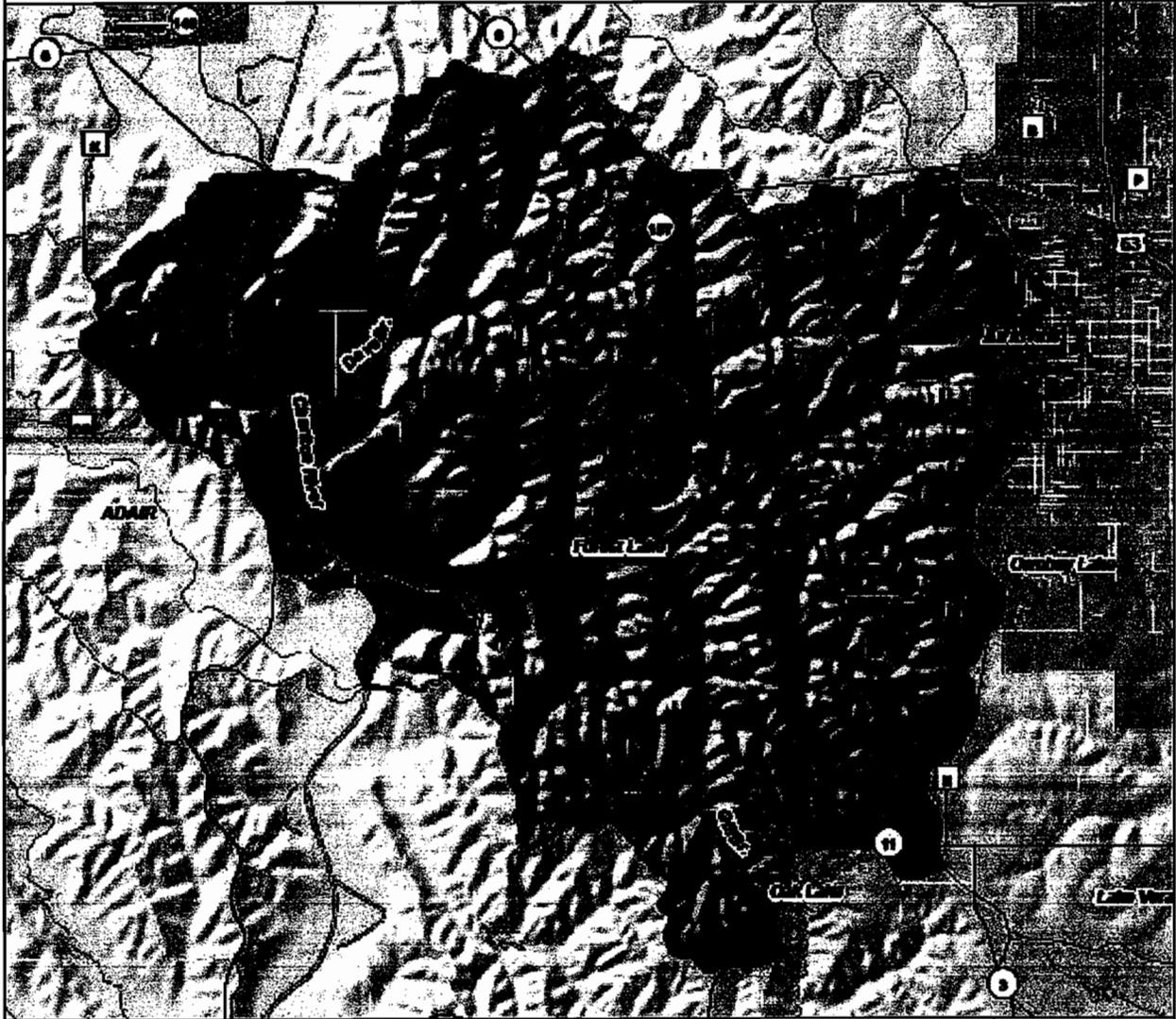
Sources: 12-Digit Hydrologic Units - NRCS, 2009; Streams, Water - USGS NHD, 2009; Cities, Counties - U.S. Census Bureau, 2000; Highways - MDOT, 2009.



# Dave Branch-Chariton River

12-Digit Hydrologic Unit: 102802020203

16,054 Acres (25.09 Sq. Miles)

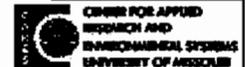
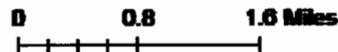


- |                          |                         |
|--------------------------|-------------------------|
| Hydrologic Unit Boundary | Interstate              |
| Streams                  | U.S. Highway            |
| Water                    | State Highway           |
| Cities and Towns         | Missouri Lettered Route |
| County Boundary          | Other Principle Route   |

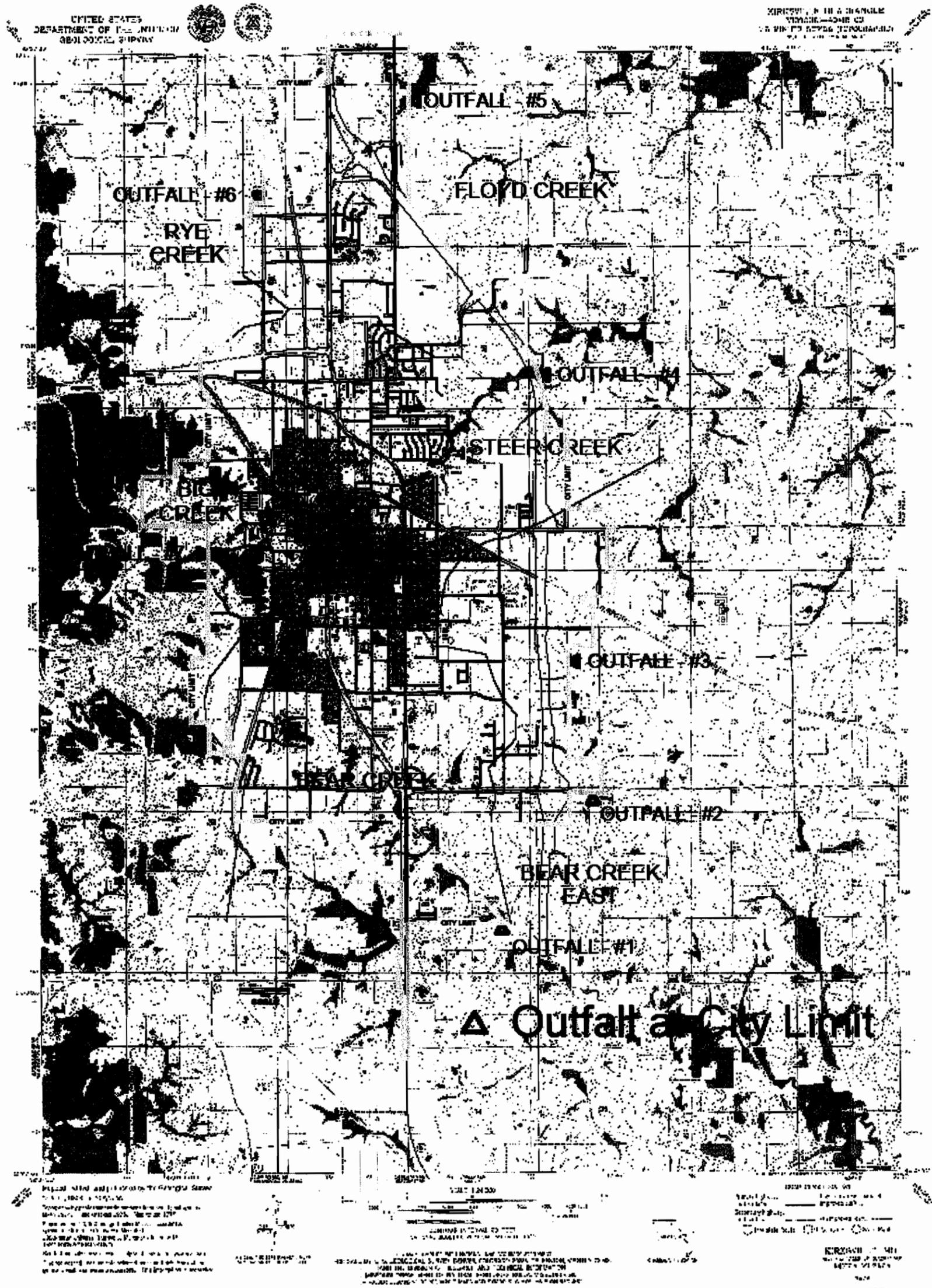
Map Date: Jan 27, 2010



Sources: 12-Digit Hydrologic Units - NRCS, 2002;  
Streams, Water - USGS NHD, 2002; Cities, Counties -  
U.S. Census Bureau, 2000; Highways - MoDOT, 2002.



# OUTFALL LOCATION MAP



## APPENDIX B

# SWPPP CHECKLISTS AND FORMS

**DRAFT**  
**SWPPP PLAN REVIEW CHECKLIST**

**GENERAL**

- Owner's name, address & phone no.
- Developer's name, address & phone no.
- Developer's contact name & phone no.
- Emergency contact name & phone no.
- Engineer's name, address & phone no.
- Property address or Tract
- Location map
- Site area (Acres)

**BEST MANAGEMENT PRACTICES (BMPS)**

- Location of BMP installation
- Physical description/detail of BMP
- BMP installation/construction procedures
- O&M procedures for each BMP  
*At least once every week and after every rainfall event of 0.50 inches or more, erosion and siltation control devices shall be inspected for damage and amount of sedimentation accumulated and corrective actions taken. Reports of these inspections and corrective actions shall be prepared on the forms provided by the City.*

**GENERAL SWPPP REQUIREMENTS**

- Key map dividing site into phased Work Areas
- Overall sequencing of the work by Work Area and estimated duration for:
  - Clearing
  - Rough grading
  - Construction of public improvements - Roads, sewers, retaining walls, & utilities
  - Final grading
  - Landscaping
- Individual Work Area Plan(s)
- Delineation of land disturbance
- Estimated grading quantity per Work Area
- Itemized list construction activities per Work Area

- Sequence of BMPs to be installed or removed
- Drainage plan designed to control surface water during the design storm
- Location of utilities within 50' of area to be disturbed
- Contours (2' interval max.)
  - Existing grades
  - Interim grades
  - Final grades
- 100-year floodplain and floodway delineated
- Plan for handling sediment removed during maintenance of BMPs
- Proposed truck and equipment access ways to/within the work site
- Location of downstream impoundments which could be affected by the proposed land disturbance
- Plan for responding to any loss of sediment off-site
- Non-sediment pollution control
  - Waste Management BMPs
  - Hazmat BMPs
  - Spill prevention and control BMPs

#### GENERAL NOTES ON SWPPP

- Notify the Public Works Department 48 hours prior to the commencement of grading and/or prior to the commencement of construction.
- Erosion and siltation control shall be installed prior to any grading and be maintained throughout the project until adequate vegetative growth insures no further erosion of the soil and work is acceptable to the owner and/or controlling regulatory agency.
- Temporary siltation control measures (structural) shall be maintained until vegetative cover is established at a sufficient density to provide erosion control on the site.
- Where natural vegetation is removed during grading, vegetation shall be reestablished as soon as possible in such a density as to prevent erosion.
- When grading operations are completed or will be suspended for more than 5 days in any area, the disturbed area shall be seeded or otherwise stabilized. Protective measures may include a combination of seeding, sodding, mulching or other suitable means to protect the ground surface from erosion.
- If cut and fill operations occur during a season not favorable for immediate establishment of permanent ground cover, a fast germinating annual seed such as

rye grasses shall be utilized to retard erosion, if adequate stormwater detention and erosion control devices have not been established.

- All finished grades (areas not to be disturbed by future improvement) in excess of 20% slopes (5:1) shall be mulched and tacked at the rate shown in the design manual, and seeded as soon as possible after final placement.
- Storm water pipes, outlets and channels shall be protected by silt barriers and kept free of waste and silt at all times prior to final surface stabilization and/or paving.
- Parking on non-surfaced areas is prohibited in order to eliminate the condition whereby mud from construction and employee vehicles is tracked onto the pavement causing hazardous roadway and driving conditions.
- The streets surrounding this development and any street used for construction access thereto shall be kept free from mud and construction debris and shall be cleaned throughout the day.
- Soft soils from the bottom and banks of any existing or former pond sites or tributaries or any sediment basins or traps shall not be placed in proposed public right-of-way locations or in any storm sewer location.
- All trash and debris on-site, either existing or from construction, must be removed and properly disposed of off-site.
- Debris and foundation material from any existing on-site building or structure which is scheduled to be razed for this development must be properly disposed of off-site.
- All excavations, grading or filling shall have a finished grade not to exceed a 3:1 slope (33%), unless specifically approved otherwise.
- No excavation shall be made so close to the property line as to endanger any adjoining property of any public or private street without supporting and protecting such public or private street or property from settling, cracking or other damage.
- Property Owner/Developer's executed certification:  
*"The Property Owner/Developer hereby certifies that he is familiar with the SWPPP and assumes full responsibility for the performance and maintenance of the SWPPP as stated on the approved plans. He will ensure that all contractors understand and are familiar with the SWPPP for the site and that each contractor agrees to implement and protect elements of the SWPPP as they relate to his work. The Property Owner's/Developer's onsite representative shall be responsible for the performance and maintenance of the SWPPP. In addition, the undersigned Owner/Developer assures that all City property or roads will be adequately protected."*

# DRAFT

## SWPPP INSPECTION REQUIREMENTS & CHECKLIST

### GENERAL REQUIREMENTS

Inspect the site to ensure proper installation, operation and maintenance of BMPs  
Perform inspections bi-weekly and within 24 hours of rainfall in excess of 0.50 inches  
Determine the overall effectiveness of the SWPPP  
Determine the need for additional control measures  
Revise the SWPPP as needed and submit a copy to City  
Promptly notifying the developer and the site contractors responsible for operation and maintenance of BMPs of the deficiencies found during an inspection.  
Notifying the developer, site contractors and the City immediately of any situation requiring immediate action  
Note corrective actions taken  
Forwarding report of inspections to Department of Public Works within 5 days of inspection

### ITEMS TO INSPECT

BMPs installed in timely fashion  
BMPs installed/performing correctly  
Is the BMP still effective or need maintenance  
Any damage to BMP  
Note areas where grading activities have started/stopped  
Areas stabilized within 5 days of work being halted  
Removal of BMPs that is no longer required  
Evaluate need for revision to SWPPP

### AREAS TO INSPECT

All disturbed areas  
All recently stabilized areas  
All locations where an erosion/silt control device is installed  
Off-site areas/outfall points – including adjacent roadways  
Operational storm sewer inlets  
Material storage areas  
Trash collection areas  
Concrete washout areas  
Temporary toilets on site

**DRAFT**  
**INSPECTOR'S REPORT**  
**STORM WATER POLLUTION PREVENTION PLAN**

Site Name \_\_\_\_\_  
 Land Disturbance Permit No. \_\_\_\_\_  
 Inspector \_\_\_\_\_  
 Inspector's Phone No. \_\_\_\_\_

Bi-Weekly Inspection Inspection Date \_\_\_\_\_  
 Storm Event

Items Inspected	Inspection Results
<input type="checkbox"/> Sediment leaving the project site.	<input type="checkbox"/> Site in accordance with SWPPP and operating properly. <input type="checkbox"/> Correction of deficiencies required. See attached comments/descriptions Deficiencies from last report: <input type="checkbox"/> Corrected <input type="checkbox"/> Not Corrected – See Attachment
<input type="checkbox"/> Mud tracked onto roadways by vehicles exiting the site. Installation, maintenance and protection of vehicle wash down areas	<input type="checkbox"/> Site in accordance with SWPPP and operating properly. <input type="checkbox"/> Correction of deficiencies required. See attached comments/descriptions Deficiencies from last report: <input type="checkbox"/> Corrected <input type="checkbox"/> Not Corrected – See Attachment
<input type="checkbox"/> BMPs installed in accordance with the approved plans/permit conditions	<input type="checkbox"/> Site in accordance with SWPPP and operating properly. <input type="checkbox"/> Correction of deficiencies required. See attached comments/descriptions Deficiencies from last report: <input type="checkbox"/> Corrected <input type="checkbox"/> Not Corrected – See Attachment
<input type="checkbox"/> BMPs maintained in accordance with the approved plans/permit conditions	<input type="checkbox"/> Site in accordance with SWPPP and operating properly. <input type="checkbox"/> Correction of deficiencies required. See attached comments/descriptions Deficiencies from last report: <input type="checkbox"/> Corrected <input type="checkbox"/> Not Corrected – See Attachment
<input type="checkbox"/> Grading/construction activities proceeding in general accordance with the approved plans	<input type="checkbox"/> Site in accordance with SWPPP and operating properly. <input type="checkbox"/> Correction of deficiencies required. See attached comments/descriptions Deficiencies from last report: <input type="checkbox"/> Corrected <input type="checkbox"/> Not Corrected – See Attachment
<input type="checkbox"/> Stabilization of areas that have been or are to be inactive for longer than five days	<input type="checkbox"/> Site in accordance with SWPPP and operating properly. <input type="checkbox"/> Correction of deficiencies required. See attached comments/descriptions Deficiencies from last report: <input type="checkbox"/> Corrected <input type="checkbox"/> Not Corrected – See Attachment

Modifications Needed to SWPPP:     Yes     No  
 Attachments to this report:         Yes     No

The grading and other construction activities being conducted, except as specifically identified above and attached, comply with the approved plans and current SWPPP.

\_\_\_\_\_  
 Signature of Inspector

\_\_\_\_\_  
 Date

# DRAFT

## INSPECTOR'S REPORT- ATTACHMENT STORM WATER POLLUTION PREVENTION PLAN

Site Name \_\_\_\_\_  
Land Disturbance Permit No. \_\_\_\_\_  
Inspector \_\_\_\_\_  
Inspector's Phone No. \_\_\_\_\_

Bi-Weekly Inspection Inspection Date \_\_\_\_\_  
 Storm Event

Location/BMP	Action Needed to Correct Deficiencies	Corrected

Areas Where Land Disturbance Activities Have Started, Stopped or Been Suspended	Date

Attach supplemental sketches and other information to identify items described in the tables above.

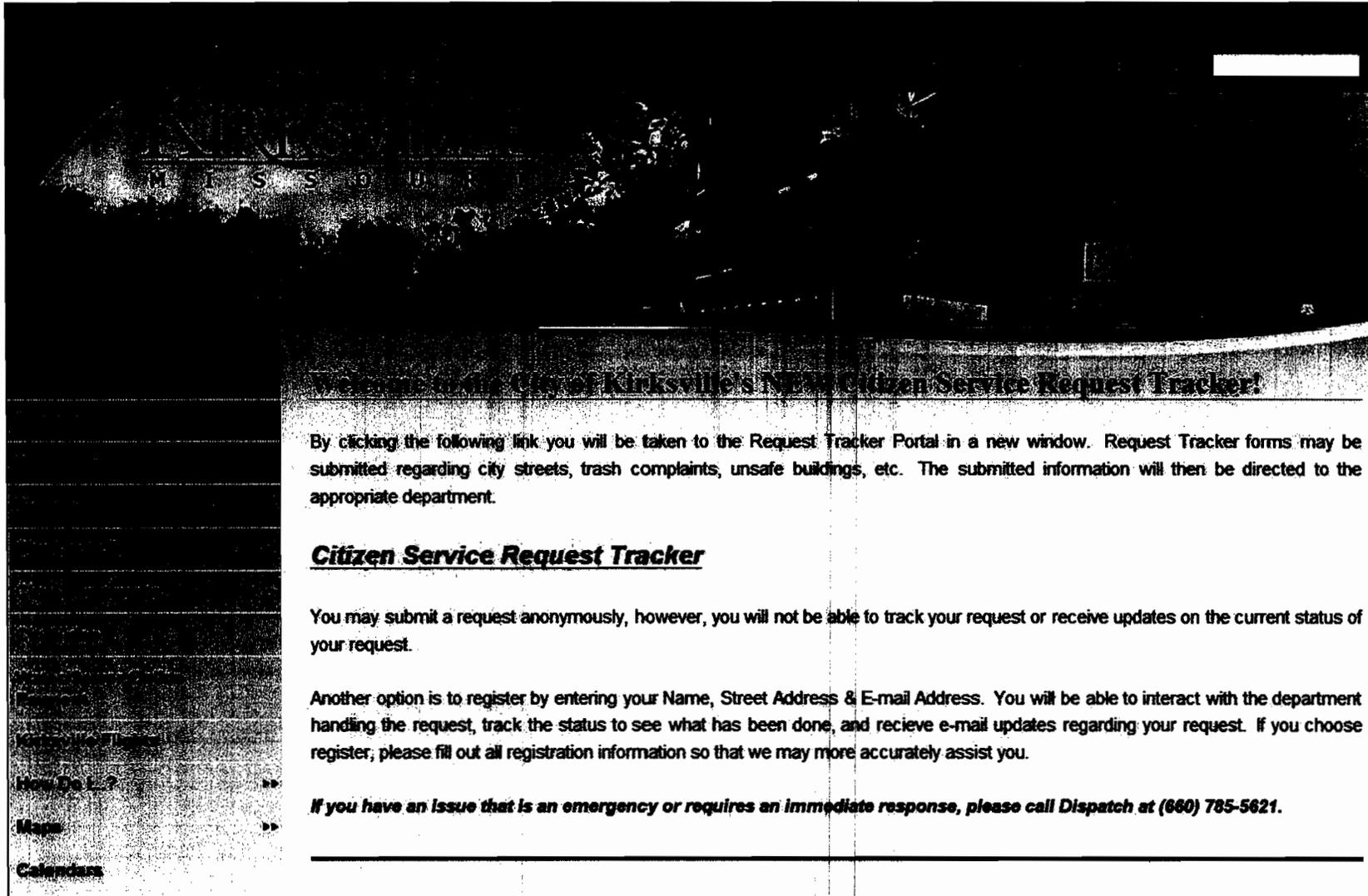
\_\_\_\_\_  
Signature of Inspector

\_\_\_\_\_  
Date

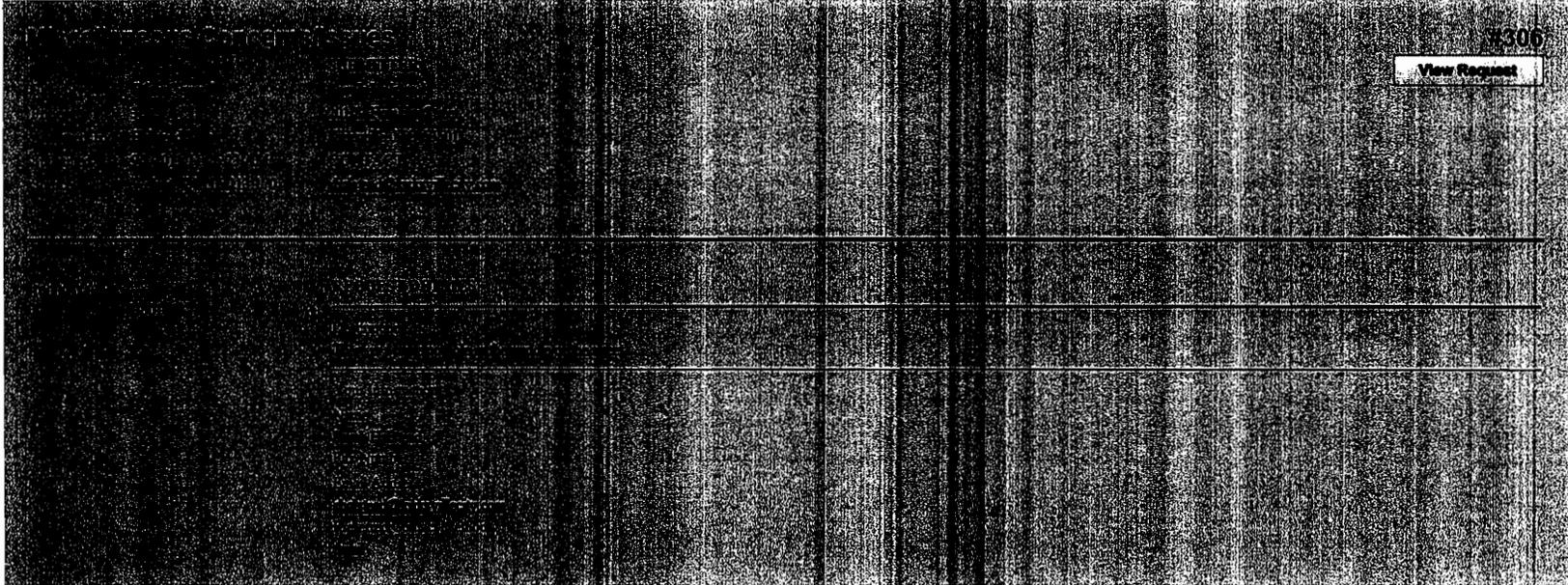
**APPENDIX C**

**CITIZEN SERVICE REQUEST TRACKER WEB SITE**

This is the initial screen on the web site.



Once logged into the Citizen Service Request Tracker, it asks for the specific information about the problem in this screen.



The problem has been entered into the Tracker system, and the problem routed to the proper department for review and follow-up work.

Dispatch Information		
Request ID Number:	306	Request Location: 100 N. Main Street
Date Printed:	9/8/2011 11:38:22 AM	Kirkville, MO 63501
Assigned to:	Halstead, Sarah	
Priority:	Normal	
Request Type:	Miscellaneous Concerns/Issues	

Original Request Information	
Date Submitted:	9/8/2011 11:26:23 AM
Original Notes:	There is a large pothole in the middle of the street

Time	Date	Work Description

Total Time:

Parts Used / Follow-Up Needed

Signature

Date