design quarterly
a publication of Ruggles & Bohm, P.A. Engineering | Surveying | Land Planning Fall 2009

Are you ready for new storm water management policies in the City of Wichita?

In the months to come, the way we deal with runoff will be changing. The EPA is requiring cities to adopt new strategies to reduce pollutants discharged into local waterways. As part of the City of Wichita's 2007 NPDES Storm Water Permit, the City has until October 2009 to approve a new storm water management policy to deal with the new requirements. The City's new policy has been under development for over a year and will be considered by City Council for adoption soon. If approved, the new policy could take effect in Spring 2010.

In general, the policy will require the use of permanent Best Management Practices (BMPs) to reduce pollutants identified by Total Daily Maximum Loads (TDMLs) in the Little Arkansas River, Arkansas River, Whitewater River, and Cowskin Creek. Key points of emphasis in the new policy are post-construction storm water management and a need to better address flooding concerns. While the current policy is generally effective, it does not require the establishment of permanent BMPs on new development and redevelopment sites. This policy is intended to address these issues, as well as existing ones, through an Integrated Storm Water Management Approach that considers all runoff flows- from light rains to flooding.

We have put this information together as a tool to help educate builders, developers, and others involved in land development of all sizes and types in the Wichita area. The proposed policy changes are outlined within along with potential solutions to dealing with the new requirements. It is our intent that this is a first step in the education process.

Chris Bohm, P.E., one of our principals at Ruggles & Bohm, has been a member of the Storm Water Management Technical Advisory Committee that is working with the City and its consultant on the new policy, so he is familiar with the process and what the new policy entails. The City will be providing additional resources and training to both developers, builders, and designers in the months to come, but should you have questions in the meantime, give Ruggles & Bohm a call and we would be happy to sit down with you to discuss your concerns and how the new policy will impact you and your site.

IMPLEMENTATION MILESTONES

STORM WATER POLICY IMPLEMENTATION PROCESS

City Staff and the Technical Advisory Committee are determining how to best implement the new policy. It is clear that plats and/ or projects submitted before the implementation date will not be subject to the new policy. However, those projects will not be allowed to be approved then lay fallow for years upon years in an attempt to bypass the new policy. A plat or project approved before the policy implementation date will most likely have a 'substantial' or 'meaningful' construction deadline it will have to meet in order to avoid being required to meet the new stormwater policy guidelines.

IMPLEMENTATION SCHEDULE

As of November 2009, the City Council and staff are still discussing the implementation dates for the policy. An implementation date of March 1, 2010 was originally proposed, however, that date has since changed and is currently undecided as discussions continue among City staff, consultants and the development community as to what is the best means of implementing the new policy.

What are the new storm water policies?

The new storm water management policies the City of Wichita is considering will include some significant changes to how storm water runoff is handled. The level to which the new policy addresses water quality is necessary for NPDES storm water permits and TDML compliance. This approach has been used throughout the East and Midwest. The following are brief highlights of new areas of the policy that go above and beyond the current storm water management policy:

New Policy Area #1
Permanent Water Quality BMPs

Why is it necessary?

The policy is necessary for the City's National Pollution Discharge Elimination System (NPDES) compliance.

As it exists today, the current policy dictates the quantity of stormwater discharged, not the quality (including sediment, etc.). This measure increases the on-site requirements through the use of permanent/ structural BMPs.

- Will apply to sites with over 1 acre of disturbed land
- Requirement will involve treating a calculated volume of water to remove 80% of Total Suspended Solids (TSS). TSS is a measure of sediment contained in the runoff. Eighty percent was established at the benchmark because it is an attainable and reasonable level of treatment. It is effective and not cost-prohibitive. In short this rule can be best described as follows: the more pavement you have, the more need you will have for treatment.
- Strategies include storm water ponds (wet and dry), enhanced swales, infiltration trenches, bioretention areas, vegetative filter strips and gravity separation, among others.
- **Potential Site Development Practices:**

1. *Undisturbed wooded and/or dense vegetation*
2. *Grass swales in lieu of curb and gutter*
3. *Narrower street pavement widths*
4. *Preserving natural drainage*
5. *Cul-de-sacs with landscaped islands in center*
6. *Avoid floodplains*
7. *Minimize footprint of impervious surfacces (roofs, parking, roadways, etc.)*
8. *Storm Water Islands in Parking Lots*
9. *Minimize clearing*

- The strategies are encouraged, but not required. In general though, the following relationships hold true when applying this policy:

1. *Less paved area= less runoff to treat*
2. *More natural or undisturbed areas will lower runoff volumes*
3. *Less clearing and less infrastructure leads to lower costs*
4. *All of these can lead to reduced the necessary size of BMPs*

New Policy Area #2
Channel Erosion Protection

Why is it necessary?

The policy is necessary for the City's National Pollution Discharge Elimination System (NPDES) compliance.

This policy change will strengthen detention requirements and other BMP requirements to better protect streams and channels from erosive actions created by high velocity storm water flow.

- The goal of this policy is to protect stream banks and reduce sediment loads
- Two methods are recommended:

1. *Detaining runoff from 1-year, 24-hour storm for at least 24 hours.*
2. *Retain the difference between pre- and post-development runoff levels. Retention may be made by infiltration, evapotranspiration, or other approved methods.*

- BMPs can treat water quality and provide flood control, addressing more concerns and making overall BMPs cost-effective
- Will apply to sites with more than one acre of disturbed area

New Policy Area #3
Flood and Groundwater Protection

Why is it necessary?

The existing policy is being improved/ enhanced as part of the City's long-standing goals of protecting property and the public water supply.

This policy change will increase requirements/restrictions adjacent to/ in floodplains and floodways to address flooding issues exacerbated by new development. Groundwater protection will expand current City policies.

- This policy will apply to new development or redevelopment sited with greater than one acre of disturbed area and includes three key areas:

- **Flood Protection**

1. It's designed to avoid the impacts on projects from flooding in 2-year through 100-year storm events
2. Based largely on existing policies
3. There is an added emphasis on peak runoff discharges and how they're addressed downstream; peak flows are to be limited to pre-development levels

- **Floodplain Management**

1. Addresses the impact of fill placed in floodplains with a high incidence of flooding
2. Addresses the potential for increased erosion caused by floodplain development
3. All future buildings must have a minimum low-opening elevation at least 2 feet above the 100-year Base Flood Elevation.
4. Existing open channels with drainage areas over 40 acres cannot be enclosed in culvert or pipe, except at crossings.
5. Increase in regulations governing encroachment in FEMA-regulated floodways.

- **Groundwater Protection**

1. Protect groundwater from pollutants carried by storm water runoff
2. Requires that storm water be treated for water quality before being discharged directly into groundwater-connected ponds or streams
3. Provides minimum vertical separation from bottom of infiltration facilities and groundwater.

Glossary

BMP- Best Management Practice
A term used to describe acceptable practices that could be implemented to protect water quality and promote soil conservation during land development activities.

FEMA- Federal Emergency Management Administration
A large Federal agency that, in the context of storm water management, is charged with developing and maintaining flood mapping and minimizing the risk of property damage to land owners through a comprehensive, risk-based system.

NPDES- National Pollution Discharge Elimination System
Program was established by the EPA as part of the Clean Water Act of 1987 with a goal of protecting the beneficial uses of water and reducing stormwater pollution. Municipal permits are issued/ renewed every five years and must include the City's plan for reducing/ preventing pollution of all types from entering waterways, including from construction activities. The City is held accountable for water quality and is responsible for curtailing illicit discharges into waterways.

TDML- Total Daily Maximum Load
It determines the greatest amount of a given pollutant that a water body can receive without violating water quality standards and designated uses. TMDLs set pollution reduction goals that are necessary to improve the quality of impaired waters.

TSS- Total Suspended Solid
A measure of the amount of small, particulate solid pollutants that are suspended in wastewater and runoff.

HOW ARE THE NEW RULES FORMATTED?

The following are the three primary components of the new Storm Water Management Manual.

Volume 1: Storm Water Management Policy
- This outlines "What is Required"

Volume 2: Storm Water Technical Guidance
- This describes how to engineer the storm water design
- Includes: Storm Water Management Planning and Design; Hydrology; Hydraulics; Water Quality BMPs; Rainfall Tables for Sedgwick Co.; Soils info. for Sedgwick Co.; and Temporary Storm Water Controls.

Volume 3: Storm Water Development Guidelines
- This outlines what is needed to get designs approved
- Includes: General Plan Submittal Process; Storm Water Development Checklist; Standardized Storm Water Pollution Prevention Plan; Updated Storm Water and Drainage Standard Detail Sheets; Storm Water As-built Requirements; and Operations & Maintenance (O&M) Requirements

The new ordinance is comprehensive and is written to not only address local concerns, but encourage and allow regional use (i.e., addressing flooding and floodplain management).

How will the new storm water management policy be implemented?

Once the policy has been implemented, there will be changes to not only the design process, but to the submittal requirements and key post-construction elements. The following is a synopsis of those changes.

Site Planning and Design

The submittal process is largely the same, new BMP measures notwithstanding.
- *More information will be required on plans at the time of submittal. Checklists for submittals can be found in Volume 3 of the new storm water manual, and detailed design and calculation guidance can be found in Volume 2.*
- *The property owner must obtain approval of the Storm Water Management Plan prior to a building permit being issued.*
- *A pre-design conference with the City is encouraged in order to discuss a site's opportunities and constraints and how the new policies will apply.*

Operation and Maintenance Plan

An Operation and Maintenance (O&M) plan will be a required element of all storm water management plans. The plan must include:
- *A map showing the location of all on-site BMPs, clearly labeled*
- *Maintenance guidance for all on-site BMPs for the short- and long-term after construction.*
- *A possible element to be included are storm water management covenants*
- *Maintenance and Inspection checklists will be included in the new Storm Water Management Manual for each BMP.*

Post-Construction

After construction, storm water facilities will need to be maintained and inspected regularly. This is necessary as part of NPDES Phase 1 compliance.
- *It will apply to BMPs on new development or redevelopment sites, not to existing BMPs*
- *This requirement will necessitate an education process for both property owners and City staff.*

o **Maintenance Options**
There are several possible options on the table to determine who maintains BMPs after construction is complete.

As currently written, the proposed ordinance requires property owners to inspect and maintain all BMPs on their property.
- *Storm Water Maintenance Covenants will be included in the Operations and Maintenance Plan.*
- *Guidance will be provided in Volume 2 of the Storm Water Manual and will be added to the Operations and Maintenance Plan to aid the property owner with inspection and maintenance guidance and documentation.*
- *Under this scenario, the City would inspect, enforce, and require corrective actions.*
- *This option presents the least cost for the City, but the burden of maintenance and operation falls to a group (property owners) that isn't knowledgeable of BMPs.*

Another Option: The City maintains BMPs.
- *There would be no need for Storm Water Management Covenants.*
- *The property owner would perform all routine maintenance (mow, prune, or other normal maintenance)*
- *City inspects the BMPs regularly and performs heavy maintenance (sediment removal, dam/ berm reconstruction, outfall repair and replacement)*
- *This option assures that plans conform to permit requirements and there are no property owner issues*
- *This option is the highest cost to the City.*

A final Option: A Hybrid Plan
- *The City maintains BMPs in residential developments; property owners would maintain non-residential BMPs (developments such as commercial, office, etc.)*
- *The City could offer to maintain existing BMPs in a residential development once a property owner brings them into compliance with the new storm water management rules.*

What can Ruggles & Bohm do to help you navigate the policy changes?

Let us put our expertise to work for you.

For Builders and Contractors:

- Give us a call and we can meet with you and your staff to discuss the new policy and how it will impact your operations.
- We can work with you to identify strategies to maintain 'clean' worksites that will help you meet NPDES requirements.
- We're also available to meet with your clients to discuss practices and technologies that are available to help them meet the new storm water management requirements either by new construction or site retrofits.

For Developers, Land Owners & Design Professionals:

- Working with you from the start, we can help create a site plan, neighborhood layout, or other design concept that meets the new storm water management requirements.
- Our engineers can identify your storm water management needs and design features, structures, or other appropriate elements to ensure your project is economical and conforms to the new policy.
- With a landscape architect on staff, we can integrate storm water management techniques into your site and create elements that are not only practical, but become visual assets to your site.
- Some practices will require revision of subdivision regulations, which has not yet occurred. We'll keep you advised of any changes.
- As always, if you have questions, we'd be happy to meet with you to discuss the new policy and how it impacts your projects.

Ruggles & Bohm, P.A.
Engineering | Surveying | Land Planning

924 N. Main
Wichita, KS 67203

Phone 316.264.8008 Fax 316.264.4621

Apply Postage Here

Ruggles & Bohm, P.A. is a consulting firm in Wichita, Kansas. We provide civil engineering, land surveying, land planning, and landscape architectural services for public and private clients across the state. While our projects vary in size and scope, we strive to ensure to our clients that each project is receiving the attention and detail it deserves and exceeds their expectations.