

Priority Concern: Surface Water

Urban Development,
Stormwater Runoff and
Pesticides

PRIORITY CONCERN: Urban Development, Stormwater Runoff and Pesticides

Water Plan Management Goal:

Protect and improve water quality by promoting and establishing stormwater management practices that reduce pesticides, fertilizers and other pollutants in runoff and reduce the rate and volume of stormwater runoff to reduce erosion.

Priority Concern

Urban stormwater runoff refers to rain water and snow melt runoff from impervious surfaces and urban type of development such as residential subdivisions, shoreland areas, commercial, business, industrial, institutional, government, and roadways located in incorporated and unincorporated areas. Pollutants contained in stormwater runoff include pesticides, nutrients, petroleum, refuse, leaves and grass, chemicals and other contaminants. Stormwater runoff can also increase the rate erosion of stream banks, ditches, gullies, and outfalls. Increasing infiltration in urban areas reduces the volume and erosion potential of stormwater discharge. Reducing pollutants in stormwater runoff and encouraging changes in urban stormwater management programs to minimize erosion are priority actions in the *Water Management Plan 2008-2013*.

Priority Concerns Assessment

Conversion of land from agricultural and open space to urban use is likely the greatest threat to natural resources in the County. New development in the Northeast corner of the County and Lake Crystal are the main areas of concern, as these areas of the County are growing. The Northeast area includes the City of Mankato, City of Madison Lake, City of Eagle Lake, Jamestown Township, Le Ray Township, Lime Township, South Bend Township and Mankato Township. New development is a mainly a concern for three reasons: 1) sediment in construction runoff, 2) pollutants in runoff after construction, and 3) changes in hydrology as a result of stormwater infrastructure and increased impervious surfaces.

When an area is developed, runoff is channeled into road gutters, storm sewers and paved channels. The amount of rainfall that can infiltrate into the soil is reduced with increases the volume of runoff from the watershed. Stormwater runoff also increases the velocity of water and decreases the time it takes to convey it to the outlet. With these increases, previously stable channels erode and widen. This occurs in stream channels as well as ravines, ditches and stormwater outlets. The resulting sedimentation is harmful to fish and other aquatic species and is harmful to vegetation and habitat.

Future urban development impacts can be minimized with new approaches to municipal stormwater management infrastructure and related development policy including low impact development strategies and storm water retention systems engineered to protect downstream channels. Retrofitting is possible but can be expensive and may not be necessary, practical or cost effective in some of the smaller communities in the County.

Low impact development

Stormwater management design, infrastructure needs and local policy can address some of the effects of development. Model ordinances and other information related to low impact development and alternative subdivision design is available from the DNR, MPCA Stormwater Manual, the Nonpoint Education for Municipal Officials (NEMO) program, the Center for Watershed Protection, MPCA Stormwater Manual, and other sources.

Key water quality points included in NEMO model ordinances:

- Provide standards for measuring velocity and volume of runoff.
- Making maximum use of infiltration, including standards and technologies, given the variety of soil types, topography and extent of existing development.
- Ensure annual runoff rates and volumes from post development site conditions mimic the annual runoff sites and volumes from predevelopment site conditions.
- Regulating the amount and types of impervious surfaces.
- Protect functional value of wetlands and natural water courses.
- Provide plant and animal habitat.
- Promote watershed-based stormwater management.
- Promote infiltration and ground water recharge.
- Provide a vegetated corridor (buffer) to protect water resources from development.
- Provide no increase in temperature.
- Protect life and property from dangers of flooding.
- Protect public and private property from damage resulting from runoff or erosion.

Runoff from urban land use can also contain pesticides, fertilizers, oil, heavy metals and other pollutants from residential areas and businesses. Research has shown that, urban stormwater runoff does contain significant amounts of fertilizer and pesticides. Compared with runoff from cropland urban runoff contains more nutrients per-acre. In Blue Earth County, the proportion of urban land use, including cities, farmsteads and rural development, occupies less than four percent of the total land area.

Addressing the problem of improper use of pesticides, fertilizers and other potentially hazardous substances by residents is largely an issue of education, as these products are used in relatively small amounts by individuals. Municipalities educate citizens with flyers, advertising and programs such as storm drain stenciling. Education programs, such as promoting rain barrels, rain gardens and other landscaping techniques can also be incorporated in municipal education programs.

Regulations relating to the sales and use of pesticides and fertilizers are preempted by the State of Minnesota. The State has greatly limited the availability and use of phosphorus in lawn fertilizers sold to residential consumers.

MPCA STORMWATER PROGRAM

Construction sites

Erosion from construction sites can be substantial. The EPA and MPCA estimate soil erosion from construction sites to be significantly higher per acre compared with agricultural land use. Soil disturbance is inherent to the construction process, as heavy equipment and vehicles move on and off the site almost daily compacting soil, dragging and tracking soil off site and destroying vegetation. Exposed and tracked soil is easily carried with stormwater directly to surface water or through the storm sewer.

The MPCA regulates stormwater runoff from construction sites with NPDES permits. Since 2003, NPDES permits are required for any construction activity disturbing:

- One or more acre of soil
- Less than one acre of soil if the activity is part of a “larger common plan of development or sale” that is greater than one acre
- Less than one acre of soil if the MPCA determines the activity poses a risk to water resources

Most construction activities are covered by the General NPDES Stormwater Permit, but some construction sites need individual permit coverage. Owners and operators are both responsible for submitting the permit application. Applications for the MPCA General NPDES Stormwater Permit can be made on the MPCA web site.

The MPCA has asked all local governments, including Blue Earth County, to provide general information about the stormwater NPDES permit requirements for construction when issuing local construction permits to encourage compliance with these State regulations.

Industry

Hazardous materials and substances used in industry can leak or spill and even small amounts can be carried with stormwater runoff. The MPCA regulates stormwater runoff from industrial sites with NPDES permits. The MPCA Industrial NPDES rules and permit are in revision process. Current Federal regulations require sites with primary activities or Standard Industrial Codes (SIC) that fall under any of the following obtain MPCA NPDES stormwater permit coverage:

- Hazardous waste treatment, storage, or disposal facilities
- Landfills
- Steam electric power generating facilities
- Junkyards, used motor vehicle parts, scrap and waste materials
- Motor freight and warehousing, transportation equipment
- Transportation related activities if they do any maintenance, fueling or clearing
- Food
- Lumber, paper, printing and publishing
- Furniture and fixtures
- Electronics and electrical components; measuring and controlling instruments
- Photographic; medical and optical goods
- Industrial commercial machinery and computer equipment
- Stone, clay, glass and concrete products

- Rubber and miscellaneous plastic products
- Mining and quarrying of nonmetallic minerals
- Chemicals and allied products

Municipalities

The MPCA phased in Clean Water Act stormwater regulations for municipalities based on size. Mankato is the only municipality in Blue Earth County with a population exceeding the threshold regulated by the MPCA. The City of Mankato was part of Phase II which requires preparation of a Stormwater Pollution Prevention Plan (SWPPP). The smaller communities in the County are not required to prepare a SWPPP.

City of Mankato Stormwater Pollution Prevention Plan

Mankato is identified as an MS4 community under the Clean Water Act and was required to prepare a Stormwater Pollution Prevention Plan (SWPPP) in 2007. The City of Mankato's SWPPP addresses:

- 1) Public education
- 2) Public participation
- 3) Illicit discharge, detection and elimination
- 4) Construction site runoff
- 5) Post-construction site runoff control
- 6) Pollution prevention housekeeping

The City of Mankato has adopted local regulations addressing stormwater. The City's new Erosion and Sediment Control Ordinance regulates construction site erosion, sediment and drainage work and exceeds the MPCA's NPDES permit requirements. The City requires all sediment be removed from city streets at the end of each day. The City Stormwater System Ordinance also regulates the temperature, color and type of liquids and waste discharged to a storm sewer.

The City also conducts public education activities, including bill stuffers, press releases and workshops for managing construction site runoff.

LOCAL STORMWATER MANAGEMENT PROGRAMS

All of the municipalities in the County can apply best management practices, programs and policies to reduce stormwater pollution impacts. Some of the municipalities currently operate yard waste and curb-side leaf collection programs, use corn-based road de-icing products and send information to individual homeowners about responsible use of pesticides, fertilizers and keeping grass clippings on the lawn. All municipalities in the County contract with a consultant engineering firm for City engineering services.

Shoreland Areas

Erosion and sedimentation, chemical pollutants, and temperature are all concerns related to urban development in shoreland areas. Wetlands are also impacted by urban land uses and runoff. Removing shore vegetation harms fish and other wildlife habitat and increases the erosive effects of lake waves along the shore of lakes and wetlands.

The long-term effects of development are more difficult to correct as water leaves lakes relatively slowly and pollutants settle and are trapped in the lake. Shoreland management around the County's lakes and wetlands is increasingly important as development pressure increases.

Northeast Corner

The City of Madison Lake and the City of Eagle Lake are growing relatively rapidly in an area of the County with the highest density of lakes and wetlands sensitive to runoff, erosion and sedimentation. With proximity to Mankato, new roadways and extension of utilities, increased development pressure is expected in this area within the planning period. Extension of wastewater utilities to Madison Lake is planned in 2008, and the formation of a sewer district involving Madison, Duck and Ballantyne Lakes is being discussed. This extension of wastewater utilities will likely increase development pressure around these lakes.

The shoreland areas of Duck Lake, Lake Ballantyne, and Madison Lake, are developed with residential subdivisions and seasonal cabins of varying ages and densities. The County anticipates conversion from seasonal to year-round use in this area in the next 5-20 years. The shoreland area of Duck Lake is densely developed with small, seasonal cabins. Most of these seasonal dwellings utilize holding tanks. Over time small cabins will likely be expanded or replaced.

A small part of the southern shore of Lake Washington is located in Blue Earth County. The dwellings on Lake Washington and part of Lake George are part of a sewer district partnership with the City of Mankato.

Duck Lake and Washington Lake are on the MPCA impaired waters list.

Lake Crystal

The City of Lake Crystal and industrial areas near the City, such as Northstar Ethanol and Crysteel, has been growing. Crystal Lake and Minneopa Creek are both receiving waters for the City's stormwater drainage.

Both Crystal Lake and Minneopa Creek are on the MPCA impaired waters list.

Shoreland Regulations

All urban stormwater discharges to surface waters, including lakes, rivers, streams, ditches and wetlands. Some municipalities are located adjacent to a lake or river and are responsible for regulating land use within 1,000 feet of the lake and 300 feet of the river. Oversight of each City's Shoreland Ordinance is the responsibility of the DNR. The following municipalities contain shoreland areas.

Lake Crystal – Crystal Lake, Loon Lake, Minneopa Creek

Madison Lake – Madison Lake, Duck Lake

Mankato – Minnesota River, Blue Earth River, Indian Creek

St. Clair – Le Sueur River

Most land use in shoreland areas is regulated by the County, but Lime Township, Mankato Township and Pleasant Mound Township also regulate land use in shoreland areas. Many of the small, undeveloped lakes are currently protected from dense development by the County land use regulations. With continued Agricultural District zoning and limited density standards, the lakeshores will continue to be protected from

development impacts. The County's land use plans and regulations steer development toward municipalities by restricting development density. In most of the County, residential development is limited to one dwelling per quarter of a quarter-section of land. This generally means one dwelling in 40 acres. The County also restricts the creation of new subdivisions and other development in "urban fringe overlap districts" surrounding Mankato, Madison Lake and along parts of County Road 90.

City and County Parks

Most of the County parks are located in shoreland areas. The County Parks Department has included rain gardens in conjunction with improvements to public canoe and boat accesses on George Lake and the Le Sueur River as a means to control and treat stormwater runoff from paved parking areas. The County has also restored wetlands in County Parks. The following is a list of existing County parkland and the river or lake associated with each.

- Bray Park – Madison Lake
- Lone Pine Rest Area – Madison Lake
- Daly Park – Lura Lake
- Duck Lake Park – Duck Lake
- Lake George Park – Lake George
- Rapidan Dam Park – Blue Earth River
- Red Jacket Trail Park – Le Sueur River
- Indian Lake Conservation Area – Indian Lake – Indian Creek Watershed
- Schimek Conservation Area – Maple River
- Wildwood Conservation Area – Le Sueur River
- Eagle Lake Wayside Area – Eagle Lake
- Hungry Hollow Stop – Le Sueur River
- Watonwan Stop – Watonwan River
- Williams Nature Center – Minneopa Creek and the Minnesota River

The City of Mankato is redeveloping the Minnesota River corridor, including the Sibley Park area on the Blue Earth River, to bring residents and visitors closer to the river. These redevelopment projects will reduce urban runoff to the river and in some cases the shore areas will be improved and erosion reduced.

The City and County are also concerned about development increasing erosion and sedimentation in the Indian Creek watershed, as Indian Creek is part of the Minnesota River flood control project and City and County parks and trails system.

State parks, including Minneopa State Park along the Minnesota River west of Mankato and the Sakatah Trail, are important park systems for local and regional users.

County Ditch Impacts

Municipalities are part of several County ditch watersheds in Blue Earth County. Some stormwater drainage systems have increased the rate and volume of water to a few County ditches causing erosion at the outfall and downstream. The City of Mapleton's and the City of Amboy's wastewater treatment stabilization ponds and stormwater systems discharge to a County ditch. The County has worked with the City of Amboy and Good Thunder on these issues. A portion of the City of Lake Crystal's stormwater system discharges to a County ditch.

In Mankato, Eagle Lake and Madison Lake, urban growth and conversions of cropland to urban land uses have impacted County ditches. Issues related to urban drainage connections with County ditches are concerns primarily in areas where conversion of agricultural land to urban type of land uses is occurring. County ditch concerns at the urban and rural interface most often involve legal or management issues of the ditch and immediately surrounding land uses. These are addressed by the each city during the land development phase. The City of Mankato's recent changes in stormwater management policy will likely reduce hydrologic impacts related to changes in the urban storm water input to the affected County ditches in the area. The County Ditch Authority works with each municipality as needed to identify problem areas and ensure compliance with the Drainage Code.

Local Plans and Policies

The County is working on a comprehensive natural resources plan, a *Greenprint* for Blue Earth County. The *Greenprint* identifies, assesses and prioritizes the combined natural resources and infrastructure needs of the County, including municipalities. County-wide and regional water quality, stormwater infrastructure, recreation and wildlife needs are combined in the plan.

City of Mankato

The City of Mankato has completed two Alternative Urban Area Review (AUAR) projects on several thousand acres east and northeast of the City under the State Environmental Review Law. The City identified high priority areas for natural resources protection and enhancement based on the draft *Greenprint* plan. The County Highway Department, County Ditch Manager, County Environmental Services and SWCD Manager participated in the AUAR process.

IMPLEMENTATION PLAN

Urban Development, Stormwater Runoff and Pesticides

Water Plan Management Goals:

Protect and improve water quality by promoting and establishing stormwater management practices that reduce the rate and volume of stormwater runoff, erosion, and use of pesticides and fertilizers.

PRIORITY CONCERN:

Urban stormwater runoff refers to rain water and snow melt runoff from impervious surfaces and urban type of development such as residential subdivisions, shoreland areas, commercial, business, industrial, institutional, government, and roadways located in both incorporated and unincorporated areas. Pollutants contained in stormwater runoff include pesticides, nutrients, petroleum, refuse, leaves and grass, chemicals and other contaminants. Stormwater runoff and management systems can also increase the rate erosion of stream banks, ditches, gullies, and outfalls. Increasing infiltration in urban areas reduces the volume and erosion potential of stormwater discharge. Reducing pollutants in stormwater runoff and encouraging changes in urban stormwater management programs to minimize erosion potential are priority actions in the *Water Management Plan 2008-2013*.

GUIDING PRINCIPLES:

- » Impervious surfaces prevent infiltration of rain water and snow melt increasing the rate and total volume of runoff.
- » Stormwater runoff from urban areas can contain high amounts of pesticides, nutrients, metals and other pollutants.
- » Soils can be compacted, infiltration properties reduced and runoff increased as a result of site grading and construction of all types of land use.
- » Stormwater runoff from construction sites and industry contain sediment and may contain hazardous pollutants.
- » Stormwater management systems that reduce the rate and volume of runoff can protect downstream channels and prevent gully and bank erosion.
- » Stormwater management and regulations within municipalities are the responsibility of each City.
- » Land use planning and regulations at the County, City and Township level, including zoning, shoreland and subdivision ordinances, generally control where development can occur and can help address stormwater management by controlling growth and incorporating best management and low impact development practices.
- » Due to sensitivity of the resource, lake shoreland and wetland areas in the County should be managed with consideration of stormwater runoff impacts.
- » The State regulates and permits stormwater runoff from construction sites and industry.
- » The City of Mankato's stormwater management program is regulated by the State.

- » Pesticide sales and use, including retail sales and homeowner use, is the responsibility of State and Federal government.
- » The Minnesota Department of Agriculture is responsible for monitoring surface and ground water for pesticides.

ONGOING ACTIVITIES:

The County will continue to administer local land use regulations and provide information and technical assistance to all municipalities. The County and SWCD will continue to participate in EAW, EIS and AUAR under the Minnesota Environmental Review Statute.

WATER MANAGEMENT PLAN:

The County will be working with all municipalities and townships on planning and land development issues as part of the comprehensive natural resources planning project, the *Greenprint* for Blue Earth County, and the *County Water Management Plan 2008-2013*. There will be a special focus in the most developing areas of the County, including the Northeast corner (Mankato, Eagle Lake and Madison Lake) and Lake Crystal. The County will encourage all municipalities, Lime Township and Mankato Township to review local plans and ordinances, making amendments as needed to control stormwater runoff from new development and incorporate low impact design strategies in new development. In addition to City officials and citizens, this will involve support from each City's consulting engineers and other technical resources and consultants. The County will also be working with the City of Mankato, maximizing opportunities to share education outreach and technical services with Mankato and other communities when possible. Existing municipal stormwater outlets will be reviewed to determine the need and potential for structural solutions to erosion and other water quality problems and the availability of existing resources. The County will be updating the Comprehensive Land Use Plan and stormwater management will be addressed.

Objective 1: Encourage municipalities and Townships to review and revise stormwater, zoning and subdivision ordinances to protect water resources.

Action 1: Work with City staff, engineers and consultants to provide each City with general information about urban stormwater runoff impacts.

Action 2: Work with the City staff, engineers, consultants, NEMO, DNR and others as appropriate to provide each City with model ordinances to address development and stormwater impacts.

Action 3: Assess the need and seek funding for consultant services to review and rewrite local ordinances, if needed.

Action 4: Work with Mankato Township and Lime Township to provide each with general information about urban stormwater runoff impacts and model ordinances to address stormwater impacts.

Objective 2: Reduce erosion at existing urban stormwater outlet structures.

Action 1: Work with City staff, engineers, SWCD and the County Ditch Manager to inventory and evaluate stormwater outlets to determine where erosion problems exist.

Action 2: Identify short-term and long-range solutions to stormwater runoff problems and construct structures, retention areas and other conservation practices where needed.

Action 3: Work with City staff and SWCD to seek funding for Action 2 if needed.

Objective 3: Reduce erosion from construction sites.

Action 1: Provide general information about MPCA NPDES permit rules to municipalities (not Mankato) and Mankato Township staff.

Action 2: Provide general information about MPCA NPDES permit rules along with construction permits issued by the County.

Action 3: Work with staff of municipalities, MPCA stormwater staff and others to assess compliance and educational needs related to State NPDES permit requirements.

Action 4: The City of Mankato will continue implementation of its Stormwater Pollution Prevention Plan, partnering with the County and local municipalities for education and other activities when appropriate.

Objective 4: Promote homeowner best management practices to reduce pesticides, fertilizer and other pollutants generated by lawn, garage and home care.

Action 1: Work with city staff to provide data and information and sample educational materials, flyers, posters, etc. from the City of Mankato and other sources.

Action 2: Include BMP's in County and SWCD newsletters, web sites and other outreach activities.

Objective 5: Protect sensitive lake shoreland areas from development.

Action 1: Assess the shoreland and riparian areas of all lakes, especially those with greatest likelihood of development such as Madison, Duck, Ballantyne, George, Eagle, Lura, Crystal, Loon, and Mills Lakes, to provide a baseline and general information for the County Planning Commission and the affected municipalities.

Action 2: Address shoreline protection in the County's Comprehensive Land Use Plan and amend County land use regulations to protect shoreland areas from development impacts.

Objective 6: City and County park systems will continue to develop and redevelop shoreland areas providing public access, reducing runoff, and protecting stream banks and shoreland.

Action 1: The County Parks Department will continue to utilize and promote best management practices, such as rain gardens and use of native vegetation, in all County parks, as appropriate.

Action 2: The County will continue to work with lake associations, local conservation organizations, the DNR and other State agencies to stabilize shoreland areas in County Parks where needed and as funding is available.

Action 3: The City of Mankato will continue to redevelop waterfront areas, trails and parkways along the Minnesota River, Blue Earth River, Indian Creek, and Thompson Creek to improve water quality and provide education and access to the river for residents and visitors where appropriate and as funding is available.