

## IV. ENVIRONMENTAL/NATURAL RESOURCES

The City of East Bethel is one of the largest cities in Minnesota encompassing approximately 48 square miles. The landscape of the community is a gentle undulating plain with vast acres of lakes, parks, open space, and wetlands. This natural environment is often noted as the most important feature and attraction to residents of the community.



Natural amenities also include recreational lakes and forested areas and are the result of unique natural forces at work in the area over many centuries. Of the 30,432 acres of land in the City, lakes or wetlands cover approximately 35 percent. Floodplain areas, which include mostly wetlands, cover roughly 48 percent of the community. While these characteristics limit the type of development that the land will support, the community feels strongly that the natural beauty and wildlife these amenities bring to East Bethel should be preserved and recognized as part of the community's long term identity.

### PHYSICAL RESOURCES

#### Coon Lake

Coon Lake is perhaps one of the most significantly utilized natural resources in East Bethel. Located between East Bethel and Ham Lake, Coon Lake is part of the Anoka County Park System. It is used recreationally with numerous access points available for launching boats and swimming. There are a number of houses on the lake, and it is home to many forms of wildlife including loons, ducks, geese, fish, beavers, and turtles.

The lake totals 1,259.2 acres with a littoral area of 1,098.2 acres. The maximum depth is 27 feet with a water clarity depth of 6.75 feet. The substrates that make up the bottom of the lake include sand, silt, and muck with an abundant aquatic plant population at a growth depth of 14 feet.



Species in the lake include a variety of fish such as: black bullhead, black crappie, bluegill, bowfin, brown bullhead, common carp, hybrid sunfish, largemouth bass, northern pike, pumpkinseed sunfish, white sucker, yellow bullhead, and yellow perch. As of 2003, bluegills made up the most abundant species in the lake and their sizes ranged from 2.6 inches to 7.4 inches in length. The second most populated species in 2003 was the northern pike and their lengths ranged from 12.5 inches to 34.4 inches.

The average water level in Coon Lake is 900.43 feet with the highest recorded level at 905.11 feet and the lowest at 900.27 feet. The last recorded reading was in October 2005, at which time the lake's water level was at 904.75 feet.

In a recent study, the lake was found to have an infestation of Eurasian Watermilfoil, an incredibly invasive species of aquatic plant which takes firm hold in lakes without well-established populations of native plants. Easily transferred from one lake to another by boats and trailers, once embedded in a lake, it is very difficult to eliminate. Milfoil can disrupt the ecology of the lake if not controlled. It would be considered harmful since it crowds out natural aquatic species. It can become a serious problem because its pervasiveness interferes with swimming, boating, and fishing.

### Natural and Wildlife Areas

East Bethel is abundant with natural resource areas, the largest of which include the Cedar Creek Natural History Area and the Sandhill Crane Natural Area. These rare environmental areas are attractions for local residents, teachers and students, nature enthusiasts, and the wildlife that inhabit them. A more detailed description of these and other parks and open space areas is provided in Chapter 6. Parks, Recreation, and Open Spaces.

These natural areas are features that make East Bethel unique from other communities in the north metro area, and the preservation and enhancement of such amenities is crucial to adding value not only to East Bethel as a community, but to the region as a whole.

### Surface and Groundwater

Individuals and families value the rural, natural quality of the landscape. Residents rely on safe drinking water from individual wells as there are limited public water and sanitary sewer utilities. Water tables are near the surface in depressions and from 3 to 10 feet deep or more in areas where the land rises. Groundwater is a particularly important natural resource for East Bethel; the relatively shallow Franconia/Ironton/Galesville aquifer is the main source of groundwater in the City. The increasing use of groundwater by residential, commercial, and industrial facilities, as well as for agricultural irrigation, raises concerns with regard to the potential for contamination.

Soils, as well as surface and sub-surface geologic features, are important factors that need to be considered in order to understand the occurrence and movement of groundwater in its relation to aquifers in the City. Major potential sources of groundwater contaminants include individual sewage treatment systems (septic systems) and surface water runoff from developed land and farmland. Susceptibility to contamination of groundwater depends on the ability of the soil to absorb, transform, and dilute contaminants from the surface.

East Bethel lies entirely within the Anoka Sandplain Region, an area consisting of sandy soils. The Anoka Sandplain is an area extending from the western edge of Sherburne County to the eastern edge of Chisago County, and from the southern border of Anoka County to the northern border of Isanti County. The Sandplain resulted from large amounts of lacustrine sand deposited by the Grantsburg Sublobe during the last period of glacial activity. Depressions are common in the Sandplain. These were formed when isolated blocks of glacial ice melted. Today, these are commonly filled with peat deposits, lakes, and wetlands. Soils in the City

consist of three “soil associations,” – the Zimmerman-Isanti-Lino Association; the Hubbard-Nymore Association, and an "Other Association."

Generalized soils are shown in Figure IV-1. Given their sandy conditions, both of the soil associations are excessively drained. The "Other Association" consists of original vegetation of scrub oak, peat bogs, and either tamarack or sedges and marsh grass. Currently, sod and a limited assortment of vegetables are grown extensively on large drained peat and muck areas. The Minnesota Geologic Survey has established aquifer sensitivity ratings, which relate to the ability of the soil to absorb contaminants, transform them into inert substances, and dilute them so as to make them inactive before releasing them into the aquifer. This ability is related to the travel time for surface water to reach the aquifer. Sandy soils aggravate aquifer contamination much faster than loam or clay soils.

The geologic sensitivity rating and groundwater travel time of the uppermost aquifer in the Anoka Sandplain range from very high (hours to months) to low (decades to a century). The majority of Anoka County, including all of East Bethel, lies within the area rated as “very high” susceptibility. It should be noted, however, that high sensitivity does not indicate that water quality has or will be degraded, and low sensitivity does not guarantee that water is or will remain pristine. The East Bethel landfill is an issue of remote concern with regards to contamination to the City's water supply. Finally, isolated incidents of contamination have occurred with extremely shallow residential wells.

Surface water is a predominant part of the East Bethel landscape. This includes lakes, Cedar Creek, and numerous wetland areas. Lakes and streams have important aesthetic, recreational, and ecological qualities that are relatively well understood, but wetland areas also provide many practical, aesthetic, and ecological benefits as well. These include acting as storage areas for water during flooding; the filtering of sediments, nutrients, and toxic substances before they enter lakes, rivers, and streams; providing habitat for fish and other wildlife; and the replenishing of groundwater sources. The relatively flat topography and wet conditions of the City result in extensive areas that are at risk of flooding.

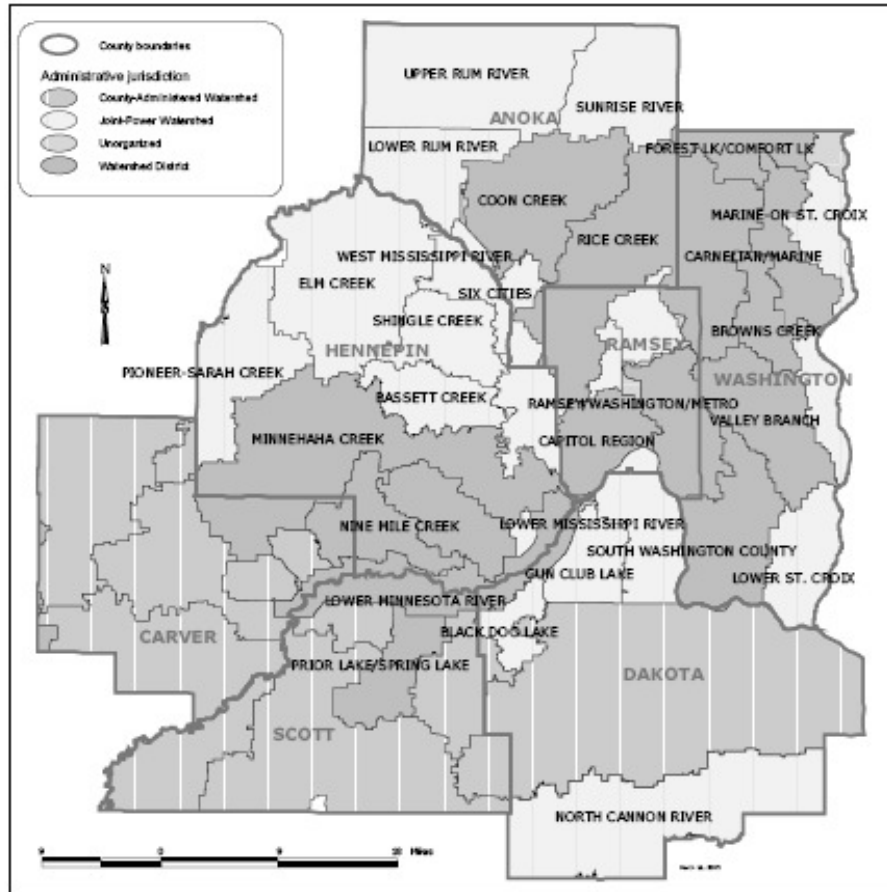
## **SURFACE WATER MANAGEMENT PLAN**

The defining characteristic of the community is the predominance of wetland areas, and this type of environment is sensitive to the effects of development. Managing surface water resources and protecting groundwater as development occurs is crucial in maintaining the long-term quality of the environment. The City of East Bethel, through implementation of a Surface Water and Groundwater Protection Plan, works toward preserving the scenic and natural resources of the community, maintaining and/or improving the quality of lakes for recreational use, and ensuring that drinking water from individual wells remains safe.

A “watershed” is a large drainage system (a large area of land over which precipitation drains). These areas are named for the rivers and streams into which this precipitation drains, and generally cross the boundaries of local jurisdictions. State legislation established Watershed Management Organizations (WMOs) to research, plan for, and manage water resources within each watershed district. Both WMOs and local governments, including the City of East Bethel, are required to prepare plans to address water quality issues within each watershed (see Minnesota Statutes Section 103B.235).

FIGURE IV-1. Gen. Soils

Figure IV-2 illustrates the secondary watersheds in the Twin Cities metropolitan area. East Bethel falls within the Upper Rum River Watershed and Sunrise River Watershed.



**Figure IV-2. Secondary Watersheds in Twin Cities Metropolitan Area**

The Metropolitan Surface Water Management Act created new planning requirements and regulations that each watershed must implement. Each WMO must complete a “second generation watershed management plan” to replace their existing plan. The Minnesota Board of Soil and Water Resources has prioritized the completion of each watershed’s plan, and WMOs are at various stages of implementing this State law. Two watersheds cover the City of East Bethel: the Upper Rum River Watershed and the Sunrise River Watershed. In 1995, amendments to the Metropolitan Land Planning Act required that local comprehensive plans must include a water management plan that addresses watershed plan elements for all land within their jurisdiction.

However, for communities in watersheds where a second generation plan has not yet been completed, the local unit of government must only implement an “*Interim Strategy to Prevent Nonpoint Source Pollution.*” Presently, a second generation plan for the Sunrise River Watershed has been completed and the Upper Rum River Watershed Plan is in process. When both second generation watershed management plans have been completed, East Bethel may be

required to update its plans and ordinances to ensure conformance with and implementation of the two watershed plans.

State requirements of local surface water management plans will include the following:

- Description of land and water resources including wetland size, type, and function.
- Map illustrating all water resources, drainage basins to all protected waters, the size of each basin, and storm sewers or other conveyance systems.
- Description of outlet flow rates for each subwatershed or basin and the level of pretreatment occurring in each basin.
- Information on sampling and monitoring programs.
- Assessment of water quality related problems.
- Water quality goals.
- Planned actions to correct problems.
- Implementation program, priorities, and costs.
- Schedule for maintenance of and estimated costs related to maintenance of stormwater facilities.
- Local ordinances that protect and buffer wetlands, control erosion and sedimentation, protect shoreland and floodplain, and which regulate stormwater runoff.
- Public education programs.

This Surface Water and Groundwater Protection Plan implements many of the required elements listed above. The City of East Bethel will implement the second-generation plans of each of its watersheds when they have been completed. At that time, the City may elect to amend this plan including referencing all or portions of each watershed plan's policies, programs, and water quality analysis. Finally, the risk of groundwater contamination in the City of East Bethel could arise, primarily from the improper functioning septic or individual sewage treatment systems (OSTS). The City is committed to ensuring that individual sewage treatment systems are built and maintained according to Minnesota Pollution Control Agency (MPCA) guidelines, specifically MPCA Rules, Chapter 7080.

## **Protection Strategies**

The City of East Bethel has the authority to create policies and regulations that ensure the health, safety, and welfare of the public. The following sections describe how the City can preserve the quality of groundwater, manage the runoff of stormwater, and protect the quality of shoreland, floodplain, and wetlands.

The City recognizes the importance of groundwater sensitivity and has established policies that will enhance protection of groundwater in the City and region. A principal risk of direct contamination of groundwater comes from sewage from individual sewage treatment systems. East Bethel will ensure protection of local groundwater through implementation of its ordinances regarding private on-site sewer systems.

Wetlands, floodplain, and shoreland areas also serve as important areas of groundwater recharge. Strategies to protect these areas are described in the sections that follow. The City of East Bethel has developed regulations that implement the MPCA's Chapter 7080 rules related to individual sewage treatment systems. All businesses and residences in East Bethel, except

for residents of manufactured home parks or Whispering Aspen subdivision, are currently served by individual sewage treatment systems and must comply with the East Bethel Sewage Treatment Ordinance. This ordinance regulates individual sewage treatment system (ISTS) design, installation, maintenance, expansion, and repair. The Sewage Treatment Ordinance also stipulates that ISTS owners must submit an inspection report of the system once every three years indicating whether the system meets minimum maintenance standards and has been pumped and cleaned. One private and one public sewer treatment system exists within the City, as well as two private and one public water distribution systems (Castle Towers/Village Green manufactured home parks and Whispering Aspen respectively).

The principal source of pollution to water bodies, wetlands, and streams comes from precipitation that accumulates contaminants before it enters water bodies. Developed land generally increases the volume of stormwater runoff, as well as the concentration of pollutants in the runoff. The City of East Bethel is responsible for developing standards that prevent or mitigate as a result of development, and which incorporate the plans of the Upper Rum River Watershed and Sunrise River Watershed Management Organizations.

Figure IV-2 identifies the boundaries of the watershed districts. East Bethel will maintain or develop policies and regulations that are consistent with ongoing watershed planning. The City currently consults with the Anoka County Soil and Water Conservation District regarding proposed development applications, but will incorporate policies and procedures of updated watershed plans.

The City will require an approved stormwater management plan before issuing a number of City permits. These include building permits, zoning permits, excavation permits, filling permits, mining permits, sign permits, wetland activities permits, plat approval, minor subdivision approval, permits for construction of utilities systems, or permits for any other land disturbing activity. As outlined in the City Code, the stormwater management plan must include an existing site map, site construction plan, and plan of final site conditions. Hydrological models and design methodologies used for the determination of runoff and analysis of stormwater management structures shall be approved by the City Engineer.

Elements of individual stormwater management plans include but are not limited to:

- Existing and proposed land contours
- Delineation and description of all on-site and adjacent streams, rivers, waters, and wetlands
- Location and description of existing stormwater drainage systems and natural drainage patterns
- Description of soils
- Description of vegetation
- Landscape plan
- Drainage plan
- Size, alignment, and proposed use of any structures
- Delineation and tabulation of all impervious surfaces

Approval of a stormwater management plan is contingent upon a number of factors. Among others, these include factors related to the management of water and materials during construction, control of erosion, the design of permanent facilities, the design of stormwater detention facilities, the use and care of wetlands for any stormwater runoff, and compliance

with existing watershed management plans. These factors are described in greater detail in the sections that follow.

Stormwater practices that permit applicants should investigate are (in order of preference): natural infiltration of precipitation, flow attenuation by use of open vegetated swales and natural depressions, stormwater retention facilities, and stormwater detention facilities. Provisions prevent runoff from being discharged directly into wetlands without pre-settlement of the runoff. The construction of stormwater detention facilities should reflect “best management practices” as identified by the Minnesota Pollution Control Agency, currently in its publication “Protecting Water Quality in Urban Areas.”

Within the City there may seem to be a considerable amount of land that is undeveloped; however, much of the land is not developable due to the extensive natural features and the restraints that accompany this land. The City has developed policies, including conservation development (Planned Unit Development – PUD), directed at preserving natural resources in areas undergoing development, as well as those which are not experiencing development. The City recognizes the importance of the preservation and protection of significant natural areas for the well-being of both current and future populations and the quality of life such areas foster. The City will employ a wide variety of means in order to achieve these goals.

Regulations related to wetlands are included in the City's ordinances and identify the City's responsibility for enforcement of the Minnesota Wetlands Conservation Act, as amended and as replatted by the Board of Water and Soil Resources Wetland Conservation Act Rules. Burning, filling, draining, excavation, or development in a Wetlands Zone is prohibited, unless permitted by the Wetlands Conservation Act.

The quality of wetlands is also protected by regulations related to the quality of stormwater described in the previous section. Various levels of government are involved in regulation of surface water, wetlands, and floodplain. The Department of Natural Resources (DNR) has inventoried and classified water bodies and wetlands in the State of Minnesota. The “protected waters and wetlands” program identifies water bodies and wetlands that require DNR permits for activities like draining, filling, dredging, and diverting of water. These include many water bodies and wetlands in the City of East Bethel.

The DNR's *Shoreland Management Program* has also established a classification system for lakes greater than ten acres in size and rivers with a drainage area two square miles or greater. These classifications establish minimum development standards for protection by local units of government and are related to their use. The standards apply to those areas within 300 feet of a classified river and 1,000 feet from a classified lake. It is the policy of the City of East Bethel to enforce the standards described above. City regulations may be stricter. “Impact Zone” refers to areas immediately adjacent to lakes, rivers, and bluffs that are necessary to preserve in order to maintain good water and visual qualities of these resources.

Floodplain and shoreland areas are governed by the City's Shoreland and Floodplain City of East Bethel Comprehensive Plan ordinances which regulate activities adjacent to water bodies classified by the Minnesota DNR.



Coon Lake is classified as a *General Development Lake*, which involves the least restrictive standards; Minard Lake is classified as a *Recreational Lake*; and the remaining lakes are classified as *Natural Environment Lakes*, the most restrictive classification. Cedar Creek is classified as a *Tributary River*.

All development activities in the City are subject to conditions and permitting requirements contained in these ordinances or those contained within other City codes, whichever are stricter. Current City development regulations meet current minimum DNR regulations for this classification system.

## **Erosion and Sedimentation Control**

Surface water quality can be compromised as a result of land uses and development practices that increase the amount of surface water flow. In addition, surface water quality can be compromised when the increased runoff causes erosion and sedimentation. Careful planning and regulation related to conservation of soils, water, and natural vegetation can reduce erosion, runoff, and sedimentation. In addition to requiring stormwater plans that include ponds that meet National Urban Runoff Program (NURP) standards, the City will implement and enforce MPCA's erosion control guidelines, "*Protecting Water Quality in Urban Areas*."

Detention ponds are one mechanism to alleviate these impacts by controlling the rate of runoff. Methods such as mulch layers or silt fences are identified in the environmental policies as means to reducing the amount of runoff entering the pond by increasing infiltration through the soil. Mineral extraction sites, in particular, may potentially result in erosion, sedimentation, and groundwater problems if they are not adequately planned and regulated.

Extraction site operations are limited to only a few locations in the City. The City has not experienced any problems resulting from such activities; however, performance standards for this type of use may be appropriate.

## **SURFACE WATER AND GROUNDWATER GOALS AND POLICIES**

The following goals and policies form the basis on the Surface Water and Groundwater Protection Plan.

### **Goals:**

- *Protect environmental systems from unnecessary impacts of future growth and development activities.*
- *Maintain and enhance the natural amenities of the City for future generations to enjoy.*
- *Protect the surface waters and wetland areas of the City to promote aesthetic qualities, natural habitat areas, and groundwater recharge.*

**Policies:**

1. Enforce all local and state regulations for activities occurring in naturally or environmentally sensitive areas.
2. Develop ordinances and incentives that encourage conservation development concepts in areas where the protection of natural resources is vital to the community.
3. Restrict and/or guide development on shoreland and floodplain areas, wetlands, and other natural features where protection of natural resources is considered vital to the community.
4. Establish development standards consistent with soil suitability, steep slopes, groundwater tables, and aquifer sensitivity.
5. Establish development standards consistent with the Wetland Conservation Act.
6. Establish minimum lot sizes, development densities and standards that are not inconsistent with environmentally sensitive areas.
7. Enforce MPCA Rules Chapter 7080 for private sewer system design, installation, maintenance, expansion, and repair.
8. Require that stormwater ponds meet the applicable design standards of the National Urban Runoff Program (NURP).
9. Establish erosion and sedimentation control standards consistent with the MPCA's "best management practices."
10. Require that any private wastewater treatment facilities meet all MPCA design, installation, and operating standards.
11. Encourage construction of municipal sewer in environmentally sensitive areas where use of septic systems may cause adverse conditions.

## **ENVIRONMENTAL AND NATURAL RESOURCES GOAL AND POLICIES**

### **Goal:**

*Utilize natural resources and environmental quality as part of the foundation for planning for future growth and development of the City.*

### **Policies:**

1. Identify and implement mechanism(s) for addressing environmentally sensitive issues.
2. Sustain natural resources as an integral part of the City's identity in the region through zoning and related municipal controls. Protect existing wetlands, parks, open spaces, and night skies.
3. Maintain recycling options for residents.
4. Develop and enforce land use controls/ordinances specific to area surrounding Coon Lake; work with surrounding communities to ensure consistency and collaboration in the Coon Lake area.
5. Encourage zoning compliance on non-conforming properties.
6. Protect environmental systems from unnecessary impacts of future growth and development activities.
7. Maintain and enhance the natural amenities of the City for future generations to enjoy.
8. Protect the surface waters and wetland areas of the City to promote aesthetic qualities, natural habitat areas, and groundwater recharge.
9. Work with the appropriate Watershed Management Organizations/Districts to determine who will be responsible for implementing surface water management activities into the future – ten years and beyond.