

Physical Profile & Natural Resources

PURPOSE

This Chapter provides background information on the City of Montgomery's physical profile that is intended to assist in guiding growth and preserving natural resources. This chapter includes:

1. A Physical Profile including information on area, topography, rivers and creeks, watersheds, groundwater, vegetation and rare species and soil conditions.
2. Natural Resource Objectives and Policies

I. PHYSICAL PROFILE.

A. Area.

The City of Montgomery is 2.47 square miles in size, or 1,582.59 acres. (Source: GIS records November 2013).

B. Topography.

Map 2-1 illustrates topography within the City of Montgomery. The area features mild fluctuations in elevation from about 998 to 1130 feet above sea level. A majority of the City is relatively flat with slopes typically under 12%; however, some areas of Kilkenny clay loam contain slopes 18% to 24%.

The City's Subdivision Ordinance defines a "Steep Slope" as an 18% or greater deviation of a surface from the horizontal. The Subdivision Ordinance; however, does not include restrictions relating to development of "steep slopes". The City may wish to consider requiring the identification of steep slopes on Preliminary Plats, including language which allows the City to evaluate land suitability for subdivision based on steep slopes, as well as other items and the requirement for replacement trees to be installed on any disturbed steep slopes.

The City's Zoning Ordinance defines a "Bluff" as "A topographical feature such as a hill, cliff, or embankment in which the average grade of any portion of the slope is thirty (30) percent or greater and there is at least a 25-foot rise in elevation." A Bluff Overlay District Map has been prepared by the Le Sueur WMO identifying the potential locations of bluffs.

As the City plans its future land uses, it is important to take the topography of the city into consideration. Flat areas are typically more conducive for industrial development with rolling hills or areas with steeper slopes preserved for residential or natural resource protection.

C. Water bodies.

There are no significant water bodies within the City; however, there are a number of lakes surrounding the city including:

- Lake Pepin to the northwest
- Dietz Lake and Lake Sanborne to the northeast
- Rice Lake to the East off CR 26 and 141st Avenue

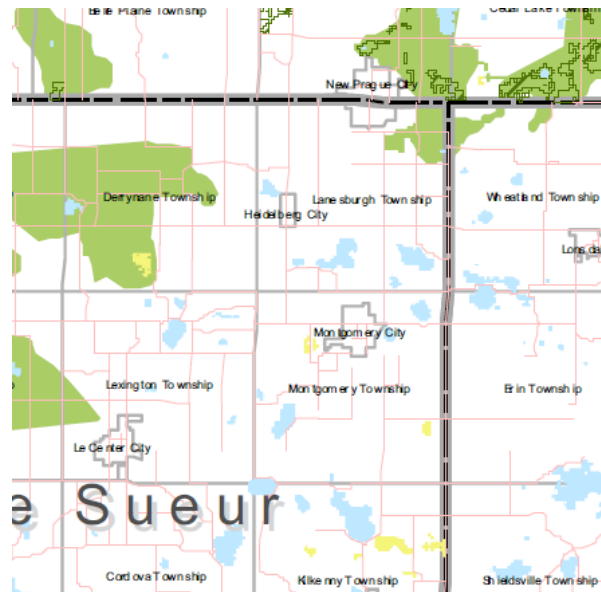
According to the Minnesota Pollution Control Agency, there are no impaired waters within the City of Montgomery. There are two impaired waterways north of Montgomery and its anticipated growth boundary:

- **Raven Stream** begins as a public ditch near Lake Pepin in Lanesburgh Township. From Le Sueur County Road 29 north it is a DNR protected watercourse. FEMA has prepared some floodplain mapping of Raven Stream, however no base flood elevations have been developed. Raven Stream East Branch is north of Montgomery.
- **Sand Creek** is a DNR protected watercourse though its tributary is not. The protected portion of the creek begins at Le Sueur County Road 29. Sand Creek flows north through New Prague and west toward the Minnesota River. Its confluence with the Minnesota occurs north of Jordan. Sand Creek joins Raven Stream upstream of the Minnesota River, just south of Helena Township. Further downstream of its meeting with Raven Stream, Sand Creek joins Porter Creek. From Porter Creek to the Minnesota River, for a distance of approximately 13.2 creek miles, Sand Creek is listed as impaired on the MPCA impaired waters list.

FEMA Floodplain. Map 2-2 illustrates areas identified by the Federal Emergency Management Agency as Floodplain. As indicated on the map, floodplain areas exist in the northeast corner of the City and its future growth boundary to the northeast. The areas around Dietz Lake, Rice Lake and Lake Pepin are also within a floodplain.

National Wetland Inventory. Map 2-3 illustrates the locations of wetlands. Shallow Marsh wetlands as well as a shrub swamp wetland and seasonally flooded wetlands are located within the City. In rural areas, wetlands larger than 10 acres are designated as DNR protected. In urban or developed areas, including the City of Montgomery City limits, this threshold falls to 2.5 acres.

Metro Wildlife Corridor Focus Areas. Also mapped by the DNR are Metro Wildlife Corridor Focus Areas (Map 2-4). The focus areas shown on the map identify regionally significant upland and/or wetland habitat area and wildlife corridors that the DNR, along with public and private partners, endeavor to preserve. Through the Wildlife Corridor Program partners purchase conservation easements which allow them to restore, enhance, or maintain significant habitat areas. A MCBS site of Biodiversity Significance has been identified to the west of city on the 2007 (DNR) Metro Wildlife Corridor Focus Area map.

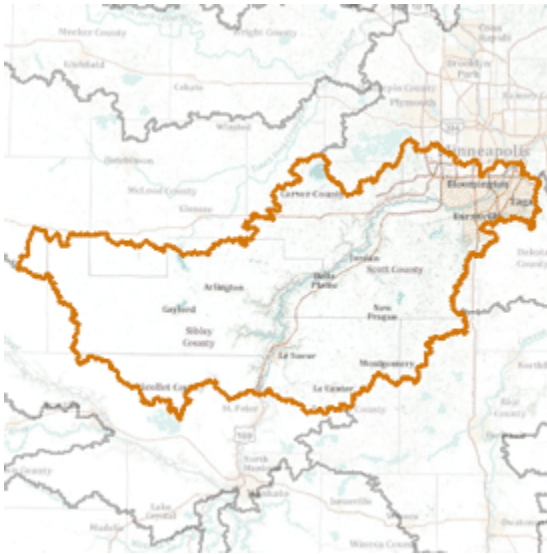


D. Watersheds.

Watersheds are drainage networks or areas of land which drain water under or off it to the same lakes and rivers and eventually to larger water bodies. Topography dictates where water or drainage flows. It is important to protect the quality of watersheds as run-off may affect water quality causing a negative

impact on wildlife and humans. Two watersheds serve the City of Montgomery; the Cannon River watershed and the Lower MN River watershed.

According to the Minnesota Pollution Control Agency (MPCA), “The Cannon River watershed is located south of the Twin Cities and encompasses areas of Dakota, Goodhue, Le Sueur, Steele, Rice and Waseca counties. The watershed drains approximately 1,460 square miles through two main channels, the Cannon and Straight Rivers, to the Mississippi at Red Wing.”



Lower Minnesota River Watershed



Cannon River Watershed

The MPCA reports that “The Lower Minnesota River watershed includes the lowest reach of the Minnesota River and flows into the Mississippi at Fort Snelling. The second largest watershed in the Minnesota River Basin, it covers 1,760 square miles, divided by the Minnesota River itself. Major tributaries in the rural part of the watershed include the Rush River and High Island Creek. Tributaries in the urban area include Bevens Creek, Carver Creek, Sand Creek, Nine Mile Creek, and the Credit River, among others. A relatively flat section of river, the 50-mile stretch of the Minnesota contained within this watershed drops approximately 90 feet in elevation from the small town of Ottawa in Le Sueur County, to its confluence with the Mississippi River in St. Paul.”¹¹

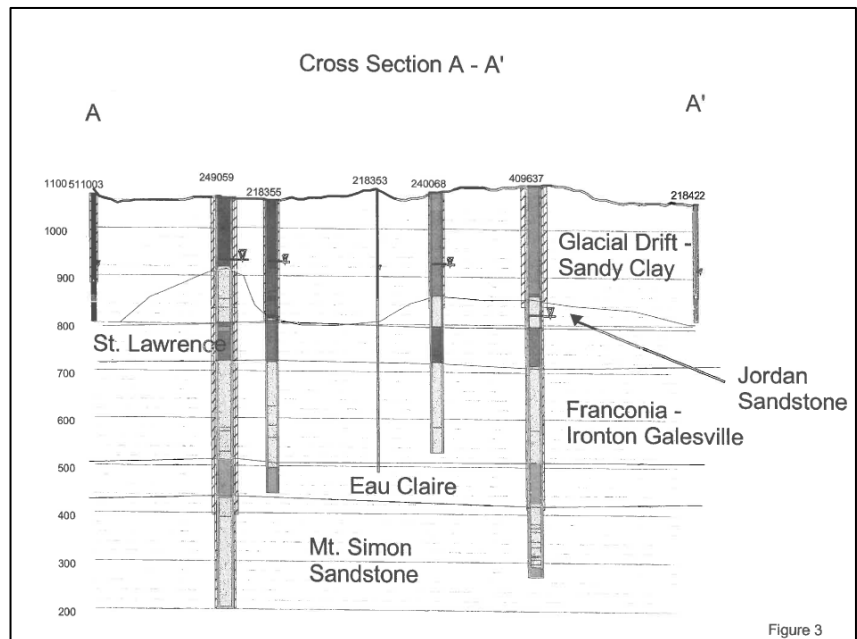
Green techniques, which may be employed by a community and its citizens to assist in maintaining the water quality of its watersheds, include such activities as repairing leaky faucets, repairing septic tanks, using pavers in lieu of asphalt driveway allowing for drainage and planting of trees and plants native to the area to reduce the use of fertilizers and pesticides.

¹ MPCA: www.pca.state.mn.us

E. Groundwater.

Montgomery draws its groundwater from the Franconia-Ironton Galesville aquifer. Groundwater quality is thought to be generally good. According to the Wellhead Protection Plan for the City of Montgomery, February 2006, "The aquifer is about 156 feet thick....The aquifer used by the water supplier is considered to exhibit a low sensitivity to potential contamination sources because 1) it is covered by approximately 200 feet of clay-rich glacial deposits and bedrock that will likely prevent the vertical movement of contamination from potential sources to the aquifer; and 2) no tritium was detected in the well water, indicating that a low rate of recharge to the aquifer occurs. The source water used by the city wells is considered not susceptible to

potential sources of contamination. No contaminants regulated under the federal Safe Drinking Water Act have been detected in the source of drinking water used by the City of Montgomery..."²



Source: City of Montgomery Wellhead Protection Plan, MN Department of Health, Feb. 2006

F. MPCA Leak Sites. The Minnesota Pollution Control Agency reports 14 confirmed instances of leaking underground storage tanks within the City. Most files on the sites have been closed as of the drafting of this Plan. The sites are identified in the following table.

² Wellhead Protection Plan, Part 1, Wellhead Protection Area Delineation Drinking Water Supply Management Area Delineation Well and Aquifer Vulnerability Assessment for the City of Montgomery, Justin Blum, Yarta Clemens Major, Minnesota Department of Health, February, 2006.

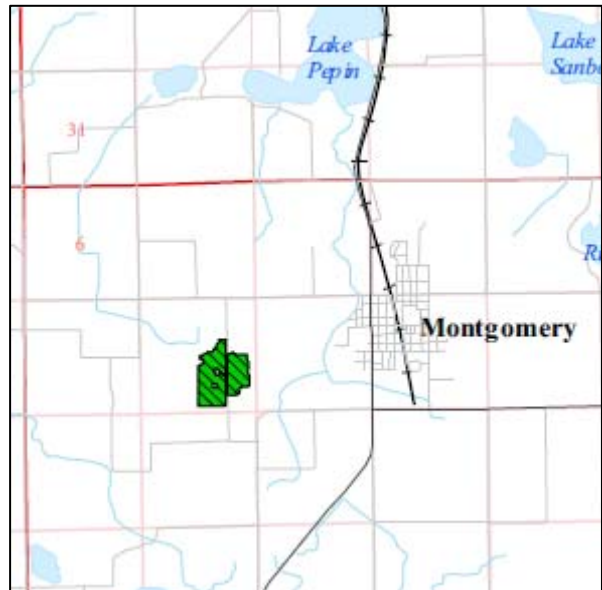
**TABLE 2-1
LEAKING UNDERGROUND STORAGE TANK SITES
CITY OF MONTGOMERY**

Site	Status
City of Montgomery Utility Site	Inactive
Edel Town & Country	Inactive 1995
Food & Fuel	Active
Former Montgomery Gas Station	Active
Franchise Mailing Systems	Inactive
Green Giant Pillsbury	Inactive
ISD 394 Montgomery Lonsdale	Inactive at Bus, Active at school
Interstate Power Company	Active
MnDOT District 7a Montgomery	Inactive
Montgomery Oil Co. Inc	Inactive
Novotny's Sport Shop	Inactive
Skuzacek Oil Bulk Plant	Active
Skuzacek Oil Co. Montgomery	Inactive
Wildwood Properties LLC	Active

- Source: MN Pollution Control Agency, 2013

F. Vegetation and Rare Species.

Within the corporate limits of the City of Montgomery there are limited wooded areas. The Native Plant Communities and Rare Species **Map 2-5** for Le Sueur County does identify a Sugar Maple Basswood (Bitternut Hickory) Forest MHs39A, to the west of the City of Montgomery. The DNR describes this area as, "Mesic forests on gently sloping sites with loamy soils derived from calcareous till of stagnation moraines and till plains. Interrupted to continuous canopy (50-100% cover) dominated primarily by forest-grown sugar maple and basswood; other frequent canopy species include northern red oak, bur oak, hackberry, and red elm. Subcanopy often dominated by sugar maple and usually contains basswood and hackberry. Shrub layer is usually sparse and commonly contains prickly gooseberry, red-berried elder, and chokecherry. Ground layer dominated through much of the growing season by wood nettle; other common herbs include cleavers, Virginia waterleaf, bloodroot, large-flowered bellwort,



rugulose violet, yellow violet, puttyroot, wild leek, and nodding trillium. Spring ephemeral wildflowers such as Dutchman's breeches, cut-leaved toothwort, and white trout lily are present.”³

G. Soils.

The characteristics of the soils in the Montgomery area should be examined in order to make proper decisions on the use of the land and to protect the natural environment. Existing soils in the City have been principally responsible for the area’s overall development pattern and may impose limitations or increased sensitivity to future urban development/redevelopment.

Montgomery and the surrounding area have soils that were formed through the action of glaciers. The parent material of most is glacial till, but a few were formed from sandy and gravelly glacial drift. Mixed with these soils are pockets of organic peat soils and marshes. A few soils were formed by the action of small streams, which flowed through the area.

The Soil Map, included as **Map 2-6**, shows soils in Montgomery. The various types of soils are depicted with a color-coding, on the Soil Legend. A description of the characteristics of the various soils, as per the US Department of Agriculture, NRCS Soil Survey Division for soils native to Montgomery follows:

The *Soil Survey of Le Sueur County* compiled with aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and other cooperating agencies in 1977, depicts the following soils are most common in Montgomery and provides the following descriptions of the some of these soils:

106B– Lester Loam. This soil is typically gently sloping (2 to 6 percent slopes) and well drained. The surface layer is a very dark brown loam about 8 inches thick. The soil is moderately permeable. This soil may be used as crop land, pasture or woodlands.

106C2- Lester Loam, Generally containing 6 to 12 percent slopes, erosion has exposed the subsoil in these areas. Permeability is moderate. The soils are suitable for cropland, pasture or woodland, with erosion posing the greatest concern.

109 – Cordova Clay Loam. This soil is nearly level. It is generally poorly drained and is in swales and slight depressions on uplands. Permeability is moderately slow. The soils are suitable for cropland, pasture or woodland. Wetness is the primary concern.

183- Le Sueur-Lester complex, 1 to 6 percent slope. These soils are typically gently sloping soils (1 to 6 percent slopes) on knolls and convex side slopes in uplands. Permeability is moderate. The soils are suitable for pasture, trees and shrubs.

1962 – Kilkenny loam, 6 to 12 percent slopes. The Kilkenny series consists of very deep, moderately well drained soils that formed in a mantle of clayey glacial till or flow till and underlying loamy glacial till on moraines. These soils have moderately slow permeability. Their slopes range from 2 to 35 percent. The mean annual precipitation is about 28 inches.

238C2 – Kilkenny clay loam, 18 to 24 percent slopes. Drainage class: Moderately well drained. Parent material: Glaciolacustrine deposits and till. Surface texture: Clay loam.

³ DNR Native Plant Communities and Rare Species Map for Le Sueur County

239B – Le Sueur Clay Loam. These soils are typically level (1 to 4 percent slopes) with moderate permeability. The soils are suitable for woodland, especially for black walnut trees. The soils are also suitable for cropland and pasture.

539 – Palms Muck These soils, which typically are very level, are very poorly drained. They generally occur in upland depressions. The seasonal high water table is one foot above to one foot below the surface. If drained, the soils may be suitable for cropland. It is also suitable for wetland wildlife habitat.

1901B- Le Sueur-Lester Complex. These soils are typically gently sloping soils (1 to 6 percent slopes) on knolls and convex side slopes in uplands. Permeability is moderate. The soils are suitable for pasture, trees and shrubs.

The various types of soils present different opportunities as well as requirements for correction for urban development. It is recommended the City require soil borings prior to granting building permits in areas where soils have been rated as severe to moderate.

H. Development Constraints

A review of several natural features has been reviewed in this chapter. It should be noted that several of the natural features identified in this chapter, including but not limited to wetlands, flood plain areas, potential areas of steep slopes, and if the City grows to the west regionally significant ecological areas, will present constraints to future development. Several of these significant natural features/areas exist in the proposed growth area of the City.

II. NATURAL RESOURCE OBJECTIVES.

- a. Promote conservation of key natural resources and open space areas.
- b. Establish a balance between the protection of natural resources and future (re) development.
- c. Promote environmental stewardship including protection of water quality, vegetation, rare species and steep slopes.

III. NATURAL RESOURCE POLICIES.

- a. Examine specific requirements for environmental protection that may be incorporated into the City's Subdivision Regulations relating to "steep slopes".
- b. Require all new developments and projects to be on municipal utilities. In areas which cannot be served with municipal utilities, continue to cooperate with Le Sueur county as well as other levels of government in maintaining existing on-site treatment systems and in promoting the use of innovative sewage treatment systems.
- c. Develop an ordinance addressing the requirement for facilities in city limits with individual sewage treatment systems to connect to the municipal system once it is available within a reasonable distance to the property and within a set number of months.

- d. Expand erosion control measures to include compliance checks for new construction for drainage plans, require as-built surveys for certificate of occupancy to ensure drainage plans approved by the city are followed.
- e. Encourage Green techniques which may be employed by a community and its citizens to assist in maintaining the water quality of its watersheds.
- f. Encourage tree planting along street rights-of-way and other publicly owned land to improve community aesthetics. As a part of the Subdivision Ordinance update, consider requiring the developer to install trees in new subdivisions
- g. Continue participation in the National Flood Insurance Program.
- h. Budget for and develop a Surface Water Management Plan to address maximizing on-land management of storm water to minimize the negative impacts of runoff on surface water quality.
- i. Emphasize proper management of open space areas in order to preserve the trees, wildlife, pre-settlement landscape communities, floodplain, water quality and similar environmentally sensitive features, especially in growth areas where areas of significance have been identified. Examples would be to consider cluster developments (PUD) in areas having significant tree cover in an effort to minimize the removal or disruption of existing trees, promote conservation easements to enhance wildlife habitat, continue to require EAW/EIS as required by law, preserve existing wildlife habitat and travel corridors.
- j. Integrate locations of identified sensitive natural resource information into a park and open space plan and/or other tools to guide development to allow for observation and interaction with natural resources. Support the construction of soft, permeable, low impact trail systems in natural areas when feasible, encourage the construction of trail connections linking residents to parkland and natural resources.
- k. Promote good stewardship of the land and support a sustainable environment through community efforts such as recycling and collection of household hazardous wastes. Encourage composting by providing a municipal compost and yard waste site. Protect the urban forest by implementing best management practices for forest management, tree preservation, and disease management and prevention. Finally, work to control and prevent invasive species.
- l. Remain involved in discussions regarding development of recreation activities relating to Lake Pepin (DNR), Wildlife Management Areas and other area natural resources as well as county parks system.
- m. Continue to protect the drinking water source management area in accordance with the Wellhead Protection Plan as adopted by the City of Montgomery.
- n. Promote the use of plant species native to Le Sueur County and south central Minnesota in landscape plans to help enhance habitat value and strongly promote avoidance of planting and landscape use of plants known to be invasive in Minnesota as defined by the MNDNR. This includes species such as Amur Maple, Glossy and European Buckthorns, Dame's Rocket, White Poplar, and other species known to be ecologically aggressive, but which may not yet be included on the Department of Agriculture list of invasive and/or exotic plants.