INTRODUCTION

St. Charles County has an area of approximately 561.35 square miles of which over 39 square miles are water surface. The extreme length of the triangular-shaped county is nearly 47 miles and the extreme breadth is approximately 25 miles. The lowest elevation at the confluence of the Mississippi and Missouri Rivers is around 400 feet above sea level. The highest elevation is in the south-central part of the county and is around 900 feet above sea level.

The natural environment places both opportunities and constraints on the way land is utilized. Soil characteristics, the slope of the land, and the flooding frequency are a few factors among many which affect land development. Other environmental considerations include wetlands, vegetative cover, and sensitive environmental areas.

WATER RESOURCES

Approximately 70 percent of St. Charles County drains into the Mississippi River, while the remaining southern 30 percent drains into the Missouri River. Approximately 43 percent of the county is within a 100-year floodplain. Most of northeastern St. Charles County between the Mississippi and Missouri Rivers is within the flood hazard area. Other areas having 100-year floodplain designations in the county are along Cuivre River, Dardenne Creek, Peruque Creek, Femme Osage Creek, and Big Creek. Flood hazard zones are depicted on Map N1.

St. Charles County at the confluence of the Missouri and Mississippi Rivers is well situated with respect to surface water supplies. These rivers can assimilate large amounts of water and still provide an abundance of good surface water for major users such as recreational boating and commercial barge operations. Rapid urbanization in the county has introduced substantial amounts of sediment in some of the smaller streams. Volunteer members of stream teams regularly monitor the water quality of various creeks and streams.

In addition to surface water sources large amounts of water are stored in underlying bedrock and alluvium. Some of this water supply has a high content of minerals, but much is good quality. This quality will vary depending upon the rock types present, water movement, and other factors. Various contaminants have been introduced into some groundwater resources by failing septic tanks, lagoons, and former landfills.
Appendix A  Background Information
Natural Resources

MINERALS

Mineral resources within St. Charles County include limestone, industrial sand, refractory clay, structural clay and shale, and construction sand and gravel. Limestone deposits in the county have chemical and physical qualities for both industrial and construction uses. Limestone is an essential commodity for the construction industry. This mineral resource is also used in the manufacture of cement and for the production of high quality construction aggregate. In southwest St. Charles County three quarries operate: LaFarge North America, Inc., Schiermeier Quarry, and Fred Weber, Inc. Fred Weber, Inc. also operates a quarry in O’Fallon, while LaFarge North America, Inc. operates one in St. Charles.

Sand resources are available within the channels of the Missouri and Mississippi Rivers. Industrial sand is used for the manufacturing or fabricating of glass.

Gravel resources although present are in limited supply and no large scale deposits for commercial usage are known. Reserves of structural clay and shale are present but production will not materialize due to the increased urbanization of the county and land use restrictions. Refractory clay is in very limited supply and not applicable for major quarrying opportunities. See Map N2.

CLIMATE

During the summer months air originating from the Gulf of Mexico tends to dominate the area producing warm and humid conditions. Since 1870, records indicate that temperatures of 90 degrees or higher occur about 25-40 days annually. Extremely hot days of 100 degrees or more are expected no more than five days per year. The average annual temperature is 54 degrees.

Winters are brisk and stimulating but long periods of extreme cold are rare. Records show that temperatures drop to zero or below an average of 2 to 3 days per year, and temperatures as cold as 32 degrees or lower occur less than 25 days in most years. Snowfall has averaged a little over 18 inches per winter season, and snowfall of an inch or less is received on five to ten days in most years.

Normal annual precipitation for the St. Louis area is less than 34 inches. The three winter months are the driest, with an average total of about six inches of precipitation. The spring months of March through May are normally the wettest months with the normal total rainfall of just under 10.5 inches. It is not unusual to have extended dry periods of one to two weeks during the growing season.

Thunderstorms normally occur between 40 to 50 days per year. During any year there are usually a few thunderstorms which are severe and produce large hail and damaging winds.
AIR QUALITY

St. Charles County, being part of the St. Louis Region, has been designated as a moderate non-attainment area for the eight-hour ozone standard by the U.S. Environmental Protection Agency. The EPA has five classifications of non-attainment areas: marginal, moderate, serious, severe, and hazardous. The non-attainment area in Missouri includes Franklin, Jefferson, St. Charles and St. Louis Counties and the city of St. Louis; and in Illinois, Jersey, Madison, Monroe and St. Clair Counties. Under the one-hour ozone standard, Jersey County is a stand alone maintenance area. The eight-hour ozone standard is being implemented nationally because it is a more protective, health-based standard.

Due to the fact that the St. Louis Region is a moderate non-attainment area, Missouri and Illinois will have to submit state implementation plans (SIP) to the EPA by June 15, 2007. The attainment date for the St. Louis Region is June 15, 2010. Current ozone modeling and forecasting indicate that the region will be able to meet the eight-hour ozone standard by 2009. Due to the lower emission from industries and vehicles for the metropolitan area removal of moderate non-attainment status is achievable. The eight-hour ozone standard is a universal standard from the Environmental Protection Agency for all metropolitan areas.

Two ozone monitors are located in St. Charles County. One is located on the Orchard Farm School campus in Orchard Farm and the other in West Alton on Highway 94.

The St. Louis Region also does not meet EPA regulations relating to fine particles (less than 2.5 microns in diameter). Particle matter (PM) is a mix of solid particles and liquid droplets suspended in the air. Fine PM is made up of a variety of components including acids, organic chemicals, metals, dirt, or dust particles. PM can affect human health and is a source of haze which reduces visibility.

New control strategies resulting in additional emissions reductions will likely be necessary to achieve the new national air quality standards. These strategies are currently being formulated by air pollution officials. The St. Louis area is required to be in attainment of the PM 2.5 standard by April 5, 2010.

Air quality in St. Charles County is regulated by the Missouri Department of Natural Resources. Unlike St. Louis County and the city of St. Louis, St. Charles County has opted not to be designated as an authority for their own permit control relating to air pollution.
PRIME AGRICULTURAL AREAS

There are two major distinctly defined areas of prime agricultural lands within St. Charles County. The first is the area between the Mississippi and Missouri Rivers north of Highway 370 and east of Highway 79. The second prime agricultural area is north of the city of O’Fallon between U.S. Highway 61 and Highway 79. Both of the above areas contain viable soils for agricultural production based upon evaluations by National Resource Recovery Service of the Department of Agriculture.

Other areas known for agricultural uses include the Greens Bottom area in the central-southern part of the Golden Triangle directly south of Greens Bottom Road, and the Darst Bottom and Augusta Bottoms areas in the southwestern section of the county. Darst Bottoms adjoins the Katy Trail south of the Defiance and Matson areas, while the Augusta Bottoms area is directly south of Augusta Bottoms Road. All of these prime agricultural areas are depicted on Map N3.

SOILS AND HABITAT

There is a great diversity of plant and animal life due to the variety of climate, soils, and topography. The six major physical habitat communities found in the county are: oak-hickory forest, floodplain forests, sloughs, glades, prairie, and stream and gravel bars.

Major soils groups and major geologic groups are depicted on Maps N4 and N5 respectively.

The alluvium soil is primarily within floodplain areas and precludes most major development. The soil is very good for crop production. Most of the prime agricultural areas within the county are of this soil type.

The best soil for development is loess soil. This soil is good for the foundations of structures and general physical development; however, most of the soils of this type in the county are in areas of significant slopes.
WETLAND AREAS

Wetland areas are located principally along the Mississippi and Missouri Rivers and in various areas of northern St. Charles County east of Highway 79. Areas of wetlands are also found in areas along creeks and lakes throughout the county.

For regulatory purposes under the Clean Water Act, the Environmental Protection Agency defines the term wetlands as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions”. Wetlands generally include swamps, marshes, bogs and similar areas. Many wetlands are seasonal, they are dry one or more seasons every year, or they may be wet periodically. Even wetlands that appear dry at times for significant parts of the year often provide critical habitat for wildlife adapted to breeding exclusively in these areas. Wetland areas are depicted on Map N6.

VEGETATIVE COVER

St. Charles County primarily has grasslands as vegetative cover. Forested areas are predominately located in the southwestern section of the county, on the north side of the Katy Trail in the Weldon Spring Area, along Highway P east of Flint Hill, and along the St. Charles and Warren County boundary lines north of I-70.

Cropland is located primarily in north St. Charles County, along the west side of Highway 79, and in the Greens Bottom, Darst Bottoms, and Augusta Bottoms areas along the Missouri River. See Map N7 - Vegetative Cover.

MAJOR DRAINAGE AREAS

The impacts of wastewater and storm water runoff are of considerable environmental concern for St. Charles County residents. As more homes are built and more commercial sites are developed, great care must be taken to protect water quality in our watersheds and to reduce storm water damage to property and human life. Map N8 depicts the drainage characteristics of various areas of the county.

Storm water is generated by water running off land and impervious surfaces (streets, rooftops, parking lots, and other hard surfaces). Storm water pollution is caused by many daily activities. Rain and snow melting can pick up oil, fertilizers, pesticides, dirt, and other contaminants as the water flows over the land on its way to streams, creeks, lakes, and rivers. The National Pollution Discharge Elimination System (NPDES) permit program, part of the Federal Clean Water Act, requires governmental agencies to control
water pollution by regulating the potential sources of pollution. The County has prepared a plan to protect the storm water system, known as the municipal separate storm water system (MS4), and the natural water bodies that these sewers flow into, in compliance with state and federal regulations. Currently, the County inspects approximately 100 detention basins per year to insure that they function as they were designed. The County also has an erosion and sediment control ordinance that regulates development by requiring measures to be accomplished on land disturbances of 5,000 square feet or more which will control runoff and soil erosion. The County also inspects on a regular basis to insure compliance.

The Missouri Department of Natural Resources 303d List of Impaired Streams was updated by the Clean Water Commission on April 30, 2007. Dardenne Creek is still listed as having sediment as a pollutant.

The 303d List removed Peruque Creek (sediment), Femme Osage (mercury), Lake St. Louise (fecal coliform bacteria), and some Missouri River segments (chlordane and PCB’s). There is local concern that removal of Peruque Creek from the list is premature. The data utilized for its removal is from 2002, and no recent data is available to warrant its removal.

**SCENIC VIEW SHEDS**

The Highway 94 corridor between U.S. Highway 40-61 and the Warren County line contains a unique set of scenic features. In a study prepared in May 2002 by a consultant, Horner & Shifrin, Inc., approximately 30 scenic vistas or view sheds were identified along this 21-mile section of highway.

The special scenic qualities embodied within this corridor include hilly topography, water features, woodlands, floodplains, and bluffs framing a largely agricultural and open landscape. Unique cultural, recreational and historic features of the area include the KATY Trail, Klondike Park, the August A. Busch Wildlife Area, major wineries, bed and breakfasts, antique shops, restaurants and historic sites.

**ENVIRONMENTAL DEVELOPMENT RESTRAINTS**

Development constraints in St. Charles County include areas within the 100-year floodplain, wetlands, extreme slopes and soils not conducive for septic tank installation. Any structure constructed within the floodplain is mandated by county floodplain regulations to elevate the base floor (including basements) a minimum of one foot above the 100-year flood elevation. Due to the flood elevations in some sections of the county.
being at times 12 feet or greater than site elevations, this regulation restricts intensive development.

Wetlands areas may not be developed. Areas within the floodplain where development and/or agricultural activities have not occurred are subject to a 404 permit review by the Army Corps of Engineers. The 404 permit review process will identify if any of the area proposed for development is within a wetland.

Ground slopes are identified on Map N9. Slopes in excess of 33 percent are generally precluded from development. Certain county requirements also regulate development on such slopes.

Soils which have a high potential for erosion can cause serious problems for some developments. These areas of high soil erosion potential are depicted on Map N10.

For areas not served by sanitary sewers the acceptability of the soil for the installation of septic tanks is a major factor in planning for future development. The installation of a private sewage treatment in the wrong soil type may lead to the contamination of ground water resources. Many of the soils in St. Charles County are either too permeable or too impermeable to allow even distribution of hundreds of gallons of fluid passing through a normal septic system per day.

When a highly permeable soil overlies highly permeable bedrock, the ground water will readily be contaminated. If the soils are clay or plastic, the absorption quality of the soil is very low and resurgence of the effluent on the surface is common.

The surfacing of effluent from a single septic tank does not cause great harm, but when the cumulative effects of numerous houses in a development served by septic tanks are evaluated, surface contamination of water supplies can be severe. Map N11 identifies which soil groups are conducive for septic tank installation. Map N12 depicts the major environmental factors which induce constraints on development within St. Charles County.
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Legend
- Severe
- Moderate
- Slight
- Not rated

Scale: 1 INCH = 3 MILES

St. Louis County

Legend
- Soil Erosion Potential
- Slight
- Moderate
- Severe
- Not rated

Data Source(s):
National Resources Conservation Service, St. Charles County Government

St. Charles County Government, 201 North Second Street, St. Charles, Missouri 63301
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Legend

- 90-100 High Potential For Standard Septic Systems With Few Soil Limitations
- 80-89 Medium Potential
- 70-79 Low Potential
- 60-69 Medium Potential
- 50-59 Low Potential
- 40-49 Very Low Potential For Septic Systems With Greatest Soil Limitations

Scale: 1 INCH = 3 MILES