

# Priority Concerns Scoping Document

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*Chisago County Local Water Management Plan*



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## **ACKNOWLEDGEMENTS**

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## A. INTRODUCTION

### 1. COUNTY PRIMER

**a. County name and county seat** shown on a map of the state of Minnesota (**Attachment 1: Chisago County Location, 2012**)

Table 1: Population trends (US Census Bureau)

Year	Population	Percent Increase
1960	13,419	
1970	17,492	30.4
1980	25,717	47.0
1990	30,521	18.7
2000	41,101	34.7
2010	53,887	31.1

The Minnesota Planning State Demographic Center projects that by 2030 the population of Chisago County will be 69,540. This represents a 29% increase over 2010. This will accelerate development pressures.

The St. Croix Watershed Research Station Fact Sheet “Changes in phosphorus loading in the Sunrise River watershed from projected population increases” (**Attachment 2: Sunrise Population Change Fact Sheet, 2012**) makes the following observations:

The population within the Sunrise River watershed totaled about 66,000 as of about 2005 (2000-10 average). Data from the state demographer’s office and the Metropolitan Council indicate that population could rise to 103,000 by 2020 and to 120,000 by 2030. Developed land area (urban and rural residential) would increase from 16% (current) to 24% (2030) of the watershed area, surpassing agricultural growth. Most of the watershed area, however, would remain as other land uses such as forest, grassland, wetland, and open water.

#### **b. Dominant land use and projected trends.**

A great majority of the land in Chisago County remains largely undeveloped, primarily in agricultural use, woodlands or wetlands. The majority of development has occurred in the southwest, along I-35 on the western side of the county, along Highway 8, and the Northern (Rush City) Lakes area. (**Attachment 3: Land Use Land Cover, 1990’s**)

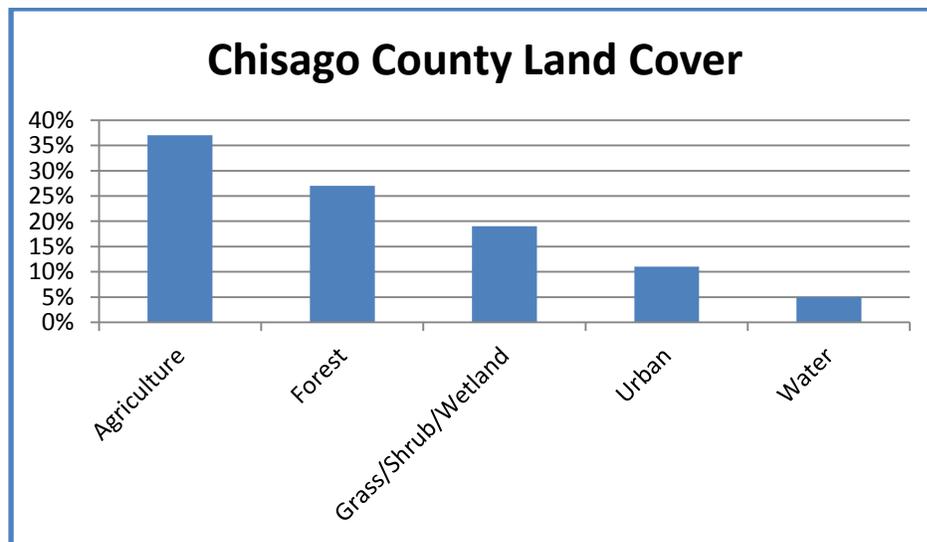
There is currently a downturn in the housing market. It is anticipated that it will be a number of years before the housing market recovers.

State owned land accounts for a significant portion of the County: Carlos Avery Wildlife Management Area, Wild River State Park, Interstate Park, and Chengwatana State Forest total over 15,500 acres.

Chisago County statistics (University of Minnesota 2000 Chisago County Land Cover and Impervious Surface Area) shows the following percentages of land use:

Table 2

<b>Chisago County Land Cover</b>	<b>Acres</b>	<b>Percent</b>
<b>Agriculture</b>	105,500	37%
<b>Forest</b>	77,100	27%
<b>Grass/Shrub/Wetland</b>	54,200	19%
<b>Water</b>	14,500	5%
<b>Urban</b>	31,800	11%
<b>Total</b>	<b>283,100</b>	<b>100%</b>



Chisago County is rich in water resources. (**Attachment 4: Chisago County Public Waters, 2011**). Public waters are designated as such to indicate which lakes, wetlands, and watercourses over which DNR Waters has regulatory jurisdiction. The statutory definition of public waters includes public waters and public waters wetlands.

Chisago County is almost entirely included within the St. Croix River watershed. Chisago County can be divided into multiple subwatersheds – Rock Creek, Rush Creek, Goose Creek, Sunrise River, Lawrence Creek, and direct drainage.

**(Attachment 5: Chisago County Watersheds, 2012).** Runoff from Chisago County contributes to water quality concerns in the St. Croix River.

The Sunrise River in east-central Minnesota is an altered watershed and river system that has many identified impairments for water quality and aquatic biota. While the majority of the watershed is in Chisago County, portions of the watershed are in Isanti, Anoka, and Washington Counties. The Sunrise River is one of the most significant contributors of phosphorus and sediment to the St. Croix River. In fall 2007, a joint multi-agency effort was initiated to perform a detailed watershed study of aquatic resources of the Sunrise River Basin. The primary partners are the US Army Corps of Engineers, Minnesota Pollution Control Agency, and Chisago County.

The objective of the Sunrise River Watershed Study is to prepare a plan for watershed management that provides the technical basis for future management of aquatic resources. Key issues to be evaluated include water quality, nutrient and sediment loading, stream stability and erosion, aquatic habitat conditions, and management of wetland resources. The study includes evaluation of how land use and projected future population growth influences these key resource issues, how future land use might be better managed, and the potential economic cost for such management actions. The results will be used to guide management decisions that will benefit not only the Sunrise River, but also the downstream St. Croix River.

## 2. PLAN INFORMATION

### a. Identify the LGU responsible for the local water management plan/program

The Chisago County Board of Commissioners adopted Resolution No. 11/1019-1 – **Authorization to revise and update the Chisago County Comprehensive Water Management Plan** on October 19, 2011. **(Attachment 6: Resolution to Update, 2011)** This resolution is authorized under Minnesota Statutes, Chapter 103B.301, the Comprehensive Local Water Management Act.

The resolution states that the Chisago County Board of Commissioners delegates the Environmental Services/Zoning Department the responsibility of coordinating, assembling, writing and implementing the revised local water management plan pursuant to M.S. 103B.301 as implemented through the Water Plan Policy Team (Policy Team).

The Policy Team consists of five citizen members (appointed by the Chisago County Board of Commissioners), one supervisor from the Chisago Soil & Water Conservation District, one County Commissioner, and the Director of Chisago County Zoning/Environmental Services. In addition, the Policy Team is supported by the Technical Advisory Team which is made up of representatives from Chisago County Public Health, Chisago Soil & Water Conservation District, Comfort Lake

Forest Lake Watershed District, Minnesota Board of Water & Soil Resources, Minnesota Department of Natural Resources, and the Natural Resources Conservation Service.

Water Plan administration and Policy Team coordination is coordinated by the Chisago County Water Resource Manager.

The resolution states that the Policy Team shall coordinate its effort in the revision and update of the Water Plan with all local units of government within Chisago County along with the state review agencies.

The resolution states that the Policy Team shall incorporate, where appropriate, any existing plans and rules which have been developed and adopted by watershed districts having jurisdiction wholly or partly within Chisago County into the Water Plan.

**b. Local water management plan adoption dates** and the number of times it has been updated.

First Chisago County Water Plan Adopted – January 19, 1993

First Update 1998 – 2002

Second Update 2006 - 2011

Amendment August 27, 2009

Amendment 2010 to 2013 – March 4, 2010

**c. Expiration date of the current plan**

September 27, 2013

## B. LIST OF PRIORITY CONCERNS

### 1. PROTECT QUALITY AND QUANTITY OF GROUND WATER

**A Priority Concern is to protect the quality and quantity of ground water used for drinking water.**

#### a. Summary

- 100% of drinking water in Chisago County is from ground water.
- All community water supplies use ground water.
- Overall ground water quality in Chisago County is high.
- Studies have shown significant ground water/surface water interaction making ground water vulnerable to pollution.
- Sensitive areas identified in the county include:
  - (1) Mount Simon Hinckley aquifer
  - (2) Wellhead Protection Areas
  - (3) Areas identified as highly sensitive to pollution in the Chisago County Hydrogeologic Atlas

#### b. Chisago County Geologic Atlas

Water, both surface water and groundwater, is one of the most precious resources in Chisago County. It nourishes communities, maintains crops, offers recreational opportunity, provides aesthetic beauty, and sustains life. Groundwater provides drinking water to all of Chisago County. However, groundwater and surface water are not separate resources. Groundwater discharge typically provides base flow to streams and rivers. In some settings, as in areas of Chisago County, surface water lakes and wetlands provide recharge to groundwater. Effective land and water management requires an understanding of the interaction between groundwater and surface water. (**Attachment 8: Chisago County Hydrogeologic Atlas Preliminary Findings June, 2012**).

In order to better understand the geology and ground water resources of Chisago County the Chisago County Geologic Atlas is currently under development with an anticipated completion date of winter 2012-13. This is a cooperative project of the Minnesota Department of Natural Resources, Minnesota Geological Survey and Chisago County. The Chisago County Geologic Atlas is a systematic study of the county's geologic and groundwater resources. Geologic mapping (Part A), conducted by the Minnesota Geologic Survey was published in 2010. Groundwater resource evaluation (Part B) is currently being conducted by the Minnesota Department of Natural Resources, Division of Waters. The Part B atlas for Chisago County is

expected to be published in winter 2012-13. (**Attachment 7: Project Update Chisago County Geologic Atlas, 2012**)

The maps, databases, and other information in an atlas are being used by counties and other levels of government in planning and environmental protection efforts. Atlases support good decision making for permit applications, land management planning, and the use and protection of natural resources. Examples of programs that benefit from atlas information include water planning, wellhead protection, lake management, site assessments such as septic assessments, and land use/development planning. Atlases are additionally used by consultants, engineering firms, educators and the public.

Below is a preliminary findings summary of Part B, Hydrogeology and Pollution Sensitivity of the Chisago County Geologic Atlas (**Attachment 8: Chisago County Hydrogeologic Atlas Preliminary Findings June, 2012**). Also provided was a map of the bedrock aquifers in Chisago County including the Mt. Simon and Hinckley aquifers (**Attachment 9: Chisago County Bedrock Aquifers, 2012**). The approach to near surface sensitivity to pollution is being reviewed and once complete, maps showing sensitivity to pollution will be developed.

Groundwater is generally extracted from two different geologic settings that exist across the county. Wells typically either penetrate saturated sand and gravel units referred to as sand and gravel aquifers or penetrate deeper saturated bedrock units that are referred to as bedrock aquifers.

The following communities extract water from bedrock aquifers (information provided by the Minnesota Department of Health) as of June 11, 2012.

Community Public Water Supplies within Chisago County	
	Population Served
Center City	629
Chisago City	3,800
Harris	378
Lindstrom	4,442
North Branch	6,145
Rush City	3,072
Stacy	1,357
Shafer	861
Taylor Falls	976
<u>Wyoming</u>	<u>3,540</u>
Total	25,200

Community Public Water Supplies within Sunrise River watershed

	Population Served
Columbus	35
East Bethel	105
Forest Lake	9,621
<u>Scandia</u>	<u>35</u>
Total	9,796

No record of having a community public water supply

Almelund  
Ham Lake  
Linwood Township

The high water yield demanded by municipalities often requires them to construct wells in deeper bedrock aquifers. In general, the added distance from the surface to these aquifers can provide the end user with an aquifer less susceptible to contamination from human activities.

Groundwater residence time is defined as the approximate time that has elapsed from the time the water infiltrated the land surface to the time when it was pumped from the aquifer. In general, short residence times suggest higher pollution sensitivity and long residence times suggest lower sensitivity.

### **c. Wellhead Protection/Drinking Water Protection**

Wellhead protection is a method of preventing contamination of a public water supply well by effectively managing potential contaminant sources in the area which contributes water to a public water supply well. The primary goal of Wellhead Protection is to protect public health.

A very clear benefit of Wellhead Protection is the emphasis on the prevention of drinking water contamination versus the remediation of a contaminated drinking water supply well. The cost of prevention is much less than the cost of remediation.

Wellhead Protection is mandated under the Federal Safe Drinking Water Act for public water suppliers. The Minnesota Department of Health has overall statutory authority over Wellhead Protection as granted through the Minnesota Groundwater Protection Act. Wellhead Protection is science based and identifies the water source along with vulnerability to contamination threats. The resultant plan identifies specific activities designed to protect the aquifer/water source. These activities can include groundwater education, land use planning, best management practices, and abandoned well sealing. Plan implementation is required and not optional.

Minnesota Department of Health will audit efforts. Financial support is available to communities to support Wellhead Protection activities.

All public water suppliers in Chisago County are required to implement Wellhead Protection measures. Many communities in Chisago County and the greater Sunrise River watershed are at various points in the process to develop Wellhead Protection Plans. Rush City, Harris, Lindstrom, Center City, Taylors Falls, Forest Lake and Hazelden Foundation have completed Wellhead Protection Plans. North Branch Stacy, Wyoming, Chisago City and Shafer are in progress. (**Attachment 10: Wellhead Protection Areas, 2012**)

#### **d. Chisago County Water Use Appropriation Permits**

A Water Use (appropriation) permit from Minnesota Department of Natural Resources Waters is required for all users withdrawing more than 10,000 gallons of water per day or 1 million gallons per year, Surface or Groundwater. (**Attachment 11: DNR Water Use Appropriation Permits, 2012**) All active water appropriation permit holders are required to measure monthly water use with an approved measuring device to an accuracy of 10 percent and report water use yearly.

There are several exemptions to water appropriation permit requirements:

- Domestic uses serving less than 25 persons for general residential purposes,
- Test pumping of a ground water source,
- Reuse of water already authorized by a permit (e.g. water purchased from a municipal water system, or
- Certain agricultural drainage systems

#### **e. Well interference resolution process**

Most well interference problems tend to be localized and short in duration, but being without water is a major inconvenience and can cause damage to well pumps. Some problems can be resolved by lowering the pump in the well or installing a new well pump.

Minnesota Statutes 103G.261 established domestic water use as the highest priority of the state's water when supplies are limited.

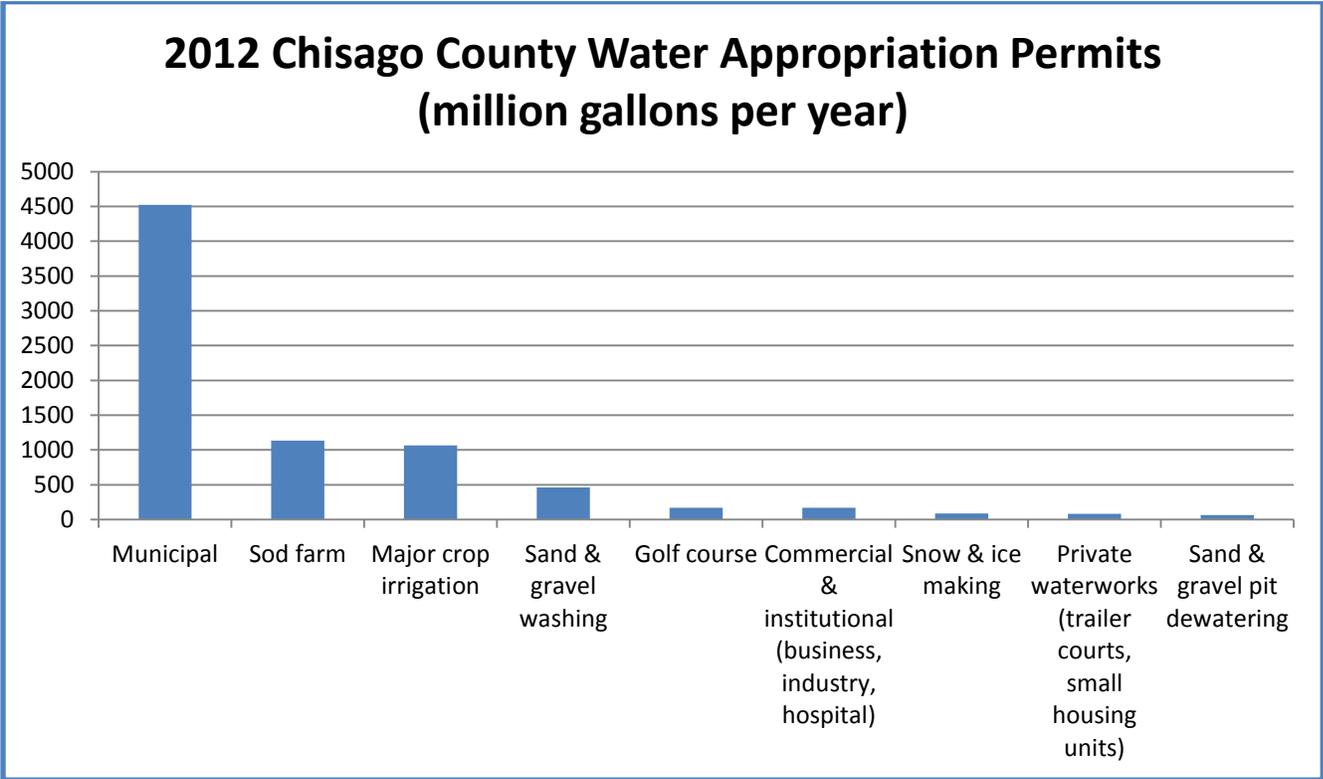
1. first priority, domestic water supply, excluding industrial and commercial uses of municipal water supply, and use for power production that meets the contingency planning provisions of section 103G.285, subdivision 6;
2. second priority, a use of water that involves consumption of less than 10,000 gallons of water per day;
3. third priority, agricultural irrigation, and processing of agricultural products involving consumption in excess of 10,000 gallons per day;
4. fourth priority, power production in excess of the use provided for in the contingency plan developed under section 103G.285, subdivision 6;

- 5. fifth priority, uses, other than agricultural irrigation, processing of agricultural products, and power production, involving consumption in excess of 10,000 gallons per day; and
- 6. sixth priority, nonessential uses.

**f. Ground Water Level Monitoring Program**

Since 1944, DNR Waters has managed a statewide network of water level observation wells to collect baseline data on ground water level fluctuations and trends. Data from these wells are used to assess ground water resources, determine long term trends, interpret impacts of pumping and climate, plan for water conservation, evaluate water conflicts, and otherwise manage the water resource.

The following is a summary of the 2012 Chisago County water appropriation permits (**Attachment 12: Chisago County Appropriation Permits, 2012**). The information is provided in million gallons per year. The primary permitted use is for municipal water supplies. This is followed by agricultural production and sod farming. Smaller amounts of water are appropriated for sand and gravel washing, golf course irrigation, commercial and industrial, snow and ice making, private water works, and sand & gravel pit dewatering.



The above chart shows the amount of water permitted. It does not, however, show actual water usage which is typically less than the permitted amount.



## 2. AQUATIC INVASIVE SPECIES

**A Priority Concern is the introduction or spread of aquatic invasive species and the negative effect on water quality, navigation, recreation and fisheries.**

### a. Summary

- Curlyleaf Pondweed and carp are common in lakes throughout the county.
- Eurasian Water Milfoil is common in most of the larger lakes.
- New invasive species including Zebra Mussels and Spiny Water Flea are in the St. Croix River and Mille Lacs Lake.
- All of these aquatic invasive species have a negative effect on aquatic ecosystems.
- Once established aquatic invasive species are difficult or impossible to control.

Aquatic invasive species pose an ever increasing threat to the health of Chisago County water resources. Aquatic invasive species can be plants, animals, or diseases that are not native to Minnesota. Invasive aquatic plants are introduced non-native plant species that have adapted to living in, on, or next to water. They can grow either submerged or partially submerged in water. Invasive aquatic animals require an aquatic habitat for at least part of their life cycle, but do not necessarily need to live entirely in water.

Aquatic invasive plants and animals threaten native species and aquatic ecosystems; interfere with municipal, commercial, and agricultural water supply and distribution; and impair water recreation activities. In their native environments, aquatic invasive species populations are typically held in check and controlled by predators, parasites, pathogens, or competitors. However, when they are transported to a new environment, the natural checks are usually left behind. This gives invasive plants and animals an advantage over native species and makes them very difficult to control.

Prevention is the key. It is much less costly to prevent an introduction than to eradicate and already introduced species. In most cases it is impossible to eradicate a species once introduced.

There are several aquatic invasive species that are of particular concern to Chisago County lakes & rivers. Depending upon the species aquatic invasives have varying degrees of negative impact on water quality, fisheries/wildlife and recreation (surface use). The following chart illustrates the impact.

Table 3

AQUATIC INVASIVE SPECIES	AREA OF IMPACT (negative)		
	WATER QUALITY	FISHERIES/WILDLIFE	RECREATION (surface use)
Asian Carp (Bighead & Silver)	x	x	x
Common Carp	x	x	
Curly Leaf Pondweed	x		x
Eurasian Water Milfoil		x	x
Flowering Rush			x
Rusty Crayfish	X	x	
Spiny Water Flea	x	x	
Zebra/Quagga Mussel	x	x	x

### b. Aquatic Invasive Species Status

The following statements provide an update on the current status of Aquatic Invasive Species in Chisago County.

- Common Carp and Curly Leaf Pondweed are commonly found in Chisago County lakes & rivers.
- Rusty Crayfish, Spiny Water Flea, Zebra/Quagga Mussels, and Asian Carp have not been found in Chisago County.
- Eurasian Water Milfoil is spreading throughout most of the larger lakes in Chisago County. These lakes include Rush, Fish, North Center, South Center, North Lindstrom, South Lindstrom, Chisago, Green, Little Green, Ellen, and Bone. It is also found in Coon Lake in Anoka County which is part of the greater Sunrise River watershed (**Attachment 13: Aquatic Invasive Species, 2012**)
- Flowering Rush can be found in Forest Lake which is in the Sunrise River watershed.

### 3. NONCOMPLIANT SEPTIC SYSTEMS

**A Priority Concern is septic systems which are failing, noncompliant or an imminent threat to public health.**

#### a. Summary

- Chisago County leads the state in identification and upgrade of Imminent Health Threat Septic Systems
- Numerous septic systems in the shoreland zone are non-compliant or failing systems.
- Failing systems pollute ground water that is hydrologically connected to surface water.
- It is estimated that 30% of all systems fail to protect ground water.

Chisago County has been a statewide leader in septic repair and replacement since 2005, when a Pilot Program was conducted to find all systems that were determined to be an imminent threat to public health. Chisago County Environmental Services staff walked 4,752 properties under the County's jurisdiction and found 429 systems that were imminent public health threats – or 9% of all systems. **All** systems have since been replaced.

Chisago County received a Certificate of Achievement from the Commissioner of the Minnesota Pollution Control Agency for the accomplishments completed as part of the Pilot Program.

In the years 2005 – 2011, Chisago County conducted 1,175 inspections to determine the compliance of individual septic systems. Of those inspections, 65% of the systems were compliant – meeting State and County regulations, and 35% were noncompliant. Noncompliant systems are either an imminent threat to public health (surfacing to the ground or directly into surface water) or failing to protect groundwater by not meeting the required separation distance between the septage and groundwater.

With a noncompliance rate of 35% of all systems inspected, much work remains to be done in order to lessen the impact to water quality from failing septic systems. According to the County's septic ordinance, any septic system that fails a compliance inspection must be replaced. The most pressing need in order to assist with the replacement of noncompliant systems is funding to assist homeowners.

During the Pilot Program it was discovered that many residents need assistance in funding the replacement of their systems. Environmental Services staff developed, and the County Board approved, a county septic loan program. Over 30 loans have been approved since the inception of this program.

In 2010, the County received additional grant funding to assist low income homeowners with septic replacement. All those funds have been spent. An additional grant was awarded to conduct compliance inspections and assist with septic pumping fees in shoreland areas under the County's jurisdiction. To date, over 200 property owners have taken advantage of this program. Clean Water Legacy funding will continue to be sought for this purpose.

#### **b. County Emphasis**

The County's emphasis in conducting inspections and replacing septic systems is due to the following primary reasons:

- All of the drinking water in the County comes from ground water. Septic systems that are not meeting current standards for operation can contaminate ground water with pollutants that are harmful to public health, particularly fecal coliform, which causes illness to both humans and animals.
- Many of the lakes in the County have been placed on the impaired waters list. Septic systems which do not meet State standards can leach septage that will directly pollute surface water, or through a ground water to surface water connection, thus contributing to the impairment of the water body.
- Chisago County's mission is to protect the health, safety and welfare of the public. It is essential that the County continue to work toward the repair and replacement of septic systems to fulfill that mission. Providing financial assistance to homeowners through State grants or the County's septic loan program is a key factor in the success of that mission. Additional funding is needed to assist homeowners with the repair or replacement of their septic systems. The need far outweighs the funding available at this time.

## 4. LAND USE PRACTICES

**A Priority Concern is the influence of agricultural, rural and urban land use practices on water quality.**

### a. Summary

- Point sources of pollution have largely been controlled through regulation.
- Non-point source pollution is the key remaining source of contamination.
- Agricultural runoff, rural areas, and urban storm water systems are significant sources of non-point pollution.
- Chisago County tributaries are major sources of nutrient and sediment loads to the St. Croix River.
- Work is underway in Chisago County to address non-point pollution.
  - Total Maximum Daily Load studies and implementation plans (protection and restoration plans)
  - Sunrise River Watershed Study
  - Rural and urban retrofit assessments
- Gullies and stream bank erosion are significant sources of nutrient and sediment pollution.
- Chisago County has lost approximately 36% of pre-settlement wetlands.
- The majority of shoreland in Chisago County has been developed.
- Drainage ditches can be a source of sediment from eroding ditch banks and can also quickly transport sediment and pollutants from agricultural and urban runoff to surface waters.

Chisago County's lakes, rivers, forests and farms all depend on the replenishing waters of annual precipitation. However, when rain falls on land and impervious surfaces such as paved streets, parking lots and building rooftops it can wash away soil and sediments. Stormwater runoff, or snow melt, can change both water quality and quantity affecting our water resources physically, chemically, and biologically. Polluted runoff containing oil, grease, chemicals, nutrients, metals, litter and pathogens for example, can severely reduce water quality.

New and existing development increases impervious surfaces, which alters natural drainage features, increases peak discharge rates and volumes, and reduces recharge to maintain wetlands and baseflows in streams. Development also results in corresponding increases in the concentration and types of pollutant loading including nutrients, solids, metals, salt, pathogens, pesticides and hydrocarbons.

A recent study of lakes in north-central Minnesota reveals water clarity is the most important factor in determining lakeshore property values, giving property owners

and elected officials firm economic reasons to think about land use and development ordinances.

Removing trees, native plants and aquatic vegetation in front of lake property, mowing down to the water, and heavy fertilizing might increase property value in the short term. But such changes by too many owners will eventually alter a lake's ecology, degrade its water and diminish property values.

Some major concerns relating to surface water quality and drainage are erosion control, current drainage practices and regulations, and chemical pollution and sedimentation from runoff. Non-point source pollutants can be traced to three primary sources – agriculture, rural and urban.

The St. Croix Watershed Research Station Fact Sheet “Changes in phosphorus loading in the Sunrise River watershed from projected population increases” (**Attachment 2: Sunrise Population Change Fact Sheet, 2012**) makes the following observations:

Most of the phosphorus appears to come from nonpoint sources, namely agriculture and developed (urban and residential) land uses. Under conventional agriculture and urban settings as modeled in the Soil and Water Assessment Tool, agriculture will remain the dominant source of phosphorus even though the area of developed land will exceed farm land by 2030. The model calculated similarly high phosphorus yields (load per unit area) for agricultural and urban land, but rural residential land yielded much less.

## **b. Chisago County Impaired Waters**

The federal Clean Water Act requires states to adopt water quality standards to protect the nation's waters. These standards define how much of a pollutant can be in surface or ground water while still allowing it to meet its designated uses, such as for drinking water, fishing, swimming, irrigation, or industrial purposes. Many of Minnesota's water resources cannot currently meet their designated uses because of pollution problems from a combination of point and nonpoint sources.

Chisago County places a high priority on addressing impaired waters and plans to fully participate in the development of total maximum daily load (TMDL) pollutant allocations and implementation of TMDLs for impaired waters. A list of impaired waters and types of impairments can be found in (**Attachment 14: MPCA Comments Chisago County Water Plan, 2012**) (**Attachment 15: Chisago County Impaired Waters, 2012**). Pollutants causing the impairments can be found in the attachment. Chisago County commits to submit any data it collects to MPCA for use in a more comprehensive assessment of waters in the County.

There are multiple TMDLs in various stages of progress within the St. Croix Basin, Chisago County and the Sunrise River watershed. These include Lake St. Croix (**Attachment 16: Lake St. Croix TMDL, 2011**), Sunrise River, North Branch Sunrise River (**Attachment 17: North Branch Sunrise River TMDL, 2006**), Comfort Lake Forest Lake Watershed District “Six Lake” TMDL (**Attachment 18: Six Lake TMDL, 2009**) and Martin and Typo Lakes TMDL (**Attachment 19: Martin and Typo Lakes TMDL, 2005**). A TMDL study for Rock Creek, RushCreek and Goose Creek is planned to begin in 2012.

### c. Agriculture

Agriculture is a contributor of non-point source pollutions. This can occur as a result of intensive land cultivation and husbandry practices. It can appear in three different forms – soil erosion, agriculture supplements such as nutrients and pesticides, and animal waste products. Each of the sources, when allowed in water bodies, change the aquatic environment by limiting light penetration of the water and resulting in the transmission of toxins to area water bodies.

- 65% of agriculture land in Chisago County is planted to either corn or soybeans (2009 United States Department of Agriculture Farm Service Agency records)
- 32% of all cropland in Chisago County had less than 30% residue left on the field after planting (2007 Chisago County tillage transect survey).

The St. Croix Watershed Research Station Fact Sheet “Reductions in phosphorus loading in the Sunrise River watershed from selected agricultural best management practices” (**Attachment 20: Sunrise Agriculture Fact Sheet, 2012**) makes the following observations:

- Agricultural land occupies only 21% of the Sunrise River watershed but delivers 55% of the phosphorus load from uplands to receiving waters, i.e. streams, lakes and wetlands. Too much phosphorus in these waters can degrade water quality because of excessive algal growth.
- Of all the crops, silage corn had the highest phosphorus yield at nearly 4 pounds per acre.
- Even though the phosphorus load reduction from any one Best Management Practice may be modest, in aggregate the reductions could be substantial.

The Minnesota Department of Agriculture provided comments on

1. agricultural drainage, wetlands and water retention;
2. groundwater and surface water protection;
3. manure management and livestock issues;
4. agricultural land management; and
5. targeting of best management practices. (**Attachment 21: MDA Priority Concerns Input, 2012**)

These comments will provide helpful considerations in development of implementation actions.

#### **d. Primary Chisago County farming regions**

(**Attachment 22: Elevational Relief, 2012**)

(**Attachment 23: Chisago County Digital Elevation Model, 2007**)

##### *Anoka Sand Plain*

sandy soils

Concern – wind erosion and ground water contamination.

Priority conservation practices – field wind breaks, conservation tillage, nutrient and pest management (variable rate technology), grassed filter strips.

##### *South East Chisago County*

steep slopes

Concern – surface water pollution by soil erosion due to runoff.

Priority conservation practices – grassed waterways, water and sediment control basins, conservation tillage, contour farming, nutrient & pest management.

##### *East Central and Northern Chisago County*

mainly flat, heavily ditched region

Concern – surface water pollution by soil erosion due to runoff.

Priority conservation practices – conservation tillage, nutrient and pest management (variable rate technology), grassed filter strips, forested riparian buffers along drainage ditches.

##### *Valley area East of Harris and North Branch*

glacial footprint of St. Croix River

Concern – heavy nutrient loading due to type of crops grown, high water table and extensive ditch network

Priority conservation practices – conservation tillage, nutrient and pest management (variable rate technology), grassed filter strips along drainage ditches.

## e. Urban

Urbanized land development generally increases the volume of runoff as well as the concentration of pollutants in the runoff. Many of the lakes in Chisago County have already been widely developed; the Lindstrom, Center City and Chisago City lakes area being a good example. Although it is inevitable that the desire for further development around lakes will continue into the future, it is important to recognize the impacts of development on the surface and ground water quality of the lakes, rivers and wetlands and to prevent further degradation.

The St. Croix Watershed Research Station Fact Sheet “Changes in phosphorus loading in the Sunrise River watershed from projected population increases” (**Attachment 2: Sunrise Population Change Fact Sheet, 2012**) makes the following observations:

- Lakes receiving drainage from urbanizing land will experience the largest increases in phosphorus loads by 2030. Lakes whose phosphorus loads are projected to increase by more than 10% include Comfort, Chisago, North & South Lindstrom, North & South Pools (in Carlos Avery Wildlife Management Area), Green and Forest Lakes.
- Lakes with projected phosphorus load increases below 10% include Bone, Typo, Linn, Sunrise, Martin, Linwood, Kroon, Coon, and North & South Center Lakes.

The St. Croix Watershed Research Station Fact Sheet “Reductions in phosphorus loading in the Sunrise River watershed from changing selected characteristics of developed land” (**Attachment 24: Sunrise Developed Land Fact Sheet, 2012**) makes the following observations:

- Developed land, i.e. urban and rural residential, currently occupies about 16% of the area of the Sunrise River watershed but accounts for about 27% of the non-point source phosphorus load reaching aquatic resources (wetlands, rivers and lakes).
- By the year 2030 developed lands are projected to occupy about 24% of the watershed area and deliver 38% of the non-point phosphorus load.
- Urban high density lands have the highest phosphorus yield of all land use types, exceeding even that of row crop agriculture.
- Urban low density lands have phosphorus yields within the range of agriculture lands.

- Runoff from urban lands can be greatly influenced by the fraction of impervious cover and connected impervious cover which are directly connected to channelized flow paths provided by curbs, gutters and storm sewers.
- Phosphorus loads to the lakes is controlled by more than simply urban high density containing subbasins. In particular, growth of urban low density land in other nearby subbasins is the source of most of the projected increase in phosphorus loads, and these subbasins likewise need mitigation efforts.

## **f. Subwatershed Assessments**

Stormwater runoff poses a significant threat to water resources throughout Chisago County. Stormwater volume and pollutant loads that are carried to receiving water bodies via stormwater infrastructure can have negative effects on water quality and surrounding habitat.

In response to these issues Chisago Soil & Water Conservation District staff conduct stormwater retrofit assessments to identify retrofit opportunities in subwatersheds that are significant contributors to the degradation of lakes and streams. Projects identified as part of the assessment process improve water quality, increase ground water recharge, and reduce stormwater runoff volumes throughout Chisago County.

Urban subwatershed assessments are completed for the developed portions of Center City, Lindstrom, and Chisago City. Rural subwatershed assessments are set to be completed in the rural portions of the Chisago Lakes watershed in 2013. These assessments help guide implementation activities by determining the potential runoff load as well as identify the most logical locations to start with best management practice implementation.

The Chisago City assessment identified projects in 27 subwatersheds that are contributing 50 pounds of phosphorus, 30,500 pounds of total suspended solids, and 34 acre feet of water per year.

The Center City assessment identified projects in 17 subwatersheds that are contributing 65 pounds of phosphorus, 23,700 pounds of total suspended solids, and 76 acre feet of water per year.

The Lindstrom assessment identified projects in 16 subwatersheds that are contributing 68 pounds of phosphorus, 43,000 pounds of total suspended solids, and 39 acre feet of water per year.

Development of subwatershed assessments has begun in other areas of Chisago County including North Branch and Rush City.

## g. Wetlands

A wetland is a land area that is saturated with water, either permanently or seasonally. The primary factor that distinguishes wetlands is the characteristic vegetation that is adapted to its unique soil conditions. Wetlands are made up of hydric soil which supports aquatic plants.

Wetlands serve a variety of functions, such as providing valuable habitat for wildlife, filtering out pollutants and sediment for the protection of downstream water quality in lakes and streams, and attenuating the impacts of floods by storing water during intense rain storms and snow melt. In addition to downstream benefits, wetlands are important resources in and of themselves. Wetlands are considered the most biologically diverse of all ecosystems, serving as home to a wide range of plant and animal life.

It is estimated that Chisago County has lost approximately 36% of the pre-settlement wetlands (Jeffrey P. Anderson and William J. Craig. 1984. Growing energy crops on Minnesota's wetlands: the land use perspective). Properly functioning wetlands trap phosphorus by settling phosphorus containing particles and containing them in the wetland. However, if water levels are lowered in wetlands through artificial drainage, the phosphorus can be released, changing the wetland from a phosphorus trap into a phosphorus source.

The St. Croix Watershed Research Station Fact Sheet "Reductions in phosphorus loading in the Sunrise River watershed from wetland mitigation" (**Attachment 25: Sunrise Wetlands Fact Sheet, 2012**) makes the following observations:

- The loading of phosphorus from our lands to our water resources is commonly the single largest cause of eutrophication, where excess algal growth degrades water quality. Wetlands can play a critical role in reducing phosphorus loading to lakes and streams by trapping runoff water and sediment.
- The Sunrise watershed currently contains many wetlands and there is the potential to create or restore many more, a process commonly called wetland mitigation.
- In general, areas predicted to have the highest phosphorus loads are those with tillage agriculture, urban land use, and low infiltration rates.
- In the Chisago Lakes Lake Improvement District, the landscape is closely connected to the lakes and streams that flow into the lakes. This results in significant loading from all subwatersheds within the Lake Improvement District. However, the extent to which phosphorus landscape inputs contribute

to St. Croix River loading depends on where in the watershed they originate. An estimated 40% of the total watershed phosphorus load is generated by areas in the upper reaches of the Sunrise, upstream of the North Pool (representing about 50% of the total watershed area). However, most all of this phosphorus from the upper watershed region is trapped in wetlands and lakes, including the North and South Pools. The result is only 5% of the total load at the confluence with the St. Croix River is predicted to originate from upstream of the North Pool. As a result, wetland scenarios for St. Croix phosphorus reduction considered only subwatersheds downstream of the North Pool. The pools are located within the Carlos Avery Wildlife Management Area.

- Wetlands trap phosphorus by settling phosphorus containing particles or by accumulating organic matter from plants that have incorporated phosphorus into their biomass. Organic matter accumulates when plant growth exceeds decay. The waterlogged soils of wetlands inhibit decay of organic matter, thereby promoting net accumulation in the wetland. However, if water levels are lowered by wetlands by either drought or artificial drainage, decay of organic matter will accelerate and phosphorus can be released, changing the wetland from a phosphorus trap into a phosphorus source.
- Wetlands play an important role in reducing phosphorus loading to lakes and streams in the Sunrise watershed. The Sunrise Soil and Water Assessment Tool model estimates that existing wetlands reduce phosphorus loading to the St. Croix River and into the Lake Improvement District by 25% and 40% respectively.
- Increasing the number of wetlands in the Sunrise River watershed is predicted to be an effective method to further reduce phosphorus. Results of model simulations show that increasing the extents of wetlands downstream of the North Pool by 25% and 50% would reduce phosphorus loading to the St. Croix River by 9% and 19%, respectively. Likewise, increasing extents of Lake Improvement District wetlands by 25% and 50% reduced phosphorus loading to lakes by 11% and 19%, respectively.
- The potential for wetland mitigation in the Sunrise River watershed to reduce phosphorus loading is considerable. When utilized as part of combined efforts that include agricultural and urban best management practices, the effects could be substantial. It is important to note that wetlands also provide other benefits such as nitrogen and sediment removal, flood attenuation and wildlife habitat. This suite of benefits makes wetland mitigation in the Sunrise River watershed a valuable and viable tool for resource managers.

## **h. Ravines**

In 2011, the Chisago Soil & Water Conservation District received a Clean Water Fund grant from the Minnesota Board of Water and Soil Resources to complete an inventory of the active gully sites along the St. Croix River escarpment. This is from the Wild River State Park entrance near Almelund south to the Chisago/Washington county line. Overall 15 miles of the escarpment was inventoried and a total of 618 gullies were identified through desktop analysis as possibly eroding. Of these, permission was received to field check 494 gullies. 112 were identified as actively eroding. This assessment identified the 36 most severely eroding gullies and estimated that they are contributing 478 tons of sediment and 464 pounds of phosphorus per year to the St. Croix River. Over time, individual gullies will be further assessed and mitigation activities will take place to reduce the negative effect on the St. Croix River.

## **i. Shorelands**

Healthy shorelines support a diverse community of fish and wildlife by providing native vegetation that fulfills habitat needs where land and water meet. Native vegetation provides important water quality functions by slowing and filtering water runoff as it moves to the lake or stream. Shorelines with a diverse mixture of native plants extending inland as well as offshore of the bank are more resilient to wave and ice erosion. Chisago County lakes, streams and wetlands need healthy shorelines to reduce runoff, filter pollutants, and provide important habitat functions that benefit fish and wildlife.

Shorelands are classified in Chisago County as either General Development, Natural Environment, or Recreational Development. (**Attachment 26: Shoreland Classification, 2006**)

## **k. Drainage Ditches**

Drainage ditches can be a source of sediment from eroding ditch banks and can also quickly transport sediment and pollutants from agricultural and urban runoff to surface waters. Buffer strips along drainage ditches help reduce erosion and sedimentation by slowing overland flow, trapping sediment and other pollutants, and holding soil in place along the ditch banks. Reducing erosion and sedimentation also reduces maintenance costs for ditch owners.

Chisago County drainage ditches (**Attachment 27: County Ditches, 2004**) alter natural hydrology by efficiently removing water from poorly drained areas. Peak flows in the drainage system have the potential to cause erosion both in the drainage system and in downstream surface waters. Retaining water within drainage systems can reduce peak flows and the rate of erosion in the drainage system and downstream.

## I. Forests

The following comments, provided by Don Mueller, DNR Forestry, summarizes the value and importance of forests to water quality in Chisago County.

Forest management is a viable practice on public and private lands in Chisago County, particularly in the northern townships. Managed forest land, whether it is conifer plantations or native hardwood forests, will return a healthy financial gain while providing wildlife habitat, recreational opportunities, and help to manage stormwater runoff. Managed forest land places very little demand on county services other than roads. The Water Plan and other county documents acknowledge the value of managed forest lands.

Trees and other natural vegetation are an important tool to manage stormwater runoff in urbanizing sections of the county. Rain gardens and permeable pavement are reasonable alternatives to traditional construction practices to manage and infiltrate surface water flow. Maintaining tree canopy cover is an important tool to intercept and store rainfall as well as break the kinetic energy of falling rain that will dislodge soil particles. Existing native vegetation and mature trees can be incorporated into construction plans. Where native vegetation and mature trees are absent, planning for adequate growth space needs to occur from the very beginning of the planning process. If vegetation is treated as a “nicety” that can be added at the end of the design phase, the functionality of this “necessity” will almost certainly be compromised during the construction process. Foresters, horticulturists, ecologists, and landscape architects who understand plants and soils need to be involved in the early design process for each new project.

## 5. MAKE INFORMED DECISIONS

**A Priority Concern is that citizens and elected officials receive accurate, understandable information to make informed decisions.**

### a. Summary

We all live in a watershed. Whether we know it or not, every resident of Chisago County may contribute to water pollution through everyday activities such as fertilizing our farm fields, throwing litter down storm drains, or not cleaning up after our pets. The resulting stormwater runoff from the surrounding watershed is one of the greatest threats to many of our lakes, ponds, wells, and ground water.

Watershed education is an important tool for protecting and restoring urban, rural and agricultural watersheds. The primary goals of watershed education include increasing community awareness, preserving local water resources, and gradually changing behaviors to reduce the amount of pollutants from stormwater runoff. Education programs may focus outreach on a single behavior on a broad basis, or concentrate their efforts at the subwatershed level. The most effective watershed education programs focus on key pollutants or behaviors, carefully target their audiences, and survey residents to understand their attitudes before designing education campaigns.

Since the passage of the Clean Water Act of 1972, point source pollution in Chisago County (e.g. a pipe dumping discolored or sludge-like liquid into a lake or river) has been dramatically reduced and another form of pollution “non-point source” is the most prominent problem. Non-point source pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human made pollutants, finally depositing them into lakes, rivers, wetlands, and even underground sources of drinking water. Non-point source pollution is now the major source of poor water quality.

Although non-point source pollution is not as easy to pin down as point source pollution, the solution involves many small steps that everyone can take in their day to day lives. The one advantage of this problem is that we have the potential to solve it together on a community level, but how can a community solve this problem if we don't know or understand it exists?

Providing accurate, understandable information is a key part of addressing this question and helping preserve and protect Chisago County waters. Many County agencies, organizations, programs and individuals are working towards protecting and improving our County's shared water resources. Providing accurate, understandable information is a primary tool that we use with citizens and elected officials in order to help them understand how issues like non-point source pollution affect their personal, economic and environmental health. This information is valuable in making informed decisions and prioritizing projects.

When a resource is cheap and readily available, it becomes all too easy to forget our reliance upon it and what we need to do to care for it over time. Accurate, understandable water information can provide Chisago County citizens and elected officials with the knowledge of how they are connected to water, how water connects all life and systems, how water is being used and abused, their own impacts on water, ways water can be improved and the choices available to us to help protect our water. Accurate information can influence people's attitudes about our water resources. By understanding that there are problems with our water and caring about this shared resource, individuals can become empowered to take part in problem solving.

Another key component that influences people's attitudes about water is personal experience. Experience is a basic building block to help people understand how our lakes, rivers, wetlands and ground water work. Education and information without a personal connection is not nearly as effective. Experiential learning is a major component of excellent water education.

Providing accurate, understandable information is a priority in Chisago County because of rapidly increasing growth and development, several of our waterways are listed as impaired, and the influx of aquatic invasive species. Providing accurate, understandable information relates to all of the other Priority Concerns.

There will always be water resource issues that people need to understand and there will always be people suggesting efforts and methods to explain and solve them, but the bottom line is citizens and elected officials need to know, care and act.

Chisago County is fortunate in having considerable high quality water resource information from which citizens and elected officials can make informed decisions. This information includes:

- Chisago County Geologic and Hydrogeologic Atlas
- Chisago County Water Resource Management Plan
- Environmental Connections Newsletter
- Protection and Restoration Plans
- Rural and Urban Assessments
- Sunrise River Watershed Study
- Water Quality Monitoring Reports
- Wellhead Protection Plans

Children and students who have a better understanding of the complexities involved in caring for our water will be better stewards of this precious resource tomorrow. Each year Chisago County hosts the Children's Water Festival. The mission of the Festival is to provide youth and classroom teachers with an innovative, quality, hands-on learning opportunity highlighting the relationship and interdependence of water to all living things. Each year approximately 750 fifth grade students, from all school districts in the County, attend the Festival. 2012 marks the 10<sup>th</sup> anniversary of the Festival. To date, over 6,000 students have attended the Festival and seniors who graduated in 2012 were the first students to attend the Festival in 2003.

## 6. SUFFICIENT RESOURCES

### **A Priority Concern is to obtain sufficient resources to achieve goals established in the Water Plan.**

Chisago County is fortunate in having abundant water resource, both ground and surface water. Unfortunately, these water resources are at risk from many threats. These threats include point and non-point pollution, aquatic invasive species, and over use. Citizens of Chisago County place high value on the importance of preserving and protecting water resources.

The vision of the Chisago County Water Plan is that surface and ground water quality and quantity is preserved, protected and enhanced for current and future generations. Implementation of the goals and objectives of the Water Plan is essential to preserving, protecting, and enhancing Chisago County water resources.

Accomplishing the vision will not be easy. Chisago County is committed to efficiently achieving the goals and objectives in the Water Plan. It is essential that sufficient staff and funding is provided from multiple sources. This can be accomplished through a combination of federal and state grants, along with local resources.



## C. PRIORITY CONCERNS IDENTIFICATION

As part of the Water Plan update process, Chisago County wishes to encourage civic engagement to help determine water priorities along with deciding on appropriate action steps to address the priorities. Civic engagement can be defined as making decisions and taking collective action on public issues through processes of public discussion, reflection and collaboration. Civic engagement actions are intended to model a new way of engaging citizens that can inform the Water Plan.

### 1. STATE AND LOCAL AGENCY PARTICIPATION

In early March, 2012 a Notice of Chisago County Water Plan Update was sent to local government units located wholly or partially within Chisago County, adjacent Counties, and state review agencies (**Attachment 28: Notice of Chisago Water Plan Update, 2012**). As part of the Notice an electronic link was provided showing the location of the current Water Plan on the Chisago County web site. An invitation was included for all recipients to submit Priority Concerns they wish to see the Water Plan address. In addition a brief survey was included (**Attachment 29: Survey Chisago County Water Plan Priorities, 2012**). The Notice and survey were sent to all the organizations required by statute (**Attachment 30: Contacts Notice of Chisago County Water Plan Update, 2012**). To fulfill a statutory requirement the Notice was sent through the US Postal Service. The results of the surveys were tabulated into a matrix (**Attachment 31: Chisago County Priority Concerns Matrix, 2012**). Information in the matrix was organized by major watersheds. The information in the spreadsheet was considered when developing the Priority Concerns.

### 2. POLICY TEAM MEMBER CONTACTS & ASSIGNMENTS

In order to increase participation and input in developing the Priority Concerns the Policy Team agreed to make person to person contact with many state and local organizations. Members of the Water Plan Policy Team, along with members of the Technical Advisory Team made direct contact with associated organizations throughout the County and State. The Policy Team asked the contacts to fill out a brief survey (**Attachment 32: Policy Team Members Contacts and Assignments, 2012**). The results of the surveys were tabulated into a matrix (**Attachment 31: Chisago County Priority Concerns Matrix, 2012**). Information in the matrix was organized by major watersheds. The information in the spreadsheet was considered when developing the Priority Concerns.

Direct contact and surveys were requested from the following organizations:

- Anoka Conservation District
- Center City
- Center Lakes Association
- Chisago City
- Chisago County Board of Commissioners
- Chisago County Public Health
- Chisago County Association of Townships
- Chisago County Zoning/Environmental Services
- Chisago Lakes Joint Sewage Treatment Commission
- Chisago Lakes Lake Improvement District
- Chisago Lindstrom Lake Association
- Chisago Soil & Water Conservation District Supervisors
- Comfort Lake Forest Lake Watershed District
- Farm Bureau
- Farmers Union
- Friends of the Sunrise River
- Goose Lake Association
- Green Lake Association
- Harris
- Isanti Soil & Water Conservation District
- Lindstrom
- Minnesota Board of Water & Soil Resources
- Minnesota Department of Natural Resources
- Minnesota Pollution Control Agency
- Natural Resource Conservation Service
- North Branch
- PICKM Alliance of lake & river associations
- Pine County Soil & Water Conservation District
- Rush City
- Rush Lake Improvement Association
- Shafer
- St. Croix Basin Water Resources Planning Team
- Stacy
- Sunrise Watershed Management Organization
- Taylors Falls
- US Army Corps of Engineers
- Washington Conservation District
- Wyoming

### 3. CITIZEN SURVEYS

Three surveys were conducted to gather input from citizens about their values and perceptions of area lakes and rivers. This information was then used to help develop the Priority Concerns.

#### a. Sunrise River Watershed Survey

This survey was conducted in spring 2008. Information on the Sunrise River Watershed was presented in the county Environmental Connections Newsletter. Citizens were then given the opportunity to take a brief on-line survey. 43 citizens took the survey. (**Attachment 33: Sunrise River Watershed Survey, 2008**)

#### b. Countywide Survey

This survey was conducted in spring 2012. Information on County lakes, rivers and watersheds was presented in the County Environmental Connections Newsletter. Citizens were then given the opportunity to take a brief on-line survey. 23 citizens took the survey. (**Attachment 34: Countywide Survey, 2012**)

#### c. Center Lakes Association Survey

This survey was conducted in spring 2012. Information on North and South Center Lakes was presented at the 2012 Center Lakes Association annual meeting. Members were then given the opportunity to take a brief hard copy survey. 18 lake association members took the survey. (**Attachment 35: Center Lakes Association Survey, 2012**)

Survey responses were relatively consistent across the three surveys. A brief description of the results follows.

The question was asked – What do you enjoy most about your nearby lake, river or stream?

- The top 5 responses in the Sunrise River Watershed Survey were scenic value, wildlife, quality of life, canoeing and fishing.
- The top 5 responses in the Countywide Survey were scenic value, wildlife, quality of life, fishing and boating.
- The top 5 results in the Center Lakes Association survey were scenic value, boating, fishing, wildlife and quality of life.

The question was asked – What is your biggest concern for your lake, river or stream?

- The top 10 responses in the Sunrise River Watershed Survey were phosphorus or other nutrients, new development impacts, erosion/sedimentation, animal or human health issues, litter/garbage, toxic pollutants, runoff from streets/sidewalks or driveways, invasive aquatic weeds, road salt, and human health swimming/fishing.

- The top 10 responses in the Countywide survey was phosphorus or other nutrients, invasive aquatic weeds, runoff from streets/sidewalks/driveways, litter/garbage, water clarity, erosion/sedimentation, bacteria, contaminated fish, new development impacts, and road salt.
- The top 10 responses from the Center Lakes Association was invasive aquatic weeds, invasive fish, phosphorus or other nutrients, water clarity, poor fishing, runoff from streets/sidewalks/driveways, erosion/sedimentation, toxic pollutants, contaminated fish, and bacteria.

The question was asked – Has the condition of your lake, river or stream changed over time? The large majority of results from the Sunrise River Watershed and Center Lakes surveys identified “Has gotten worse” as the number 1 response. The Countywide survey identified “Has gotten worse” and “Hasn’t changed” equally as the number 1 response. A small minority of all three surveys identified “Has gotten better” as the response.

The question was asked – How do you perceive the current condition of your lake, river or stream? A small minority of all three surveys identified “Excellent” as the response. When the results of all three surveys were combined, the responses were somewhat evenly split between “Good, Fair and Poor”.

The question was asked – How willing are you to make simple changes on your property that will improve the quality of your lake, stream or river? When the results of all three surveys were combined the large majority of responses listed “Very willing, even if it costs me money”. A smaller number of responses listed “Moderately willing, I’ll help if I can get financial assistance or other types of help”. There were very few responses for “Not very willing – the lake, river or stream is not very important to me.”

#### **4. PUBLIC MEETINGS**

Presentations on the Water Plan update were provided to the Chisago County Association of Township Officials on February 29 and to the Friends of the Sunrise River on April 26. At both presentations, comments were requested on the developing Priority Concerns.

Water Plan Policy Team meetings are open to the public. On the following dates, a large portion of the meetings focused on updating the Water Plan.

October 10, 2012	March 12, 2012
December 12, 2012	April 9, 2012
January 9, 2012	May 14, 2012
February 13, 2012	July 9, 2012

## D. PRIORITY CONCERNS SELECTION

### 1. SELECTION

#### **Describe how the priority concerns were chosen**

As part of the update process, Chisago County chose to encourage civic engagement to help determine priorities along with deciding on appropriate action steps to address the priorities. Civic engagement can be defined as making decisions and taking collective action on public issues through processes of public discussion, reflection and collaboration.

Civic engagement produces better defined priorities, increased buy-in of action steps, more successful outcomes, and a sense of public ownership of not just the Water Plan but actual water quality improvements.

The Priority Concerns were chosen by the Water Plan Policy Team over a series of meetings facilitated by staff from the Minnesota Pollution Control Agency.

January 9, 2012: The Water Plan Policy Team developed a shared understanding of the purpose of the Water Plan, reflected on successful planning processes and developed a list of ways to proceed with Water Plan creation. Through a facilitated discussion the Water Plan Policy Team developed the following Vision, Purpose and Mission.

Vision: Surface and ground water quality and quantity in Chisago County is preserved, protected and enhanced for current and future generations.

Purpose: Set County watershed priorities to obtain and use resources in order to protect, improve, and conserve the water resources of Chisago County including lakes, rivers, wetlands, and ground water.

Mission of Water Plan Policy Team: Develop, update and oversee implementation of the Water Plan.

February 13, 2012: The Water Plan Policy Team began the development of Priority Concerns. As part of the process, Policy Team members were requested to contact multiple groups and organizations to gather input on the priorities of these groups and report back to the Policy Team what they learned. (**Attachment 32: Policy Team Members Contacts and Assignments, 2012**). The results of the surveys were tabulated into a matrix (**Attachment 31: Chisago County Priority Concerns Matrix, 2012**).

March 12, 2012: Members of the Water Plan Policy Team began reporting on discussions and surveys with affiliated organizations. The Policy Team decided to form a Technical Advisory Committee made up of state and local agency staff. The purpose of the Technical

Advisory Committee was to hold meetings in between meetings of the Policy Team in order to work through details and provide recommendations to the Policy Team.

April 9, 2012: Members of the Water Plan Policy Team continued to report on discussions and surveys with affiliated organizations. Based on these discussions and surveys, Minnesota Pollution Control Agency staff helped facilitate Policy Team members as they developed draft Priority Concerns.

April 26, 2012: The Technical Advisory Committee met to discuss the draft Priority Concerns and made recommendations for improvement.

May 14, 2012: Draft Priority Concerns were presented to the Water Plan Policy Team. The Priority Concerns listed earlier in this document were unanimously adopted.

## **2. DIFFERENCES**

**Identify any differences between the plan's priority concerns and other state, local and regional concerns and describe the process used to resolve the differences.**

Comments on the Chisago County Water Plan were received by multiple agencies and organizations. There was consistency between state, local, and regional concerns and the Priority Concerns which were adopted. There were no substantial differences and no need to enter into a process to resolve differences.

## **E. PRIORITY CONCERNS NOT ADDRESSED BY THE PLAN**

**Based on the list of priority concerns submitted for consideration, summarize why concerns were not chosen or how they will be incorporated into the concerns that will be addressed by the plan. Provide a brief description of how the concerns not addressed by the plan may be addressed through other efforts or delegated to other partnering entities.**

Throughout the process of determining Priority Concerns there was much consistency between the recommendations received and the Priority Concerns chosen. In many instances commenters went beyond recommending Priority Concerns and began recommending action steps to address the concerns. These action step recommendations will be considered when developing goals and objectives.

There were a few suggestions that three items be included as priorities (1) shorelands, (2) wetlands, and (3) ditch, channel & weir maintenance. These items are important. However, rather than making these individual Priority Concerns, these were incorporated as subcategories under the broader Priority Concern – the influence of agricultural, rural and urban land use practices on water quality.

A small number of commenters made the suggestion that navigation and recreation be included as Priority Concerns. These are not included in the Priority Concerns as they are outside the vision and purpose of the Water Plan.

Vision: Surface and ground water quality and quantity in Chisago County is preserved, protected and enhanced for current and future generations.

Purpose: Set County watershed priorities to obtain and use resources in order to protect, improve, and conserve the water resources of Chisago County including lakes, rivers, wetlands, and ground water.

## **F. ATTACHMENTS**

1. Chisago County Location, 2012
2. Sunrise Population Change Fact Sheet, 2012
3. Land Use Land Cover, 1990's
4. Chisago County Public Waters, 2011
5. Chisago County Watersheds, 2012
6. Resolution to Update, 2011
7. Project Update Chisago County Geologic Atlas, 2012
8. Chisago County Hydrogeologic Atlas Preliminary Findings June, 2012
9. Chisago County Bedrock Aquifers, 2012
10. Wellhead Protection Areas, 2012
11. DNR Water Use Appropriation Permits, 2012
12. Chisago County Appropriation Permits, 2012
13. Aquatic Invasive Species, 2012
14. MPCA Comments Chisago County Water Plan, 2012
15. Chisago County Impaired Waters, 2012
16. Lake St. Croix TMDL, 2011
17. North Branch Sunrise River TMDL, 2006
18. Six Lake TMDL, 2009
19. Martin and Typo Lakes TMDL, 2005
20. Sunrise Agriculture Fact Sheet, 2012
21. MDA Priority Concerns Input, 2012
22. Elevational Relief, 2012
23. Chisago County Digital Elevation Model, 2007
24. Sunrise Developed Land Fact Sheet, 2012
25. Sunrise Wetlands Fact Sheet, 2012
26. Shoreland Classification, 2006
27. County Ditches, 2004
28. Notice of Chisago Water Plan Update, 2012
29. Survey Chisago County Water Plan Priorities, 2012
30. Contacts Notice of Chisago County Water Plan Update, 2012
31. Chisago County Priority Concerns Matrix, 2012
32. Policy Team Members Contacts and Assignments, 2012
33. Sunrise River Watershed Survey, 2008
34. Countywide Survey, 2012
35. Center Lakes Association Survey 2012