Section 3 – Upper Mississippi River Issues and Needs Identification

The needs identification process for the Upper Mississippi River Basin Water Quality Plan consisted of two separate activities to identify the water quality issues facing the Upper Mississippi River Basin. As the Minnesota Pollution Control Agency was beginning the Upper Mississippi River Basin Planning process, the Minnesota Environmental Quality Board completed the revision of the State Water Plan, 

*Watermarks 2000*. The public input meetings on the State Water Plan identified needs and issues for inclusion in the Upper Mississippi River Basin Water Quality Plan.

Additionally, the MPCA conducted stakeholder surveys in four of the five planning areas of the Upper Mississippi River Basin. The issues identified were then used to develop goals and implementation strategies for the Upper Mississippi River Basin Water Quality Plan. The Crow River Watershed Planning Unit also conducted a separate needs identification process, which the MPCA incorporated into this Basin Plan.
Minnesota Planning Agency - Environmental Quality Board
Watermarks 2000 State Water Plan Issue Identification

The Minnesota Planning Agency – Environmental Quality Board (EQB) Watermarks 2000 State Water Plan issue identification process consisted of three meetings in the Upper Mississippi River Basin. One was in Walker to gain perspective on the upper part of the Basin, which is characterized by lakes and forests; a second in Onamia, to focus on the issues of the Rum River watershed and Mille Lacs Lake; and a third in St. Cloud to focus on the North Fork and South Fork of the Crow watersheds, Sauk River watersheds, and the watershed surrounding St. Cloud where agricultural land uses are more dominant. Issues and comments are summarized into the following three categories related to water quality (not expressed in a priority order). The complete report is included in Appendix F.

- Protect and improve water quality in streams.
- Protect and improve lake water quality.
- Prevent degradation of ground water quality and reduce concentrations of contaminants.

Commenter's focused on the need for better monitoring data to improve our ability to determine the condition of the Basin’s surface and ground water quality. A secondary issue was the need for easier access to the monitoring data for water management decision makers, local elected officials, and professional staff in order to make water and land management decisions.

Minnesota Pollution Control Agency’s Upper Mississippi River Basin
Water Quality Planning - Needs Survey

Issue Identification Process

For the UMRB Plan, the MPCA surveyed water professionals, interested citizens, and the MPCA Basin Planning Advisory Committee members using a survey tool developed with the local advisory committees. The Advisory Committee members and survey recipients were asked to list and to prioritize the water quality issues facing surface and ground water in their watershed planning unit. The Crow River Organization of Water (C.R.O.W) conducted a separate survey for the Crow River Watersheds which is discussed later in this document. The MPCA collected additional input in public meetings and from local county water plans. Although not initially identified in the survey process, the Advisory Committees added feedlots as an area of concern.
Upon completion of the issue identification, the input was summarized into issue categories. The committees then scored the issue categories for priority determination; goal and objective creation, and implementation action item development. The ranked issues are divided into water resource type: a) streams and rivers; b) lakes; and c) ground water.

Individual watershed planning unit issues and priorities are discussed separately below by watershed planning unit. In general, the issues were very similar between the watershed planning units and the EQB Watermarks 2000 issue identification. The issues identified in the Upper Mississippi River Headwaters/Main Stem Watersheds Planning Unit also closely correlate to issues identified by the U.S. Environmental Protection Agency of increased risk to streams, rivers, and lakes including: 1) reduction of flows; 2) removal of riparian – streamside vegetation resulting in increased light penetration and sediment loading; 3) discharge of nutrient-rich wastewater; 4) over fertilization of agricultural land; and 5) discharge of untreated storm water from urbanizing areas (USEPA 1999).

For the Upper Mississippi River Basin, the needs identification process resulted in the identification of the following issues: 1) the need for nutrient (phosphorus and nitrogen) standards or measures; 2) the need for more and better access to monitoring data; 3) failing individual sewage treatment systems and other wastewater related issues; 4) the rapid growth and development in the area, with related impacts to lakes due to storm water runoff or urbanization issues; and 5) agricultural impacts on the water quality.

The results of the needs surveys are presented below for the Upper Mississippi Headwaters/Main Stem, Crow Wing – Long Prairie – Red Eye/Leaf River, Sauk River – St. Cloud Area, and Rum River – Mille Lacs Lake Watershed Planning Units. The following discussion presents the top five issues identified for streams and rivers, lakes and ground water in each of the watershed planning units. A complete discussion of the results of the survey, scores, and rankings is included in Appendix G.

**The Upper Mississippi River Headwaters/Main Stem Watersheds Planning Unit Issue Identification Process**

The top five issues identified in the Upper Mississippi River Headwaters/Main Stem Watersheds Planning Unit are listed below for each of the water body types – streams and rivers, lakes, and ground water (Table 3).

The top priority identified in the Upper Mississippi River Headwaters/Main Stem Watershed Planning Unit for ground water, rivers and lakes is the need for more monitoring, inventories, and water quality data for making management decisions. In general, the known water quality for the streams, rivers, lakes and ground water is very good. However, the number of monitored water bodies is very low. For example, in Cass County only 73 of 308 lakes (approximately
24 percent) have been monitored or assessed. For Hubbard County, the percentage is higher with 60 of 147 lakes (about 40 percent) having been assessed. In Crow Wing County, 53 of 312 (approximately 17 percent) of the lakes have been assessed. The percentages of assessed lakes in Cass and Crow Wing Counties are similar to those for other counties with a significant number of lakes in the Upper Mississippi River Basin.

The second issue ranked is a high priority for all three water types (ground water, rivers and lakes) relates to individual sewage treatment systems (ISTS): the need to upgrade failing systems; the impacts of ISTS drainfields on water resources: the management of septage; and the use of ISTS for non-domestic wastewater systems, such as commercial uses. Also identified was a related issue concerning the need for more options in alternative or cluster subsurface disposal systems.
The increasing growth and development in the planning unit and the relationship with the area’s high quality lakes, a third priority (both for surface and ground water) reflects on issues associated with urbanization, storm water, and wastewater treatment. Also related to the lakes and rivers of the planning unit a priority concern is nutrient management (phosphorus and nitrogen) in the waterways. Specifically for rivers and lakes, the need for nutrient standards (phosphorus and nitrogen) followed the growth and urbanization concerns.

While agricultural and feedlot related operations are relatively limited in the Headwaters/Main Stem planning area, concerns about the proper operation of ag-waste systems, their number, management, operation, and proper closure were a concern for ground water quality management.

Finally, within all of the issues areas in the Headwaters/Main Stem planning, the committee felt that education programs were a priority for the group.


The issue identification in the Crow Wing-Long Prairie-Red Eye River Watershed Planning Unit was similar to the Upper Mississippi River Main Stem/Headwaters process discussed above. The Crow Wing – Long Prairie – Red Eye River Planning Unit rankings are presented in Table 4.

The Long Prairie River Watershed completed a Phase I Clean Water Partnership (CWP) Diagnostic Study under the direction of the Todd County Soil and Water Conservation District. Part of the Phase I effort included an issue identification, goal setting, and activity development process for the Long Prairie River and its major tributaries. This Basin Plan adopts the findings of the Long Prairie River CWP goals, priorities, and implementation activities for the Long Prairie River segment of the Crow Wing-Long Prairie-Red Eye River Watershed.

In the Crow Wing – Long Prairie – Red Eye River Watershed Planning Unit, the major issue identified for ground water, rivers and lakes is the need for more monitoring, inventories, and data for management decisions. With some exceptions, the known water quality for the streams, rivers, lakes and ground water is very good. Since the planning unit encompasses a number of the same counties, the limitations of data are similar to the discussion above for the Upper Mississippi River Headwaters/Main Stem Planning Unit. In general, the top priority identified in this planning unit is the need for more monitoring, inventories, and water quality data for making management decisions.

The second major issue in the Crow Wing – Long Prairie – Red Eye/Leaf Watershed Planning Unit is for growth and development impacts, and the related issues of individual sewage treatment systems (including septage and non-domestic wastewater systems) and storm water.
Concerns about nutrient management (phosphorus and nitrogen) followed the growth and urbanization concerns. Finally, concerns about the proper operation of feedlots, ag-waste systems, their number, management, operation, and proper closure were identified.

While not specifically identified by the Advisory Committee as an issue, the Long Prairie River Watershed area of the planning unit has been designated as an impaired water under Section 303, otherwise known as the TMDL list, and discussed in the specific planning area implementation strategies later in this Plan. As an identified impaired water, priority will be given to the watershed to identify the source of impairments. Progress toward the implementation of this TMDL will be reflected in future updates to this Basin Plan.

Table 4
Crow Wing/Long Prairie/Red Eye River Advisory Committee
Issue Identification Priorities

<table>
<thead>
<tr>
<th>Issue Identified</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Streams and Rivers</strong></td>
<td></td>
</tr>
<tr>
<td>Municipal/industrial wastewater</td>
<td>1</td>
</tr>
<tr>
<td>Storm water a big problem; cluster development; planned unit developments</td>
<td>2</td>
</tr>
<tr>
<td>Urban development, impervious, runoff, construction</td>
<td>3</td>
</tr>
<tr>
<td>Individual sewage treatment system</td>
<td>4</td>
</tr>
<tr>
<td>Standard for phosphorus</td>
<td>5</td>
</tr>
<tr>
<td><strong>Lakes</strong></td>
<td></td>
</tr>
<tr>
<td>Inventory and management</td>
<td>1</td>
</tr>
<tr>
<td>Urban development, impervious, runoff, construction</td>
<td>2</td>
</tr>
<tr>
<td>Municipal/industrial wastewater</td>
<td>3</td>
</tr>
<tr>
<td>Storm water a big problem; cluster development; planned unit developments</td>
<td>4</td>
</tr>
<tr>
<td>Individual sewage treatment system</td>
<td>5</td>
</tr>
<tr>
<td><strong>Ground Water</strong></td>
<td></td>
</tr>
<tr>
<td>Need to get data and information back to the people who need it</td>
<td>1</td>
</tr>
<tr>
<td>Individual sewage treatment system issues</td>
<td>2</td>
</tr>
<tr>
<td>Ag waste systems, inventory, closure, and management</td>
<td>3</td>
</tr>
<tr>
<td>Build a file of best management practices</td>
<td>4</td>
</tr>
<tr>
<td>Better access to all data-easy access; Web based-baseline</td>
<td>5</td>
</tr>
</tbody>
</table>
**The Sauk River-St. Cloud Area Watersheds Planning Unit - Issue Identification Process**

The issue identification survey results in the Sauk River – St. Cloud Area Watersheds Planning Unit are presented in Table 5. The top priority issue in the Sauk River – St. Cloud Area Watersheds Planning Unit for ground water, rivers and lakes is related to wastewater treatment and the need for expanded municipal or cluster wastewater treatment for unsewered areas. With the rapid development of the watershed in the St. Cloud area, issues commonly associated with urbanization - the need for wastewater treatment, individual sewage treatment systems, and storm water - are predominant concerns. Portions of the area around St. Cloud, as well as Stearns County, are designated as “Urbanized Areas” and will require permitting under Phase II of the storm water program regulations.

For rivers and lakes, the need for nutrient standards (phosphorus and nitrogen) followed the growth and urbanization issues. Finally, the Sauk River – St. Cloud Area Watershed Planning Unit Advisory Committee expressed concerns about the proper operation of ag-waste systems, their number, management, operation, and proper closure.

**Other Watershed Planning Unit Needs Identified**

The Sauk River – St. Cloud Area Watershed Planning Unit has a number of formal watershed districts formed under Minnesota Statutes. Two of the watershed districts plans have established priorities and are discussed below.

**Sauk River Watershed District Plan**

The Sauk River Watershed District revised their overall plan in 2002. Major needs or issues of concern from the plan focus on: 1) Nutrient management and phosphorus reduction in the Sauk River and its tributaries; 2) Sediment reduction in the Sauk River and its tributaries; 3) Implementation of ag-related best management practices; 4) Implementation of appropriate wastewater treatment technologies; and 5) Nutrient management (phosphorus and nitrogen) and sediment reduction in identified lakes within the watershed district boundaries. Included in these five groups is the Sauk River Watershed Districts continued emphasis on impaired waters in the watershed. More specific information on issues and actions is presented in Section 4 under the Sauk River – St. Cloud Area Watershed Implementation Plan.

**Clearwater River Watershed District Plan**

The Clearwater River Watershed District (CRWD) was first established in 1975 to respond to declining water quality in the area’s lakes. Since its inception, the CRWD has completed a number of water quality projects within the District. According to its 2003 Watershed District Plan, the CRWD goals focus on five areas: individual sewage treatment systems, erosion and sedimentation, feedlots, wetlands, and impaired waters/TMDLs.
Within these four areas, the highest priority of the CRWD is identified as sewage management and impaired/TMDL waters. For sewage management, the CRWD objectives include:
1) Facilitate the development and implementation of sanitary sewage management plans in the CRWD; and 2) Coordinate with the cities of Annandale, South Haven and Kimball to implement sewer management plans.

For Impaired/TMDL waters, the CRWD proposes to undertake or accelerate the TMDL schedule for the identified water bodies in the watershed district. These waters are Lake Louisa and the Clearwater River from Clear Lake to Lake Betsy. For the lakes, the identified impairment is excess nutrients. The river reach impairments are dissolved oxygen and fecal coliform. Additional information is available at the Clearwater River Watershed Districts web site: http:\www.crwd.org.
The Rum River Area Watersheds Planning Unit - Issue Identification Process

The issue identification in the Rum River Watersheds Planning Unit was initiated through a mail survey input of local water resource professionals, local governmental units, and interested citizens. Upon completion of the issue identification process, the input was summarized into the categories listed in Table 6 below. The issues identified in the Rum River Area Watersheds Planning Unit closely correlate to the other issues identified in the other planning areas, EQB Watermarks 2000 effort and local county water plans.

The top priority issue in the Rum River Watersheds Planning Unit for ground water, rivers and lakes is concern about growth, development, and storm water management. Individual sewage treatment system concerns followed closely. Additional issues focused on concerns about nutrient standards (phosphorus and nitrogen) and feedlot or ag-waste system management.
The Crow River Area Watersheds Planning Unit

Issue Identification Process: A Summary of Existing Water Quality and Related Information

In both the North and South Forks of the Crow Watersheds, water quality and quantity information is limited, scarce, or non-existent. Prior to the formation of the Crow River Organization of Water (C.R.O.W.) group, there had been no coordinated effort to characterize water quality in the entire watershed, particularly the lower reaches of the river.
Because of the lack of efforts prior to the formation of the C.R.O.W. group, needs identification for the watersheds is based on a series of prior individual efforts, studies and data that provide snapshots in time that give a general perspective of the water quality needs in this watershed planning unit. These needs or issues are identified individually. When looked at broadly, it becomes clear that the Crow River Watersheds (North and South Forks) still require additional, in-depth assessment and water quality management work activities.

Over the past five to ten years, the eastern portion of the Crow River Watershed has undergone rapid growth and development. As a result of this development, there are a number of cities that have installed, or plan to install, new wastewater treatment facilities or plan to expand existing plants. Approximately five years ago, preliminary data modeling indicated that during low-flow conditions, the ability for the lower segments of the Crow River to assimilate additional wastewater discharges could severely impact the amount of dissolved oxygen available for aquatic life. Additionally, these treatment plants, or point sources, were identified as potential significant contributors of phosphorus to the Crow River during low flow conditions. Conversely, under high-flow conditions, non-point sources appear to contribute the heaviest phosphorus loading. These early monitoring and modeling activities quickly showed that additional efforts would be required for both the North and South Forks of the Crow River.

**Minnesota Pollution Control Agency River Nutrient Study**

In 1999 and 2000, the Minnesota Pollution Control Agency conducted a river nutrient study of medium to large rivers that are typical of Minnesota’s Ecoregion framework. The River Nutrient study sampled two sites on the Crow River, Site CR-0 near the mouth of the Crow before it discharges to the Mississippi River and Site CR-23 near the city of Rockford, Minnesota.

During the 1999 sampling season, Site CR-0 had a mean phosphorus of 329 ug/L (micrograms per liter or parts per billion). In that same period, Site CR-23 had a mean phosphorus of 359 ug/L. For the 2000 sampling season, Site CR-0 had a mean phosphorus of 284 ug/l with a mean at Site CR-23 of 349 ug/L. The mean phosphorus for both sample years was significantly higher then the expected in-stream phosphorus value range for streams in its ecoregion (Heiskary and Wilson, 1990; and Heiskary and Markus, 2001).

In this area, the Crow River drains from different ecoregions. The North Fork of the Crow River drains about 53 percent of the watershed from the North Central Hardwoods Forest Ecoregion. The South Fork drains about 47 percent of the combined watershed units from the agricultural dominated Western Corn Belt Plains ecoregion. The heavy agricultural land uses and numerous wastewater treatment facilities contribute to the nutrient-rich conditions within the Crow River today (Heiskary and Markus, 2001). In total, during the 1999 sampling period, the Crow River itself (Site CR-23) contributed approximately twenty-three (23) percent of the total phosphorus load to the Mississippi River at the Anoka sampling site based on a simple mass-balance calculation (Map 4) (Heiskary and Markus, 2001).
Map 4
MPCA River Nutrient Study Results
Estimated Load Contribution based on Sample Concentration (MPCA) combined with USGS Flow Data (for Summer 1999 data)

Upper Mississippi River Basin
Summer - mean TP and Percent of TP Flux at UM-872 for 1999

Ecoregions:
- Northern Minnesota Wetlands
- Northern Lakes and Forests
- North Central Hardwood Forests
- Western Corn Belt Plains

County Boundaries
Watershed Boundaries

Major River
UM-72.3 33 ppb 2%
CWR-72.3 33 ppb 2%
CWR-1 50 ppb 10%
UM-953.7 63 ppb 57%
CR-23 359 ppb 29%
UM-1004 72 ppb 44%
RUM-18 138 ppb 7%
UM-872 92 ppb 987,597 Kg P/yr

St. Paul
Little Falls
St. Cloud
Minneapolis
Brainerd
Wadena
Aitkin
Anoka

Minnesota Pollution Control Agency
January 2001
North Fork of the Crow Watershed District Studies (North Fork of the Crow Watershed)

The North Fork Crow River Watershed District has completed studies on Rice and Koronis Lakes, located on the North Fork of the Crow River. They have also completed a study on Grove Lake, which is essentially the headwater of the North Fork.

The study on the Rice and Koronis Lakes area concluded that non-point source pollution is a problem in the upper reaches of the North Fork of the Crow River. Of particular concern are high levels of phosphorus and sediment. The study recommended that efforts should be made to reduce phosphorus and sediment levels as well as increase proper land use management.

Buffalo Creek Watershed District (South Fork of the Crow Watershed)

Buffalo Creek Watershed District has been collecting information on phosphorus, nitrates, fecal coliform and sediment in Buffalo Creek since 1995. Studies conducted by the Buffalo Creek Watershed District have indicated that the Buffalo Creek maintains high levels of phosphorus, nitrate, fecal coliform and sediment, particularly during the summer months.

Metropolitan Council Environmental Services

Preliminary data obtained from the Metropolitan Council-Rockford monitoring station indicates that the Crow River is a significant contributor of phosphorus to the Mississippi River. The contributions of the Crow River are important from the perspective that the Twin Cities Metropolitan area gets most of its drinking water from the Mississippi River, downstream of its confluence with the Crow River.

C.R.O.W. Public Input and Needs Identification

Citizens in the watershed are very concerned about the condition of the Crow River. The C.R.O.W. group held a series of open houses in the spring of 2000, to obtain input from local citizens on their concerns regarding the Crow River. Water quality, development along the river corridor, farm runoff, obstructions in the river, recreational usage, and flooding (South Fork only) were among the primary concerns identified. Local resource managers and decision makers are primarily concerned about bank erosion, channelization, habitat degradation, the recent increase in discharge permits, development, and lack of management practices in the watershed.
C. R. O. W. Crow River Watersheds Water Quality Goals

Based on existing data, the water quality in the Crow River Watersheds requires further evaluation to determine sources followed by nutrient source reduction or remediation efforts to reduce the amount of nutrients (nitrogen and phosphorus) measured at the CR-23 and CR-18 monitoring sites. To meet this need, the C.R.O.W. group was formed as a ten county Joint Powers Board to coordinate the management of the Crow River Watersheds. The overall goal of the C.R.O.W. group is to support and facilitate the cooperation of local governments, agricultural communities, businesses and citizens in the preservation and restoration of the Crow River.

As part of its mission, the primary goal of the C.R.O.W. group was to undertake a watershed-wide Phase I diagnostic evaluation of the water quality problems of the Crow River. This effort is presently underway with financial and technical assistance from the MPCA.
Total cost of the effort is estimated at greater than $400,000. The Phase I effort will consist of monitoring activities and preparation of an action plan for both watersheds of the Crow River. Results of this planning effort will be incorporated into this document during the next regular update of the Basin Plan.

**Upper Mississippi River Basin Issues Summary and the Next Steps**

Based on the overall needs identification process for the Upper Mississippi River Basin as conducted in the five different watershed planning units, seven broad categories of issues emerged for the development of goals, objectives, and priority activities throughout the Basin. During a review of the seven issues by the watershed planning unit advisory committees, an eighth issue – feedlot management was identified and included.

The eight categories are listed below (not listed in priority order):

1. Inventory and Classification of the Water Quality Resource.
2. Monitoring and Data Collection.
3. Nutrient Management and other Water Quality Impacts – Phosphorus, Nitrogen, Dissolved Oxygen, Sedimentation, and Section CWA 303 (d) Impaired (otherwise known as the Total Daily Maximum Load (TMDL)) Waters List.
4. Storm Water Management.
5. Wastewater, Municipal/Industrial Wastewater Treatment and Individual Sewage Treatment Systems (ISTS) and the MPCA Phosphorus Strategy.
7. Feedlots and Agricultural Related Issues¹
8. Emerging issues facing the Upper Mississippi River Basin. This category includes the Hypoxia Zone in the Gulf of Mexico and other issues such as pharmaceuticals and endocrine disrupters in the water.

These eight issues form the basis for Basin-wide goals, targets, and individual watershed planning unit goals developed and discussed later in this document. Unless otherwise identified, the Basin-wide goals will apply to all waters of the individual watersheds discussed later in this Plan. Additionally, some individual watershed units have more specific goals which will be identified in the specific watershed sections that follow.

¹ The original survey results did not identify feedlot management as an issue. Feedlots were added as an eighth water quality issue or need during discussions by the watershed unit advisory committees on feedlot and animal agriculture production impacts on water quality.
Upper Mississippi River Basin Goals, Objectives, Strategies/Activities and Milestones

The goals, objectives, strategies/activities, and Basin milestones in the next section of this UMRB Plan were developed to meet the needs identified above and to focus efforts on measurable environmental outcomes. They are intended to help guide the activities of the MPCA as well as the other agencies, stakeholders, and partners. They are also meant to support and provide structure to the Upper Mississippi River Basin Coordinating Team that will be formed to integrate the activities of the individual groups within the various watersheds and regional, state and federal agencies working in the Upper Mississippi River Basin.

In the following section, separate goals, objectives, strategies/activities, and milestones are detailed for each of the eight issue areas identified by the Advisory Committees. The goals, objectives, strategies/activities and milestones were developed using an environmental outcomes-based approach based on the following definitions:

**Goals:** Broad environmental statements that derive from the MPCA’s authorizing legislation. The overall goal of this UMRB Plan is “To protect, manage and restore, if needed, the water quality of the Upper Mississippi River Basin.”

**Objectives:** Specific targets that the appropriate agencies intend to achieve. An attempt has been made to ensure that the objectives are measurable and based on either state water quality standards (Minnesota Rules Chapter 7050) or on scientific water quality assessments.

**Strategy/Activity:** Method(s) and task(s) required to achieve objectives.

**Milestones:** Indicators used to evaluate the effectiveness of the methods and the accomplishments of the task. Measures must be clearly connected to an objective and goal to be useful. Milestones are typically used at a work plan level. The UMRB Plan is intended to be at the strategic level and not at the work plan level; therefore, the milestones are intended as a guidance.

Finally, it is important to remember that, over time, the goals and objectives identified in this UMRB plan will change as they are attained, as better data becomes available, or other factors are considered. In most cases, it is expected that the goals and objectives will become more specific or targeted and will be directed toward efforts within individual watersheds and subwatersheds.