

Section 4

Assessment of Problems and Issues

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4.0 Assessment of Problems and Issues

This section discusses the problems and issues facing LMRWD, taking into consideration comments received from the reviewers. Water quality, flood control and runoff management, navigation, erosion and sediment control, regulation, program, and capital improvement program issues are discussed in this section.

As required by Minnesota Rules 8410.0090, LMRWD sent letters to the plan review authorities, local officials, the Minnesota Department of Transportation (Mn/DOT), the Minnesota Department of Agriculture, the U.S. Army Corps of Engineers (COE) and the U.S. Fish and Wildlife Service (USFWS) requesting input regarding existing and potential problems in LMRWD. Table 4-1 lists the recipients of the letter request, most of whom responded in the form of letters, plans, and/or telephone conversations. LMRWD continued to receive input throughout the planning process. The LMRWD Managers considered all responses and comments in developing this plan.

A significant issue for the LMRWD Managers and others reviewing the plan was for the District to define a clear role for itself in relation to the local units of government. LMRWD developed a focused role for itself, described in Section 5.2, that presents LMRWD's role in regulation, information services and resource protection.

LMRWD's relationship to other units of government is important because of the District's position at the downstream end of the Minnesota River watershed. Because of its location, the District does not have control over upstream practices that impact the river. Also, although the District contains that portion of the Minnesota River watershed extending generally to the bluff line, the District has no control over activities that affect the District but take place over the bluff. Many tributary streams originate outside LMRWD but pass through the District. For some tributary streams, this meant an apparent gap in resource protection from the bluff line to the Minnesota River. LMRWD believes that many of the District's resources warrant special management that will require cooperation with other units of government. Section 5.2 of this plan describes LMRWD's resource assessment program that addresses this issue.

To address the need to set goals for various water bodies, LMRWD and local units of government developed water body classification systems which classify water bodies according to intended use (see Section 5.3.3).

Another issue for LMRWD is the concern of reviewers that this plan provide enough direction to local units of government, including definite guidance regarding content of local water management plans. The Joint Resolution/Agreement addresses LMRWD's expectations for the local units of government (see Section 6.2.3 and Appendix C). Section 6.5 presents the requirements for local water management plans.

4.1 Water Quality - General Problems and Issues

The lower Minnesota River valley within LMRWD contains resources that LMRWD seeks to protect. The LMRWD managers will focus on those resources not addressed in detail by other agencies, prioritized generally as follows:

1. Minnesota River and floodplain
2. Upland lakes and wetlands
3. Floodplain lakes and wetlands
4. Minnesota River bluffs
5. Tributary streams
6. Endangered and threatened species, and species of special concern
7. Boiling Springs
8. Calcareous fens

The LMRWD Managers realize there is not enough information available to make informed management decisions about these resources. To answer this need, LMRWD will implement a data collection and assessment program for the District's resources (see Section 5.2).

An issue for managing these resources is the quality of water entering the resources. Groundwater is an important source of water for the majority of LMRWD's surface water resources. Changes in the quantity and/or quality of the groundwater sources can have a significant impact on the water quality of LMRWD's surface water resources. Although groundwater plays such an important role in the District's water resources, the LMRWD Managers do not believe they should concentrate on groundwater issues since they are appropriately addressed by existing groups (see Section 5.8).

Existing and potential discharges of water quality pollutants in the District can be separated into two general categories: point sources and nonpoint sources. The remainder of this section discusses these two pollutant sources.

4.1.1 Point Source Pollution

Point source pollutants discharge to a receiving surface water at a specific point from a specific identifiable source. Discharge of treated sewage from a wastewater treatment plant (such as Blue Lake) is an example of a point source. The Minnesota Pollution Control Agency's (MPCAs) National Pollutant Discharge Elimination System (NPDES) permit program regulates point source wastewater discharges to the surface waters of the State. NPDES permits contain effluent limitations conforming to State and Federal standards.

A relatively new point source is the Rahr Malting plant wastewater treatment facility, which received an NPDES permit from the MPCA. The treated wastewater will discharge directly to the Minnesota River. In exchange for obtaining an allocation for the point discharge, Rahr will invest in non-point pollution reduction within the watershed.

The LMRWD Managers believe the MPCA adequately addresses the issues associated with NPDES permits, however, LMRWD will review and comment on all proposals for new discharges to the Minnesota River and its tributaries.

4.1.2 Non-point Source Pollution

Non-point sources of pollution are a major cause of violations of applicable water quality standards on the lower Minnesota River. Non-point source pollution cannot be traced to a single source or pipe as with a point source. Instead, pollutants are carried from land to water in runoff with stormwater or snowmelt, in seepage through the soil, and in atmospheric transport. All these forms of pollutant movement from land to water make up non-point source pollution (MPCA, 1986). Non-point source pollution has an impact throughout LMRWD. Table 4-2 lists some of the impacts on water quality and associated uses caused by the non-point source pollutants.

It is difficult to identify and quantify non-point sources of pollution that affect the District's water resources, considering the diverse nature of the problem. An assessment of Minnesota River quality and probable sources of pollutant loadings from areas upstream of Shakopee concluded that the largest percentage of the organic load carried by the river was attributable to non-point sources (*Minnesota River Assessment Project Report*, MPCA, 1994). Both natural and human-caused sources of non-point pollution are closely related to types of land use and associated land management practices. In the watershed of the Minnesota River upstream of LMRWD, land use is primarily agricultural. Immediately north of the LMRWD, land use is solidly urban; immediately south of LMRWD, land use is becoming increasingly urban. These lands outside the District boundaries contribute the majority of non-point source pollutants to the District's water resources.

In their response letter to LMRWD's request for input regarding existing and potential problems, the DNR noted the following impacts of stormwater runoff (non-point source) on water quality and fish and wildlife resources:

- Toxic levels of pollutants resulting in death or impairment of aquatic life.
- Reductions in water clarity and water quality (including warmer water temperatures) resulting in a shift of aquatic species to more pollution tolerant species.
- Wildlife injury or death resulting from ingestion of, or entanglement with, trash and debris.
- Negative impacts of nutrients, oxygen-poor water and sediment on the wildlife habitat.

The Metropolitan Council's December 1996 □ *Water Resources Management Policy Plan* states that non-point source pollution has surpassed point source pollution as the primary contributor to water pollution in the metropolitan area. Although much of the non-point pollution in the Minnesota River within the District originates from outside the District, the Metropolitan Council believes the most important current and future problem in LMRWD is the control of additional non-point source pollution from existing and new developments. To control this pollution, the Metropolitan Council promotes ... a combination of sensible development and installation of effective management practices. The DNR voiced a similar opinion.

The DNR noted that water recreation activities, especially water contact sports, become more limited as water quality becomes poorer. The DNR also noted that poor water quality affects fish and limits fish consumption; better water quality provides better fishing.

To improve the water quality of LMRWD's water resources, comprehensive changes in land management practices throughout the entire Minnesota River watershed are needed to reduce non-point source loadings. Effective land management practices are needed to control surface runoff and reduce wind and water erosion problems. Such practices include minimum tillage and contour plowing, sedimentation/retention of surface runoff, construction site runoff controls (see also Sections 4.4 and 4.6.5), vegetated buffer strips along waterways, proper fertilizer and pesticide use, feedlot runoff controls, streambank erosion controls, etc. By itself, the LMRWD cannot cause these things to happen. However, the LMRWD can participate in and support coordinated efforts by other groups seeking to manage these non-point sources. LMRWD's proposed purposes and goals and policies (Section 5) address stormwater runoff control.

Local units of government recognize that increased imperviousness and other land use practices have resulted in increased rates and volumes of stormwater runoff, which can negatively impact water

quality. A challenge for many local units of government is to provide opportunities for water quality improvement prior to discharging stormwater to the Minnesota River.

The DNR is concerned that extensive ditching in the watershed is reducing the filtration and settling capacities of the watershed. There are no county ditches in LMRWD, so this should not be an issue in LMRWD. The DNR also notes that crop farming in the reach from Carver to Savage may contribute to water quality problems in the Minnesota River.

An example of a future possible non-point source pollution problem relates to the future expansion of the Flying Cloud Airport, located in the city of Eden Prairie. Currently, the airport discharges the majority of its stormwater to three infiltration basins on airport property; the remainder flows towards Staring Lake (outside of LMRWD). The proposed expansion includes filling two of the infiltration basins. The city and LMRWD are concerned that the remaining pond may not be sized correctly to handle the runoff. In addition, the airport currently has on-site sewage treatment. LMRWD believes that the airport should be connected to the city's sanitary sewer system as part of the proposed expansion. These issues will be considered during LMRWD's project review.

The general public expects the local units of government to improve water quality. LMRWD's defined role in resource protection will allow LMRWD to work with other units of government to improve the District's resources. LMRWD will work with other units of government to reduce non-point source pollution.

4.2 Water Quality - Specific Water Resource Problems and Issues

This section discusses specific water quality problems and issues to be addressed in LMRWD, grouped according to the type of water resource. The types of water resources discussed include: the Minnesota River, trout streams/lakes, other tributary streams, lakes, fens, and wetlands.

4.2.1 Minnesota River

The MPCA completed the Minnesota River Assessment Project (MRAP) in 1994. The purpose of the MRAP was to evaluate the current condition of the Minnesota River, and identify the sources of pollution and types of pollutants entering the Minnesota River through study of the entire Minnesota River basin. The MRAP results estimate that 80% of the sediment loading to the Minnesota River is from upland sources and the remaining 20% is from streambank and bed scour sources. This means that the cause of the high suspended sediment loading in the portion of the Minnesota River located in the District is likely from sources located far away from the District. As noted in Section 4.1.2, any successful improvement in the water quality of the Minnesota River depends on the cooperation and participation of adjoining WMO's, other local units of government, and upstream communities and watersheds. The MRAP reports recommend that certain best management practices (BMPs) be undertaken in the watershed to improve water quality in the Minnesota River. The District's policies and standards in Section 5 require implementation of BMPs and call for cooperation with other units of government.

The Metropolitan Council's February, 1993 draft paper *Water Quality Management for the Next Century* also notes that the historically severe water quality problems in the Minnesota River are due to the fine-grained soils in the watershed and the large amount of agricultural activity in the basin. The Metropolitan Council paper also notes that urban development in the metropolitan area and some poor wastewater treatment in the rural parts of the basin exacerbate the agricultural impacts on the

river. The DNR notes that the spring flush from flooding in the Minnesota River severely impacts water quality.

The MPCA's 1994 stream water quality assessment report, based on the 1994 Minnesota 305(b) Report to the United States Congress, lists the entire reach of the Minnesota River within LMRWD as not supporting for overall use. Although agricultural/wildlife use is listed as fully supported, aquatic and swimming uses are listed as not supported. In the reach from river mile 21 to its confluence with the Mississippi River, the MPCA lists the Minnesota River's aquatic life as threatened due to nutrients, total suspended solids and biochemical oxygen demand (low dissolved oxygen). The MPCA lists the causes of the Minnesota River's impaired water quality within LMRWD as turbidity and fecal coliform. The corresponding sources are listed as both non-point and point; point sources (wastewater treatment plants, for example) only affect the reach from river mile 21 to the confluence with the Mississippi River.

The Minnesota Department of Health's *Minnesota Fish Consumption Advisory* (May, 1996) lists fish advisories for the Minnesota River within LMRWD which recommend severe restrictions on eating fish caught from the river. The most restrictive advisories are based on PCB contamination and some mercury contamination. This is further evidence of the poor water quality of the Minnesota River.

To meet state water quality standards for the Minnesota River, the MPCA and the U.S. Environmental Protection Agency in 1990 agreed to a goal to reduce non-point source pollution to the Minnesota River by 40% from pre-1980 levels. The goal was to be reached by July 1, 1996, to avoid making expensive (and possibly not effective) improvements to the Blue Lake and Seneca wastewater treatment plants. This goal was later moved to 2002. Legislation passed in 1990 charged the Metropolitan Council to adopt target pollution loads for all watersheds in the Twin Cities Metropolitan Area. The Metropolitan Council placed priority on developing loads for the Minnesota River to assist in meeting the overall 40% pollution reduction goal, but has not yet established the target loads.

An interim strategy for the Minnesota River was adopted by the Metropolitan Council in 1992 to make progress toward the 40% pollution reduction goal. The interim strategy required that any local government, as part of their comprehensive plan, adopt NURP basin design guidelines, incorporate MPCA's best management practices listed in *Protecting Water Quality in Urban Areas* (1988), and adopt the DNR's shoreland regulations. The current status of the LMRWD local governments adoption of the interim strategy is listed in Table 4-3. Most of the local units of government have either adopted the interim strategy or come under the jurisdiction of a county action. The local units of government recognize that they must meet the 40% pollution reduction goals for the Minnesota River. Some will achieve this goal through implementation of BMPs; others have identified more specific water quality improvements.

As part of the implementation of the Metropolitan Council's interim strategy, it awarded Twin City Water Quality Initiative (TCQI) grants for projects and programs geared towards reducing non-point source pollution, especially in the Minnesota River basin. The majority of the grants awarded from 1994 to 1996 were for projects and programs in the Minnesota River basin; many of the grants were for projects and programs located in LMRWD (Scott County and the city of Chaska, for example). The last of the TCQI funds were awarded in 1998.

In addition to the non-point source pollution control program, the Metropolitan Council will be closing the Chaska Wastewater Treatment Plant and providing additional treatment levels at the two remaining wastewater treatment plants that discharge to the Minnesota River (Blue Lake and Seneca).

With these programs and treatment levels in place, the Metropolitan Council believes the water quality standards for the lower reaches of the Minnesota River can be achieved and maintained.

The backwater effects from Lock and Dam No. 2 on the Mississippi River at Hastings, along with stream channelization work, have significantly altered the natural hydraulic characteristics of the lower Minnesota River (MPCA, 1985). The resultant slower stream velocities and greater channel depths reduce atmospheric re-aeration potential, which reduces the river's capacity to assimilate pollutant loadings. The slower stream velocities also promote settling of suspended matter (non-point source pollutants) from upstream. Decomposition of the settled organic matter creates an additional demand on the available dissolved oxygen in the river. In the relatively narrow channel of the lower Minnesota River, the turbulence and wake created by each towboat passage may also add to water quality problems by re-suspending bottom sediments and eroding streambanks.

LMRWD recognizes that the poor water quality of the Minnesota River is a significant issue. The Managers believe that the most effective way for LMRWD to improve the Minnesota River water quality is through improving the water quality of the tributary streams and water bodies and addressing erosion control issues.

4.2.2 Trout Streams/Lakes

The DNR-designated trout streams and trout lakes (see Sections 3.5.1.1 and 3.5.1.2 for listing) present both opportunities and problems. Streams and lakes that can support viable trout populations are rare in the Twin Cities metropolitan area. The District, DNR and other groups are very interested in preserving these streams and lakes.

The key characteristics of trout habitat include a stable supply of cold water (which usually comes from springs and seeps), high oxygen concentrations, riparian shade, and nutrient inputs (DNR, 1996). Temperatures higher than 60-70F threaten the health of trout. According to Kohler and Hubert (1993), most coldwater fishes do not tolerate summer temperatures above 22C (72F) and fish growth declines rapidly at temperatures above 29C (68F). Trout need higher oxygen levels than other types of fish (DNR, 1996). Kohler and Hubert (1993) state that oxygen concentrations should be at least 8 mg/l for rearing and 10 mg/l for egg and larval development.

Schueler (1995) found that when the amount of impervious cover in a trout stream's watershed reached approximately 10%, the diversity of the trout and macroinvertebrate populations declined. Similar impacts were found for trout lakes when the impervious cover reached about 20% of the watershed. The impervious cover causes water temperatures to rise, which also causes oxygen concentrations to decline. Galli (1990) found that typical stormwater BMPs installed to mitigate other water quality impacts cause water temperatures to rise anywhere from about 3F (infiltration basins) to 9F (wet detention ponds). Other threats to trout populations include removal of riparian trees, streambank erosion and channelization which remove the places trout need to rest, feed, and spawn (DNR, 1996). Elimination of streamside vegetation also results in the removal of food inputs for the fish.

Residential lot sizes of 0.5 acre to 1.0 acre translate to about 10% to 20% impervious cover. Land outside the MUSA boundary will usually have <10% impervious cover, whereas land within the MUSA boundary will usually have >10% impervious cover (DNR, 1996).

Development pressures are increasing in the areas tributary to metropolitan area trout streams and lakes. As evidenced by the controversy that surrounded the development adjacent to the west branch

of Eagle Creek, there is much argument about whether adequate measures can be taken during and after development for such trout streams and lakes to retain their trout habitat. To help mitigate the possible adverse impacts of development on Eagle Creek and Boiling Springs, LMRWD assisted in the creation of an Aquatic Management Area in 1995 for management of Eagle Creek.

The DNR established trout stream watershed coordinator positions for the Twin Cities metropolitan area to work with local units of government on trout stream issues. It will be important for LMRWD to involve the appropriate coordinator in any District trout stream issues.

Since the trout streams are coldwater streams fed by groundwater, LMRWD realizes that the water quality of the trout streams and their continued ability to support a trout population are closely tied to the quantity and quality of the groundwater.

LMRWD recognizes that, as the MUSA boundary expands and development continues in the District, the stream corridors, shorelines and watersheds of the District's trout streams and lakes will require special protection. This will create opportunities for the District to work with other units of government and the public to create standards for the protection of these unique water resources. This would likely happen through the development of resource plans, which are discussed in Section 5.2 and Section 5.10.

Examples of specific concerns and issues regarding trout waters include:

- The *Gun Club Lake Watershed Management Plan* and the DNR identified Kennaley's Creek as experiencing water quality and temperature problems. The DNR believes that some of the problems are the result of the Minnesota River backing up into the creek during high water periods. The corrective action in the Gun Club Lake plan describes a project to study alternatives for protection and management of the creek, with LMRWD listed as a funding source.
- The DNR is also concerned about the impacts of continued development in the watersheds tributary to the trout streams that are in good condition, such as Eagle Creek, Assumption Creek, and Unnamed Creeks 1, 4 and 7. The DNR believes LMRWD should consider stronger language relating to construction near sensitive trout streams.
- The *City of Savage Comprehensive Water Resource Management Plan* recognizes that stormwater runoff may negatively impact Eagle Creek's trout population. To mitigate this concern, the plan calls for the city of Savage to implement the *Alternative Urban Areawide Review Comprehensive Mitigation Plan* (AUAR) for Eagle Creek and Boiling Springs. The city would like to see LMRWD in a more proactive role in the protection and management of the creek.
- The cities of Savage and Shakopee prepared a study entitled *Stormwater Management Plan/ Feasibility Study for the Eagle Creek Watershed* (OSM, 1994). The plan provides comprehensive storm drainage information to allow the cities to consistently manage stormwater runoff. The cities have used the Eagle Creek stormwater plan, combined with the AUAR document, to protect Eagle Creek from the adverse impacts of stormwater runoff.
- Courthouse Lake, formerly a quarry pit, is now a trout lake. The lake has a gated outlet to East Creek to keep rough fish out of Courthouse Lake. With completion of the Chaska flood control dike in 1996, the gated outlet should now be more effective at preventing migration of rough fish from the Minnesota River into the lake.

LMRWD recognizes these are important issues and will address these specific resource issues as part of the resource assessment process (see Section 5.2) and according to the priority given in Section 6.

4.2.3 Other Tributary Streams

Many tributary streams enter the LMRWD from outside the boundaries of the LMRWD. As a result, water quality problems occurring outside LMRWD will likely be transported into LMRWD and down to the Minnesota River. This points to one of the larger issues facing LMRWD and discussed in Section 4.0: the impact on LMRWD of actions and problems that occur outside the LMRWD. Examples of some of the tributary stream issues are discussed in the following paragraphs.

Urbanization has created significant changes in the tributary watershed, particularly the streams which have large watershed areas outside the District. These streams also transport non-point source pollutants from areas outside the LMRWD's boundaries into the water resources of the District (mainly to the Minnesota River).

An LMRWD issue is the lack of data available regarding the chemical, physical and biological conditions of the streams within LMRWD. Some of the adjoining WMOs have collected at least some of this information for streams just outside LMRWD. It is difficult to assess the current ecological integrity of the LMRWD streams without this data (see Section 5.3.3.1 for a discussion about use attainability analyses).

Examples of specific concerns and issues regarding streams include:

- The DNR identified Black Dog Creek as experiencing water quality and temperature problems. The DNR believes that some of the problems are the result of the Minnesota River backing up into this and other creeks during high water periods. The DNR also believes that stormwater inputs destroyed the trout stream characteristics of Shakopee Creek.
- The *City of Savage Comprehensive Water Resource Management Plan* recognizes the possible adverse impact of streambank erosion on the water quality of the Credit River. The city completed a survey of erosion problems along the Credit River in response to complaints. The survey results showed 40 problem areas along the river, 16 of which are located within LMRWD. The estimated cost to correct all of the erosion problems is over \$650,000, \$220,000 of which is for the problems located within LMRWD. The city's plan calls for implementation of the Credit River Erosion Control Plan as a corrective action to the problems discovered during the survey. The DNR believes the upper watershed of Credit River is affected by inputs from development.
- The City of Chaska identified ravine erosion as their next water quality issue of concern. Although the ravine erosion occurs outside of LMRWD, the resultant sedimentation is likely taking place within the LMRWD. Similar ravine erosion situations occur in other communities that affect the Minnesota River, but are located outside LMRWD, such as Nine Mile Creek in the City of Bloomington. The Lower Valley Project was completed by the Nine Mile Creek Watershed District to address erosion and other problems along the creek.
- The Scott SWCD *Comprehensive Plan* identifies streambank and shoreland erosion as another source of sedimentation.

LMRWD recognizes these are important issues and will address these individual stream issues during the resource assessment and planning process (see Section 5.2), according to the priority given in Section 6.

4.2.4 Lakes

Since the majority of lakes within LMRWD are floodplain or backwater lakes, floodwaters from the Minnesota River contribute a large portion of the overall nutrients and sediments that enter these lakes. After flooding subsides, the lakes are again separated from the river, trapping the high sediment and nutrient loads in the lakes. Any improvement to Minnesota River water quality will help reduce the heavy sediment and nutrient loading to the floodplain and backwater lakes. Until the water quality of the Minnesota River improves, other water quality improvement measures will not be effective in the floodplain lakes.

Examples of specific concerns and issues regarding lakes include:

- The Metropolitan Council's *A 1997 Study of the Water Quality of 71 Metropolitan Area Lakes* provides the 1997 water quality monitoring data for Courthouse Lake. The monitoring data show Courthouse Lake to have very low concentrations of total phosphorus and chlorophyll, but surprisingly poor Secchi disc transparencies (from 0.9m to 2.3m). The reason for the Secchi disc transparencies not matching the high quality total phosphorus and chlorophyll concentrations is not known. The Metropolitan Council could not determine any water quality trends, since 1997 is the only complete year of water quality data available for Courthouse Lake.
- The Minnesota Department of Health's *Minnesota Fish Consumption Advisory* (May, 1996) lists fish advisories for Snelling Lake. The most restrictive advisories are based on PCB contamination and some mercury contamination. Snelling Lake is a floodplain lake located in Fort Snelling State Park that has a swimming beach. Lack of water quality data is a problem.
- The DNR believes that the water quality of Rice Lake, located on the Eden Prairie/Chanhasen border north of the Minnesota River, is affected by the Moon Valley gravel pit operation.
- The City of Bloomington recognizes that its future surface water management plan will need to address stormwater quality treatment issues, including the U.S. Fish and Wildlife Service's concern about the heavy metal concentrations in the sediments of Long Meadow Lake. The city completed a feasibility study for the area above the bluff that flows into the lake. This study identified regional structural alternatives to address stormwater quality issues. The city wants LMRWD to consider participating in the identified projects.
- The City of Bloomington is also concerned about sedimentation in Coleman Lake, which has reduced the water depth from about 4 feet to less than 2 feet. The city and Nine Mile Creek Watershed District are considering a lake restoration project to clean out enough sediment to restore the lake's fishery.
- The City of Burnsville, through its request for assessment and monitoring, indicated concern about the water quality of Black Dog Lake.
- Shakopee's surface water management plan identifies the following water quality problems affecting Dean's Lake: sediment deposition, degraded water quality and septic system failures.

The city plan recommends a diagnostic feasibility study for the lake. LMRWD recognizes the lack of water quality data as an issue.

- As stated in Section 3.5.4.2.2 of the plan, the USFWS 1988 study of the Blue Lake watershed identified problems and concerns for water bodies in the Minnesota Valley National Wildlife Refuge, which also apply to many other lakes and wetlands in the LMRWD. The contaminant study of Long Meadow Lake, completed as part of the Blue Lake Watershed Study, found that:
 1. Urban stormwater conveyance systems transport contaminants, especially heavy metals, into refuge wetlands.
 2. Contaminated runoff is a greater problem in more urbanized areas and around major highways.
 3. Stormwater detention ponds are not large enough to effectively trap contaminants, which then overflow into refuge wetlands.

Other concerns brought up in the Blue Lake Watershed Study include: lack of information about the problems associated with urban stormwater runoff and its impacts on wetland biological systems, uptake of heavy metals by aquatic plant species, and the possible concentration of these heavy metals in waterfowl and other birds that feed on these aquatic plants. The study also recommended additional research and studies in refuge lakes to determine the pollutant loading.

LMRWD recognizes these are important issues and the resource assessment and planning process (see Section 5.2) will address the issues associated with the District's lakes, according to the priority given in Section 6.

4.2.5 Fens

Some of the District's wetlands are calcareous fens (see Section 3.5.2, Land and Water Resource Inventory), which require specific hydrologic and chemical conditions to exist. A special section of the Wetland Conservation Act and Rules pertain specifically to fens.

The continued existence of the fens is highly dependent on the quantity and quality of the groundwater that feeds them. The DNR has developed the (draft) *Savage Fen Resource Plan* for managing the Savage fen, located in LMRWD. Drilling of additional water supply wells in critical formations is not being allowed by the DNR because of the possible negative impact to the fen. As a result, communities are faced with investigating alternative water sources, including intercommunity water supplies. An example of an alternative water source is the groundwater Shiely pumps from its dewatering wells.

Specific concerns raised regarding fens include:

- The DNR is concerned about the impacts of continued development in the Savage fen and Seminary fen tributary watersheds.
- The *City of Savage Comprehensive Water Resource Management Plan* recognizes that stormwater runoff could have a negative impact on the Savage fen. The city's plan proposes to protect and manage the Savage fen resources through implementation of the *Alternative Urban Areawide Review Comprehensive Mitigation Plan*. The city would like to see LMRWD in a more

proactive role in the protection and management of the fen. Currently, only the west boundary of the fen is defined, as a result of development. LMRWD and the City of Savage believe the entire fen boundary needs to be defined to better manage and protect the fen.

- The city of Shakopee's surface water management plan calls for the city to complete a groundwater study in the Boiling Springs and fen area to assure protection of groundwater levels in these areas. The plan also called for the coordination of the two cities groundwater protection activities in these areas. The city of Shakopee also noted that any impacts to Boiling Springs will require close monitoring.
- The *Gun Club Lake Watershed Management Plan* identifies Nichols fen as a water body with water quality problems and proposes a project to evaluate and select alternatives for protecting and managing the fen. LMRWD is listed in the plan as a funding source. Stormwater flows may be eroding the edge of Nichols fen. Dakota County is concerned that the drawdown associated with groundwater withdrawals could have a negative impact on Nichols fen.
- The *City of Chaska Stormwater Quality Management Plan* identifies the Seminary fen wetland complex as an area that could be enhanced through restoration efforts. As is common with the other fens, fire suppression has allowed the invasion of woody plants to replace the native fen plants. The city is considering restoration of the fen to provide a large wetland bank.
- The Chanhassen water management plan identifies two large wetlands in LMRWD as pristine wetlands worthy of greater water quality protection efforts. These wetlands are part of the Seminary fen wetland complex, which extends into the city of Chaska. The city of Chanhassen proposes to provide additional upstream water quality treatment to reduce nutrient inflow to the wetlands to pre-settlement conditions. The city also recommends allowing more water to pass from the upstream to the downstream half of the Seminary fen wetland complex to improve hydrologic conditions.

Many factors threaten the health of calcareous fens, including changed groundwater conditions, stormwater runoff, sedimentation, and invasive plants. Although five calcareous fens are located within LMRWD, many of the factors affecting the fens (especially changed groundwater conditions) originate outside LMRWD. Although LMRWD contains a relatively large number of fens, the LMRWD Managers are not placing a high priority on assessing and managing the fens, since other units of government and other groups appear to be adequately addressing the issues. LMRWD could take a more active role in the future, if the other units of government (i.e. the DNR) determine they need assistance from LMRWD.

4.2.6 Wetlands

Since many of the wetlands in LMRWD are located in the Minnesota River floodplain, they face the same water quality threats as the floodplain lakes (see Section 4.2.4). LMRWD's role in wetland protection is limited, since LMRWD is not the LGU for the WCA (see Section 4.6.1).

Specific concerns raised regarding wetlands include:

- The *Minnesota Valley National Wildlife Refuge Comprehensive Plan* (1984) notes that wetlands provide habitat for many species of plants and animals and that many of the plant species may be rare or significant on a statewide or regional basis. The plan also states that wetlands are particularly well suited for waterfowl and migratory birds. The comprehensive plan also notes

that wetlands affect the amount of water in the floodplain. Many of the wetlands in the lower Minnesota River valley are spring-fed, providing a water source during droughts. The wetlands also act as natural holding ponds during periods of flooding. Through the comprehensive plan, the USFWS and the DNR expressed concern that ...if wetlands are not conserved in their natural state, severe disruption of the local hydrological system and ecological systems could result. Filling, draining, or eliminating wetland areas could increase flooding (USFWS-DNR, 1984).

- The DNR believes that wetlands should not be used for stormwater detention without adequate pretreatment. The MPCA discourages local governments from using natural wetlands for water treatment, including stormwater treatment. In certain areas of the District, existing development may not have provided water quality basins or the basins may not permit retrofit for water quality benefit.
- The Chanhassen surface water management plan identifies the large wetlands in the Minnesota Valley National Wildlife Refuge as natural wetlands needing greater water quality protection efforts. The city of Chanhassen proposes to provide additional upstream water quality treatment to reduce nutrient inflow to the wetlands to pre-settlement conditions.
- Chaska's water quality plan identifies water quality treatment basins to protect wetlands from development impacts.
- The city of Savage is in the process of creating a comprehensive wetland protection and management plan to protect wetlands with higher functions and values and identify lower quality wetlands for filling or stormwater management. The city anticipates the plan to be complete in December 1999.

The LMRWD Managers believe that the existing wetland regulatory programs/rules (and the agencies responsible for administering them) adequately protect wetlands, so further involvement of LMRWD in wetland activities is not needed at this time. Section 4.6.1 describes the existing wetland regulatory programs and the agencies responsible for their administration. LMRWD's standards for project proposals listed in Section 5.13 will help improve wetland water quality.

4.3 Floodplain and Runoff Management Issues

Water quantity issues can be divided into two general categories: flooding/floodplain and runoff management issues.

4.3.1 Floodplain Issues

As defined by the DNR, a floodplain is the land adjacent to a watercourse which may be covered by a regional or 100-year flood (a flood having a one percent chance of occurring each year). The floodway includes the river channel and the portions of the adjoining floodplain which must be kept free of encroachment to carry and discharge the regional flood (the floodway may be the same width or narrower than the floodplain). The flood fringe refers to the remainder of the floodplain area outside the floodway which is subject to inundation by a regional flood. Floodplain ordinances and regulations are based on defined floodplains.

Expenses resulting from flood damage include costs for cleanup and repair of infrastructure, such as roads and sewers, as well as lost wages and profits. Other costs include large public expenditures for

rebuilding efforts and for providing future flood protection. Flooding can also disrupt public services. Undeveloped areas sustain flood damage to wetlands, crops and pastures, including siltation, erosion, debris cleanup, replanting, reduced yields, and pollution of wells.

The DNR also identified the following impacts on recreation caused by flooding:

- Larger flood peaks and longer flood durations result in longer periods of time that recreational facilities are not available for use.
- Flooding damages or destroys recreational trails and bridges.
- Repair of flood-damaged facilities and controlling public use of facilities during flooding events places more strain on budgets and personnel.
- Inundation of upland habitats for longer time periods also alters the mix of wildlife species present and reducing the species diversity.

The Minnesota Valley National Wildlife Refuge (MVNWR) also voiced similar concerns, including: flood waters destroying or reducing species diversity (especially in the floodplain forest); and flood-borne sediment filling wetlands, covering vegetation and filling outlet structures; the resultant altered habitat allows exotic species to flourish.

LMRWD is concerned about flooding issues that impact the District's water resources. More localized nuisance flooding should be addressed at the local level.

Floodplain issues can be further subdivided into the following categories: Minnesota River floodplain and areas outside the Minnesota River floodplain.

4.3.1.1 Minnesota River Floodplain

The broad Minnesota River floodplain covers a large portion of LMRWD. Flooding in the LMRWD portion of the Minnesota River valley is often prolonged because tributary flood crests seldom reach the same point simultaneously. The floodplain's natural function is to carry or hold excess water during floods. Channel restrictions and floodplain encroachments can greatly hinder this natural function, increasing the tendency for the river to flood, and causing greater damage.

The United States Geological Survey (USGS) completed a HEC-2 model in the early 1970's to define the Minnesota River floodplain and flood profile. The model results were used to develop the maps contained in the document *Flood-Plain Areas of the Lower Minnesota River* (USGS, 1973), which show the floodplain superimposed on contour elevations. These maps are not used to define the floodplain for the Federal Emergency Management Agency's (FEMA) Flood Insurance Program. FEMA Flood Insurance Studies (FISs) contain the official floodplain maps used to administer the Flood Insurance Program (the FEMA FISs refer to the USGS study and used the same HEC-2 model results to define the floodplain).

Since the time the original HEC-2 model was developed, many changes to the river and floodplain cross section have occurred. For example, bridges have been constructed and removed, dikes have been installed, and fill has been placed. The HEC-2 model is used to evaluate the impacts of new developments (such as bridges) on Minnesota River flooding. Since so many changes have taken place, there is concern that the current model is outdated and does not provide accurate enough

information. The LMRWD Managers believe there is a need to revise the model and redefine the Minnesota River floodplain. LMRWD will assist other units of government in this effort by assembling the necessary technical data (see Section 5.5.1, policy 5, and item 19 in Table 6-1).

Downtown Chaska experienced severe flooding during the Minnesota River flooding event of 1993. The Corps of Engineers recently completed projects include diverting portions of Chaska Creek and East Creek, constructing pump stations, and constructing a new levee near Courthouse Lake. These flood control projects should relieve the flooding problems in downtown Chaska.

The City of Bloomington identifies only one chronic flooding and access problem in LMRWD, located in the Minnesota River floodplain, near Cedar Avenue.

The LMRWD adopted floodplain regulations in 1973 (see Appendix B) to reduce flood damage as well as protect and enhance the aesthetic values of the Minnesota River floodplain. See Section 4.6.3 for more information about LMRWDs floodplain regulations.

4.3.1.2 Other Floodplain Issues

Specific concerns raised regarding other floodplain issues include:

- Dakota County raised the issue concerning the possible impact of future closure of the Kramer quarry on surrounding lands and water bodies. Currently, dewatering operations keep groundwater levels at an elevation to which the community has become accustomed. If dewatering stops and the groundwater table rises, it could have adverse impacts on the businesses and water bodies in the area.
- The *City of Savage Comprehensive Water Resource Management Plan* notes various flooding problems in the city, including downtown. The plan calls for implementation of the downtown storm sewer reconstruction and improvement project to relieve that flooding problem.
- The City of Shakopee's *Comprehensive Stormwater Management Plan* identifies low water levels on Dean Lake as a significant problem. A suggested solution is to pump water from the Shiely Pit into the lake. However, the plan also identifies the need to lower the 100-year flood elevation of Dean Lake. The DNR turned down the City of Shakopee's request to lower the Dean Lake outlet from Elevation 747 to 746. The future flow rates into Dean Lake are proposed to increase significantly as a result of increased discharge from the Prior Lake Outlet and upstream tribal lands. The impact of these increased flow rates on the flood level of Dean Lake needs to be determined.
- Shakopee's plan also identifies flooding problems in the Boiling Springs area, in the Canterbury south drainage area, behind Eagle Creek Town Hall, and near County Road 21 and County Road 16 (just south of LMRWD border). Some of these flooding problems have been corrected since the plan was completed.
- Mendota's central area is a bowl-shaped depression that may have been carved by a whirlpool or eddy of the Glacial River Warren. The bowl has no outlet and sewerage and excess storm water must be pumped out of the area.
- The Chanhassen surface water management plan identifies a major flooding problem at the intersection of Highway 212 and the railroad, at the west end of the city. In the plan, the city

proposes to install larger box culverts and other improvements to correct the flooding problem. The plan also identifies a flooding problem at the intersection of Bluff Creek Drive and Highway 212 and proposes additional storage to solve the flooding problem.

LMRWD believes the local units of government are responsible for addressing flooding issues that are more local in nature (i.e. are not the result of an intercommunity stormwater issue - see Section 5.5.2).

4.3.2 Runoff Management

The local units of government generally recognize that increased imperviousness and other land use practices have resulted in increased rates and volumes of stormwater runoff. LMRWD recognizes that increased runoff rates resulting from development are a problem. Higher flowrates can result in future erosion, sedimentation, flooding, and water quality problems.

The addition of the Minneapolis – St. Paul International Airport to the LMRWD as a result of the “2000 Boundary Change” order has resulted in a substantial amount of impervious surface to the LMRWD. The runoff from this area present potential problems for the Minnesota River including increased sedimentation, higher flow rates, and decreased dissolved oxygen levels.

The DNR is also concerned that extensive ditching in the watershed is increasing runoff rates. Again, since there are no county ditches in the District, this should not be an issue in LMRWD.

4.3.2.1 Stormwater Runoff Management Within Communities

LMRWD believes flowrates need to be managed, with special considerations given for discharges from currently landlocked areas (see Section 5.5.2). Without proper planning and management, increased flowrates could cause downstream erosion, sedimentation and flooding problems.

Specific concerns raised regarding stormwater runoff management within communities include:

- Burnsville’s *Comprehensive Stormwater Management Plan* identifies the following areas as needing improved drainage systems:
 - Embassy Cliff storm sewer □ intersection of Embassy Road and Cliff Road
 - Box culvert to the Minnesota River □ vicinity of Highway 13 and County Road 5 (under construction)
- Lilydale’s stormwater plan identifies a rate control problem at the Lexington-Riverside complex that was alleviated by diverting stormwater flows to a pond in Mendota Heights. Although the problem was outside of LMRWD, part of the project included diverting water from LMRWD to the Lower Mississippi River WMO. Another recent project in the Lexington/TH 13 area was constructed to address drainage problems along TH 13 and Lexington Avenue. LMRWD contributed funds for both of these projects.
- The Mendota Heights *Water Resources Management Plan* describes problems in their industrial park area (outside LMRWD). Runoff from the area flows to TH 13 and into LMRWD. A recent Mn/DOT improvement project addressed capacity problems at the TH 13 road crossing.

- The City of Bloomington identified the ultimate reconstruction of I-35W and I-494 as a future potential problem because of its possible impact on the city's stormwater management system.
- Metropolitan Airports Commissions' expansion project at the Mpls – St. Paul International Airport.
- The MnDOT Highway 55/62 road construction project and future Highway 494 expansion project.

LMRWD believes that local units of government are responsible for controlling stormwater runoff within their boundaries (see Section 5.5.2 for related goals and policies).

4.3.2.2 Stormwater Runoff Management Between Communities

The Shakopee and Savage surface water management plans identify the need to review and formalize their agreements with neighboring communities regarding stormwater discharge rates across community borders. If stormwater discharges from neighboring communities, including tribal lands, are not controlled, downstream stormwater systems may not have the capacity to handle the resultant higher flows. This affects the water resources in LMRWD. Intercommunity flowrates need to be managed, with special considerations given for discharges from currently landlocked areas (see Section 5.5.2). Intercommunity flowrates must be addressed in local water management plans.

The city of Mendota Heights *Water Resources Management Plan* describes an intercommunity drainage issue with the city of Mendota. A small portion of Mendota Heights drains to Mendota which causes problems because Mendota is essentially landlocked. The completion of stormwater improvements associated with the TH 110 construction project, and construction of a rate control basin in a ravine just upstream of Mendota alleviated some of the flooding problems.

LMRWD is concerned about the effect of the proposed increase in the capacity of the Prior Lake/Spring Lake outlet channel from 50 cfs to 100 cfs. The outlet channel carries water from the City of Prior Lake into the city of Shakopee, eventually discharging into Dean Lake. LMRWD is concerned that the increased discharge will worsen the existing erosion and resulting sedimentation problem, and possibly create a flooding problem on Dean Lake. LMRWD will continue meeting with Prior Lake Spring Lake Watershed District (PLSLWD) and the City of Shakopee to discuss management of the Prior Lake outlet channel to address erosion, maintenance, water quality, discharge rate, and Dean Lake outlet issues.

See Section 5.5.2 for the goals and policies relating to LMRWD's role in managing intercommunity flowrate issues.

4.4 Erosion and Sediment Control Issues

Many reviewers identified soil erosion associated with construction sites (including single family home construction) as a significant sediment source to LMRWD's water resources, resulting in decreased water depth and degraded water quality. Local units of government also recognize enforcement of existing erosion and sediment control programs as an issue (see Section 4.6.5).

Specific examples of the erosion and sediment control issues identified include:

- The Shakopee surface water management plan notes bluff erosion north of County Road 16, near Mullenhardt Road and the intersection of County Roads 21 and 17.
- The city of Eagan is just completing a project to correct a severe erosion problem at Hayes Delosh Ravine. Although the project ends at the LMRWD boundary, sediment from past erosion likely entered LMRWD in the past.
- The Mendota Heights plan identifies the river bluffs near the confluence of the Minnesota and Mississippi Rivers, as steep wooded ravines with a high potential for erosion. The plan also describes a ravine erosion problem just upstream of TH 13 and the LMRWD boundary.
- The city of Chanhassen identified a bank erosion problem adjacent to the LRT trail in the northeast quarter of Section 35 which washes out the trail. The city has met with Hennepin Parks and LMRWD staff to discuss the problem.
- The city of Eden Prairie identified bank erosion as a problem along the Minnesota River, with portions of Riverview Road closed as a result. The city believes the bank erosion is caused by natural erosion, vegetation removal for agricultural purposes and recreational activities (such as 3-wheeling). The USFWS is evaluating the problem and considering a tree planting program to combat the erosion. The City of Eden Prairie also notes that erosion occurs along the bluff face, especially east of the BFI landfill, and believes that as the area develops, erosion should decrease. LMRWD's concern about streambank erosion led to their implementation of a demonstration project (see Section 4.7.1).

Erosion also impacts stormwater rates and volumes. Vegetation slows down stormwater runoff rates by holding back water, allowing it more time to infiltrate into the soil. As soil erodes, vegetation is removed from the ground surface, which results in increased rates of stormwater runoff. Erosion also results in channelization of stormwater flow, increasing the rate of stormwater runoff.

The public needs to be educated about the cost of erosion and sediment control versus the value of downstream water bodies and the value of eroded topsoil washed downstream.

Some local units of government recognize that stormwater ponds can be degraded as a result of erosion and sedimentation, pointing to the need for development of a maintenance plan to prevent future degradation.

The deposition of sediment released during the erosion process can wholly or partially block culverts, manholes, storm sewers, etc., causing flooding. The sediment deposited in detention ponds and wetlands reduces the storage volume capacity, causing flood levels to rise. LMRWD's application of the policies, standards and criteria listed in Section 5 will lessen the likelihood and severity of soil erosion associated with urban development. LMRWD will address bank erosion problems as part of the resource assessment and planning process (see Section 5.5.2), according to the priority given in Section 6.

4.5 Commercial and Recreational Navigation

As noted in Section 3.8.2, freight traffic on the Minnesota River within the District is one of the District's greatest commercial assets. One of the main purposes for formation of the District was to assist the Corps of Engineers (COE) in constructing and maintaining the navigation channel in the

Minnesota River. The District has continued to work cooperatively with the COE regarding maintenance of the navigation channel.

The barge traffic volume on the Minnesota River was about 4.2 million tons in 1996, including both northbound and southbound products. Traffic volume peaked at 7.5 million tons in 1983. A study completed about 20 years ago estimated that an 18-fold increase in barge transportation (about 68 million tons) would be required before saturating the Minnesota River's barge capacity. The COE and the barge industry determined that it was not necessary to expand the river's capacity for barge traffic.

Commercial navigation is very important to agriculture in the State of Minnesota. Approximately 50% of the grain that exits Minnesota is loaded by barge within the city of Savage. The city of Burnsville also has barge fleeting sites. The riparian rights for the barge fleeting sites in Burnsville and Savage are privately owned. The land owners contract directly with towing companies for fleeting leases. The city of Eagan currently has no barge fleeting areas and does not foresee the siting of future barge fleeting areas in the city.

Some of the issues associated with the navigation channel include the following:

- Co-existence of commercial and recreational navigation.
- Ongoing dredge material disposal needs.
- Effect of barge traffic on water quality.

Barge traffic causes re-suspension of sediments and their associated contaminants, making it difficult to improve water quality in the Minnesota River. The DNR believes that both barge and recreational boat traffic contribute to bank erosion on the Minnesota River and that commercial dredging contributes to sedimentation and water quality problems in the river. Bank erosion leads to increased sediment loading to the Minnesota River. Mn/DOT believes that since dredging removes the sediment from the water, if the river were not dredged, it would eventually fill in. Mn/DOT believes that barge traffic will cause re-suspension of light sediments in the river, but this will not be noticeable when compared with the amount of sediment coming from upland and riverbank sources. LMRWD believes that if upland, streambank, and riverbank erosion and sediment controls are successful, the re-suspension of light sediments could be an issue.

The MVNWR comprehensive plan contains guidelines for avoiding the negative impacts which could result from placing new barge fleeting facilities along the Minnesota River.

The city of Burnsville's riverfront development plans call for development of the river for recreational uses. This could be in conflict with the existing commercial use of the river. The CAC was concerned about the safety issues surrounding the mixing of recreational and commercial uses of the river; LMRWD believes this is a DNR issue. Mn/DOT believes there will be limited growth in water contact activities on the Minnesota River. LMRWD agrees that the existing water quality conditions limit the recreational use of the river. If efforts to improve the Minnesota River's water quality are successful, recreational use will likely increase as a result. Another issue is locating dredge sites that are compatible with riverfront development plans.

The District's cooperation with the COE regarding maintenance of the navigation channel has historically been the provision of dredge material disposal sites in the District. The COE annually dredges and disposes of approximately 21,000 cubic yards of material from the Minnesota River in the District. At least once a year, the COE also performs snagging operations (pulling out trees, large

branches, etc.) at a cost of \$5,000/year. Currently, dredge material remains on the disposal sites only temporarily; it is hauled off site to be used for fill and other projects. Assuming this practice continues, the present number of dredge disposal sites should be able to continue to accept dredge material. This is important because it will be difficult to locate new dredge disposal sites since much of the land adjacent to the Minnesota River is either floodplain or wetland and is protected from filling. It is possible that new dredge disposal sites would need to be located further away from the dredging sites than in the past. This would increase the cost of maintaining the navigation channel and would play a role in determining whether the channel can be maintained in its present condition.

LMRWD follows a process which fulfills Wetland Conservation Act and other legal requirements before a possible dredge material disposal site is used for placement of dredge materials. The District performs a property survey, locates and delineates wetlands, performs any needed archaeological surveys, negotiates access to the site, and negotiates purchase or lease agreements. LMRWD first tries to avoid placement of dredged material in wetlands. If placement cannot be avoided, then wetland replacement will be accomplished as required by law.

Currently, LMRWD has easements for dredge material disposal Sites 1, 2, and 3. LMRWD needs to obtain easements for Sites 4, 5, and 6 or a replacement site(s).

Another issue is the need for good road access to the dredge disposal sites. LMRWD will work with the cities to obtain more permanent access to the sites.

4.6 Adequacy of Existing Regulatory Controls and Programs to Address Problems and Issues

This section summarizes the existing water resource-related regulations and programs in LMRWD.

4.6.1 Wetland Management

There are federal, state, regional and local regulations pertaining to wetland management. Federal regulatory programs include the following:

- Section 10 of the Rivers and Harbors Act□The Corps of Engineers (COE) is the responsible agency for this program, which regulates the placement of structures and/or work in, or affecting, navigable waters of the United States (Minnesota River in LMRWD).
- Section 404 of the Clean Water Act□The COE has primary responsibility for administering the program but the Environmental Protection Agency (EPA) can appeal to a higher COE authority or veto a COE decision. This program regulates excavation of wetlands and the discharge of dredged or fill material into waters of the United States, which includes wetlands. There are basically two types of Section 404 permits: (1) regional and nationwide general permits, and (2) individual permits.
- Section 401 of the Clean Water Act□The Environmental Protection Agency delegated responsibility for this program to the MPCA. Activities which require a Section 10, Section 404, or Federal Energy Regulatory Commission permit must first obtain Section 401 water quality certification from the MPCA stating that the activity conforms to state water quality standards.

- Food Security Act of 1985, Swampbuster: The U.S. Department of Agriculture/Agricultural Stabilization and Conservation Service is responsible for administering the program. The program regulates the alteration of wetlands for agricultural use and prohibits farmers who receive federal subsidies from draining wetlands. Alteration of a wetland results in ineligibility for all government price and income support programs.

State regulatory programs include the following:

- Protected Waters and Wetlands program, Minnesota Statutes 103G □ The DNR is the responsible agency for administering this program. The program regulates activities at or below the OHW that alter the course, current or cross section of public waters and wetlands. Regulations apply to designated U.S. Fish and Wildlife Service Circular #39 Types 3, 4, and 5 wetlands which are 10 acres or more in size in unincorporated areas, or 2.5 acres or more in size in incorporated areas. The program prohibits the filling of protected waters and wetlands for the purpose of creating upland areas.
- Wetland Conservation Act of 1991 (WCA) □ Local Government Units (LGUs) are responsible for administering the rules. The intent of the WCA is to promote no net loss of wetlands. The WCA rules regulate draining and filling activities in all wetlands, except DNR-protected waters and wetlands. The WCA rules require that drained and filled wetlands be replaced at a minimum replacement ratio of 1:1 in agricultural areas and 2:1 in non-agricultural areas. The 1:1 replacement ratio only applies if the land is kept in agricultural use for 10 years after replacement. Local units of government may have stricter wetland regulations. For example, Hennepin County requires 2:1 replacement in both urban and agricultural areas. Amendments to WCA in 1994 allow for the preparation of wetland management plans by local units of government that may give them more flexibility through a more regional wetland analysis. The DNR is involved in enforcement of the WCA and is responsible for identification, protection and management of calcareous fens.

Other State Rules include:

- State Water Quality Standards, Minnesota Rules 7050 □ The MPCA is the responsible agency. The rules include water use classifications and water quality standards for wetlands which are narrative rather than numerical. The rules include a mitigative process to protect wetlands from significant adverse impacts and to maintain nondegradation of wetland designated uses.

Local and regional regulatory programs include shoreland and floodplain ordinances, watershed plans and regulations, municipal zoning ordinances, and wetland ordinances. As described in Section 6, LMRWD will enter into a joint resolution/agreement with each local unit of government that will outline the water management responsibilities of LMRWD and the local unit of government. This agreement will also set forth the LGU responsible for administering the WCA for that portion of the community within LMRWD. Currently, most of the municipalities, townships and counties are the local government units (LGUs) responsible for administering the WCA within LMRWD. There are some areas within LMRWD where apparently no unit of government is the designated LGU. This is the case for the city of Mendota and the portion of the city of Eden Prairie located within LMRWD.

As noted in Section 3, Land and Water Resource Inventory, much of the District's floodplain is covered by wetlands (see Figure 3-10). Wetlands are also located outside the floodplain. Jurisdiction over these wetlands is a patchwork of the USFWS, COE, DNR, the District and cities, depending on the location of the wetland in question. Most of the Minnesota River floodplain

wetlands are part of the Minnesota Valley National Wildlife Refuge and are considered high priority wetlands.

The LGUs are responsible for delineating wetlands and determining wetland functions and values. The methods proposed for delineation and determination of functions and values are presented in Section 5.9.

LMRWD's floodplain rules restrict the amount of fill which can be placed within the floodplain of the Minnesota River. LMRWD's authority for reviewing or regulating activities in wetlands and waters only extends to those wetland activities which are proposed within the Minnesota River floodplain.

Although wetlands are not prohibited to be used as stormwater detention basins, the Metropolitan Council's model stormwater ordinance states that presettlement of runoff must occur prior to discharge to wetlands. The MPCA also discourages the use of wetlands for treatment of stormwater. LMRWD encourages pretreatment of stormwater prior to discharge to wetlands to help prevent sedimentation of wetlands.

The Metropolitan Council model ordinance also calls for buffer strips around both wetlands and detention basins. The WCA requires 16.5-foot wide buffer strips around wetland preservation areas only. LMRWD will require local water management plans (see Section 6) to address the need for wetland buffer strips.

A concern of Dakota County, echoed by the CAC, is the impact of groundwater use and dewatering on the high value wetlands located in the Minnesota River valley and the role of LMRWD in resolving drawdown related conflicts. Dakota County is especially concerned about the wetlands located along the Highway 13 corridor. LMRWD does not believe it should be actively involved in these groundwater issues since other groups are already addressing these issues. LMRWD could take a more active role in the future, if the other units of government (i.e. the DNR) determine they need assistance from LMRWD.

The LMRWD Managers believe that the existing wetland regulatory programs/rules (and the agencies responsible for administering them) adequately protect wetlands, so further involvement of LMRWD in wetland activities is not needed at this time.

4.6.2 Public Waters Regulation

The DNR's Protected Waters and Wetlands Permit Program (described in Section 4.6.1) requires a protected waters permit from the DNR for any work below the Ordinary High Water (OHW) mark that will alter or diminish the course, current, or cross-section of any protected water, including lakes, wetlands, rivers and streams. LMRWD and the DNR cooperate in referring projects in these areas to each other for review and comment. Figure 3-9 shows the protected waters within LMRWD.

4.6.3 Floodplain Regulation

LMRWD adopted floodplain regulations in 1973 to protect and enhance the Minnesota River floodplain. The 1965 flood (117,000 cfs) is considered to be very close to the 100-year flood event (115,000 cfs) for the Minnesota River. LMRWD's regulations apply to those areas of land that are below an elevation that is three (3) feet above the maximum known flood level (1965 flood). This increased freeboard is intended to allow for the effect of a significant spring rainfall superimposed on

the 1965 flood event. A cooperative study completed by the United States Department of the Interior and LMRWD (*The Effectiveness of Flood Control Structures of the Lower Minnesota River Watershed District*, 1970) analyzed the effect of actual spring storms in the Minnesota River watershed, superimposed on snowmelt, on Minnesota River flood levels. This study determined the flood elevation would be two feet higher than the 1965 flood. A second study, completed by LMRWD between 1970 and 1973, analyzed the impact of a Sioux Falls, South Dakota spring storm (translated to the Minnesota River watershed), superimposed on snowmelt, on Minnesota River flood levels. This study found the flood elevation would be three feet higher than the 1965 flood.

Most of the local units of government within LMRWD have adopted DNR-approved floodplain ordinances (see Table 3-6). LMRWD's floodplain regulations are advisory only in those communities that already have a DNR-approved floodplain ordinance.

The differences between the local units of government floodplain ordinances and the LMRWD floodplain regulations are as follows:

1. LMRWD advises the community of the warning zone between the 100-year flood elevation and three (3) feet above the 100-year floodplain elevation. There are no restrictions on building or filling in the warning zone.
2. LMRWD enforces equal encroachment which requires that the effect of the proposed project be considered for both sides of the Minnesota River. For example, if the criteria is that the cumulative effect of all projects is to not raise the flood level more than 0.1 foot, then each side of the river would only be allowed to raise the flood level by half that much (0.05 foot). Most local units of government floodplain regulations do not enforce equal encroachment.

LMRWD encourages that if fill is placed in the floodplain (not including the warning zone), an equal amount of excavation should take place within the same cross section.

See Section 6.2.1 for information about LMRWD's continued application of its floodplain program. Since LMRWD's floodplain regulations apply only to the Minnesota River floodplain, local units of government are responsible for managing flooding and floodplain issues outside the Minnesota River floodplain.

4.6.4 Project Review and Inspection Program

LMRWD currently provides technical review of project proposals for their impact on LMRWD's water resources and navigation. The District's review and comment process is not a permit or any other type of approval. The District Administrator in consultation with the consulting engineer performs the reviews and brings the proposed projects before the Board for comment, which are then passed on to the local units of government. LMRWD also performs limited inspections of these projects while they are under construction.

LMRWD relies on the local units of government to forward project proposals to the District for review. Some of the local units of government forward all project proposals to the District, others forward only some of the project proposals, and yet others forward none of the project proposals to the District. Many local units of government and project proposers were confused whether LMRWD's review process constituted a permit program. One of the purposes of this plan and the resultant joint resolutions/agreements is to clarify LMRWD's project review and inspection program. See Sections 5.2.2, 5.5.2, 5.13 and 6.2.2 for information regarding LMRWD's future role.

The LMRWD has entered into cooperative agreements with MAC and MnDOT, and will seek to enter into similar agreements with the Minneapolis Park and Recreation Board and affected federal agencies, giving LMRWD permitting authority of the entities within the “2000 Boundary Change Area” described in the appendix. Project proposers in the 2000 Boundary Change Area must submit plans to the District Administrator five (5) weeks prior to the LMRWD Board taking action on the project. The project proposers are required to present the project to the Board at the monthly Board meeting one month prior to the Board taking action on the project. This will provide ample time for District staff to review projects and resolve any issues or concerns that the District may have regarding the project.

4.6.5 Erosion and Sediment Control Programs

Most (if not all) local units of government already have erosion and sediment control ordinances in place. In addition, projects disturbing five or more acres of land are required to obtain an NPDES construction permit from the MPCA. Many reviewers identified enforcement of existing erosion control ordinances as an important issue. Since the MPCA has limited staff to oversee and enforce all of the NPDES permits, enforcement of erosion control regulations becomes the sole responsibility of the local units of government. LMRWD agrees that effective enforcement of required erosion and sediment controls is lacking. See Section 5.11 for LMRWD’s goals and policies to strengthen the enforcement process.

With expanded enforcement, the existing erosion and sediment control ordinances, in conjunction with the NPDES construction permit program, should be adequate for limiting soil erosion and the resultant water quality impacts.

4.6.6 Maintenance of Stormwater Systems

The stormwater system includes not only pipes and constructed ponds, but also lakes, wetlands, ditches, swales, and other drainageways. In addition to more typical maintenance measures, maintenance of the stormwater system may also mean maintaining or restoring the ecological characteristics of the natural portions of the stormwater system. LMRWD does not own any stormwater system components that require the more typical maintenance measures. Other units of government (cities, counties, DNR) are responsible for this maintenance. LMRWD may become involved in maintaining or restoring ecological characteristics as part of the resource assessment and planning process (see Section 5.2).

Action Step 4A in the Metropolitan Council’s *Regional Blueprint* (December, 1996) states that the Council will work to protect natural watercourses...and the critical adjoining land areas...to maintain and improve water quality and quantity and to preserve their ecological functions. Metropolitan Council actions include studying the costs and effects of existing water management regulations and providing technical assistance to local governments as they formulate protection tactics.

LMRWD is not responsible for maintenance of any water level control structures. The DNR believes that wildlife management agencies need more resources to maintain water level control structures used for management of aquatic wildlife. At this time, LMRWD does not consider this to be a significant issue.

4.6.7 Water Quality Degradation

The MPCA administers programs that are aimed at protecting the state's water quality. The MPCA sets water quality standards for all waters of the state, including groundwater, in Minnesota Rules Chapter 7050. The MPCA also administers the NPDES program for municipal and industrial discharges to waters of the state. Another MPCA program is the individual sewage treatment system program. Legislation went into effect in 1996 that sets minimum standards for individual sewage systems and other requirements.

In the document Regional Blueprint (December, 1996), the Metropolitan Council states that community success at controlling non-point source pollution and increased surface water runoff from development has been variable. Correcting the resultant water quality problems can be expensive. The Metropolitan Council believes pollution prevention programs, public education and review of discharge permits are needed to reduce the pollution which results from daily activities. It also suggests permit reviews, water management planning and grant programs to correct surface and groundwater problems. The Metropolitan Council also believes better data collection is needed to monitor the status of water quality.

Although local units of government may have policies addressing water quality, they often lack an effective water quality monitoring program in their communities. The lack of water quality data available for the District's water resources is an issue for LMRWD. Without water quality data, it is difficult to assess water quality needs. This problem will be addressed during LMRWD's resource assessment process and LMRWD's participation in the Metropolitan Council's Watershed Outlet Monitoring Program (WOMP).

4.7 Adequacy of Existing Capital Improvement Programs to Correct Problems

4.7.1 Water Quality

Most local units of government believe they can (or already do) address water quality problems in their communities, especially in the developing areas of the community. It becomes difficult (expensive) for capital improvement programs to address water quality programs in already developed or controversial areas.

For example, the city of Savage believes their capital improvements program is adequate for addressing water quality problems. However, the city would like to see LMRWD develop a capital improvement project fund to cover necessary projects for protection of Eagle Creek and the Savage fen as development occurs adjacent to them.

The City of Shakopee recently completed improvements to the Mill Pond Treatment Basin to provide additional water quality treatment prior to discharge to the Minnesota River. The remaining issue is whether additional stormwater quality treatment can be provided downstream of the Mill Pond Treatment Basin.

As another example, the City of Bloomington believes that the cost of stormwater monitoring and subsequent water quality improvement projects will be high. It could be difficult for the city to accomplish the projects if they involve purchase of already developed land. For this reason, the city

believes it will need to partner with other cities and watershed districts. The city is also concerned about the cost of addressing the NPDES requirements for Phase II cities.

LMRWD is conducting a demonstration project on bank erosion to evaluate different streambank erosion control methods ranging from vegetative to structural. Reducing streambank erosion will help to reduce sediment loads in the Minnesota River. The results of LMRWD's demonstration project can be used to guide the District, cities and other units of government that are considering streambank stabilization projects.

LMRWD's resource assessment and planning process may result in capital improvement projects that improve water quality.

4.7.2 Floodplain and Runoff Management

LMRWD's efforts in floodplain and runoff management are limited to programs and regulations, not construction of improvement projects. Local water management plans include capital improvement programs for correcting floodplain and runoff problems.

For example, the City of Shakopee's plan noted that the construction of a fixed outlet from Deans Lake would establish a normal elevation on the lake. The diagnostic feasibility study discussed in Section 4.2.4 will also determine the feasibility of constructing a modified lake outlet. A DNR permit will be required for the construction of a new outlet.

Another example is the city of Burnsville's plan, which noted significant capital projects for relief of stormwater conveyance problems within LMRWD. The proposed Embassy Cliffs storm sewer project involves installation of 2,500 feet of pipe at an estimated cost of \$800,000. The recently constructed box culvert to the Minnesota River has a project cost of about \$3,500,000. Burnsville believes its capital improvements program, funded by the city's stormwater utility, is adequate to respond to anticipated problems.

4.7.3 Fish and Wildlife Habitat and Public Waters and Wetlands Management

LMRWD is not aware of capital improvement programs that address fish and wildlife habitat or public waters and wetland management. In addition to the standards and criteria proposed in Section 5.13, LMRWD's resource assessment and planning process may result in capital improvement projects to improve particular fish and wildlife habitat issues. LMRWD believes that current programs adequately address public waters and wetland management issues.

4.7.4 Recreational Opportunities

Many different units of government are involved in providing capital improvements that provide recreational opportunities. Construction of trails, boat ramps and nature areas are examples of such improvements.

The city of Shakopee anticipates increased demand for public access and trail systems for water bodies in the city, including the need for an improved public boat access for the Minnesota River. Although outside the Shakopee city limits, the Minnesota River trail crossing that was removed in 1986 has been greatly missed by those who use the regional trail system. A concern for the city is whether the trail crossing will be replaced. The DNR notes that construction of a new bridge across

the Minnesota River is one example of a trail corridor enhancement that could be undertaken to improve recreational opportunities in LMRWD. The Scott SWCD *Comprehensive Plan* notes that there may be inadequate access to public facilities and fishing lakes in the county. The Burnsville plan also anticipates an increased demand for public access and trail systems for water bodies. Trails could be rerouted to protect sensitive natural resources, such as fens.

The DNR anticipates erosion resulting from trail use and other recreational activities will continue to occur. The Scott SWCD *Comprehensive Plan* also noted that heavy trail use results in loss of vegetative cover and shade trees and causes trail erosion.

LMRWD recognizes the need to increase public access to the District's resources. In the past, LMRWD promoted and supported the construction of boat ramps on the Minnesota River to emphasize increasing public access to the Minnesota River.

Table 4-1. Recipients of LMRWD’s Request for Information Regarding Problem Assessment

Recipient	Recipient
Cities:	Counties:
Bloomington	Hennepin
Eden Prairie	Dakota
Chanhassen	Carver
Chaska	Scott
Burnsville	Soil and Water Conservation Districts:
Savage	Hennepin Conservation District
Shakopee	Dakota SWCD
Eagan	Scott SWCD
Mendota Heights	Carver SWCD
Lilydale	Ramsey SWCD
Mendota	Metropolitan Council:
Carver	Metropolitan Council Environmental Services
Townships:	State Review Agencies:
Chaska Township	Minnesota Board of Water and Soil Resources
Jackson Township	Minnesota Pollution Control Agency
Louisville Township	Minnesota Department of Natural Resources
Federal Agencies:	Minnesota Department of Transportation
U.S. Fish & Wildlife Service	Minnesota Department of Health
U.S. Army Corps of Engineers	Minnesota Department of Agriculture

Table 4-2. Effect of Nonpoint Source Pollutants on Water Quality

Sediment		Nutrients (Nitrogen, Phosphorus)		Toxic Chemicals	
Origins	Impacts on Water Quality and Associated Uses	Origins	Impacts on Water Quality and Associated Uses	Origins	Impacts on Water Quality and Associated Uses
<p>Agriculture Urban Runoff Construction Mining Forestry</p>	<p>Decreased transmission of light through water.</p> <ul style="list-style-type: none"> □ Decreases primary productivity (aquatic plants and phytoplankton) upon which other species feed, causing decrease in food supply. □ Obscures sources of food, habitat, hiding places, nesting sites; interferes with mating activities that rely on sight and delays reproductive timing. <p>Directly affects respiration of aquatic species (e.g., gill abrasion). Decreases viability of aquatic life. Decreases survival rates of fish eggs and therefore size of fish population; affects species composition.</p> <p>Increases temperature of surface layer of water increases stratification and reduces oxygen-mixing with lower layers, therefore decreasing oxygen supply for supporting aquatic life.</p> <p>Decreases value for recreational and commercial activities.</p> <ul style="list-style-type: none"> □ Reduces aesthetic value. □ Reduces sport and commercial fish populations. □ Decreases boating and swimming activities. □ Interferes with navigation. <p>Increases water treatment costs.</p>	<p>Agriculture Animal Feedlots Urban Runoff Construction Forestry</p>	<p>Promotes premature aging of lakes (eutrophication)</p> <ul style="list-style-type: none"> □ Algal blooms and decay of organic materials create turbid conditions that eliminate submerged aquatic vegetation and destroy habitat and food for aquatic animals and waterfowl. □ Blooms of toxic algae can affect health of swimmers and aesthetic qualities of water bodies (odor and murkiness). □ Blooms of toxic algae can cause illness and death in animals and livestock that drink affected water. □ Favors survival of less desirable fish species. □ Interferes with boating and fishing. □ Reduces quality of drinking-water supplies. □ Reduced dissolved-oxygen levels can suffocate fish. □ Reduces waterfront property values. 	<p>Agriculture Urban Runoff Construction Forestry Mining</p>	<p>Sublethal effects lower organism's resistance and increase susceptibility to other environmental stresses.</p> <p>Can affect reproduction, respiration, growth and development, reduce food supply, or be fatal to aquatic life.</p> <p>Some toxic chemicals are carcinogenic, mutagenic, or teratogenic to aquatic life.</p> <p>Some toxic chemicals can bioaccumulate in tissues of fish and other aquatic life.</p> <p>Reduces commercial/sport fishing and other recreational values.</p> <p>Creates health hazard from human consumption of contaminated fish/water.</p>
				Fecal Bacteria	

Sediment	Nutrients (Nitrogen, Phosphorus)		Toxic Chemicals
<p>Origins</p> <p>Agriculture Urban Runoff Construction Mining Forestry</p> <p>Impacts on Water Quality and Associated Uses</p> <ul style="list-style-type: none"> Decreased transmission of light through water. <ul style="list-style-type: none"> <input type="checkbox"/> Decreases primary productivity (aquatic plants and phytoplankton) upon which other species feed, causing decrease in food supply. <input type="checkbox"/> Obscures sources of food, habitat, hiding places, nesting sites; interferes with mating activities that rely on sight and delays reproductive timing. Directly affects respiration of aquatic species (e.g., gill abrasion). Decreases viability of aquatic life. Decreases survival rates of fish eggs and therefore size of fish population; affects species composition. Increases temperature of surface layer of water; increases stratification and reduces oxygen-mixing with lower layers, therefore decreasing oxygen supply for supporting aquatic life. Decreases value for recreational and commercial activities. <ul style="list-style-type: none"> <input type="checkbox"/> Reduces aesthetic value. <input type="checkbox"/> Reduces sport and commercial fish populations. <input type="checkbox"/> Decreases boating and swimming activities. <input type="checkbox"/> Interferes with navigation. Increases water treatment costs. 	<p>Origins</p> <p>Agriculture Animal Feedlots Urban Runoff Construction Forestry</p> <p>Impacts on Water Quality and Associated Uses</p> <ul style="list-style-type: none"> Promotes premature aging of lakes (eutrophication) <ul style="list-style-type: none"> <input type="checkbox"/> Algal blooms and decay of organic materials create turbid conditions that eliminate submerged aquatic vegetation and destroy habitat and food for aquatic animals and waterfowl. <input type="checkbox"/> Blooms of toxic algae can affect health of swimmers and aesthetic qualities of water bodies (odor and murkiness). <input type="checkbox"/> Blooms of toxic algae can cause illness and death in animals and livestock that drink affected water. <input type="checkbox"/> Favors survival of less desirable fish species. <input type="checkbox"/> Interferes with boating and fishing. <input type="checkbox"/> Reduces quality of drinking-water supplies. <input type="checkbox"/> Reduced dissolved-oxygen levels can suffocate fish. <input type="checkbox"/> Reduces waterfront property values. 	<p>Origins</p> <p>Agriculture Urban Runoff Construction Forestry Mining</p> <p>Impacts on Water Quality and Associated Uses</p> <ul style="list-style-type: none"> Sublethal effects lower organism's resistance and increase susceptibility to other environmental stresses. Can affect reproduction, respiration, growth and development, reduce food supply, or be fatal to aquatic life. Some toxic chemicals are carcinogenic, mutagenic, or teratogenic to aquatic life. Some toxic chemicals can bioaccumulate in tissues of fish and other aquatic life. Reduces commercial/sport fishing and other recreational values. Creates health hazard from human consumption of contaminated fish/water. 	
		<p>Origins</p> <p>Agriculture Animal Feedlots Urban Runoff</p> <p>Impacts on Water Quality and Associated Uses</p> <ul style="list-style-type: none"> Introduces pathogens (disease-bearing organisms) to surface and ground water. Reduces recreational uses. Increases treatment costs for drinking water. Creates a human health hazard. 	

SOURCE: MPCA PUBLICATION ENTITLED: □PROTECTING MINNESOTA'S WATERS . . . THE LAND-USE CONNECTION.□

Table 4-3. Status of Adoption of Metropolitan Council’s Interim Non-point Strategy

Community	Status	Community	Status
Bloomington	Adopted in 1993	Mendota	No action
Eden Prairie	Adopted in 1993	Lilydale	Adopted strategy in 1997 supplement to 1990 stormwater management plan
Eagan	Approved in 1992	Chaska Township	No action
Burnsville	Adopted in 1996	Louisville Township	No action
Chaska	Adopted in 1993	Jackson Township	No action
Chanhassen	Adopted strategy in 1994 stormwater management plan	Carver County	Adopted in 1995
Savage	Adopted in 1996	Hennepin County	No action
Shakopee	Adopted in 1997	Dakota County	Adopted in 1993
Mendota Heights	Adopted in 1993	Scott County	Adopted in 1993