Minnesota Pollution Control Agency

April 20, 1993

Dear Interested or Affected Party:

The Minnesota Pollution Control Agency (MPCA) is proposing certain amendments to the state's water quality standards and use classification rule, Minnesota Rules Chapter 7050. You are being sent a copy of the proposed amendments and the Statement of Need and Reasonableness because you have been involved in previous revisions of Minn. Rules ch. 7050, have indicated an interest or provided comments on the current proposed changes, or you may be affected by the proposed changes. We will be asking the MPCA Board on April 27, 1993, to authorize the public noticing and the holding of public hearings for the amendments. If authorization is received, a notice containing the details of the upcoming comment period and hearings will be mailed to you. A notice showing the proposed rule amendments will also be published in the State Register.

The major amendments being proposed include:

1. The addition of water use classifications and water quality standards for wetlands,
2. the addition of a mitigative process to protect wetlands,
3. the addition of narrative biocriteria,
4. the addition of eight new numerical aquatic life standards for toxics,
5 the updating of nine of the current numerical aquatic life standards,
6. the designation of some surface waters, used as a source of drinking water, as Class 1C waters to recognize and protect this use,
7. the addition of a scientific and natural area and 37 calcareous fens to the list of Outstanding Resource Value Waters,
8. incorporate the most current listing of designated trout streams and lakes into the rule, and
9. reclassify certain watercourses as Class 7 Limited Resource Value waters.

Questions or comments may be sent to Ms. Debbie Olson, Water Quality Division, at the MPCA's St. Paul office, or you can call her directly at (612) 296-7223, TDD (612) 297-5353.

Sincerely,

Patricia M. Burke

Patricia M. Burke
Division Manager
Water Quality Division

PMB/jmg

ATTACHMENT 2

STATE OF MINNESOTA
POLLUTION CONTROL AGENCY

IN THE MATTER OF THE PROPOSED REVISIONS
TO THE RULES GOVERNING THE CLASSIFICATION
AND STANDARDS FOR WATERS OF THE STATE,
MINNESOTA RULES CHAPTER 7050

STATEMENT OF NEED
AND REASONABLENESS

April 27, 1993

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I. INTRODUCTION

A. Minnesota Rules Chapter 7050

Minnesota Rules Chapter 7050 are the rules of the Minnesota Pollution Control Agency (hereinafter "Agency" or "MPCA") that establish water quality standards and the beneficial use classifications for all the waters of the state. These rules define the water quality standards for all water bodies consistent with the goals of the federal Clean Water Act to provide fishable and swimmable waters wherever attainable. The standards in general include narrative requirements such as nondegradation, mixing zone requirements, and general provisions applicable to all dischargers or to all waters of the state. Specific numerical water quality standards* are established to protect aquatic life and recreation, and other beneficial uses as well, such as water for drinking, industrial and agricultural uses. The numerical standards provide a measuring stick against which the Agency can assess the quality of the state's waters, determine the need for treatment or clean-up programs, measure the success of ongoing pollution abatement programs, and help establish priorities when planning for pollution control needs. Also, standards are the basis for effluent limitations in some permits.

Chapter 7050 also defines the levels of wastewater treatment that are applicable to industrial and municipal point source dischargers. Secondary treatment and federal technology-based minimum treatment requirements are generally required, although more advanced water quality based effluent limitations may be required if the technology-based effluent limitations are not adequate to maintain water quality standards.

*The term "standards" is used both in a broad sense to refer to all of Chapter 7050, and in a strict sense to refer to pollutant-specific numerical standards. The words "numerical standards" will be used when standards has the latter meaning, unless the meaning is clear from the context.

B. Scope of the Proposed Revisions

1. The major subjects of this hearing are the proposed revisions of Chapter 7050 as follows:

   a. Add water quality standards specifically for wetlands under parts 7050.0110; 7050.0130, items D and F; 7050.0185, subparts 1 and 9; 7050.0186; 7050.0210, subpart 13a; 7050.0222, subpart 6; 7050.0223, subpart 5; 7050.0224, subpart 4; 7050.0225; 7050.0410; 7050.0425; and 7050.0430. The proposed language will address the unique characteristics of wetlands.

b. Expand biological-criteria narrative and standards under parts 7050.0150; 7050.0200, subparts 3 and 8; and 7050.0222, subparts 2 to 7. The proposed language will be used to develop a biological criteria value from reference conditions that can be used to evaluate biological integrity through assessment.

c. Add an exemption to point source discharge requirements under part 7050.0212, subpart 2a, for return flows from dredge disposal facilities. The proposed exemption will allow return water from short-term dredge projects to be treated through best management practices (BMPs), best practicable technology (BPTs) and special site-specific conditions established under a State Disposal System permit.

d. Add eight new aquatic life standards for toxics under part 7050.0222, subparts 2 to 4. Standards are proposed for Alachlor, Antimony, Atrazine, Cobalt, Iron, Manganese, Naphthalene, and Thallium.

e. Update nine current aquatic life standards for toxics under part 7050.0222, subparts 2 to 4. The toxics standards proposed to be updated are for Arsenic, Benzene, Bromoform, Endosulfan, Fluoranthene, Hexachlorobenzene, Nickel, Pentachlorophenol, and Vinyl Chloride.

2. The minor subjects of this hearing are the proposed revisions of Chapter 7050 as follows:

a. Clarify the language for natural water quality under part 7050.0170.

b. Add one scientific and natural area called Falls Creek, in Washington County, as an Outstanding Resource Value Water under part 7050.0180, subpart 4.

c. Add calcareous fens identified by the Minnesota Department of Natural Resources as Outstanding Resource Value Waters under part 7050.0180, subpart 6b.

d. Revise the fen names under part 7050.0180, subpart 6b, to correspond to the names established by the Minnesota Department of Natural Resources.

e. Add the location information (county, township, range and section) to the fens listed under part 7050.0180, subpart 6b.

f. Add the term "specific pollutants or whole effluent toxicity" under the general standard for "water quality based effluent limitations," part 7050.0210, subpart 9.

g. Change the requirement for discharges from feedlots that are not regulated by federal requirements from a five-day biochemical oxygen demand standard to a feedlot pollution rating under part 7050.0215, subpart 2.

h. Clarify the definition for "acute toxicity" under part 7050.0218, subpart 3, item B.

i. Add the words "or effluent" under the definition for "chronic criterion," part 7050.0218, subpart 3, item H.

j. Add a definition for "percent effluent" under part 7050.0218, subpart 3, item Z.

k. Add a definition for "toxic unit" under part 7050.0218, subpart 3, item EE.

l. Clarify the definition of "whole effluent toxicity test" under part 7050.0218, subpart 3, item HH.

m. Add the words "and narrative" under part 7050.0220, subpart 1.

n. Add tables under part 7050.0220 that summarize how the narrative and numerical standards for associated water use classifications, and provide updated drinking water standards.

o. Update the references to the federal drinking water standards and incorporate certain federal standards by reference to the Code of Federal Regulations under part 7050.0221, subparts 2 to 5.

p. Update reference to the Minnesota Department of Natural Resources Commissioner's Order under part 7050.0420 for trout waters and list all designated trout streams and trout lakes under part 7050.0470.

q. Classify additional waters identified as public drinking water supply sources by the Minnesota Department of Health as Class 1C under part 7050.0470.

r. Include or modify exclusionary references to certain waters listed in part 7050.0470 which are currently or which were designated trout streams identified by Minnesota Department of Natural Resources Commissioner's Order.

s. Make new entries and revise existing entries under part 7050.0470 to correspond with changes proposed under part 7050.0180.

t. Add the county name to the fen entries under part 7050.0470.

u. Change the class designation under part 7050.0470 for waters requested to be reclassified by persons outside the Agency and recommended by staff.

v. Change the class designation for fens listed under part 7050.0470 from Class 2B to Class 2D to correspond to Class 2D proposed under part 7050.0222, subpart 7, item C.

w. Make miscellaneous changes throughout the chapter to correct cross references and spelling, modify the structure of the rule to improve the readability of the language and make subpart and item number and letter changes to accommodate the proposed language.

C. Introduction of Proposed Wetland Water Quality Standards and Biological Criteria

The proposed wetland water quality standards and biological criteria require a more in-depth introduction.

1. Wetland Water Quality Standards.

There are many types of wetlands, just as there are a wide variety of types of lakes and rivers. Names associated with moving water include rivers, streams, creeks, brooks, and rills and those associated with standing water include lakes, ponds, reservoirs, and pools. In the same way, there are numerous names associated with wetlands, including marshes, fens, swamps, bogs, sloughs, and mires. Each of the different water resources has its own set of values, functions, and uses but all have a place in the fabric of the environment. These resources are treated with equal protection for their designated uses under the federal Clean Water Act and the Ch. 7050 Water Quality Standards.

Shallow seasonal wetlands are not more or less valuable in the landscape than deep open water wetlands, but their designated uses are as different as streams are different than rivers or lakes. It is recognized that damming a stream to form a ponded reservoir causes significant changes in the habitat, the hydrology and water quality downstream, and the plants and animals utilizing the resource.

In the same way, wetlands deserve careful consideration before they are converted to other types of wetlands or removed from the landscape altogether. Water resources are not isolated from each other or from the ecosystem. Wetland uses such as nutrient uptake, storm water storage, erosion control, low flow augmentation, wildlife habitat, and ground water recharge, are extremely valuable even in remote wetlands only distantly connected to the other resources in the watershed. And wetland removal will have reverberations throughout the fabric of the landscape. The poor water quality of the Minnesota River can be directly tied to the loss of small, seemingly insignificant, upland and riparian wetlands that cumulatively served the functions noted above. One major component of the restoration of the Minnesota River will be to restore the hydrologic and treatment capabilities lost with the reduction in wetlands. Exhibits W1 and W2.

Wetlands are "waters of the United States" and "waters of the State", just like lakes and rivers. "Waters of the State" are defined under Minnesota Statutes, section 115.01, subdivision 9, to mean:

> "all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, reservoirs, aquifers, irrigation systems, drainage systems and all other bodies or accumulations of water, surface or underground, natural or artificial, public or private, which are contained within, flow through, or border upon the state or any portion thereof."

The Agency's authority to protect waters of the state from pollution originated in 1967 with the establishment of the Agency. Pollutant and pollution are defined under Minnesota Statutes section 115.01, subdivisions 8, 9, 12, 13, and 17 as follows:

> Subd. 8. "'Industrial waste' means any liquid, gaseous or solid waste substance resulting from any process of industry, manufacturing trade or business or from the development of any natural resource."
>
> Subd. 9. " 'Other wastes' mean garbage, municipal refuse, decayed wood, sawdust, shavings, bark, lime, sand, ashes, offal, oil, tar, chemicals, dredged spoils, solid waste, incinerator residue, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, cellar dirt or municipal or agricultural waste, and all other substances not included within the definitions of sewage and industrial waste set forth in this chapter which may pollute or tend to pollute the waters of the state."
>
> Subd. 12. " 'Pollutant' means any 'sewage', 'industrial waste', or 'other waste', as defined in this chapter, discharged into a disposal system or to waters of the state.
>
> Subd. 13. " 'Pollution of water', 'water pollution', or 'pollute the water' means : (a) the discharge of any pollutant into any waters of the state or the contamination of any waters of the state so as to create a nuisance or render such waters unclean, or noxious, or impure so as to be actually or potentially harmful or detrimental or injurious to public health, safety or welfare, to domestic, agricultural, commercial, industrial, recreational or other legitimate uses, or to livestock, animals, birds, fish or other aquatic life; or (b) the alteration made or induced by human activity of the chemical, physical, biological, or radiological integrity of waters of the state."

> Subd. 17. "'Sewage' means the water-carried waste products from residences, public buildings, institutions or other buildings, or any mobile source, including the excrementitious of other discharge from the bodies of human beings or animals, together with such ground water infiltration and surface water as may be present.

The 1972 amendments to the Federal Water Pollution Control Act (now called the Clean Water Act, CWA) created the National Pollutant Discharge Elimination System (NPDES) program for point source discharges and CWA section 401 Water Quality Certifications. Exhibit W50. The Agency is the designated state agency for administrating these programs and issuing corresponding permits and certifications.

Significant adverse impacts to wetlands result in degraded water quality, both in the wetland and downstream. Exhibits W29 and W19. These impacts to water quality must be replaced to balance the loss of designated uses. Exhibit W30.

The U.S. Fish and Wildlife publication Circular 39 separates freshwater wetlands into eight types. Exhibit W31. These types range widely in characteristics. Some have saturated soils for only a few weeks a year while others are flooded all year. Some wetlands are treeless, containing only grasses and/or shrubs, while others are completely forested. Thus each wetland type provides its own individual set of characteristics, values, and uses, yet all wetlands, to some extent, provide the attributes described below.

To understand why wetlands provide these values, it is important to explain how wetlands enhance water quality. Filtering of pollutants by wetlands is an important function and benefit of wetlands. Exhibits W32, W33, W34 and W35. These pollutants are often buried by newer plant material, isolating them in the sediments.

The trapping of nutrients by wetlands also helps reduce excess plant growth in lakes and rivers. The main nutrients of concern are phosphorus and nitrogen. Exhibit W29. Common sources of nutrients in run-off are urban storm water, cultivated fields, and feedlots. Exhibit W1. If a lake becomes polluted because of excess nutrients or sediments, lake restoration must be undertaken. Most lake restoration methods are very costly, and this cost is usually borne by the public. Thus the value of upland wetlands that capture nutrients can be significant.

Sediments are trapped in wetlands in several ways. Exhibit W36. When the narrow channel of a stream widens into a wetland, water velocity slows. This allows the sediments time to drop out and settle in the wetland. This also occurs along the riparian border of a stream, which capture erosional sediments before they can get to the stream. Exhibit W37. When wetlands decrease stream velocity, downstream bank scouring is also diminished. This further decreases the sediment in the stream and enhances the water quality. These downstream water quality enhancements are an important public benefit provided by wetlands. Exhibits W38 and W39.

Also important are the losses in designated use from the cumulative loss of wetlands. Exhibits W40, W41 and W42. The Code of Federal Regulation 40 CFR 1508.7 defines a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions...Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." Exhibits W43 and W45. Any one wetland loss may not significantly impair downstream water quality, but the cumulative impact from the loss of many wetlands in a basin may be large. Exhibit W44. The Minnesota River Basin has degraded water quality, partially as a result of the cumulative loss of wetlands in the basin. Exhibits W1 and W2. Also, one consideration before a Clean Water Act Section 401 Water Quality Certification can be issued by the Agency is cumulative impacts. Another type of potential cumulative impact to wetlands is the loss of variety of the natural wetland types that commonly exists in the landscape. Different wetland types provide a range of designated uses. If many of the wetlands in a watershed were to be converted to a single type, such as a shallow water marsh, many of the wide range of uses that were present in the watershed would be lost, even if the net acres remained relatively constant.

The concept of nondegradation of Minnesota's water resources is an integral part of the Water Quality Standards. Two of the major themes of the federal Clean Water Act are: 1) all waters of the nation are to be assigned uses and those uses must be protected (Section 303(c)(2)(A)), and 2) the water resources of the nation must be protected from degradation to either maintain or improve the water quality of the nation (Section 101(a)(2)). The nondegradation language in the water quality standards is designed to protect the existing uses of the waters of the state. Waters are protected from point source discharges by setting effluent limits which are designed to ensure designated uses are maintained.

In a parallel way, the designated uses of the state's wetlands are protected from significant adverse impacts to the designated uses by requiring a mitigative process before wetlands are physically altered. This process of wetlands replacing wetlands to maintain the overall wetland resource is called "no-net-loss". State Executive Order 91-3 orders that "(a)ll responsible departments and agencies of the State of Minnesota shall operate to the fullest extent of their authority under the strict concept of 'NO-NET-LOSS' of wetlands of the state in regard to projects under their jurisdiction." Exhibit W26. The concept of "no-net-loss" of wetlands also fits within the federal goal of nondegradation of the nation's water resources (40 CFR 131.12(a)(1)).

The mitigation sequence has been established in 40 CFR Sec. 1508.20, in the State Executive Order 91-3, and in the State Wetland Conservation Act, Exhibit W53, as the approach to evaluate the potential for reasonable alternatives development. The mitigative sequence, in descending order, is as follows: avoid wetland impacts, minimize unavoidance impacts, and mitigate for the remaining impacts to the wetland designated uses.

2. Biological Criteria.

Historically, the evaluation of water quality has primarily been driven by the need to determine compliance under pollution abatement and regulatory programs. This made regulatory agencies rely heavily on water chemistry to evaluate water quality. Even though water chemistry is an important element of the quality of a water resource, it does not directly measure the health of the plant and animal communities that are part of the resource. Therefore, it is an incomplete measure of quality.

A nationwide effort is beginning, under the guidance of U.S. Environmental Protection Agency (EPA), to improve the accuracy of water quality measurement by establishing and utilizing narrative biological criteria. Narrative biological criteria (biocriteria) are general statements that describe the biological integrity of aquatic communities inhabiting waters of a given aquatic life designated use such as Class 2A and 2B. Biological integrity can be defined as the condition of aquatic communities inhabiting natural, unimpaired waterbodies or habitats of a region as measured by their structure and function. These reference conditions provide the benchmark against which other waterbodies or sites can be judged.

At this time, the Agency is proposing to modify the descriptions of the aquatic life use classes and to include a statement indicating the intention to use reference conditions as the benchmark for evaluating the biological condition. The proposal includes a change in the description of the aquatic life use classes to emphasize biological communities as the focus of protection and biological condition determination. An additional aquatic life classification called Class 2D is proposed to address wetlands as a separate habitat type.

D. Solicitation for Comments

To establish an opportunity for public input about the major revision issues to be aired during the development of rule language, the Agency conducted two periods to solicit opinions and comments from persons outside the Agency.

The first solicitation period began on February 25, 1992, and ended on March 31, 1992. A notice announcing this period was published in the State Register. Exhibit G1. The Agency received seven letters and three comments by phone during this period. Exhibit G2.

Much concern was raised about the plan to establish water quality standards specifically for wetlands. A public meeting was held in May 1992 to explain the federal regulations that require the development of wetland water quality standards, explain staff's ideas for language development and discuss the confusion between the Agency's rule revision plans and the rule development work being completed by the Board of Water and Soil Resources.

The second solicitation period began on September 1, 1992, and ended on September 30, 1992. A notice announcing this period was published in the State Register. Exhibit G3. This notice included a list of the issues that staff planned to address with rule revisions. A fact sheet was produced for each issue. Exhibit G7.

Three Agency letters were also sent out during the September solicitation period. The first letter introduced all the revision issues identified by staff and was sent to persons that submitted a comment during the February solicitation period, members of the Board of Water and Soil Resources rule working committee, and persons that attended the May 1992 wetland issues meeting. Exhibits G4a and G4b. The second letter addressed the plan to propose statewide toxic standards for alachlor, atrazine, antimony, cobalt, iron, manganese, naphthalene, and thallium, and was sent to active members of the Toxics Technical Advisory Committee, which was established during the 1990 triennial review for Minn. Rules ch. 7050. Exhibits G5a and G5b. A third letter addressed the reclassification of drinking water sources, identified by the Minnesota Health Department, to Class 1C and was sent to property owners known to draw drinking water from the listed waters. Exhibits G6a and G6b.

The Agency received 18 letters and nine comments by phone during the September solicitation period.

On January 29, 1993, a preliminary draft of revisions to Chapter 7050 was sent to persons in other state agencies that were used as consultants during the development of draft language. The purpose of this advance review was to ensure that policies and rules from other state agencies would not be violated by MPCA's intended changes.

II. STATEMENT OF AGENCY'S STATUTORY AUTHORITY

The Agency's statutory authority to adopt water quality standards and to classify waters of the state is found in Minn. Stat. sec. 115.03 (1992), particularly subdivisions 1(b) and 1(c). Subdivision 1(b) authorizes the Agency to classify waters, while subdivision 1(c) authorizes the Agency to "establish and alter such reasonable pollution standards for any waters of the state in relation to the public use to which they are or may be put as it shall deem necessary for the purposes of this chapter and, with respect to the pollution of the waters of the state, chapter 116."

Additional authority for adopting standards is established under Minn. Stat. sec. 115.44, subds. 2 and 4 (1992). Subdivision 2 authorizes the Agency to "group the designated waters of the state into classes, and adopt classifications and standards of purity and quality." Subdivision 4 authorizes the Agency to "adopt and design standards of quality and purity for each such classification necessary for the public use or benefit contemplated by such classification. Such standards shall prescribe what qualities and properties of water shall indicate a polluted condition of the waters of the state which is actually or potentially deleterious, harmful, detrimental or injurious to the public health, safety or welfare, to terrestrial or aquatic life or to the growth and propagation thereof, or to

the use of such waters for domestic, commercial and industrial, agricultural, recreational or other reasonable purposes, with respect to the various classes established..."

III. STATEMENT OF NEED

Minn. Stat. ch. 14 (1992) requires the Agency to make an affirmative presentation of facts establishing the need for and reasonableness of the rules as proposed. In general terms, this means that the Agency must set forth the reasons for its proposal, and the reasons must not be arbitrary or capricious. However, to the extent that need and reasonableness are separate, need has come to mean that a problem exists which requires administrative attention, and reasonableness means that the solution proposed by the Agency is appropriate. The need for the rule amendments is discussed below.

Rule revisions are needed at this time to meet requirements of the federal Clean Water Act (CWA). States are obligated by the Clean Water Act under section 303(c)(1) to review and revise their water quality standards at least once every three years. CWA sec. 303(c)(1) states:

> "The Governor of a State or the State water pollution control agency of such State shall from time to time (but at least once every three years period ...) hold public hearings for the purpose of reviewing applicable water quality standards and, as appropriate, modifying and adopting standards. Results of such review shall be made available to the [U.S. Environmental Protection Agency (EPA)] Administrator."

Under section 303(c)(3) of the Clean Water Act, EPA has final approval of proposed standards. CWA sec. 303(c)(3) states:

> "If the Administrator, within sixty days after the date of submission of the revised or new standard, determines that such standard meets the requirements of this Act, such standard shall thereafter be the water quality standard for the applicable waters of the State. If the Administrator determines that any such revised or new standard is not consistent with the applicable requirements of this Act, he shall not later than the ninetieth day after the date of submission of such standard notify the State and specify the changes to meet such requirements. If such changes are not adopted by the State within ninety days after the date of notification, the Administrator shall promulgate such standard pursuant to paragraph (4) of this subsection."

This review and approval process is called the triennial review. The Agency last reviewed its water quality standards in 1990. The current EPA deadline to have standard revisions adopted is September 30, 1993.

The EPA has provided the states with guidance on how to review and amend their water quality standards in the Water Quality Standards Handbook, July, 1990. Exhibit W3. The handbook discusses the states' obligation to review and amend their rules every three years and the federal authority to review and approve the states' standards after they are promulgated. The handbook requires the states to address water quality standards for wetlands and biocriteria during the 1993 review. Additional revisions are needed to address staff concerns that arose from their project work, to include information that has developed since the last revision, to make the rules easier to read by improving the structure and format, and to correct errors. The need for each major rule revision subject is discussed below.

A. Wetland water quality standards.

The EPA has directed that one of the major goals in this triennial review will be to emphasize wetlands protection. To guide the states in revising their Water Quality Standards for this triennium, U.S. EPA supplied National Technical Guidance, Exhibit W3, which require states to include the following:

- Include wetlands in the definition of 'State waters.'
- Designate uses for all wetlands.
- Adopt aesthetic narrative criteria (the 'free froms') and numeric criteria for wetlands.
- Adopt narrative biological criteria for wetlands.
- Apply the State's antidegradation policy* and implementation methods to wetlands."

*"Antidegradation" means the same as "nondegradation". "Nondegradation" in Chapter 7050 was revised during the 1981-1984 triennial review period. The term antidegradation first appeared in Federal regulation on November 8, 1983. The Agency saw no reason to change its terminology.

The Technical Guidance Executive Summary states that "(a)t a minimum, all wetlands must have uses designated that meet the goals of Section 101(a)(2) of the CWA by providing for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the water, unless a use attainability analysis (UAA) shows that the Clean Water Act Section 101(a)(2) goals cannot be achieved." The guidance goes on to state that "(t)he Water Quality Standards Regulation (40 CFR 131.11(a)(1)) requires States to adopt criteria sufficient to protect designated uses that may include general statements (narrative) and specific numerical values (i.e. concentrations of contaminants and water quality characteristics)." 40 CFR 131.3 defines designated uses as "those uses specified for water quality standards for each water body or segment whether or not they are being attained." 40 CFR 131.3 defines use attainability analysis as "a structured scientific assessment of the use which may include physical, chemical, biological, and economic factors..."

Once the Agency received the Technical Guidance listing the federal requirements, an internal working group was formed to draft the water quality standards wetland revision. Exhibit W4. The proposed draft was written to clarify the role of wetlands in the standards under existing

authority, which is already extensive. The draft document was first presented to a group of state and federal agencies in November, 1991, and then presented to a group of interest groups in May, 1992. Exhibits W6 and W7. There were also two public notice comment periods, in March and September, 1992.

B. Biological criteria.

Narrative biocriteria is needed to make progress toward fulfilling the requirements of the Clean Water Act and to establish a method of measuring water quality by examining biological communities structure and function.

MPCA establishes rules that define the goals for all waterbodies consistent with the federal Clean Water Act. The main objective of the CWA as stated in Section 101(a) is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. To achieve the objective, Section 101(a)(2) sets, wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and provides for recreation in and on the water. In furthering both of these goals, the United States Environmental Protection Agency has directed states to adopt narrative biological criteria in EPA guidance dated April 1990. Exhibit B2. EPA considers the adoption of biocriteria into state water quality standards as an indication of intent to formally consider the status of biological communities in states' water quality management programs.

Sections 303 and 304 of the Clean Water Act give specific directives for the development of biological criteria. Section 303(c)(2)(B) requires development of criteria based on biological assessment methods when numerical criteria are not established for toxic pollutants listed pursuant to Section 307(a)(1). Section 304(a) requires EPA to develop water quality criteria, methods, and information for assessing 1) the effects of pollutants on aquatic community components such as fish, shellfish, wildlife, and plant life, 2) the effects of pollutants on biological community diversity, productivity, and stability and 3) the factors that are necessary to restore and maintain the physical, chemical, and biological integrity of all waters. In addition, biological criteria are seen as an aid to states in meeting requirements of the Clean Water Act under Section 305(b), 303(d), 304(l), 314 and 319.

The need to more explicitly address the biological integrity of waterbodies stems from the inadequacy of protecting and assessing biological condition primarily through a chemical approach. Historically, most pollution control programs have attempted to achieve the Clean Water Act goals by focusing regulatory efforts and assessment on the chemical condition of waters. In large part this has occurred because the initial regulatory thrust was to control chemical discharges from point sources. Standards were developed that set chemical specific criteria which are considered protective of aquatic life uses.

Significant improvements in water quality have been made using this chemical criteria approach. However, there are many factors that affect biological integrity which are not addressed by present numeric chemical criteria and chemical monitoring. Chemical toxicity tests have been completed on only a minority of suspected toxicants and laboratory testing cannot take into account all possible toxicity changes that can occur in the receiving water. Significant nutrient loadings typically associated with nonpoint source pollution can impact biological integrity as well by increasing primary production and altering the energy flow through the system, which can change the aquatic community structure. Biological condition can also be impacted by non-chemical factors such as habitat alteration, sedimentation, and hydrologic modifications.

Biological criteria and biological surveys provide a more direct means of assessing aquatic life use attainment. Chemical monitoring is an indirect method for judging biological integrity and is not always an effective tool to evaluate all impairments. The results of a study conducted by Ohio Environmental Protection Agency illustrate this point. The study compared aquatic life use impairment, as determined by an integrated biologically based assessment and by water column chemistry testing. Exhibit B1. The biological survey showed nonattainment to aquatic life uses in 49.8 percent of the 645 stream segments where water column parameters, that had corresponding criteria, indicated no impairment. In large part the causes of impairment were organic enrichment/low dissolved oxygen, habitat modification, or siltation.

If Agency water quality management programs and water quality rules are to further the goals of the Clean Water Act, then the Agency needs to ensure protection of biological communities by establishing biological criteria and assessing against that criteria. The Agency's proposed amendments do not infer that biological criteria are superior to existing criteria but that integrated chemical, physical, and biological tools are needed to assess attainment of designated uses.

The EPA has provided guidance to the states on how to develop biological criteria. Exhibit B2. The guidance outlines a phased process for implementation. The EPA first requires the adoption of narrative biological criteria. At a future date, the use of biological surveys will be required to derive biological criteria for all types of surface waters (rivers and streams, lakes, reservoirs, and wetlands) and designated aquatic life uses. EPA considers the adoption of narrative biological criteria in Chapter 7050 the legal and programmatic basis for using ambient biological assessments in the Agency's water quality management programs. Procedures on initiating narrative biological criteria have also been provided by EPA. Exhibit B3.

C. Exemption for return waters from dredge disposal facilities.

The Agency is proposing an exemption from the secondary effluent limitations for suspended solids and phosphorus for dredge disposal facilities. This exemption is needed to address the unique treatment problems associated with dredge spoils and the history of State Disposal System permit violations at these treatment facilities.

Minnesota has approximately 20 dredge disposal facilities that discharge excess water from dredge holding ponds into the state's waters and are unable to consistently meet water quality permit limitations for total suspended solids and phosphorous. Establishing permit limitations that are not achievable by the permittee sets up permit noncompliance situations that cause many problems for both the Agency and the regulated community. These problems include but are not limited to: penalties for noncompliance, the permittee's vulnerability to citizens lawsuits, the time and expense spent on enforcement actions, permit issuance backlogs and some loss of the Agency's ability to ensure minimization of water quality impacts.

D. Eight new aquatic life standards for toxics.

In 1990 the Agency adopted aquatic life water quality standards for 53 toxic pollutants. Also, a detailed procedure (Parts 7050.0217 and 7050.0218) was added to replace very general guidance on developing site-specific criteria for other pollutants. Since 1990, Agency staff has developed 17 site-specific criteria. The Agency is proposing to adopt eight of these as statewide standards. The eight proposed standards include alachlor, antimony, atrazine, cobalt, iron, manganese, naphthalene, and thallium.

The 17 criteria were developed in response to requests from staff in the Agency's Ground water and Solid Waste, Hazardous Waste, and Water Quality Divisions to protect surface waters threatened by pollution from a variety of sources, and by pollutants for which no numerical standards were available.

The eight criteria were selected for promulgation based on the quality and quantity of the toxicity data supporting the proposed standard and on the number of times the criterion was requested to be used at different locations. Once promulgated as standards these eight criteria can be applied statewide without the need for a time consuming site-specific review. These eight criteria are the ones most likely to be needed in the foreseeable future to help set goals for remedial actions at ground water contamination sites or to set effluent limitations for point source dischargers.

The following is a more detailed discussion of why each of the eight criteria was developed and selected for promulgation.

1. Alachlor and Atrazine.

Criteria for these herbicides were originally developed for the Huntting Elevator Spill Site near Lansing, Minnesota at the request of the Agency's Ground Water and Solid Waste Division. Atrazine is the most widely used herbicide in the U.S. for corn and sorghum production. Exhibit T10. Atrazine has been found as a contaminant in ground water and surface waters in many locations. Exhibits T32 and T34. With the greater emphasis being place on the control of nonpoint source pollution, including agricultural runoff, standards for atrazine and alachlor are needed to help assess the progress of these programs.

2. Antimony, Cobalt, Iron, Manganese and Thallium.

Criteria for these elements were originally developed to set mine leachate permit limitations for the AMAX-Department of Natural Resources mine near Babbitt, MN.

Subsequently, the cobalt criterion has been used to set permit limitations for leachate at LTV mining near Birch Lake, evaluate conditions at Eveleth Taconite Mining Co., Eveleth, and assess conditions at two landfill leachate sites and two contaminated ground water sites.

The iron criterion has been used to assess the potential addition of coal ash leachate to the Red Wing municipal waste water treatment plant, and to assess the quality of landfill leachate at two sites. The manganese criterion has been used to assess leachate at the Flying Cloud, Kluver, and Dakhue sanitary landfills.

The thallium criterion has been used to evaluate clean up activities at the Twin Cities Army Ammunition Plant (TCAAP) in New Brighton.

These metals are common pollutants in mine leachate drainage, ash and landfill leachate and at some ground water clean up sites. The availability of statewide standards for these metals will expedite the review of potential pollution situations and the setting of site-specific effluent limitations in the future.

3. Naphthalene.

This criterion was developed for Harvest States Site, a contaminated grain elevator area, at the request of the Agency's Ground Water and Solid Waste Division. Naphthalene is commonly associated with coal gasification production, petroleum activities, coking facilities and wood treatment processes. The standard is needed to address clean-up activities involving these activities.

There is little or no evidence for any of the eight proposed standards that their toxicity changes significantly from one location to another. Therefore, site-by-site evaluation of the applicability of the criteria has not resulted in any changes to the original criteria. The same criterion is generally applicable at each new site. Promulgation of statewide standards for these common pollutants will facilitate the protection of Class 2 waters threatened by these pollutants.

E. Update nine current aquatic life standards for toxics.

When the Agency adopted 53 Class 2 (aquatic life) numerical standards for toxic pollutants in 1990, Agency staff indicated that the standards could be updated as part of each subsequent triennial review of Ch. 7050. Also, part 7050.0218, subpart 1 states that: "the agency may adopt new standards according to Minnesota Statutes, chapter 14, to replace those listed in part 7050.0220 that are more stringent or less stringent if new scientific evidence shows that a change in the standard is justified".

At this time the Agency proposes to update nine standards. All of the standards proposed to be updated are human health-based for Class 2A and 2Bd waters. Six of the proposed Class 2B and 2C standards are human health-based and two are toxicity-based (nickel is both). The discussion in the reasonableness part of this document on the proposed eight new standards provides a brief description of how standards are determined.

These standards are being proposed for change because the reference doses or potency slopes used to calculate the standards in 1990 have changed. Revising these nine standards will bring them up to date with the latest EPA consensus on human health risk as represented by the current reference doses and potency slopes in the Integrated Risk Information System (IRIS), or as recorded in the Health Effects Assessment Summary Tables (HEAST) for 1991. IRIS is current as of September, 1992. Exhibit T54.

IV. STATEMENT OF REASONABLENESS

Section IV describes the Agency's rationale for the proposed changes in the rule. The Agency is required by Minn. Stat. ch. 14 to make an affirmative presentation of facts establishing the reasonableness of the proposed rules. Reasonableness is the opposite of arbitrariness or capriciousness. It means that there is a rational and factual basis for the Agency's proposed action. The reasonableness of the proposed rules is discussed below.

Reasonableness of Individual Rules. The following discussion addresses the specific provisions of the proposed rules.

A. Part 7050.0110 SCOPE.

The Scope has been amended to state that Chapter 7050 applies to the physical alterations of wetlands, as well as point and nonpoint source discharges. This is reasonable because wetlands are waters of the state and waters of the state are protected against pollution from both point source discharges and alterations that can have significant adverse impacts to the designated uses. This clarification is necessary to emphasize that wetlands face both chemical and physical impacts and must be protected against these specific threats. The new language is within the Agency's existing authority (found in Minn. Stat. sec. 115.03, subd. 1, items (a) and (c)) to protect waters of the state from these impacts.

The word "both" has also been proposed to be deleted. This word is no longer appropriate with the language proposed to be added under this part.

B. Part 7050.0130 DEFINITIONS.

The State Revisor of Statutes has directed the Agency to add items A to G under this part to better identify each definition. Items A to C, E and G contain language from the current rules.

1. Item C. Nonpoint source.

   The reference to Minn. Stat. sec. 115.01, subd. 15 is proposed to be changed to subd. 11 because the statute has been recodified.

2. Item D. Physical alterations of wetlands.

   A definition for "physical alteration" is proposed to be added as follows:

   "Physical alteration" means the dredging, filling, draining, or the permanent inundating of a wetland.

   This definition is needed to clarify the narrative standards being proposed for physical alterations of wetlands. The definition is reasonable because, although the Agency must maintain the chemical, physical, and biological integrity of wetlands, the four alterations that are likely to cause a significant adverse impact on the designated uses of wetlands are dredging, filling, draining, and permanent inundation.

   Dredging is defined as the excavation of the wetland bottom. Designated uses that could be adversely impacted or lost through dredging include wildlife habitat, recreation, aesthetics, and biological diversity.

   Filling is defined as any solid material added to or re-suspended in a wetland that would alter its cross-section or hydrological characteristics, obstruct flow patterns, change the wetland boundary, or convert the wetland to a non-wetland. Designated uses that could be adversely impacted or lost through fill activities include low flow augmentation, biological diversity, wildlife habitat, recreation, erosion control, floodwater retention, stream sedimentation reductions, ground water recharge, aesthetics and biological diversity.

   Draining is defined as the lowering of the water table by a method such as ditching, tiling, or lowering the outlet elevation. Another method to drain a wetland is to divert flow around it. Designated uses that could be adversely impacted or lost through draining activities include low flow augmentation, biological diversity, wildlife habitat, recreation, erosion control, floodwater retention, stream sedimentation reductions, ground water recharge, aesthetics and biological diversity.

   Permanent inundating is defined as the raising of the water table by a physical change caused by human activity. Designated uses that could be adversely impacted or lost through permanent inundations include wildlife habitat, recreation, floodwater retention, aesthetics, and biological diversity.

   Seasonal wetlands are accustomed to variations in flow. Draining or permanently inundating a wetland causes a loss of fluctuations, resulting in a decrease of plant and animal diversity and possibility a conversion to another wetland type. Exhibits W19, W20, W21 and W57. The loss of flood storage and erosion control may cause water quality impacts to downstream water bodies.

The 1987 MPCA Statement of Need and Reasonableness (SONAR) discussed the impacts of inundation on wetlands in some length. Exhibit W22. Although the contents were specific to calcareous fens, the point that even small permanent changes in water elevation can have significant adverse impacts to the designated uses of small seasonal wetlands was established.

A Biwabik Minnesota wetland is an example of how inundating can cause the gradual conversion of a bog to a marsh. The city uses a natural bog for final nutrient assimilation. The permanent inundation of the bog, the change in pH, and the introduction of nutrients from the wastewater caused the loss of Tamarack trees and the sphagnum moss that had predominated. In its place, cattails (a typical marsh plant) are growing profusely. Although total wetland acres are preserved, some of the designated uses of the natural bog have been lost.

The definition of "physical alteration" recognizes that filling, dredging, draining, and permanently inundating are the major causes of impacts in wetlands. However, as stated in part 7050.0185, subpart 9, the Agency is limiting application at this time to those activities where formal permitting or certification processes are in place in Chapter 7001. Currently, these are Section 401 Water Quality Certifications, National Pollutant Discharge Elimination System (NPDES) permits, and State Disposal System permits. Additional processes may be proposed in future revisions of this chapter if conditions warrant.

Several questions and statements from the public were received during the Agency's solicitation of outside opinion. The Agency's authority to control physical alterations of wetlands was questioned. Exhibits W13 and W23. Authority to prevent water pollution that includes physical alterations of a water's integrity is clearly contained in Minn. Stat. ch. 115.

3. Item F. Wetlands.

The definition for "wetlands" is proposed as follows:

> "Wetlands are those areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Constructed wetlands designed for wastewater treatment are not waters of the state. Wetlands must have the following attributes:
>
> (1) A predominance of hydric soils;
> (2) Inundated or saturated by surface water or ground water at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in a saturated soil condition; and

(3) Under normal circumstances support a prevalence of such vegetation."

The proposed definition is reasonable because it is consistent with both federal law (40 CFR 230.41(a)(1)) and the Wetland Conservation Act. Exhibit W53. Stating that constructed wetlands designed for wastewater treatment are not waters of the state is in accordance with federal regulations. 40 CFR 232.3(q) states that "(w)aste treatment systems, including treatment ponds or lagoons ...are not waters of the United States." Storm water is a type of wastewater. "Constructed wetlands" are designed and created for the primary purpose of treating wastewater. However, when a natural wetland is converted to a wastewater treatment system, which is not a water of the state, there is the potential for significant adverse impacts to wetland designated uses. This conversion must be mitigated.

The Agency received several comments that the Agency definition of wetlands must be consistent with the Wetland Conservation Act. Exhibits W13, W24, and W25; W53. The definition is consistent with the Wetland Conservation Act and the applicable federal regulation noted in the previous paragraph.

C. Part 7050.0150 DETERMINATION OF COMPLIANCE.

The Agency proposes to change the heading of this part from "Determination of Compliance" to "Determination of Water Quality Condition and Compliance." This change is reasonable because the process proposed to be established under part 7050.0150 will determine the quality condition of a water resource as well as compliance. The term "water quality condition" is proposed to be added to this part for the same reason.

The Agency proposes to establish biological integrity as an indicator of water quality and is part of the Agency's effort to establish narrative biocriteria. "Biocriteria" is discussed under section C of part I, Introduction, and the need for biocriteria is explained in more detail in item 3 of part III, Statement of Need, of this document.

The Agency proposes to restate EPA guidance for developing biocriteria under this part by saying that the condition of a surface water is determined by its physical, chemical, and biological qualities. Exhibit B3, page 3. The Agency currently relies mostly on water chemistry to judge a waters support of its designated uses. However, the Agency will increasingly be placing more emphasis on biological information and evaluations of physical habitat along with water chemistry data to make these aquatic life use support evaluations.

Use of biological information for determining support characteristics of a water is not new to the Agency. Biological monitoring for fecal coliform organisms and Chlorophyll a is currently used to determine if a water can support a "swimmable" use. As the Agency develops reference conditions, it will integrate biological information with chemical information to make use support determinations.

The proposed language establishes that the biological quality of a water body will be assessed by comparison to reference conditions which best represent the most natural condition for a given water body type within a geographic region. It is reasonable that the Agency proposes to establish expectations of biological quality based on a reference condition approach because it is not possible to provide specific biological community expectations for the nation or state as a whole.

Biological communities vary considerably in their structure and function from region to region, and in various types of surface waters. It is also difficult to evaluate the biological condition of a site without comparing against a benchmark. Implicit in the definition of biocriteria is the notion of comparison. The reference condition provides the biological community characteristics against which other similar sites can be measured.

The preferred way in which the reference condition for a waterbody or site will be established is from biological information gathered from natural settings that are unimpacted or minimally impacted by physical alteration, development, or discharges. These reference sites will be regionally representative of the the same types of waterbodies or sites in terms of their intrinsic watershed characteristics. Reference sites for a region will be sought where there is natural vegetation, unaltered channel and bed morphometry, and a natural hydrology. In regions where data has not been gathered from reference sites or the area has been extensively degraded, historical records from the region and/or consensus of expert opinion may be alternatively used to determine the reference condition.

The reference condition will be used as one method for assessing designated aquatic life use attainment. If a waterbody or site deviates considerably from the characteristics of the reference condition, then the aquatic life use designation will not be supported from a biological perspective. For purposes of determining the impacts of specific activities or discharges, control sites will also be developed. Control sites may be "upstream" locations, "far field" transects, or paired watersheds that are similar to the site under investigation but without the impact under evaluation. The methods for establishing controls will follow procedures similar to those given in EPA's Rapid Bioassessment Protocols for Use in Streams and Rivers Chapter 8.3. Exhibit B4.

In developing the reference condition for each designated use and waterbody type, the entire aquatic community will not be evaluated. Indicative communities that are considered good indicators of the overall biological condition in specific surface water body types will be used instead. Indicative communities are groups of organisms such as fish, macroinvertebrates, macrophtyes, or algae. Evaluating one or more of these selected communities is seen as being cost effective, practical and provides sufficient information to determine overall biological condition.

In sampling the reference condition, control sites, and/or sites under investigation, consistent sampling methods will be used to determine community characteristics. Habitat structure will also be assessed

because interpretation of biological data has to be considered in the context of habitat quality. The characteristics of the indicative communities will be analyzed through reliable measures of community structure and function, which are referred to as metrics. Structural metrics will be chosen that describe the composition of the assemblage such as number of species, number of specific species, composition of tolerant and intolerant species and biological diversity. Functional metrics will consider ecological processes such as community photosynthesis and respiration or proportion of various trophic levels. An example of an index that uses an array of structural and functional metrics is the Index of Biotic Integrity (IBI). Exhibit B5. The IBI is a fish community based index developed for midwestern streams and rivers. The index is comprised of 12 metrics. These metrics evaluate species richness and composition, indicator taxa (tolerant and intolerant), trophic guilds, fish abundance, and external anomalies.

Changes are being proposed to correct the rule citation that references effluent limitations for point source dischargers. The citation will be changed from "part 7050.0211, subpart 1" to "part 7050.0211 or 7050.0212."

This part was written to establish how compliance is determined for all types of point source dischargers. However, part 7050.0211, subpart 1, does not include the limitations for existing trickling filters, pond facilities or discharges of industrial or other wastes. The proposed citation identifies the spectrum of possible point source dischargers and their effluent limitations and, in turn, completes the list of options for considering dilution effects.

D. Part 7050.0170 NATURAL WATER QUALITY.

Part 7050.0170 deals with several important issues regarding natural background concentrations of pollutants. It provides guidance on the application of water quality standards when background concentrations approach or exceed the standards. Also, it provides general guidance on how background concentrations are used when water quality standards become the basis for setting effluent limitations.

The current language in this part is unnecessarily complex and convoluted, making it difficult for the reader to understand and apply it. The Agency proposes to clarify and simplify the wording without changing the meaning of the existing language.

Two minor substantive changes are being proposed as part of the effort to clarify this part. They are the addition of 1) a definition of natural conditions, and 2) references to the nondegradation parts in the current rule. The current language of part 7050.0170 does not define "natural (background) conditions", and a definition is needed to make this part more explicit. Secondly, one of the provisions of part 7050.0170 is in essence a nondegradation statement. The Agency proposes to link this statement to parts 7050.0180 and 7050.0185 so that the existing nondegradation procedures apply to this statement. The intent is to make these changes and simplify the wording without changing the primary meaning of this part.

The current language can be broken out into four separate provisions as follows:

1. Natural background concentrations of pollutants that are below applicable standards will be taken into account when determining allowable loadings from point or nonpoint sources.

2. When natural background concentrations are known and exceed the standard, the background concentrations can be used as the standard.

3. Natural background concentrations below (or better quality than) the standard may be used in lieu of the applicable standard, if the Commissioner can demonstrate the need for protecting the receiving water at its current high quality. This is essentially a nondegradation standard.

4. The adoption of standards will follow the guidance in the rule, but reasonable changes can be made to the standards based on evidence brought forth at a public hearing.

It is proposed to revise the current wording for provisions 1,2 and 3 listed above; no changes are proposed for number 4. The wording of the revised language is intended to preserve these meanings while making part 7050.0170 easier to understand.

The addition of a definition of "natural conditions" will clarify how this term is used in the context of this part. It is proposed to define natural conditions to mean water quality that:

a. is defined by monitoring programs,
b. is relatively unaffected by man-made sources of pollution, both point and nonpoint,
c. is not affected by physical alterations to wetlands, and
d. can be predicted based on data from a similar watershed when data are unavailable for the watershed of interest.

Most of these points are self explanatory. Point "b." will probably require more interpretation than the others. The Agency understands that no surface water in the state is entirely free from anthropogenic pollution. For example, atmospheric deposition of pollutants affects all waters in Minnesota. Careful evaluation will be needed to identify natural conditions affected only by ubiquitous pollution as opposed to natural conditions affected by identifiable local sources.

The provision of part 7050.0170 that allows the Commissioner, when there is sufficient justification, to preserve natural conditions that are better than the water quality standards (number 3 above), is a nondegradation clause. Therefore, the Agency believes it should be tied to existing nondegradation provisions and propose to add the statement: "The reasonable justification must meet the requirements under parts 7050.0180 and 7050.0185." These requirements will provide a process

that limits the Commissioner's discretion and uses the same levels of protection, the same social and economic tests, and other nondegradation provisions that are in the nondegradation parts to justify protecting a given water at a higher level.

Neither this addition, nor the addition of the definition of natural conditions are intended to make the rule any more or less stringent than it is now.

E. Part 7050.0180 NONDEGRADATION FOR OUTSTANDING RESOURCE VALUE WATERS.

In 1984, the Agency revised its nondegradation policy in Chapter 7050 to include a special category of waters identified as Outstanding Resource Value Waters (ORVWs). As stated in part 7050.0180, subpart 2, item A, waters assigned the ORVW designation are waters of the state with "high water quality, wilderness characteristics, unique scientific or ecological significance, exceptional recreational value or other special qualities which warrant stringent protection from pollution."

Waters designated as ORVWs are assigned in one of the following protection level categories:

Prohibited Discharges. Waters listed under the prohibited discharges category are afforded the highest level of protection in that no new or expanded discharges are allowed to these waters. Discharges to waters in the prohibited discharges category, in existence at the time a given water is designated as an ORVW is permitted to continue discharging to these waters so long as they remain at or under their National Pollutant Discharge Elimination System (NPDES) permit mass loadings for regulated pollutants contained in the applicable permit and no new pollutants are discharged.

Restricted Discharges. Under the restricted discharges category, new or expanded discharges are prohibited from discharging to these waters, unless there is no prudent and feasible alternative to the discharge. If there is no feasible and prudent alternative, the discharge will be restricted to protect the natural water quality of the receiving water in order to preserve the functional integrity of the characteristics or features which contribute to the water's unique, scientific or recreational value.

When the nondegradation provisions for the ORVWs were first adopted into rule, the Agency recognized that its list of ORVWs was not all inclusive and that additional waters would likely be added through future rulemaking proceedings. Such is the case in this rulemaking proceeding in that additional waters are proposed as ORVWs under subpart 4 and subpart 6b.

1. Subpart 4. DNR designated scientific and natural areas.

Scientific and natural areas (SNA) are areas of the state that possess exceptional scientific or educational value with respect to various natural features. See Minn. Stat. sec. 86A.05, subd. 5 items (a) and (b) (1992). To be designated, each site must possess outstanding

natural features of statewide significance such as unusual landforms, rare and endangered plant and animal communities, or other features of scientific and exceptional value. The MDNR manages these areas to preserve, perpetuate, and protect from unnatural influences the scientific and educational resources within them. Minn. Stat. sec. 86A.05, subd. 5, item (c) (1992). In support of these efforts to preserve and protect these resources, discharges to SNAs or other activities which would impair the natural features of the SNAs are prohibited under the provisions of part 7050.0180, subpart 3.

One SNA, identified by the MDNR as the Falls Creek SNA in Washington County, is proposed to be added as items M under part 7050.0180, subpart 4.

a. Item M. Falls Creek

The Falls Creek SNA, also referred to in certain references as the Cedar Bend White Pines site, has been described as one of the most diverse natural areas remaining in Washington County. The site includes two major physical geographical areas, a large ravine complex and a low terrace of the St. Croix River. Of particular significance is the fact that the area appears to contain a stand of virgin timber, which is reportedly quite rare for the St. Croix valley. The site contains a number diverse habitats ranging from cool, moist stream bottoms to very dry ridge tops. Two rare plant populations, kitten-tails (Besseya bullii) and bog bluegrass (Poa paludigena) occur on the site. Portions of Falls Creek, a designated trout stream, are also within the boundaries of this SNA. A further discussion of this site can be found in the Falls Creek SNA Project Evaluation report, Exhibit C1.

2. Subpart 6b. Calcareous fens.

The word "fen" has been used to describe a variety of different types of wetlands. In Europe, the terms has been applied to peatlands which have at least a portion of their source of water coming from ground water which has percolated through mineral soil or bedrock. In North America, similar types of peatlands are further differentiated into swamps, fens, and marshes, based primarily on their dominant vegetation. In the midwestern states, this terms has a narrower definition. In this region, a fen is considered to be a grassland on a wet and springy site, with an internal flow of water rich in calcium and magnesium bicarbonates and sometimes calcium and magnesium sulfates. "Springy" indicates the presence of peat deposits and "internal flow" refers to the availability of a constant supply of ground water.

Calcareous fens are a type of fen which can be characterized by a distinctive floristic species composition. Calcareous fens are typically grass-sedge dominated peatlands which apparently only develop where surface discharges of calcium and magnesium bicarbonate-rich ground water occur. The ground water is typically discharged from dolomitic bedrock and/or calcareous glacial deposits. These calcareous fens have a high pH (7.0 to 8.2) and high mineral content (Ca+2 90-160 mg/l) and are maintained primarily by the ground water discharges.

Calcareous fens are dependent upon very localized water chemistry and hydrologic conditions. The circumstances producing the proper conditions necessary for the formation of calcareous fens are not common, making these fens a very rare and unique type of wetland. It has been theorized that as the ground water, supersaturated with calcium and magnesium bicarbonates, reaches the surface, its temperature increases and the calcium and magnesium bicarbonates precipitate out, thereby creating a harsh, alkaline soil condition. Since the cold internal ground water flows have low oxygen and nutrient concentrations, conditions are favorable for the formation and accumulation of peat. Many calcareous fens are noticeably raised in the middle, exhibiting a convex profile which reflects this build-up of peat.

Calcareous fen plant communities are characterized by a distinctive assemblage of plants adapted to the wet, calcareous peat soils. Many of these plants, called calcicoles, are rare in Minnesota. In this state, calcareous fens may be dominated by herbaceous plants (sedges, grasses and forbs) or by certain woody shrubs. Table I lists the calciphilic species found in Minnesota calcareous fens and that serve as indicator species for this plant community. Table II lists the endangered, threatened or special concern species found in these fens. Minn. Rules part 6134.0300 (1991) provides a list of endangered, threatened or special concern species.

TABLE I

Calciphilic Species Found in Minnesota Calcareous Fens

Scientific Name	Common Name
Aster junciformis	Rush aster
Valeriana edulis var. ciliata	Valerian
Betula pumila	Bog birch
Potentilla fruticosa	Shrubby cinquefoil
Lobelia kalmii	Brook lobelia
Parnassia glauca	Grass of Parnassus
Solidago riddellii	Riddell's goldenrod
Triglochin maritima	Arrowgrass
Gentiana procera	Lesser fringed gentian
Utricularia intermedia	Small bladderwort
Liparis loeselii	Yellow twayblade
Pedicularis lanceolata	Swamp lousewort
Carex sterilis	a sedge
Carex prairea	a sedge
Muhlenbergia glomerata	Fen muhly grass
Lysimachia quadriflora	Loosestrife
Cladium mariscoides	Twig-rush
Rhynchospora capillacea	Fen beak-rush
Scleria verticillata	Nut-rush
Gerardia paupercula	Pink gerardia

Source: MDNR Minnesota Natural Heritage Program

TABLE II

Rare Plant Species Found in Minnesota Calcareous Fens

Scientific Name	Common Name	Status
Carex sterilis	a sedge	State threatened1
Cladium mariscoides	Twig-rush	State special concern2
Scleria verticillata	Nut-rush	State threatened
Rhynchospora capillacea	Fen beak-rush	State threatened
Valerian edulis var. ciliata	Valerian	State threatened
Tofieldia glutinosa	False asphodel	State special concern
Eleocharis rostellata	Beaked spike rush	State threatened
Triglochin palustris	Arrowgrass	State special concern
Cypripedium candidum	White ladyslipper	State special concern

[1]Species listed as threatened by the state are species that may become endangered if their populations are significantly reduced. Species assigned to this category might be characterized by:

(1) Populations that have always been small and any decline in their numbers would be significant and/or,
(2) Populations that have already undergone an apparent decline and for which any further decline would be detrimental.

[2]Species listed as of special concern by the state are species that are not listed as threatened or endangered but do require special attention. Included are:

(1) Species subjected to species-specific exploitation; and
(2) Species whose habitats and habitats lend them to being particularly vulnerable to disturbance.

Source: MDNR Minnesota Natural Heritage Program

In Minnesota, calcareous fens have a sporadic distribution throughout the prairie region of the state. The calcareous fens in Minnesota occur in three broad geomorphic areas: 1) at the base of terrace escarpments in the major river valleys of southern Minnesota; 2) sides of glacial hills in the morainic uplands of western Minnesota; and 3) adjacent to Glacial Lake Agassiz beach ridges in northwestern Minnesota. The 31 calcareous fens already listed in subpart 6b of part 7050.0180 and the additional calcareous fens proposed for ORVW designation have been identified by the Natural Heritage Program of the Section of Wildlife, MDNR. The Natural Heritage Program identifies and locates significant examples of Minnesota's plant and animal species, plant community types, special wildlife habitats and special geologic features. Most of the information presented in this Statement of Need and Reasonableness (SONAR) on fens is directly from the Natural Heritage Program element abstract developed for the calcareous fen plant community. Exhibit C2.

Currently there are 31 calcareous fens identified as ORVWs in part 7050.0180, subp 6b. In addition to adding the 37 proposed calcareous fens to this list, the Agency is proposing some name changes for those fens currently in the rule to correspond to coding convention used by

the MDNR to inventory these plant communities in its Natural Heritage data base. The number following the name of the fen is the assigned occurrence number which uniquely identifies the record of information for the particular fen. The following list of calcareous fens reflect these name changes.

Fens listed according to current rule under part 7050.0180, subpart 6b:

A. Spring Creek WMA NHR fen, 34; Becker County (T.142, R.42, S.13); proposed to be part 7050.0180, subpart 6b, item A.

B. ~~B-B Ranch~~ Felton Prairie fen, 36; Clay County (T.141, R.46, S.13); proposed to be part 7050.0180, subpart 6b, item C, subitem (5).

C. Barnesville WMA fen, 10; Clay County (T.137, R.45, S.1); proposed to be part 7050.0180, subpart 6b, item C, subitem (2).

D. Felton Prairie fen, 28; Clay County (T.142, R.46, S.36); proposed to be part 7050.0180, subpart 6b, item C, subitem (4).

E. Spring Prairie fen, 37; Clay County (T.140, R.46, S.11); proposed to be part 7050.0180, subpart 6b, item C, subitem (9).

F. Clearbrook fen, 61; Clearwater County (T.149, R.37, S.17); proposed to be part 7050.0180, subpart 6b, item D.

G. Fort Snelling State Park fen, 25; Dakota County (T.027, R.23, S.4); proposed to be part 7050.0180, subpart 6b, item E, subitem (1).

H. Minnesota Valley NWR fen, 63; Dakota County (T.27, R.24, S.34); proposed to be part 7050.0180, subpart 6b, item E, subitem (2).

It should be noted that the entry for this fen currently under part 7050.0470, subpart 5, item C, subitem (6) includes section 27 in the legal description. The Agency is proposing to delete reference to section 27 because MDNR has designated the fen in this section as noncalcareous.

I. Nicols Meadow fen, 24; Dakota County (T.27, R.23, S.18); proposed to be part 7050.0180, subpart 6b, item E, subitem (3).

J. Perched Valley ~~WMA~~ Wetlands fen, 2; Goodhue County (T.112, R.13, S.8); proposed to be part 7050.0180, subpart 6b, item F, subitem (2).

K. Heron Lake fen, 45; Jackson County (T.103, R.36, S.29); proposed to be part 7050.0180, subpart 6b, item H, subitem (1).

L. Thompson Prairie fen, 20; Jackson County (T.103, R.35, S.7); proposed to be part 7050.0180, subpart 6b, item H, subitem (2).

M. Fish Hatchery fen, 60; Le Sueur County (T.110, R.26, S.14); proposed to be part 7050.0180, subpart 6b, item I, subitem (1).

N. ~~St. Peter~~ Ottawa WMA fen, 7; Le Sueur County (T.110, R.26, S.11); proposed to be part 7050.0180, subpart 6b, item I, subitem (3).

O. ~~Altona State Wildlife Management Area~~ Hole-in-the-Mountain Prairie fen, 6; Lincoln and Pipestone Counties (T.108, R.46, S.1, T.109, R.45, S.31); proposed to be part 7050.0180, subpart 6b, items J and T, subitem (2).

It should be noted that the legal description proposed under part 7050.0180 is the legal description currently identified for Altona State Wildlife Management Area under part 7050.0470, subpart 9, item B, subitem (3). Township 109, Range 45, Section 31, is not identified in the legal description on Exhibit C3 (MDNR Cal fen locations and ownership in MN) because the computer system used to generate the list will accept only information for one township.

P. Waubun WMA fen, 11; Mahnomen County (T.143, R.42, S.25); proposed to be part 7050.0180, subpart 6b, item K.

Q. ~~Truman~~ Perch Creek WMA fen, 33; Martin County (T.104, R.30, S.7); proposed to be part 7050.0180, subpart 6b, item M.

R. Fort Ridgely fen, 21; Nicollet County (T.111, R.32, S.6); proposed to be part 7050.0180. subpart 6b, item O, subitem (1).

S. Le Sueur fen, 32; Nicollet County (T.111, R.26, S.16); proposed to be part 7050.0180, subpart 6b, item O, subitem (2).

T. ~~Adrian~~ Westside fen, 59; Nobles County (T.102, R.43, S.11); proposed to be part 7050.0180, subpart 6b, item P.

U. ~~Primula Meadow (~~Faith Prairie fen~~)~~, 27; Norman County (T.144, R.43, S.25); proposed to be part 7050.0180, subpart 6b, item Q, subitem (4).

V. ~~Rock Dell~~ Nelson WMA fen, 5; Olmsted County (T.105, R.15, S.16); proposed to be part 7050.0180, subpart 6b, item R, subitem (2).

W. Burke ~~State Wildlife Management Area~~ WMA fen, 57; Pipestone County (T.106, R.44, S.28); proposed to be part 7050.0180, subpart 6b, item T, subitem (1).

X. Chicog ~~WMA~~ Prairie fen, 41; Polk County (T.148, R.45, S.20, 29); proposed to be part 7050.0180, subpart 6b, item U, subitem (3).

It should be noted that the entry for this fen under part 7050.0470, subpart 3, item C, subitem (3) includes section 33 in the legal description. The MDNR has assigned three occurrence numbers to the fens at this site: one in sections 20 and 29 (occurrence number 41) and one in section SWNE33 (occurrence number 40) and one in section NENE33 (occurrence numbers 42). Therefore, the Agency is proposing to make three separate entries under part 7050.0470 for the one existing entry. The second and third entries under part 7050.0180 are proposed as follows:

Chicog Prairie fen, 40; Polk County (T.148, R.45, S.33); proposed to be part 7050.0180, subpart 6b, item U, subitem (2).

Chicog Prairie fen, 42; Polk County (T.148, R.45, S.33); proposed to be part 7050.0180, subpart 6b, item U, subitem (4).

Y. ~~Kertsonville WMA~~ Tympanuchus Prairie fen, 38; Polk County (T.149, R.45, S.16); proposed to be part 7050.0180, subpart 6b, item U, subitem (7).

Z. ~~Pankratz~~ Tympanuchus Prairie fen ~~(Svedarsky's fen)~~, 26; Polk County (T.149, R.45, S.17); proposed to be part 7050.0180, subpart 6b, item U, subitem (6).

AA. Ordway Prairie fen, 35; Pope County (T.123, R.36, S.30); proposed to be part 7050.0180, subpart 6b, item V, subitem (3).

BB. Cannon River Wilderness Area fen, 18; Rice County (T.111, R.20, S.34); proposed to be part 7050.0180, subpart 6b, item X, subitem (1).

CC. Savage fen, 66; Scott County (T.115, R.21, S.16); proposed to be part 7050.0180, subpart 6b, item Y, subitem (2).

It should be noted that the entry for this fen currently under part 7050.0470, subpart 3, item C, subitem (3) includes section 17 in the legal description. The MDNR has assigned separate occurrence numbers to the fens at this site: one in section 16 (occurrence number 66) and two in section 17 (occurrence numbers 22 and 67). Therefore, the Agency is proposing to make three separate entries under part 7050.0470 from the one existing entry. The second and third entries under part 7050.0180 are proposed as follows:

Savage fen, 22; Scott County (T.115, R.21, S.17); proposed to be part 7050.0180, subpart 6b, item Y, subitem (1).

Savage fen, 67; Scott County (T.115, R.21, S.17); proposed to be part 7050.0180, subpart 6b, item Y, subitem (3).

DD. ~~Kennedy~~ Wiscoy fen, 58; Winona County (T.105, R.7, S.15); proposed to be part 7050.0180, subpart 6b, item AA.

EE. Sioux Nation WMA NHR fen, 29; Yellow Medicine County (T.114, R.46, S.17); proposed to be part 7050.0180, subpart 6b, item BB, subitem (1).

New calcareous fens proposed to be added to Chapter 7050 are listed below as they will appear under part 7050.0180, subpart 6b. The noted exhibits refer to the site maps showing the locations of the calcareous fens proposed for ORVW designation during the current rulemaking revision.

B. Carver County: Seminary fen, 75 (T.116, R.23, S.35), Exhibit C5;
C. Clay County:
   (1) Barnesville Moraine fen, 44 (T.137, R.44, S.18), Exhibit C6;
   (3) Barnesville WMA fen, 43 (T.137, R.44, S.18), Exhibit C7;
   (6) Felton Prairie fen, 48 (T.142, R.45, S.31), Exhibit C8;
   (7) Felton Prairie fen, 53 (T.141, R.46, S.24), Exhibit C9;
   (8) Haugtvedt WPA North Unit fen, 54 (T.137, R.44, S.28, 29), Exhibit C10;
F. Goodhue County:
   (1) Holden 1 West fen, 3 (T.110, R.18, S.1), Exhibit C11;
   (3) Red Wing fen, 72 (T.113, R.15, S.21), Exhibit C12;

G. Houston County: Houston fen, 62 (T.104, R.6, S.26), Exhibit C13;
I. Le Sueur County:
(2) Ottawa Bluffs fen, 56 (T.110, R.26, S.3), Exhibit C14;
L. Marshall County:
(1) Tamarac River fen, 71 (T.157, R.46, S.2), Exhibit C15;
(2) Viking fen, 68 (T.155, R.45, S.18), Exhibit C16;
(3) Viking fen, 70 (T.155, R.45, S.20), Exhibit C17;
(4) Viking Strip fen, 69 (T.154, R.45, S.4), Exhibit C18;
N. Murray County: Lost Timber Prairie fen, 13 (T.105, R.43, S.2), Exhibit C19;
Q. Norman County:
(1) Agassiz-Olson WMA fen, 17 (T.146, R.45, S.22), Exhibit C20;
(2) Faith Prairie fen, 15 (T.144, R.43, S.26), Exhibit C21;
(3) Faith Prairie fen, 16 (T.144, R.43, S.35), Exhibit C22;
(5) Green Meadow fen, 14 (T.145, R.45, S.35, 36), Exhibit C23;
R. Olmsted County:
(1) High Forest fen, 12 (T.105, R.14, S.14, 15), Exhibit C24;
S. Pennington County:
(1) Sanders East fen, 65 (T.153, R.44, S.7), Exhibit C25;
(2) Sanders East fen, 74 (T.153, R.44, S.7), Exhibit C26;
(3) Sanders fen, 64 (T.153, R.44, S.18, 19), Exhibit C27;
U. Polk County:
(1) Chicog Prairie fen, 39 (T.148, R.45, S.28), Exhibit C28;
(5) Kittleson Creek Mire fen, 55 (T.147, R.44, S.6, 7), Exhibit C29;
V. Pope County:
(1) Blue Mounds fen, 1 (T.124, R.39, S.15, 14), Exhibit C30;
(2) Lake Johanna fen, 4 (T.123, R.36, S.29), Exhibit C31;
W. Redwood County:
(1) Swedes Forest fen, 8 (T.114, R.37, S.19, 20), Exhibit C32;
(2) Swedes Forest fen, 9 (T.114, R.37, S.22, 27), Exhibit C33;
X. Rice County:
(2) Cannon River Wilderness Area Fen, 73 (T.111, R.20, S.22), Exhibit C34;
Z. Wilkin County:
(1) Anna Gronseth Prairie fen, 47 (T.134, R.45, S.15), Exhibit C35;
(2) Anna Gronseth Prairie fen, 49 (T134, R.45, S.10), Exhibit C36;
(3) Anna Gronseth Prairie fen, 52 (T.134, R.45, S.4), Exhibit C37;
(4) Rothsay Prairie fen, 46 (T.136, R.45, S.33), Exhibit C38;
(5) Rothsay Prairie fen, 50 (T.135, R.45, S.15, 16), Exhibit C39;
(6) Rothsay Prairie fen, 51 (T.135, R.45, S.9), Exhibit C40;
BB. Yellow Medicine County:
(2) Yellow Medicine fen, 30 (T.115, R.46, S.18), Exhibit C41.

Calcareous fens in this state vary greatly in size and quality. Since fens are fed by ground water and not dependent on seasonally fluctuating amounts of precipitation, a constant microenvironment can be maintained, producing a climax vegetation type which has remained stable for thousands of years. For this reason, fens often harbor relict plant species that are uncharacteristic or absent from other vegetation types. Due to human activities, however, a number of these fens have been seriously degraded and have lost much of their original character. In general, impacts to calcareous fens are evidenced by a loss of calicoles which in turn are replaced by weedy opportunistic plant species that take advantage of the changed habitat conditions.

The major threats to calcareous fens come from ditching, drainage, permanently inundating, and filling operations relating to agricultural activities, commercial development, gravel mining activities and highway construction. Water pollution impacts from those activities and from point source discharges have the potential to significantly alter the quality and quantities of the water upon which fen development and maintenance are so dependent. For this reason, the Agency believes that it is reasonable to propose that the calcareous fens listed in part 7050.0470 be designated as Outstanding Resource Value Waters. By placing the calcareous fens under the restricted discharges category of the nondegradation section of the rule, activities which do or could potentially contribute to the degradation of the waters of these fens can be prohibited or more stringently controlled, depending on the outcome of the prudent and feasible test referenced in part 7050.0180, subpart 6. These prohibitions and controls can apply to both point source discharges as defined in Minnesota Statutes section 115.01, subdivision 11, and to nonpoint source impacts resulting from land management and land use activities.

Since calcareous fens are so dependent upon specific hydrological conditions, impacts to water quantities in these fens resulting from certain land use activities, and to lesser degree from point source discharges, become important considerations in their protection and preservation. Too much water or too little water can disrupt the unique habitat and can lead to a shift in the plant species composition to one where common plant species become more abundant.

Under item (b) of Minnesota Statutes section 115.01, subdivision 13, pollution of waters is defined as, "the alteration made or induced by human activity of the chemical, physical, biological or radiological integrity of waters of the state." A change in the physical integrity of waters of the state, in this instance a change in the quantity of water present in the calcareous fen needed to maintain a suitable habitat for this plant community, will be construed as pollution of waters.

Therefore, within the context of the Agency's regulatory authorities, a land use activity, or a point source discharge (notwithstanding its chemical quality), which could potentially bring about a detrimental change in the water quantity present in these fens will trigger the need for the prudent and feasible analysis.

In 1991 the State Legislature passed the Wetlands Conservation Act which contained a provision stating that calcareous fens, as identified by the MDNR commissioner, may not be filled, drained, or otherwise degraded, wholly or partially, by any activity, unless the MDNR commissioner, under an approved management plan, decides some alteration is necessary. Minn. Stat. sec. 103G.223. Standards and criteria for identification, protection, and management of calcareous fens have also been proposed by the Board of Soil and Water Resources in Minn. Rules pts. 8420.1010 to 8420.1060, which relate to the Wetlands Conservation Act. Exhibit W10. While the prudent and feasible analysis referenced above is a process whereby the Agency Board has the ultimate decision making authority on the existence or lack of prudent and feasible alternatives, the Agency plans to cooperate with the MDNR on issues regarding calcareous fen protection.

The proper hydro-geological conditions which allow for the formation of calcareous fens are uncommon occurrences throughout the State. The rare and endangered plant species they support make these fens unique resources deserving of a high degree of protection. The Agency therefore believes that it is reasonable to designate these calcareous fens as ORVWs. Essentially, all of the calcareous fens identified by the MDNR to date are being proposed for this designation. In doing so, it is hoped that an element of protection will be added to aid in the effort to preserve these unique wetland plant communities.

A county-by-county inventory conducted by the MDNR of rare natural features is currently proceeding by way of the Minnesota County Biological Survey. As this survey progresses, additional fens will likely be identified and inventoried in the future. As new calcareous fens are identified, it is the Agency's intent, in cooperation with the MDNR, to include additional calcareous fens as ORVWs in subsequent rule revisions. In those instances where a MDNR newly identified calcareous fen is threatened by a potential discharger or certain land use activity, the Agency will consider the calcareous fen as an unlisted outstanding resource value water pursuant to the provisions of part 7050.0180, subpart 7.

F. Part 7050.0185 NONDEGRADATION FOR ALL WATERS.

1. Subpart 1. Policy.

The policy statement is proposed to be revised to add phrases that: 1) emphasize that the beneficial uses inherent in the State's water bodies, including wetlands, are valuable public resources and 2) emphasize that wetland alteration can cause a significant degradation on wetland designated uses and that one of these designated uses is habitat. These phrases are reasonable because they serve to clarify the rules and propose no changes to protection levels of the standards. Wetlands are waters of the state and protected by the existing standards. "Wetland" must now be identified in the rules because of the effort to develop water quality standards that more specifically apply to wetlands.

2. Subpart 2. Definitions.

The reference to Minn. Stat. sec. 115.01, subd. 14 is proposed to be changed to subd. 20 because the statute has been recodified.

3. Subpart 4. Additional requirements for significant discharges.

The word "and" is proposed to be deleted because it does not belong in the sentence and confuses the meaning of the rule. The sentence was intended to refer to the economic and social development impacts of a project not the economic, social development and impacts of a project. "And" was mistakenly included during the original drafting of this subpart.

4. Subpart 9. Physical alterations of wetlands.

The Agency is proposing a new subpart to establish nondegradation rules for projects that propose to physically alter wetlands. The subpart is proposed as follows:

> Physical alteration of a wetlands. The permit or certification applicant shall comply with part 7050.0186 if there is a proposed physical alteration that has the potential for a significant adverse impact to a designated use of a wetland and that is associated with a project that requires a National Pollutant Discharge Elimination System (NPDES) permit, a 401 certification under parts 7001.1400 to 7001.1470, or a state disposal system permit.

Nondegradation is proposed to be accomplished through the mitigation sequence. In general, nondegradation means that there can be no net increase in pollution discharges. Physical alteration results from a discharge. It is reasonable to use the mitigative process as the standard for nondegradation because the process is specifically written to replace wetlands that have been significantly altered such that one or more designated uses are lost. Exhibit W55 contains a matrix of wetland designated uses and the most common potential significant physical impacts.

G. Part 7050.0186 WETLAND MITIGATION.

This is a new part that specifies the steps and conditions for the mitigative process that is identified in part 7050.0185, subpart 9 as the nondegradation standard for the physical alteration of wetlands.

1. Subpart 1. Policy.

The policy statement emphasizes that wetlands must be protected from significant adverse impacts on their designated uses. It also identifies the wetland mitigative process as the means to achieve nondegradation of wetland designated uses.

2. Subpart 2. Wetland mitigation principles.

Subpart 2 describes the mitigative sequence of avoiding, minimizing, and mitigating. This is reasonable because the process is consistent with the Agency's present review process for Section 401 water quality certification applications. The sequence is also consistent, and complements, 40 CFR 230.10, 40 CFR 1508.20, and the Wetland Conservation Act. Exhibits W17, W18, W27, W28, W53, and W58. The process of using the mitigative sequence involves negotiations between the applicant and the Agency, with specific case-by-case considerations being the paramount factor.

The Clean Water Act Section 404(b)(1) guidelines were promulgated in 1982. Since then the Agency has conditioned waivers of Section 401 water quality certifications for fill activities with the requirement that sequencing be satisfied. Exhibit W59. As the water quality standards are currently written, a fill activity violates water quality standards because of suspended solids exceedances and impacts to the biota in the wetland. This necessitated the use of a conditional waiver. The current revision would allow the certification process to

proceed without the necessity of a waiver because the mitigation sequence is being incorporated into the water quality standards, which satisfied the nondegradation requirements.

The most common types of activities requiring use of the mitigative process in Minnesota are fill activities associated with building developments and road construction. For example, during the last two years, only four agriculture-related projects (out of a total of 121 projects requiring Section 401 certification) were reviewed for water quality considerations and only one was required to have wetland replacement as a condition of the Section 401 Water Quality Certification waiver. Exhibit W59 contains several examples of projects the Agency reviews. In all cases, either the conditional waiver requires use of the mitigative sequencing or the proposed project is denied because nondegradation and mitigative sequencing requirements were not met.

3. Subpart 3. Determination of wetland dependency.

This subpart was added to ensure consistency with, and to complement, the Wetland Conservation Act. A project is wetland dependent if wetland features, functions, or values are essential to fulfill the basic purposes of the project. Projects that are wetland dependent are assumed to be unable to avoid having some impact on a wetland. Examples of wetland dependent activities are growing rice and constructing wetland interpretive trails. These projects are directed to the second step of the mitigative sequence, impact minimization.

4. Subpart 4. Impact avoidance.

This subpart emphasizes that the first step in the mitigative sequence is avoidance to the extent possible. According to 40 CFR 230.10, because wetlands are "special aquatic sites", there is a presumption that prudent and feasible alternatives that will not involve wetlands are available. Exhibits W28, W50, W52 and W58. It is the responsibility of the applicant to demonstrate otherwise. As noted in subpart 3, activities that meet the wetland dependency requirement may go directly to the second step in the mitigative sequence.

As an example, the Agency denied Section 401 certification for a proposed fill activity in 1987 (#NCSCO-RF 87-830-77 in Exhibit W59) because impacts to the wetland could be avoided, but were not.

The term "prudent and feasible" is one that is well known in environmental statutes. The phrase appears in the Minnesota Environmental Rights Act, Minn. Stat. sec. 116B.09, subd. 2, and in the Minnesota Environmental Policy Act, Minn. Stat. sec. 116D.04, subd. 6. To paraphrase, no Agency may allow an action that results in pollution if there is a reasonable alternative which avoids the impact.

5. Subpart 5. Impact minimization.

The second step in the sequence is impact minimization. All projects that can not avoid impacts to wetlands must actively pursue minimizing significant adverse impacts to wetland designated uses.

The seven factors to consider when evaluating attempts to minimize a project's impact on a wetland are consistent with, and complement, Minnesota Rules, part 8420.0520, subp. 4 (Exhibit W10) and 40 CFR 230, Subpart H. Spatial considerations involve reviewing the footprint of the proposed project. If rotating a project would avoid the wetland yet still meet the project purpose, that alternative should be selected. The location of existing features and the type of project would be reviewed for minimization potential also.

In addition to project-specific minimization considerations, landscape considerations must also be reviewed. These include topographic, hydrologic, and biotic information, wetland designated uses and distribution, and consideration of individual and cumulative impacts to wetlands. 40 CFR 230, Subpart H specifies actions to minimize adverse effects, including considerations to minimize impacts to plants and animals.

6. Subpart 6. Impact compensation.

The last step in the sequence is compensatory mitigation for those impacts that could not be avoided. Replacement wetlands are required to maintain nondegradation of wetland designated uses.

The mitigative process in subpart 6 specifically states a preference for restored wetlands over created wetlands. Although some types of wetlands have been created with short term success, most restored wetlands will have better long term success for most types of wetlands in providing the uses of natural undisturbed wetlands. Exhibits W24, W49 and W58.

Restored wetlands are re-established in an area that was historically wetlands but which provides no or minimal wetland uses because of past alterations, such as filling or draining.

Created wetlands are constructed in areas that were not wetlands in the past. These should have, at a minimum, undulating bottom contours, shallow side slopes, and irregular edges. These attributes will enable created wetlands to increase the likelihood of replacing the designated uses of natural wetlands that were impacted. Exhibits W10 and W49.

The mitigative process in subpart 6 also states preferences for in-kind and on-site wetlands. Exhibit W58. In-kind wetlands are the same type of wetland as the one being impacted. Exhibit W32. On-site wetlands are in the same immediate watershed as the impacted wetland. Exhibit W27. A replacement wetland that is in-kind and on-site will come closest to maintaining the uses of the impacted wetland. Also, the replacement wetland should be completed prior to the loss of the impacted wetland, if possible. This language is consistent with the Wetland Conservation Act. Exhibit W53.

Subpart 6, item C, uses the phrase "to the extent feasible". The Agency recognizes that, although it is preferable for a replacement wetland to be in-kind and on-site, it is not always possible. There may not be space available in the immediate area or there may not be a potential

restoration wetland in the immediate sub-watershed. As noted in subpart 2 above, the process of achieving a reasonable replacement wetland involves negotiations between the applicant and the Agency, with specific case-by-case considerations being the paramount factor.

To provide further insight in the area of water quality designated uses for replacement wetlands, the Agency will be guided by a wetland assessment matrix when possible. Exhibits W54; W44. The matrix is designed to qualitatively assess the water quality designated uses of the wetland to be impacted to help determine the qualities that should be possessed by the replacement. Reference wetlands are not always available but, when they are, they provide further valuable information as to the attributes the existing wetland might have had if it is now degraded. The qualitative attributes listed along the side of the matrix were selected because, taken together, they provide a picture that can be used to assess the relative value of the wetland. Because wetlands provide benefits both within the wetland and downstream (nutrient retention and bank erosion control are two examples) the matrix also assesses cumulative impacts and downstream resource protection in a qualitative manner.

The Agency received several comments regarding the wetland mitigative process language. Several commenters questioned whether the Agency has legal authority beyond the Wetland Conservation Act. Exhibits W23; W24; W53. The Agency's authority is established under Minnesota Statutes sections 115.03, 115.44, and 115.01 (see section II, Statement of Agency's Statutory Authority, and section I, Introduction, part C, Wetland Water Quality Standards, respectively). Authority is also authorized under Section 303(c)(1) of the federal Clean Water Act (see III, Statement of Need).

Another letter recommended the mitigative process be moved from the Water Quality Standards to the Permit Rule (Ch. 7001). Exhibit W15. The mitigative process parallels effluent limits as forms of overall nondegradation of the water resources.

H. Part 7050.0200 WATER USE CLASSIFICATIONS FOR WATERS OF THE STATE.

The State Revisor of Statutes has added subparts under this part.

1. Subpart 1. Introduction

The word "following" is proposed to be removed and the phrase "in subpart 2 to 8" is proposed to be added in response to the structural change under this part.

2. Subpart 3. Class 2.

The term "aquatic life" is proposed to replace "fisheries" in Class 2. This change is also proposed under part 7050.0222, subparts 2 to 7. This change is needed to indicate that the protection of the standards is given to aquatic life in general under the rules. In addition, because wetlands are proposed to be recognized as a separate use class under this rule, fisheries is not necessarily an inclusive term for the aquatic communities found in these habitats.

This change is part of the effort to establish biological criteria in the chapter. The change is reasonable because it does not change the level of protection established under the standards, but, instead, describes the coverage of the protection more explicitly.

The level of protection established under the standards already protects more than just fish. According to the 1990 SONAR for revisions to part 7050.0218, subpart 1, the protection of aquatic life is the primary purpose of the proposed standards and protecting the aquatic community means protecting sensitive organisms in the community from the direct effects of toxic chemicals. The 1990 SONAR for part 7050.0218, subpart 2, states that toxic-based standards are established to protect 95 percent of the species in a given aquatic community. Since the toxic standards protect more than fish, this change will not change the level of protection provided by the standards, but will increase the visibility of aquatic species other than fish and establish them as an indicators of water quality and a unit of measure for evaluating degradation.

The phrase "be used for fishing, fish culture" is proposed to be changed to "support fish, other aquatic life" in accordance with the change from "fisheries" to "aquatic life."

The word "are" is proposed to be changed to "do" and the words "for which" are proposed to be changed to "where" to achieve correct word usage.

The word "boating" is proposed to be added to make the description of Class 2 consistent with the language under part 7050.0222, subpart 7, item B and C in the proposed rules.

3. Subpart 8. Class 7.

The Agency proposes to replace the term "agency water quality assessment procedure" with "use attainability analysis". The use of the proposed term is consistent with the requirements under 40 CFR 131.10(j) which indicates that the state must conduct a use attainability analysis when a state designates or has designated uses that do not include the uses specified in Section 101(a)(2) of the CWA, or when the a state wishes to remove a designated use that is specified in section 101(a)(2). The water assessment procedures that have been conducted in the past have been a type of use attainability analysis. However, in the future there will be greater emphasis placed on conducting more formal biological assessments as part of the use classification and use attainability procedures.

There are three conditions that are evaluated to determine whether a water should be Classified as a limited resource value water. The revised rule seeks to change language to examine the broader community of fauna and flora rather than limiting the analysis only to fisheries. This change is proposed to provide for a context in which habitats such as wetlands can be assessed for their value to aquatic life.

Additional changes have been proposed to clarify the meaning of the rule language and to achieve correct word usage. Also, the State Revisor has relisted the paragraphs under this subpart to lettered items.

I. Part 7050.0210 GENERAL STANDARDS FOR DISCHARGERS TO WATERS OF THE STATE.

1. Subpart 9. Water quality based effluent limitations.

The Agency proposes to add the phrase, "for specific pollutants or whole effluent toxicity" to the description of water quality based effluent limitations. This addition does not change the manner in which effluent limitations are determined, but merely clarifies the nature or type of limitation that may be affected. This is a reasonable change, as it provides accurate and specific information to the reader. For a discussion of the reasonableness of whole effluent toxicity (WET) tests, see the discussion under part 7050.0218.

2. Subpart 13a. Wetland pollution prohibited.

The Agency proposes to add this subpart and the following language:

> "Wetland pollution prohibited. Wetland conditions shall be protected from chemical, physical, biological, or radiological changes to prevent significant adverse impacts to the following designated uses: maintaining biological diversity, preserving wildlife habitat, and providing recreational opportunities as specified in part 7050.0222, subpart 6; erosion control, ground water recharge, low flow augmentation, storm water retention, and stream sedimentation as specified in part 7050.0224, subpart 4; and aesthetic enjoyment as specified in part 7050.0225, subpart 2."

Part 7050.0218, subpart 13, uses narrative language to protect waters of the state from water pollution. Wetland protection is implicit in the term "waters of the state". The proposed subpart 13a will make wetland protection explicit and provides guidance to applicants as to what uses are commonly found in wetlands and the kinds of changes that can impact them. Exhibit W55. It does not change levels of wetland protection that have been available since subpart 13 was promulgated. Previous to this revision, when an application was reviewed for potential impacts to water resources, including wetlands, subpart 13 was used as a narrative guide for determining whether an impact to a designated use would occur as a result of the activity described on the application. With this revision, the Agency will review both subparts as appropriate.

It is reasonable to protect wetlands as specified under the proposed language because chemical, physical, biological, or radiological changes to a wetland may result in changes in the designated uses of the wetland. For example, a physical change in wetland hydrology, such as

permanently increasing the water level, could result in a complete die-back in wetland trees. The designated uses that would be impacted, in this case, include maintaining biological diversity and enhancing the natural beauty of the landscape. However the impact varies with each wetland. See SONAR language for part 7050.0130 for further discussion on the impact of varying water levels. Protecting the designated uses will ensure the attributes of a wetland will not be significantly degraded.

EPA's Water Quality Standards for Wetlands National Guidance, Exhibit W3, requires states to, at a minimum, "apply aesthetic narrative criteria and appropriate numeric criteria to wetlands and to adopt narrative biological criteria for wetlands by [September 30, 1993]." Narrative criteria are general statements designed to protect a specific designated use or set of uses for a waterbody. The Water Quality Standards Regulations (40 CFR 131.11 (b)) requires inclusion of narrative criteria in state water quality standards to supplement numeric criteria. Narrative criteria are particularly important in wetlands, since wetlands, depending on their particular type and background condition, may require different numeric standards to protect their designated uses. Therefore, it is reasonable to use the narrative criteria as stated.

J. Part 7050.0211 FACILITY STANDARDS.

1. Subpart 1. Minimum secondary treatment for municipal point source and other point source dischargers of sewage.

A formatting change is proposed under the standards table. The information under the "Limiting Concentration or Range" category for "Toxic or corrosive pollutants" is proposed to be formatted so that the text is contained within the column of the appropriate category. This is reasonable because it does not change the meaning of the text, but makes the rule easier for readers to understand.

The State Revisor of Statutes has also changed "5-day" to "five-day" here and throughout the standards.

The reference to part 7050.0218, subpart 3, item FF, is proposed to be changed to item HH to correspond to changes proposed under part 7050.0218.

Also, the sentence "The arithmetic mean shall not exceed the stated value in any calendar month." is proposed to be added to the double-asterisks note that corresponds to the standards table. This sentence is needed to address the environmental concern for phosphorus loading. This addition is reasonable because an arithmetic mean of 1 milligram per liter total phosphorus is generally sufficient protection and it clarifies the rule by identifying how the Agency will determine compliance.

2. Subpart 2. Exception for existing trickling filter facilities.

The Agency proposes to change the rule citation from "part 7050.0210, subpart 1" to "subpart 1" under this part. The reference to part 7050.0210, subpart 1 appears under items A and C and under subpart 3,

items A and C and is an error. The proposed change is needed to correct this error and make the rules accurate.

The purpose of this subpart is to identify exemptions to the requirements for minimum secondary treatment standards for municipal point source and other point source dischargers. This purpose is clearly illustrated in the context of the first sentence under item A, which lists standards for five-day carbonaceous biochemical oxygen demand and total suspended solids. Subpart 1 under part 7050.0210 does not contain these standards, but contains a general narrative standard for untreated sewage instead.

3. Subpart 3. Exception for pond facilities.

The Agency proposes to change the rule citation from "part 7050.0210, subpart 1," to "subpart 1" under part 7050.0211. This change appears under item A and item C. See subpart 2 for an explanation of need for and reasonableness of this revision.

K. Part 7050.0212 REQUIREMENTS FOR POINT SOURCE DISCHARGERS OF INDUSTRIAL OR OTHER WASTES.

1. Subpart 2a. Dredge disposal exemption.

This subpart establishes the basis for exemptions from secondary effluent limitations for suspended solids and phosphorous for dredge disposal facilities. It states that waters discharged from a dredge disposal facility and returned to the water body from where it was removed are not subject to limitations for these parameters if best management practices (BMPs) and best practicable technology (BPT) are established in a state disposal system (SDS) permit and the designated uses of the receiving water are maintained.

The exemption is needed to address the inability of the dischargers of return water to meet the existing standards for total suspended solids (TSS) and phosphorus. Minnesota has approximately 20 dredge disposal facilities that discharge excess water from dredge holding ponds into the state's waters and are unable to consistently meet a 30 mg/l limitation for TSS. SDS permits are required for all dredge disposal facilities. National Pollutant Discharge Elimination System (NPDES) permits are not required for dredge disposal facilities. Establishing permit limitations that are not achievable by the permittee sets up permit noncompliance situations that cause many problems for both the Agency and the regulated community.

Individual variances to these limitations may be obtained by the permit applicant; however, this is a rigorous and time consuming activity. In addition, obtaining a variance requires demonstration that either meeting the standard is technically infeasible or that it will result in a financial hardship for the permittee.

In general, technology does exist that would treat dredged materials so that return waters meet secondary effluent limitations. The technology may include several retention ponds operated in a series, sophisticated

filtration systems, mechanical treatment facilities or other highly technical options. However, discharges from dredge disposal facilities are generally temporary or intermittent. Investing in technically complex and expensive treatment systems would not usually be cost-effective for the incremental environmental benefit that might be achieved. In addition, these systems pose some operation problems due to the varied characteristics of dredged material.

In order to qualify for a variance on financial grounds, the applicant must demonstrate that meeting the standard would result in financial hardship. The test for financial hardship is dependent on the financial health of the applicant, rather than the cost-effectiveness of the treatment option.

The inability to achieve secondary effluent limitations for TSS is a problem with a class of facilities; variances are meant to address specific and unique cases. Therefore, it is reasonable to address this problem through the standards rules rather than through the variance process.

None of the current SDS permits for dredge disposal facilities include limitations for phosphorous, although according to current standards, this limitation should apply. Because of that fact, the Agency does not have data on the phosphorous content of dredge return water. One of the properties of phosphorous is that it binds with solids, so it is expected that a dredge return water with elevated suspended solids is likely to exceed the 1 mg/l phosphorous effluent limitation. However, removal of phosphorous-rich sediments from a water body is likely to reduce the overall reintroduction of phosphorous into the water column, thereby resulting in a net benefit from the dredging activity. Therefore, it is reasonable to include phosphorous in this exemption.

This exemption is limited to effluents that are returned to the water body from where the sediments were removed. This is reasonable because it ensures that physical, chemical and biological impairments are not transferred from one water body to another. This revision does not exempt permittees from meeting effluent limitations for toxics, metals or other parameters not expressly exempted in this part. Dredge disposal system permits will continue to include effluent limitations for parameters other than total suspended solids and phosphorus where appropriate. Those permittees not employing best management practices will continue to be subject to effluent limitations for total suspended solids and phosphorus.

a. Item A.

In order to qualify for this exemption, BPT and BMPs must be established in the SDS permit.

Best practicable control technology (BPT) refers to the design of the treatment system. In order to achieve BPT, an evaluation of alternatives for the specific project is necessary and will be reviewed as a part of the permit application. Typical alternatives to be evaluated would be:

- alternative dredging technology that may be less water-intensive.
- alternative sites for the disposal facility
- alternative design of the treatment facility, such as a confined or non-discharging facility
- use of polymers to aid in settling solids

Best management practices (BMPs) are practices to prevent or reduce the pollution of the waters of the state. These practices may include schedules of activities, prohibitions of land use practices, specific operating procedures and control practices for site runoff or dredge material storage.

It is reasonable to require BPT and BMPs in order to protect the receiving water to the greatest extent practicable because the permittee is relieved from having to meet stringent effluent standards. This does not exempt permittees from monitoring for these parameters. As a matter of fact, monitoring is very important to measure the effectiveness of the technology and management practices.

b. Item B.

It is required that the designated uses for the receiving water body as established under part 7050.0200 are maintained. It is reasonable to require that the goals of the federal Clean Water Act are maintained.

A comment was received from Cleveland-Cliffs Incorporated of Duluth, Minnesota in response to the August 31, 1992 Notice of Intent to Solicit Outside Information. They requested that, in its standards revisions, the Agency take into account the importance of maintaining safe shipping lanes, the nature of the material being dredged, and the practical limitations on the handling of the return water and dredged materials. These revisions do not place any additional restrictions that would impede the maintenance of safe shipping lanes. In addition, the purpose for these revisions was to address the practical limitations and varied characteristics of dredged material. Characteristics of dredged material vary widely depending upon the water body from which it was removed. The dredged material may include clay, silt and/or sand, all of which have different properties in solution. Some materials may remain suspended for longer periods of time than others, or resuspend more easily with the influence of wind mixing. This supports the use of BPT and BMPs, since they are applied to the specific situation.

Another comment was received from Northern States Power (NSP), agreeing with the proposal to regulate discharges from dredge disposal facilities through best management practices and best practical technology instead of through numeric limits on total suspended solids and phosphorus. NSP also suggested that when the Agency reviews proposed disposal options, it should recognize that the source of the accumulated sediment is not necessarily the dredger. Within the standards rule, the Agency's responsibility is to ensure environmentally safe disposal of dredged materials. Issues of liability must be addressed in another forum. And finally, NSP suggested that the Agency undertake activities with other regulators to streamline the regulatory process concerning dredge and

fill activities. The Agency believes this revision moves toward that goal. The Agency is participating in discussions with other state and federal agencies in an effort to streamline the regulatory process, however, most of those activities are outside of the scope of this rule revision.

The Agency also received a comment from Project Environment Foundation indicating a concern that there is a lack of consistency in the definitions of the terms BPT and BMPs. They suggest that numerical standards should be used in conjunction with BPT and BMPs to ensure the best protection of water quality. The definition and application of BPT and BMPs are addressed in item A above. In addition, as stated earlier, characteristics of dredged material vary widely, depending upon the source of the materials. The Agency does not have sufficient data to establish a "ceiling" effluent limitation that would be achievable and appropriate. Therefore, the Agency has elected not to change the proposed rule language in response to this comment.

L. Part 7050.0213 ADVANCED WASTEWATER TREATMENT REQUIREMENTS.

The Agency proposes to break the first paragraph of the asterisks note into two paragraphs. This division will separate the information about compliance at treatment works designed and constructed to meet limitations into the second paragraph. This format change is reasonable because it does not change the meaning of the rules and it makes the language easier to read and understand.

The State Revisor of Statutes added subparts under part 7050.0220, which made changing "part 7050.0200, number 7" to "part 7050.0200, subpart 8" necessary under this part. This reference change is also proposed under part 7050.0214, subparts 1 and 4.

M. Part 7050.0214 REQUIREMENTS FOR POINT SOURCE DISCHARGERS TO LIMITED RESOURCE VALUE WATERS.

1. Subpart 1. Effluent limitations.

"Part 7050.0220, number 7" is proposed to be changed to "subpart 8." See part 7050.0213 for an explanation.

2. Subpart 2. Alternative secondary treatment effluent.

This subpart references part 7050.0211, subpart 1. The Agency proposes to delete "subpart 1" from this reference.

This subpart identifies the limitations that will be used to determine the construction or operation of a wastewater treatment facility that discharges into a limited resource value water. While the reference to part 7050.0211, subpart 1, is appropriate for most types of treatment facilities, it is not appropriate for existing trickling filters or pond facilities. The effluent limitations for these types of treatment facilities are identified under part 7050.0211, subparts 2 and 3 respectively. Therefore, the reference only to subpart 1 inadvertently excludes the application of this subpart to existing trickling filters and pond facilities. The change is reasonable because it corrects a reference error and does not establish new effluent limitations.

3. Subpart 4. Public waters designated unaffected.

The State Revisor of Statutes has deleted the phrase "applicable provisions and requirements of."

The reference to Minn. Stat. ch. 105 has been changed to 103G because the statutory chapter has been recodified.

"Part 7050.0220, number 7" is proposed to be changed to "subpart 8." See part 7050.0213 for an explanation.

N. Part 7050.0215 REQUIREMENTS FOR ANIMAL FEEDLOTS.

1. Subpart 1. Definitions.

a. Item D.

The reference to Minn. Stat. sec. 115.01, subd. 7 has been changed to subd. 21 because of a recodification.

2. Subpart 2. Effluent limitations for a discharge.

a. Item A.

The Agency proposes to substitute the term "requirements" for the term "effluent limitations," to delete the phrase "comply with the following limitations" and to substitute "a feedlot pollution rating of zero using a 25-year, 24-hour rainfall event" for the 25 milligrams per liter standard for five-day biochemical oxygen demand (BOD). These changes are reasonable because the zero model rating that is substituted is a widely recognized method of uniformly and objectively evaluating a feedlot facility's pollution potential without costly storm event monitoring. The model represents the Best Professional Judgment of the authors who are leading research specialists who deal with agricultural nonpoint source pollution and experienced Agency engineers.

A model rating of zero corresponds to an estimated discharge of 25 mg/L BOD, therefore the change does not constitute back sliding. The size of the storm event being modeled is one of the variables to be inputted during the rating calculation. The 25-year, 24-hour storm is specified to be consistent with the current language. Where phosphorus (P) is an issue, the model rating is not proposed to be used because the model does not accurately predict P discharges. Overland flow will effectively reduce BOD, but is not as effective in reducing P. Exhibit F1, page 9 and 11. The requirement for P currently follows the 25 mg/l BOD standard in item A. This requirement is proposed to be made item B and the existing item B is proposed to be made item C. This restructuring is to avoid potentially confusing redundancy, since the 25-year, 24-hour storm event is already specified in item A.

As noted in the model documentation, the model is the result of efforts by four Federal and State agencies - the Agricultural Stabilization and Conservation Service, the Soil Conservation Service, the Minnesota Soil

and Water Conservation Board, (which has since become part of the Minnesota Board of Water and Soil Resources), and the Agency, to coordinate their animal waste control programs so that Federal and State cost-share funds, the Federal technical assistance program, and the State permit program could all work together to efficiently combat this source of pollution. The model is impartial, relatively simple to use, reasonably accurate and based on research data.

The model will more effectively use limited financial resources to abate and correct water pollution than the existing BOD standard. There are an estimated 40,000 facilities which are regulated by Minn. Rules ch. 7020, governing animal feedlots. Costs to monitor an individual feedlot would be a minimum of $6,000 to set up a monitoring station, and a minimum of $3,000 per year for sample collection and analysis. These costs would not contribute to solving any potential pollution hazards. In view of the limited resources available to both producers and in government cost share programs, it is reasonable to use the model to determine which sites need additional pollution control efforts, so that money that would otherwise be spent on monitoring can be spent on correcting pollution hazards. The model is and has been used in standard practice for the evaluation of potential pollution hazards from feedlots.

The publication "An Evaluation System to Rate Feedlot Pollution Potential," which contains the feedlot evaluation system model, is available through the MPCA library and the State Law Library for interlibrary loan.

0. Part 7050.0218 METHODS FOR PROTECTION OF SURFACE WATERS FROM TOXIC POLLUTANTS FOR WHICH NUMERICAL STANDARDS NOT PROMULGATED.

1. Subpart 3. Definitions.

"Whole effluent toxicity test" is defined under part 7050.0218, subpart 3, item FF, of the existing rules. Whole effluent toxicity (WET) testing has been established by the EPA and many states including Minnesota as an important means to assess the potential toxicity of effluents. WET tests are based on the well established narrative standard that pollutants should not be discharged in toxic amounts.

WET tests measure the composite effect of a largely unknown array of substances in an effluent on aquatic organisms. WET tests can quantify these effects and the results transformed into water quality-based effluent limitations similar to how pollutant specific standards are used to set effluent limitations. As a state with delegated NPDES permit authority, the Agency is entrusted to carry out the requirements of the Clean Water Act, and to implement major policy initiatives directed by the EPA. One of the EPA's major efforts is the implementation of toxicity testing requirements in the NPDES permit program.

The Agency has been requiring dischargers to do WET tests on their effluents for several years. In an acute WET test, test organisms such as fathead minnows or Daphnia (water fleas) are placed in samples of

effluent, the same effluent that is discharged to the receiving stream, and the number of organisms that die in two days is recorded. If more than half of the organisms die, the effluent is considered acutely toxic. In general, if a repeat test also shows acute toxicity, the discharger is required to determine the cause of the toxicity and to eliminate it.

The rule is clear regarding the use of acute WET tests as an effluent limitation in permits. However, there is a need to clarify the rule language so that WET tests, as well as chemical-specific standards, can be used as the basis for permit limitations in water quality limited situations. In situations where the allowable dilution provided by the receiving stream is limited or absent, the end point of the WET test must be chronic toxicity rather than acute toxicity. Also, there is a need to add to the definitions in part 7050.0218 so the terminology associated with whole effluent testing will be in the rule. Together these proposed changes will help establish a clearly defined method for evaluation and compliance that parallels the process used with the numerical standards identified under parts 7050.0220 through 7050.0227.

Part of the 1990 amendments to ch. 7050 was the addition of a number of definitions related to toxicity. These definitions were designed to accompany the procedures for developing pollutant specific criteria added to the rule in 1990. Included was a definition of, and references to, WET tests. Many of the concepts embodied in the definitions are common to both pollutant specific and whole effluent approaches. The difference is in terminology that may be employed, primarily when quantifying the effects.

The Agency propose to add some language to three existing definitions and add two new definitions

a. Item B. Acute toxicity.

The Agency is proposing to add the phrase "represented as LC50s or EC50s, and expressed as concentrations of mass per unit volume, percent effluent, or toxic units" to the definition of Acute toxicity. This language is needed to clarify how the effects of acute toxicity will be evaluated and quantified.

The terminology used in the proposed phrase corresponds to whole effluent tests, defined under item FF of the existing rules. "LC50" is an abbreviation for "lethal concentration" and is currently defined under item R. "EC50" is an abbreviation for "effect concentration" and is currently defined under item N. "Percent effluent" is proposed to be defined under item Z and "toxic unit" is proposed to be defined under item EE.

Acute toxicity in pollutant specific toxicity tests and whole effluent tests can be represented as lethal concentrations or effect concentrations, the concentration of chemical or effluent which is lethal or debilitating to 50 percent of exposed organisms at acute durations (usually 2 to 4 days). Pollutant specific concentrations are expressed as mass per unit volume, whereas whole effluent concentrations express toxicity as percent effluent or its reciprocal, toxicity units.

The proposed terminology and units of measure are reasonable because they correspond to the standards for toxics identified under part 7050.0222 and to the methods the MPCA uses to determine compliance with those standards. Also, they are consistent with common usage by EPA and in EPA guidance. Exhibit T61.

b. Item H. Chronic criterion.

A situation analogous to to the one discussed under item B for acute toxicity exists for chronic toxicity. Chronic no observed adverse effect levels (NOAEL) for pollutant specific criteria are expressed as mass per unit volume, whereas chronic whole effluent tests express their NOAEL's as percent effluent or as toxicity units.

The Agency proposes to add the word "effluent" to the definition of chronic toxicity to establish that a chronic criterion can be designated for an effluent. Adding this word is reasonable because chronic toxicity is part of whole effluent toxicity testing. Effluents usually contain a mixture of toxicants which can have an unknown chronic as well as acute effect.

c. Item Z. Percent effluent.

This is a new item. Since this part contains terms that are in alphabetical order, the existing items lettered Z to CC will be changed to correspond to this addition.

The Agency is proposing to add a definition for "percent effluent." This definition is needed to further explain the language proposed to be added to the definition of "whole effluent toxicity test," under item FF of the existing rules.

The definition will identify how a WET test is quantified and expressed in a fashion that is parallel to chemical-specific terms. The definition is consistent with terminology used in EPA guidance. Exhibit T58.

d. Item EE. Toxic unit.

This is a new item and items lettered DD to FF will be changed to accommodate this addition.

The Agency is proposing to add a definition for "toxic unit." This definition is also needed to further explain the language proposed to be added to the definition of "whole effluent toxicity test," under item FF of the existing rules.

This definition is consistent with the terminology used in EPA guidance. Exhibit T58.

e. Item HH. Whole effluent toxicity test.

This item letter is proposed to be changed from "FF" to "HH" due to the addition of two definitions under this part.

The Agency is proposing to add the following sentence to the definition of whole effluent toxicity test: "Effects on tested organisms are measured and expressed as toxic units or percent effluent for both acute and chronic whole effluent toxicity tests." This sentence is needed to clarify how tests results will be reported. The proposed language is reasonable because the terminology is the common terminology used in EPA guidance, Exhibit T58, and the procedures are consistent with those used to establish the numerical toxicity standards identified under part 7050.0222.

2. Subpart 10. Applicable criteria.

a. Item C.

"Part 7050.0220, subpart 3, items E to H" is proposed to be changed to "7050.0222, subpart 7, items B to E" because of the proposed restructuring of part 7050.0220.

P. Part 7050.0220 SPECIFIC STANDARDS OF QUALITY AND PURITY FOR DESIGNATED CLASSES OF WATERS OF THE STATE

Upon the advise of the Revisor's Office, the Agency proposes to split the current part 7050.0220, which contains all the numerical and narrative standards for the various use classes, into eight new parts. The proposed addition of the tables of standards, the eight new Class 2 standards, and the new Class 2D for wetlands makes the current part 7050.0220 very large and unwieldy. The Agency, in consultation with staff of the Revisor's Office, believes that the addition of several new parts will reduce confusion and make the rule easier to read and to amend in the future.

The current rule is proposed to be modified to create eight new parts as follows:

Part 7050.0220. The heading for this part is proposed to be changed from "Specific Standards of Quality and Purity for Designated Classes of Waters of the State" to "Specific Standards of Quality and Purity By Associated Use Classes." This part will include part 7050.0220, subpart 1, from the current rules and the proposed new tables of numerical standards arranged by the four associated use classes.

Part 7050.0221. This part will contain part 7050.0220, subpart 2, from the current rules and contain the standards for Class 1 waters.

Part 7050.0222. This part will contain part 7050.0220, subpart 3, from the current rules and contain the standards for Class 2 waters.

Part 7050.0223. This part will contain part 7050.0220, subpart 4, from the current rules and contain the standards for Class 3 waters.

Part 7050.0224. This part will contain part 7050.0220, subpart 5, from the current rules and contain the standards for Class 4 waters.

Part 7050.0225. This part will contain part 7050.0220, subpart 6, from the current rules and contain the standards for Class 5 waters.

Part 7050.0226. This part will contain part 7050.0220, subpart 7, from the current rules and contain the standards for Class 6 waters.

Part 7050.0227. This part will contain part 7050.0220, subpart 8, from the current rules and contain the standards for Class 7 waters.

Q. Part 7050.0220 SPECIFIC STANDARDS OF QUALITY AND PURITY BY ASSOCIATED USE CLASSES.

The Agency is proposing to add to the rule four tables listing numerical and narrative standards together for all the use classes applicable to a particular surface water of the state. For example, trout streams are protected for six separate beneficial uses; fisheries and recreation, drinking water, industrial consumption, irrigation and livestock watering, aesthetics, and other uses. Each of these beneficial uses, except "other", has numerical and narrative standards that protect these uses. Currently the rule lists the standards separately under each use class in part 7050.0220, subparts 2 through 8. The proposed tables will list, side-by-side, all the numerical and some narrative standards for the associated use classes applicable to surface waters. The longer narrative standards will be listed at the end of each table.

The Agency believes that the proposed tables will make the rule easier to use and reduce the chances of making errors in selecting the correct standards for a particular surface water.

The standards in the proposed tables are restricted to surface waters because surface waters have multiple beneficial uses and multiple sets of standards assigned to them, which has been the source of some confusion as mentioned above. Ground waters (Class 1) are protected for just one beneficial use, drinking water, and only the drinking water standards apply to ground waters. For this reason the proposed tables are restricted to the associated use classes and standards applicable to surface waters. However, it should be noted that some surface waters are protected for drinking water in addition to their other uses, and the same drinking water standards applicable to these surface waters are applicable to ground waters.

The addition of the tables will address three issues. Two aspects of the current arrangement of standards make it confusing to readers, often leading to errors in the application of standards. A third issue is the updating of the documents that incorporate the Class 1 primary and secondary drinking water standards in the current rule which were originally established in 1962.

First, many users of the rule are not fully aware that all surface waters are protected for more than one beneficial use, and therefore, they may be unaware that numerous standards for the multiple beneficial uses apply to their surface water of interest. The result is surface waters may go unprotected for these other uses. Second, several use classes, particularly class 1 and 2, have standards for the same pollutant that differ from class to class. PH provides an example; a total of six use classes have a standard for pH, and they are not all the same. Part 7050.0450 states that if use classes have different standards for the same pollutant, the lowest (most restrictive) standard applies. The current rule arrangement of the numerical standards (listed separately by use class) makes determining the correct standard

more difficult and time consuming, and could lead to the application of an incorrect standard or no standard at all.

The third issue is the potential confusion and mistakes that users of the rule might make due the presence of the outdated Class 1 primary and secondary drinking water standards in the current rule. These standards are based on a 1962 document (Public Health Service Drinking Water Standards Revised 1962, U.S. Department of Health, Education, and Welfare, Public Health Service, Washington 25, D.C.). These outdated standards have never been updated because of the language in part 7050.0220, subpart 2 which cites the 1962 document and "any revisions, amendments, or supplements to it." This language has been in ch. 7050 since statewide standards were first adopted in 1967. The Agency has interpreted "revisions, amendments, or supplements to it" to mean that the latest drinking water standards issued by the EPA are applicable. The presence of the 1962 standards in the rule caused only limited confusion for many years because there were few changes to the drinking water standards from 1962 to about 1985. However, since 1985, as more and more new drinking water standards have been finalized by EPA and more of the old standards have changed, the outdated standards and the reference to the 1962 document in the rule has increasingly become a major source of confusion to outside parties.

It is proposed to include most of the current drinking water standards in the proposed tables of standards and replace the reference to the 1962 document with a reference to the current drinking water standards standards in the Code of Federal Regulations. These proposals are further discussed below.

1. Subpart 1. General.

In the current rule, this subpart provides an introductory statement leading into the numerical and narrative standards for all use classes. The words "and narrative" are proposed to be added at this time to address the existing narrative standards already in ch. 7050 and the proposed addition of narrative standards for designated classes of wetlands. This general language is proposed to be repeated under subpart 1 of parts 7050.0221 to 7050.0227.

The Agency received several comments regarding the use of narrative language as a tool to protect state water resources. All waters of the state, including wetlands, are covered by narrative language in the existing standards. Although wetlands are already protected through existing water quality standards, the additional language proposed under parts 7050.0222, subpart 6; 7050.0223, subpart 5; 7050.0224, subpart 4; and 7050.0225, subpart 2, will more appropriately address the unique characteristics of wetlands.

2. Subpart 2. Explanation of the tables of standards in subparts 3 to 6.

This proposed subpart will contain information needed for the reader to use the proposed tables of standards in the rest of this part. In order to accommodate the standards in a table format, a number of abbreviations, acronyms and explanatory notes must be included. All are defined or explained in this subpart to make the tables easier to use. Three of the terms used in the tables have been defined elsewhere in the rule and these definitions are repeated in subpart 2 so the reader does not need to hunt for the definitions when using the tables of standards.

The abbreviations and acronyms used in the tables are:

(C) This means the chemical is considered carcinogenic and the standard is human health-based. This symbol is used in the current rule in part 7050.0220, subpart 3, and it has the same meaning there. A cancer potency slope or a reference dose plus an extra safety factor of 10 (class C carcinogen) was used to calculate the human health-based standard.

CS This means "chronic standard". CS is defined in the current rule (part 7050.0218, subpart 3, item I.) as the highest water concentration of a toxicant to which organisms can be exposed indefinitely without causing chronic toxicity.

exp. () This means the natural antilogarithm (base e) of the expression in parenthesis. The expression refers to the standards that vary with total hardness or pH. These standards are in the form of a formula and are listed at the end of the tables as "Notes".

FAV This means "Final Acute Value". FAV is defined in the current rule (part 7050.0218, subpart 3, item O.) as an estimate of the concentration of a pollutant corresponding to the cumulative probability of 0.05 in the distribution of all the acute toxicity values for the genera or species from the acceptable acute toxicity tests conducted on a pollutant. The FAV can be applied as an effluent limitation or to prevent acutely toxic conditions in mixing zones.

MS This means "maximum standard". MS is defined in the current rule (part 7050.0218, subpart 3, item U.) as the highest concentration of a toxicant in water to which aquatic organisms can be exposed for a brief time with zero to slight mortality. The MS equals the FAV divided by two. The MSs are often used as remedial action cleanup goals to protect surface waters in some ground water contamination situations.

(S) This means the associated value is a secondary drinking water standard. Secondary drinking water standards are based on non-health related end points such as unpleasant tastes or odors and properties that stain laundry.

TH This means "total hardness" in mg/l; used in the calculation of the hardness related metal standards

TON This means "threshold odor number", which refers to the number of times a sample must be diluted to produce odor-free water from a sample having a perceptible odor.

Common synonyms or acronyms for some of the chemicals, pollutants and other materials listed under "Substance or Characteristic" are included in the proposed tables. For example, under "polychlorinated biphenyls", "(PCBs, total)" is listed. The synonyms and acronyms are either after or under the primary listing, and they are always in parentheses. In the case of "Trihalomethanes, total", the four chemicals in parentheses which follow are the four trihalomethanes included in the total. Additional identifying information such as ortho, para, cis and trans is included after some chemical names in parentheses.

3. Subparts 3. through 6.

The use classes for waters of the state are defined in part 7050.0200. The numerical and most narrative standards for surface waters have been arranged into four tables, based on the three subcategories of Class 2 waters (fisheries and recreation), plus limited resource value waters (Class 7) and their associated uses, as follows:

Proposed Subpart	Aquatic Life and Recreation Category	Associated Use Classes
3	Trout Waters, including drinking water	1B, 2A, 3A or 3B, 4A and 4B, and 5
4	Cool and warm water fisheries including drinking water	1B or 1C, 2Bd, 3A or 3B, 4A and 4B and 5
5	Cool and warm water fisheries (2B), or "rough fish" waters (2C), or wetlands (proposed 2D)	2B, 2C or 2D; 3A, 3B, 3C or 3D; 4A and 4B, or 4C; and 5
6	Limited Resource Value Waters	3C, 4A and 4B, 5 and 7

All surface waters are protected for Class 6, "other" uses, but there are no numerical standards associated with this use class and it is not included in the tables.

The proposed tables include all the numerical and some narrative standards currently listed in part 7050.0220, subparts 3 through 8, plus the proposed new eight standards. When a narrative standard is included in the table, such as the dissolved oxygen standard for trout waters (Class 2A) of "7 [mg/l] as a daily minimum", the standard given is the chronic standard. In these cases, there are no maximum or final acute value standards. In another case, such as the trout water standard for silver, there is single numerical chronic standard of 0.12 ug/l followed by "note # 8", which refers the reader to the hardness variable maximum and final acute value standards at the end of the table.

Other narrative standards, those too long to fit in the table itself, are either listed in full at the end of the tables in the "notes", or the "note" refers the reader to the portions of the rule containing the full standard. The latter include the narrative standards for radioactive materials, the site specific dissolved oxygen standards, and some of the standards pertaining to wetlands.

The tables include the following narrative standards as "notes".

Fecal coliform organisms
Radioactive materials (reference)
Temperature
Site specific Dissolved Oxygen (DO) standards for Class 2B and 2C waters (reference), and the DO standard for Class 7 waters
Class 3D, 4C and 5 standards for wetlands (reference)
Class 2D (wetlands) standard for pH
Toxic Pollutants standard for Class 7 waters

The only narrative standards not listed or referenced in the proposed tables are the Class 4B Toxic substances standard, and a statement following the Class 2 Dissolved oxygen standards. The Toxic substances standard reads: "Toxic materials - None at levels harmful either directly or indirectly". The statement following the dissolved oxygen standards provides guidance on implementing the standard and reads: "This dissolved oxygen standard requires compliance with the standard 50 percent of the days at which the flow of the receiving stream is equal to the lowest average 7-day flow with a once in ten year recurrence interval (7Q10). These were omitted because of space limitations in the tables.

The other "notes" at the end of the tables list the eight standards which vary with total hardness or pH. These standards are in the form of formulas. Seven of the eight are trace metal standards which vary with total hardness. Some trace metals are more toxic in soft waters than they are in hard waters. The standards reflect this toxicity-hardness relationship. Example standards are included for hardness values of 50, 100, 200, 300 and 400 mg/l as a convenience to the reader. The pentachlorophenol standard varies with pH; example standards are listed for pH values of 6.5, 7, 7.5, 8, 8.5 and 9.

The drinking water standards included in the proposed tables are the current primary and secondary drinking water standards issued by the EPA under the Safe Drinking Water Act. EPA primary and secondary drinking water standards are called Maximum Contaminant Levels (MCL). These standards are codified in the Code of Federal Regulations, Title 40, part 141 subparts B and G, and part 143. Exhibit T64. No MCLs which are not final and no Maximum Contaminant Level Goals (MCLG), which are the precursors to MCLs, are included in the tables.

Placing the latest drinking water standards and the other standards in the tables does not change the standards currently applicable to Minnesota's ground or surface waters. Tabulation of the standards does not cause any standard to go up or down, nor will it add or subtract any standard that is applicable now. This change is intended only to make the rule more usable and reduce commonly committed errors and misinterpretations made by users. Some drinking water standards are not included in the tables for the reasons discussed below.

A few drinking water standards are relevant to ground water but not to the raw surface water supplies. These standards, fecal coliform bacteria and two water treatment additives, are not included in the tables. The current rule addresses this situation for fecal coliform by including the term "bacteriological standard" in the standards normally restricted to ground waters (Class 1A), but excludes the bacteriological standard from the subclasses that include surface waters (Classes 1B through 1D). The total coliform bacteria standard is excluded by the purposeful omission of "bacteriological standards" in the last line in part 7050.0220, subpart 2, item B which reads: "The physical and chemical standards quoted above for Class 1A waters shall also apply to these [Class 1B] waters in the untreated state". No surface waters are classified 1A currently. Therefore, the total coliform standard does not currently apply to surface waters protected for drinking, and it is not included in the proposed tables under Class 1.

Two water treatment additives have EPA drinking water standards which are not in the tables. These chemicals, acrylamide and epichlorohydrin, may be added to the water as part of the treatment process before it is distributed to the consumer. These chemicals are not likely to be found in the raw surface water supplies.

The primary drinking water standards for copper and lead consist of required treatment techniques including corrosion control treatment, source water treatment, lead service line replacement, and public education rather than the usual numbers. These treatment standards for copper and lead are not included in the tables.

The EPA drinking water standards for radioactivity are excluded from the tables due to the space limitations.

Two pollutants, fluoride and hexachlorocyclopentadiene, have both primary and secondary drinking water standards. In both cases the secondary standard is the lower of the two standards and the lower secondary standard would be the applicable standard for compliance and enforcement purposes. The primary standards are listed to be complete and for the benefit of the reader.

Should any discrepancy occur between a standard listed in the proposed tables (part 7050.0220, subparts 3 through 6) and the standards listed under each use class separately (parts 7050.0221 through 7050.0227), the latter, class by class listings of standards, will be considered the correct standards for application and compliance determinations. This includes the drinking water standards in the Code of Federal Regulations.

R. Part 7050.0221 SPECIFIC STANDARDS OF QUALITY AND PURITY FOR CLASS 1 WATERS OF THE STATE, DOMESTIC CONSUMPTION.

This part was created from part 7050.0220 as follows:

Proposed rules	Current rules
Subpart 2	7050.0220, subpart 2, item A
Subpart 3	7050.0220, subpart 2, item B
Subpart 4	7050.0220, subpart 2, item C

Subpart 5	7050.0220, subpart 2, item D
Subpart 6	7050.0220, subpart 2, item D

As already stated, the EPA primary and secondary drinking water standards are incorporated by reference as Class 1 standards to protect raw water supplies for domestic consumption. The primary drinking water standards, or MCLs, are established to protect human health, but they also take into account non-health related factors such as treatability and analytical detection limits. MCLs go through a lengthy promulgation and public notice process before being finalized and published in the Federal Register. Secondary drinking water standards are based on non-health related aesthetic end points.

Several changes are proposed for this subpart in conjunction with the addition of the proposed tables of standards.

First, the reference to the 1962 Public Health Service document will be deleted and replaced with the reference to the primary and secondary drinking water standards in the Code of Federal Regulations (CFR), Title 40, part 141 subparts B and G, and part 143. Exhibit T64. It is proposed to retain the "revisions, amendments, or supplements" language so the Agency can use the latest EPA drinking water standards in their risk assessment, compliance and enforcement activities.

Second, the outdated standards listed for Class 1A waters are proposed to be deleted to eliminate a source of confusion with the updated standards in the proposed tables. The Agency is not proposing, at this time, to list out all the updated standards in subpart 2. The Agency believes this would be an unnecessary duplication in the rule since all but a few standards (the bacteriological, radiological, treatment technique (Cu and Pb), and water treatment additive standards) will be listed in the proposed part 7050.0220, subparts 3 and 4, and the complete set of primary and secondary standards are incorporated by referencing the CFR.

Third, it is proposed to delete the references in subparts 3 and 4 (Class 1B-1C), back to the standards in item A (Class 1A). The incorporation by reference of the standards in the CFR will suffice as the source of the numerical standards. However, the exception to the current Class 1A total coliform standard, as discussed above, for Class 1B and 1C will be retained. Also, the more lenient turbidity standard for Class 1C of 25 NTU will be retained.

Finally, some of the standards for Class 1D waters in the current rule are less stringent than the Class 1A primary and secondary drinking water standards. This is a recognition that very poorly protected aquifers in karst topographies may not be able to meet the Class 1A standards. The Agency is proposing to retain the Class 1D standards and not change them at this time.

In conclusion, these changes are being proposed to help end the confusion over selection of appropriate standards, and to update the primary drinking water standards. These changes will not make the rule more or less stringent than it is now, nor will these changes affect treatment or cleanup costs.

1. Subpart 6. Additional Standards.

The proposed dividing of part 7050.0220 made it necessary to change the reference to "above listed" standards to standards "in subparts 2 to 5." This does not change the meaning of the current rules.

S. Part 7050.0222 SPECIFIC STANDARDS OF QUALITY AND PURITY FOR CLASS 2 WATERS OF THE STATE; AQUATIC LIFE AND RECREATION.

This part was created from part 7050.0220 as follows:

Proposed rules	Current rules
Subpart 2	7050.0220, subpart 3, item A
Subpart 3	7050.0220, subpart 3, item B
Subpart 4	7050.0220, subpart 3, item C
Subpart 5	7050.0220, subpart 3, item D
Subpart 7	
item A	7050.0220, subpart 3, item D
item B	7050.0220, subpart 3, item E
item C	7050.0220, subpart 3, item F
item D	7050.0220, subpart 3, item G
item E	7050.0220, subpart 3, item H
Subpart 8	7050.0220, subpart 3a

Revision subjects.

Three of the major revision subjects identified in the SONAR introduction are discussed under this part of the SONAR. These subjects are: narrative biocriteria, the eight new aquatic life standards, and the nine updated aquatic life standards. This part of the SONAR includes a general discussion of each major subject as a preliminary introduction and background to the specific revisions that will be made in each item. Then, the changes that are unique to an item will be discussed separately under the heading for the corresponding item.

1. Narrative biocriteria.

The aquatic life use classes are currently described in terms of various fisheries group. The Agency is proposing changes in the language that will maintain fish as a descriptor of use class in Classes 2A, 2B, 2Bd, and 2C but also include the terms "healthy community" and "associated aquatic organisms". It is reasonable to make these changes because, as discussed in the SONAR for part 7050.0200, Class 2, the criteria that are set forth under this rule are established to protect the entire aquatic community. The wording change describes this protection more explicitly.

The emphasis of the proposed changes provides the narrative language for utilizing indicator community for use support determinations. Fish communities may be good indicators of biological condition and may be sensitive to various impacts. However, in certain waterbody types and for assessing some impacts macroinvertebrates, macrophytes, algae, or

other indicative communities may be a better choice. In adding the 2D classification, "fish" were not highlighted because in many wetland types they may not be present.

The term healthy was added to all the aquatic life use class descriptions to indicate what the attainable goal is for each aquatic life use class. Healthy can be defined as a community that has a structure and function comparable to that of the most natural situations or reference condition for that region and waterbody type.

The Agency also proposes to delete the terms "commercial" and "rough fisheries" in the use class description. These terms are ambiguous in that the Agency has never identified what are considered to be rough or commercial fish species for this rule. Where they have been identified, the terms "rough" and "commercial" describe many of the same fish species. According to the game and fish regulations, Minnesota Statutes chapter 97A and 97C, "rough fish" include carp, buffalo, sucker, sheepshead, bowfin, burbot, cisco, gar, goldeye, and bullhead. Under the same statutes, many of these fish species are considered commercial fish when taken for sale in inland waters.

The intent of the designated use classification scheme is not to distinguish the types of fishing regulations that are being imposed in the waters. The Agency's intent is to illustrate differences in aquatic life, habitat type, and biological potential and establish criteria to protect these different aquatic life uses. Class 2A waters are those waters that are or have the potential to support coldwater sport fish species in the Salmonidae family including, for example, brook trout, rainbow trout, brown trout, and lake trout. Class 2B waters are those waters that because of their size and natural condition can support or have the potential to support populations of warm or cool water fish that are top carnivore species and are typically of interest to sport anglers. These fish species for example would include walleye, smallmouth bass, northern pike, channel catfish, and white bass. Class 2C waters are those waters that because of their size and natural condition do not support or have the potential to support populations of top carnivore species but do support a community of fish and associated organisms that naturally occur in an area; in other words, an indigenous community.

2. Eight new aquatic life standards.

   a. The development of the proposed water quality standards.

The Agency has developed 17 site-specific criteria since 1990. Eight of these are being proposed as state wide standards. The procedures used to develop state wide standards are the same procedures used to develop site-specific criteria. These procedures are contained in part 7050.0218, subparts 4 through 10. The difference between a criterion and a standard is that a standard has been promulgated through the rulemaking process and is listed in chapter 7050.

Each criterion or standard takes about two to three months of an Agency staff person's time to complete the extensive data search and evaluation needed to determine the number. Toxicity data are summarized in tables

and the most pertinent data are recorded on "summary sheets". Page one of the summary sheets provides an overall summary of the process and includes the criterion or standard. Page two of the summary sheets is reserved for pollutants that have an EPA criterion. Since none of the eight proposed standards has a recent (since 1980) EPA aquatic life criterion, page two was not used. (Iron has an old aquatic life criterion of 1000 ug/l dating from 1976, and antimony has a draft aquatic life criterion dated 1988. Exhibits T50 and T36.) Page three is used to summarize the toxicity data when no EPA criterion is available. And finally, page four of the summary sheets records the information for the human health-based criterion. The data tables and summary sheets for all eight proposed standards are contained in Exhibit T1. Table 1 lists the eight proposed standards (also listed in Exhibit T48).

Same as Exhibit T48

Table 1. Proposed Water Quality Standards for Class 2 Waters.

Chemical	Class 2A			Class 2Bd	Class 2B/2C/2D			Basis
All units in ug/l	CS	MC	FAV	CS	CS	MC	FAV	
1. Alachlor (c)	3.8	800	1600	4.2	59	800	1600	PCA Hc, T1
2. Antimony	5.5	90	180	5.5	31	90	180	PCA Hs, T1
3. Atrazine (c)	3.4	323	645	3.4	10	323	645	PCA Hc, T1
4. Cobalt	2.8	436	872	2.8	5.0	436	872	PCA Hs, T1
5. Iron	221	243	485	1245	1245	1363	2726	PCA T1
6. Manganese	138	4643	9285	138	491	4643	9285	PCA Hs, T1
7. Naphthalene	81	409	818	81	81	409	818	PCA T1
8. Thallium	0.28	64	128	0.28	0.56	64	128	PCA Hs

Abbreviations

CS = Chronic standard
MS = Maximum standard
FAV = Final acute value
(c) = Carcinogen

Class 2A = Trout waters, protected for drinking and aquatic life
Class 2Bd = Warm and cool waters protected for drinking and aquatic life
Class 2B/2C = Warm and cool waters protected for aquatic life
Class 2D = Wetlands

Note: The MS and FAV standards applicable to Class 2Bd are shown under Class 2B/2C

Basis codes for standards

PCA = Criterion developed by MPCA staff
Hc = Human health carcinogenic effects
Hs = Human health systemic effects
T1 = Direct aquatic life Toxicity, EPA national procedures used

Aquatic life criteria (standard) development is broken down into three major portions: (1) Toxicity-based criteria development for protection of aquatic life from direct toxicity, (2) Human health-based criteria development for protection of humans who eat the fish and other edible aquatic organisms, and (3) wildlife-based criteria development for protection of wildlife that consume aquatic life. The three steps are briefly described below. Exhibit T40 provides a detailed description of the process.

1) Toxicity-based criteria development.

Development of a toxicity-based criteria begins with a data search using EPA's AQUatic toxicity Information REtrieval data base (AQUIRE). AQUIRE provides a systematic computerized data base including toxicity, physicochemical bioaccumulation, and bioconcentration data for thousands of chemicals. The Agency also utilizes the state's library system to do further literature search, access EPA and U.S. Fish and Wildlife Service publications, International Joint Commissions reports, and obtain other reports and publications from scientific journals and universities, to gather acute and chronic data for a particular chemical.

The literature is reviewed and acceptable acute and chronic data are tabulated. If acute data is available for at least eight species, a method developed by EPA is used to determine the toxicity-based criterion. Logarithmic means of the acute data, by genus, are ranked from highest to lowest. The four lowest "genus mean acute values" (GMAV) are used to calculate a statistical estimate of the fifth percentile GMAV from the low or sensitive end of the distribution of all GMAVs. This value is called the Final Acute Value (FAV). Thus, the goal of the FAV is to protect 95 percent of the species in an aquatic community from unacceptable acute toxicity.

If acute data for eight species are not available, the Agency uses an alternative method that utilizes the limited available toxicity data to calculate the FAV. This method is known as the EPA Advisory Method.

The next step in the toxicity-based criterion development is the calculation of an Acute to Chronic Ratio (ACR). Acute values (LC50s) and chronic values for the same test organism from the same experiment or laboratory are needed to calculate ACRs. The ACR is simply the acute value divided by the chronic value. All the acceptable ACRs available for the chemical are averaged together. The ACR is used to determine the chronic criterion by dividing the FAV by the ACR.

Toxicity data for algae and other aquatic plants are also reviewed. If plants are more sensitive to a pollutant than the animal species, the criterion is lowered to protect aquatic plants.

2) Human health-based criteria development.

Human health-based criteria protect human consumers of fish and shellfish that are taken in Minnesota waters. A bioaccumulative pollutant may be at a very low concentration in the water such that no acute or chronic toxicity is observed. The pollutant, however, may

accumulate in fish or shellfish over a period of time which is passed on to consumers who eat these organisms. Bioaccumulative pollutants may cause health problems, especially to those who frequently eat contaminated organisms.

The primary task in the development of the human health-based criterion is the determination of a bioaccumulation factor (BAF). Most BAFs are based on bioconcentration tests and bioconcentration factors (BCF). Both BAFs and BCFs are the ratio of the concentration of the pollutant in fish tissue to the concentration in the surrounding water. The difference between a BAF and BCF is that a BAF reflects uptake of the chemical from both the food chain and the water, whereas a BCF reflects uptake of the chemical only from the water. BAFs are measured in the field and BCFs are based on lab tests. Minnesota's criteria development procedures include a method to predict a BAF from a BCF. Exhibit T40.

The greater the BAF, the more likely the pollutant will be a concern to human consumers of fish. BAF data are gathered through the same literature search as is done for toxicity data.

There are two different pathways that can be taken to calculate human health-based criteria. One pathway is taken if the pollutant is known or believed to cause cancer. While another pathway is taken for a noncarcinogenic pollutant. If the pollutant causes cancer, the Agency uses a cancer potency slope to calculate the criterion. If the pollutant is a noncarcinogen, a reference dose is used to calculate the criterion. Both the potency slopes and reference doses are obtained from the EPA Integrated Risk Information System (IRIS) through the Minnesota Department of Health (MDH). The Agency is careful to use the same potency slopes and reference doses used by the MDH to set drinking water criteria which are referred to as Recommended Allowable Limits (RAL). Exhibit T47.

For most surface water of the state (Class 2B, C and D) the human health-based criteria protect people who catch and eat fish from these waters. For this purpose it is assumed people eat 30 grams of fish per day. Some surface waters are also protected as a source of drinking water. All trout waters (Class 2A) and certain nontrout waters, such as a portions of the Mississippi and Red Rivers (Class 2Bd), are protected for drinking water plus fish consumption. Human health-based standards for these waters are calculated assuming people drink two liters of water and eat 30 grams from the same water. Exhibit T40.

3) Wildlife-based criteria development.

This process is designed to protect wildlife that feed on aquatic life. To date the Agency has not developed any wildlife-based criteria. The procedures for developing wildlife-based criteria are contained in part 7050.0218, subpart 9.

b. Selection of the criterion.

The lowest of the two criteria, toxicity-based or human health-based, becomes the Chronic Criterion (CC). Finally, the CC is checked against

EPA taste and odor criteria that protect humans from objectionable tastes or odors in edible fish tissue. The CC is lowered to the taste and odor criterion if the latter is lower.

c. The eight proposed standards.

The eight proposed standards fall into three categories: 1) herbicides, 2) metals, and 3) other organics. The proposed standards are listed in Table 1. Table 1 is the same as Exhibit T48. A discussion of the important aspects of the toxicity or bioaccumulation data, background concentrations, analytical detection limits, and other relevant information for each of the proposed standards follows.

1) Herbicides.

Standards are proposed for two herbicides: Alachlor and Atrazine.

a) Alachlor

Alachlor is a preplant or preemergence herbicide sold under several trade names including Lasso. The chemical name is: 2-chloro-2', 6'-diethyl-N-(methoxymethyl) acetanilide. Alachlor is used to control annual grasses, certain broadleaf weeds, and yellow nutsedge. It is used in growing corn, soybeans, potatoes, peanuts, and cotton. It acts by preventing germination in the target plants. Exhibit T6.

The proposed alachlor standard is human health-based for surface waters protected for drinking and aquatic life (Class 2A and 2Bd), but toxicity-based for Class 2 waters not protected for drinking (Class 2B, 2C and 2D). Exhibit T1.

The toxicity-based criterion was developed using the EPA national method, however, one of the eight species requirements was not met. The MPCA advisory method produced a criterion that seemed overly protective and therefore, the national method was used. The chronic data available for alachlor indicate that using the national method (rather than the advisory method) is adequately protective. Table 2 of Exhibit T1. The usable plant toxicity data suggests that aquatic plants will be adequately protected by the proposed standard as well. Exhibits T2 through T6 contain the most pertinent toxicity data used to set the proposed alachlor standard.

Alachlor is classified by the EPA as a carcinogen, and the Agency used the latest cancer potency slope recommended by the MDH to calculate the human health-based criterion. Alachlor is not highly bioaccumulative. The final BAFs of 2.5 (Classes 2B, 2C, and 2D) and 10 (Class 2A) were obtained from an excellent bioconcentration study done at the University of Wisconsin, Superior. Exhibit T3.

In 1988 the Agency, with the cooperation of the Department of Agriculture, started analyzing river samples for herbicides. The samples were taken at selected stations in the Agency's routine water quality monitoring program. Most stations selected were located in the agricultural regions of Minnesota with a few in nonagricultural areas.

Samples were taken in June of 1988 and 1989, the two years for which data are available. The results show only a few values, most from the 1989 sampling, above detection limits. The detection limit is 0.02 ug/l, but some values were reported as less than 0.2 ug/l. A notable exception to this pattern was a 1989 value of 3.4 ug/l from the Blue Earth River near its mouth in Mankato. The next highest value, 1.4 ug/l, was measured in 1989 in the Cedar River, three miles south of Austin. The highest values measured are below the proposed standards.

b) Atrazine

As with alachlor, the proposed atrazine standard is human health-based for surface waters protected for drinking and aquatic life, but toxicity-based for Class 2 waters not protected for drinking. Exhibit T1.

The discussion of atrazine is more extensive than the discussion provided for the other chemicals because of its widespread use, its presence in surface and ground waters, and the emphasis being placed on nonpoint source pollution prevention in general by the Agency. More information is also available about the toxicity of atrazine and the toxicity of its breakdown products.

Atrazine is a heterocyclic nitrogen compound and one of several common triazine herbicides (chemical name: 2-chloro-4-ethylamino-6-isopropyl-amino-1, 3,5-triazine). Commercial names include AAtrex and Atranex. Atrazine kills weeds by interfering with the photosynthetic process. Exhibit T10.

Atrazine is used for weed control in a variety of crops such as corn, asparagus, potatoes, tomatoes, sorghum, rye and sugar cane. Exhibits T10 and T32. Atrazine is the most heavily used herbicide in the United States. Exhibit T10. Atrazine can enter the surface water through surface runoff, ground water upwelling, and atmospheric deposition. The amount of atrazine entering the surface water is dependent on the soil type, how soon a major rainfall occurs after application, the amount of humus in the soil, and other factors. The more sandy the soil and the less humic material present, the more likely atrazine will migrate to ground water. Exhibit T32.

Atrazine has been found to be persistent in soils (half lives of 20-101 days), but little is known about persistence in the aquatic environment. Its mobility is largely dependent on factors such as soil type, and amount of rainfall. Highest surface water concentrations are found in late spring and summer months, following application. Residual atrazine values, however, are found throughout the year. After application, atrazine breaks down into the major metabolite products of deethylatrazine, deisopropylatrazine, diaminoatrazine, hydroxyatrazine, deethylhydroxyatrazine, deisopropylhydroxatrazine, and diaminohydroxyatrazine. The metabolites appear to be fairly mobile in surface water. Exhibit T32.

Atrazine metabolite toxicity.

For the most part, the literature suggests that in the aquatic environment, the toxicity of the metabolites appears to be equal to, or less than, that of the parent chemical. Stratton (1984) reports deethylated atrazine to be less toxic than atrazine itself, but it was more toxic than the other metabolites tested. Exhibit T49. In the same study, Stratton investigated the toxicity of mixtures of metabolites and the parent compound to blue-green algae. In most tests, Stratton found toxicity to be less than additive. However, when atrazine was mixed with deisopropylated atrazine or deethylated atrazine, there was a greater than additive effect (synergism). Deisopropylated atrazine and deethylated atrazine mixtures were additive in their toxicity. In spite of Stratton's important study, the information on metabolite toxicity is fragmented and does not give sufficient information to establish separate criteria for each metabolite. Exhibit T34 illustrates that individual metabolite toxicity values for plants are above the proposed standard.

The Agency assessed the options of applying the atrazine standard as 1) the parent compound plus metabolites, or 2) the parent compound alone. A standard of "Atrazine plus metabolites" would assure protection of aquatic communities as the parent chemical is broken down into the various metabolites, and, conversely, a standard of "atrazine" alone may be under protective as atrazine is metabolized into other compounds. However, the Agency is proposing an atrazine alone standard at this time for the following reasons. First and most importantly, the breakdown products of all triazine herbicides (cyanazine, simazine and prometone for example, as well as atrazine) are chemically very similar, and triazine metabolites can not be traced back to an individual parent chemical. Thus, it would not be possible to attribute the metabolites measured in surface waters to atrazine or any other single triazine herbicide. Secondly, while there is ample toxicity data to develop an atrazine standard, there is insufficient data to develop standards for individual metabolites.

Determination of the proposed atrazine standard.

There is enough acute data to use the EPA national method to determine the toxicity-based criterion. Also, there is a great deal of information on chronic toxicity as listed in table 2a of Exhibit T1, as well as acute to chronic data for ACRs as shown in table 2b of Exhibit T1 for this pollutant. However, the calculated toxicity-based criterion is greater than some toxicity values for aquatic plants. Table 4b or Exhibit T1. Criteria development procedures allow for the lowering of the criterion to protect sensitive aquatic plants in this situation. Therefore, the Agency lowered the toxicity-based criterion of 30 ug/l to match the results of the lowest acceptable plant toxicity test which is 10 ug/l.

The EPA advisory value for atrazine of 1.0 ug/l is considerably lower than the proposed standard. Exhibit T10. However, EPA urges caution in the use of this advisory number because it is not based on their 96 hour algal exposure or acceptable chronic exposures to vascular plants. The advisory is based on the lowest effect level found to algae. However, the plant toxicity data listed in Table 4a and 4b in Exhibit T1 shows

that by lowering the proposed standard to 10 ug/l, algae will be protected. Other toxicity information pertaining to the proposed atrazine standard can be found in Exhibits T11 and T12. Tables B-1 and C-1 in Exhibit T34 provide a concise summary of animal and plant toxicity data.

Atrazine is a class C carcinogen according to the EPA. A class C designation means this chemical is a suspected carcinogen but the evidence is not conclusive. The reference dose plus an additional safety factor of 10, rather than a potency slope, is used to determine human health criteria for class C carcinogens. The Agency has learned that the reference dose for atrazine may be changed soon. The information Agency staff has indicates the reference dose will be raised or made less stringent. If the change occurs before the hearing record closes, the Agency proposes to adjust the proposed atrazine standard accordingly.

Atrazine is not bioaccumulative in fish. The final BAF value of 2 came from a whitefish bioconcentration study. Bioconcentration data for some invertebrates are available, but vertebrate animals tend to metabolize atrazine more readily than do invertebrates. Fish BCFs and BAFs are given preference over invertebrate BCFs and BAFs when they are not in agreement because fresh water invertebrates caught in Minnesota are seldom eaten by people while fresh water fish are readily consumed by Minnesotants and visitors. The most pertinent BCF information on atrazine is in Exhibits T13 through T15.

Atrazine in surface and ground water.

Samples taken from the Mississippi River and its tributaries in a United States Geological Survey study found that 27 percent of the samples exceeded the federal drinking water standard of 3 ug/l. Exhibit T33. The Des Moines River in Iowa had an atrazine concentration ranging from 0.05 to 0.8 ug/L. The South Skunk River, which parallels most of the Des Moines River, had an atrazine concentration of 0.16 to 12.0 ug/L. Exhibit T34. Concentrations higher than 40 ug/l have been measured in some streams in Iowa, Ohio and in the tributaries to Chesapeake Bay.

Samples taken in Minnesota as part of the routine water quality monitoring in 1988 and 1989, as discussed for alachlor, showed concentrations ranging from 0.02 to 2.0 ug/l. The value of 2.0 ug/l was measured in 1989 in the Cedar River, three miles south of Austin. Values of 1.8 and 1.9 ug/l were measured in 1989 in the Rabbit River five miles northwest of Cambell (near western Minnesota boarder, southwest of Fergus Falls). A concentration of 2.3 ug/l was measured in Garvin Brook in 1982. All these samples were taken in June. The highest values measured are below the proposed standards. More typical concentrations were in the 0.1 to 0.4 range in agricultural watersheds, and below detection (0.02 ug/l) in watersheds with little agriculture. These results show generally lower concentration than have been reported elsewhere in the United States. The results of ongoing intensive surveys by the Department of Agriculture should help define the potential herbicide problem, including atrazine, in Minnesota in more detail.

2) Metals.

Standards are proposed for five metals: Antimony, Cobalt, Iron, Manganese, and Thallium. Table 1 and Exhibit T48 contain a list of the proposed standards for metals.

a) Antimony

Antimony is a silverly-white metallic alloy that is used in making matches, fireproofing materials, and hardening other metallic compounds. The proposed standard is human health-based for Class 2A and Class 2Bd waters, and toxicity-based for Class 2B, 2C and 2D waters. Exhibit T1.

The toxicity-based criterion was developed using the EPA national method. A great deal of the most useful information was developed by the University of Wisconsin at Superior, under contract by the EPA Environmental Research Laboratory-Duluth. Exhibit T7. Exhibits T8 through T9 contain other pertinent antimony toxicity information.

The human health-based criterion was developed using a BCF of 1 based on data in the EPA draft criterion. Exhibit T36. The Agency used 0.4 for the Relative Source Contribution Factor (RSC) in calculating the criterion. This RSC was used by the EPA to calculate the new antimony primary drinking water standard of 6 ug/l. Exhibit T35. The Agency proposes to use the recent RSC from EPA, together with the reference dose from the MDH to calculate the human health-based criterion.

No usable ambient stream or lake data for antimony were found in the STORET data base for Minnesota.

b) Cobalt

Cobalt is a steel-gray metallic element used in ink coloration, and as a metal alloy. The proposed standard is human health-based for Class 2A and Class 2Bd waters, and toxicity-based for Class 2B, 2C and 2D waters. Exhibit T1.

The toxicity-based criterion was developed using the EPA national method despite the lack of information for salmonids. There are a total of 14 Genus Mean Acute Values (GMAV) available to calculate the Final Acute Value (FAV). The toxicity-based criterion was lowered to match the chronic value of 5 ug/l for Daphnia magna as shown in table 2a of Exhibit T1. Daphnids have often been shown to be sensitive to metals. Other pertinent cobalt toxicity information can be found in Exhibits T8 and T16.

A single BCF of 0.3 is available for calculating the human health-based criterion. Exhibit T17. The procedures require using a BAF of 1.0 when the measured value is less than 1.0. The procedures also require the use of a RSC of 0.2 when no chemical specific data are available, which is the case for cobalt. Since the RAL list number 3 was issued in January 1991, the reference dose for cobalt has been withdrawn from the Health Assessment Summary Tables (HEAST). Because 0.0004 is the last reference dose available, the human health-based criterion is based on this reference dose. The human health-based criterion is not much lower (2.8 compared to 5.0 ug/l) than the toxicity-based criterion, but the Agency believes that the lower human health-based criterion should be used for the proposed Class 2A and Class 2Bd standards based on the last reference dose available.

The Agency has monitored for cobalt on a few occasions as part of the routine monitoring program. In general, concentrations range from about 1.0 to 2.2 ug/l in rivers across Minnesota, but some of these values may not reflect true concentrations because ambient levels are near or below the analytical detection limit of 0.5 ug/l. Cobalt data from the copper-nickel study in northeastern Minnesota reported most of concentration to be below detection limits of 0.2 to 0.5 ug/l. This study made special efforts to obtain the lowest detection levels possible.

c) Iron

Iron is a metallic element used in steel production. The proposed standard is toxicity-based for all Class 2 waters. Exhibit T1.

The EPA national method was used in developing the toxicity-based criterion despite the lack of a third fish species. The advisory method would have resulted in a criterion lower than background concentrations in most areas of the state. A single measured acute to chronic ratio of 2.19 for Daphnia magna is available. Exhibit T16. Daphnia magna is the third most sensitive organism to iron toxicity. The use of the D. magna ACR will be protective. Also, use of the generic acute to chronic ratio of 55, as called for in the procedures to "fill in" for the required second and third ACRs (resulting in an ACR of 18.8), would have driven the toxicity-based criterion well below background concentrations found in Minnesota.

The brook trout appears to be considerably more sensitive to iron toxicity than other aquatic organisms. Exhibit T1. The low brook trout LC50 of 917 ug/l is the reason for the lower proposed standard for trout waters. Other pertinent iron toxicity information can be found in Exhibits T18 through T21.

There was no BCF or BAF data found for iron, so a human health-based criterion could not be developed. Iron is not known to bioaccumulate in fish tissue and the toxicity-based criterion should protect human health. The secondary drinking water standard of 300 ug/l is based on iron's ability to stain laundry and impart unpleasant tastes to drinking water. Iron has no primary drinking water standard.

Background concentrations of iron in Minnesota's waters become an important issue relative to the proposed standard. Background concentrations may exceed the proposed standard in all areas of the state. Background data from the Agency's routine water quality monitoring network are summarized in Table 2, and in Exhibit T51. As shown in Table 2, the percent of measured iron concentrations above the proposed Class 2B, 2C and 2D standard range from a low of six percent in

the Upper Mississippi River basin to a high of 35 percent in the Red River basin. The percent of values above the proposed standard of 221 ug/l for trout waters (Class 2A) is substantially higher. Ninety, 81 and 67 percent of the measured values exceeded the Class 2A standard in the Lower Mississippi, Lake Superior and Rainy River watersheds, respectively. Very few routine monitoring stations are located on trout streams.

Table 2. Summary of Background Data for Total Iron For Rivers and Streams in Minnesota

Showing % of Values Above Proposed Class 2B, 2C and 2D Chronic Standard of 1245 ug/l

Watershed	% Above Std.	Median Value ug/l	No. of Values
Big Sioux, Cedar, Des Moines	28	743	541
Minnesota	30	660	1303
Red	35	680	665
Rainy	13	350	346
Lake Superior	15	520	890
St. Croix	15	660	370
Upper Mississippi	6	340	1228
Lower Mississippi	23	640	888

The Agency is aware that proposing a standard that will be below some background concentrations poses potential problems in the application of the standard. Application of the iron standard in risk assessment or in determining the need for remedial action or treatment will have to be within the context of the local background concentrations of iron. Several issues are involved when background concentrations often exceed a standard. These issues include: 1) the quality of the toxicity data upon which the standard is based and how those data are interpreted, 2) the form of the metal in the toxicity test and the form as measured in ambient waters, and 3) the guidance in part 7050.0170 on how to treat background levels that are greater than the standard.

The iron toxicity data base, while small compared to the data base for the trace metals, consistently shows iron to be fairly toxic. As noted above, in evaluating the toxicity data for iron, the Agency used the national method rather than the advisory method and selected a lower acute to chronic ratio (ACR). These choices resulted in the proposed standards being less stringent in recognition of naturally high concentrations of iron in Minnesota waters.

The proposed standard is consistent with the laboratory toxicity tests. However, it is quite possible that unaccounted for, or unknown, factors are mitigating iron toxicity in nature. The proposed standard is for total iron, as are the background concentrations shown in Table 2. The

chemistry of iron in natural water is very complex, Exhibit T53, and it is reasonable to assume that some forms of iron are not toxic to aquatic life, at least in concentrations likely to occur in natural waters. Iron toxicity is usually attributed to the soluble ferrous (Fe++) ion and the insoluble ferric (Fe+++) ion. However, particulate ferric hydroxide can accumulate on and clog the gills of small fish and invertebrates causing reduced survival or growth. A "total" iron analysis includes the complexed and particulate iron in suspension as well as dissolved iron, and, therefore, will be protective or potentially over protective of aquatic life. A filtered or "dissolved" iron analysis would exclude the particulate forms of iron and may be under protective. Exhibit T52. Until more definitive information is available on the toxicity of common forms of iron in natural waters, the Agency believe the standard should be in terms of total metal as recommended by Exhibit T52.

The third issue mentioned above is the guidance provided by part 7050.0170 on dealing with background levels that exceed standards. The most pertinent provision states that, if the background levels exceed the standard, the background levels can be used as the standard in place of the numerical standard to control loadings from point or nonpoint sources. This provision means that those waters that have natural levels higher than the proposed standard will not be considered in noncompliance with the standard, and that the background levels become the standards used to control additional loadings. In implementing this provision, the Agency assesses the variability of the background levels and allow loadings or effluent concentrations within the range of this variability.

d) Manganese

Manganese is a grayish-white metallic element used in an alloy with the manufacturing of iron, aluminum, and copper. The proposed standard is toxicity-based for Classes 2B, 2C and 2D waters and human health-based for Class 2A and 2Bd waters. Exhibit T1.

The manganese toxicity-based criterion was developed using the EPA national method. The national method was used despite the lack of a third fish species and the lack of a species from a phylum other than Arthropoda or Chordata. The EPA advisory method results in a criterion that is believed to be unreasonably low. Pertinent manganese toxicity data can be found in Exhibits T8, T16, T22, and T23.

A new Reference dose (RfD) for manganese of 0.005 mg/kg/day has recently been added to IRIS. The RfD is based on effects to the central nervous system. The MDH proposes to use this RfD to determine a Health Risk Limit (HRL) to add to their draft HRL rule. The new HRL for manganese is not in the draft rule dated January 11, 1993. Exhibit T62. MDH is using a relative source contribution factor of 0.8 for manganese. The Agency proposes to use the new RfD and the relative source contribution factor of 0.8 to calculate the human health-based criterion. Acceptable BAF or BCF data for manganese for fresh water fish is scarce. Based on the limited data, the Agency believes that manganese is not

bioaccumulative in fish and propose to use a BAF of one. This results in a proposed human health-based standard of 138 ug/l for Classes 2A and 2Bd waters.

The proposed Class 2A and Class 2Bd manganese standard will be exceeded frequently by background concentrations, as shown in Table 3. Not all waters in these watersheds are Class 2A and Class 2Bd. Exceedances of the Class 2B standard of 491 mg/l will be infrequent. The percent exceedance of the Class 2B standard ranged from zero to six percent for the same watersheds listed in Table 3. The Big Sioux, Cedar and Des Moines watersheds had six percent exceedances. When natural levels exceed the standard the provisions of part 7050.0170 apply as in the case of iron.

Table 3. Summary of Background Data for Total Manganese For Rivers and Streams in Minnesota

Showing % of Values Above Proposed Class 2A and 2Bd Chronic Standard of 138 ug/l

Watershed	% Above Std.	Median Value ug/l	No. of Values
Big Sioux, Cedar, Des Moines	54	150	539
Minnesota	62	160	1182
Red	37	110	666
Rainy	21	59	347
Lake Superior	11	21	898
St. Croix	37	100	371
Upper Mississippi	37	110	1225
Lower Mississippi	45	130	875

e) Thallium

Thallium is a bluish-white metallic element used to make photo electric cells and rat poison. The proposed standard is human health-based for all Class 2 waters. Exhibit T1.

The thallium toxicity-based criterion was developed using the EPA advisory method. There was one low plant toxicity value of 8 ug/l; however, the difference between 11 and 8 ug/l is not significant and the Agency believes the toxicity-based criterion of 11 ug/l will protect aquatic plants. The human health-based criterion of less than 1 ug/l should protect all biota. Pertinent thallium toxicity information can be found in Exhibits T8, T38 through 39, and T41 through T44.

The human health-based criterion was developed using BCF of 66.5 based on data from Atlantic salmon and bluegill studies. BCFs for saltwater clams are available, but these data were not used because the BCF values

were lower than the fish BCFs, and clams are eaten less frequently than fish. Pertinent thallium BCF data is shown in Exhibits T41, T45, and T46. The Agency used a reference dose obtained from the MDH for thallium, and the default RSC of 0.2. The MDH used an RSC of 0.1 for antimony and other metals in the RAL list number 3 RAL (January 1991). Exhibit T47.

No usable ambient stream or lake data for thallium were found in the STORET data base for Minnesota.

3) Other Organics

Standards are proposed for one chemical under this category: Naphthalene.

a) Naphthalene

Naphthalene is a polynuclear aromatic hydrocarbon used as a wood preservative, the production of certain dyes, and as a moth repellent. The proposed standard is toxicity-based for all Class 2 waters.

The toxicity-based criterion was developed using the EPA national method. The lowest GMAVs were selected so that no more than two saltwater GMAVs were among the lowest four GMAVs (See part 7050.0218, subpart 5, item C.). Table 3b of Exhibit T1. The Agency found one chronic value that was lower than the toxicity-based criterion. Table 2a of Exhibit T1. However, this value is for a saltwater species and the proposed standard should protect freshwater organisms, based on the chronic data for them. Exhibit T1. Exhibits T24 through T29 and Exhibit T37 contain pertinent naphthalene toxicity data.

The human health-based criterion was developed using a new reference dose of 0.04 milligram per kilogram per day (mg/kg/day) as recommended by the MDH. The MDH used 0.004 mg/kg/day to calculate the RAL, which was the reference dose available at the time the RAL was released (January 1991). Exhibit T47. The bioaccumulation factor is from a whole body bluegill BCF and a rainbow trout edible portion BCF. Exhibits T30 and T31.

No usable ambient stream or lake data for naphthalene were found in the STORET data base for Minnesota.

Analytical Detection Limits.

The analytical detection limits obtained by the MDH analytical laboratory are shown in Table 4. The proposed Class 2A and Class 2Bd standard of 0.28 ug/l for thallium will be below the detection limit of 0.5 ug/l, otherwise, the proposed standards are above detection levels. The Agency believes that standards have to be set at levels required to protect aquatic life and human health independent of detection limits. A standard below detection does make ascertaining compliance with the standard more difficult. Techniques employed by the Agency to deal with this situation include monitoring the effluent before dilution, predicting water concentrations based on loading data, monitoring the pollutant in sediments where concentrations are likely to be higher, and monitoring bioaccumulative pollutants in fish tissue.

Table 4. Analytical Detection Limits
Compared to the Lowest Proposed Chronic Standard

Chemical	Detection Limit ug/l	Chronic Standard ug/l
Alachlor	0.02	3.8
Antimony	2	5.5
Atrazine	0.02	3.4
Cobalt	0.5	2.8
Iron	20	221
Manganese	3	138
Naphthalene	0.5	81
Thallium	0.5	0.28

d. Nine updated aquatic life standards for toxics.

The Agency is proposing to update nine of the 53 Class 2 aquatic life standards for toxics in parts 7050.0220 and 7050.0222. All nine are proposed for change because the reference doses (RfD) or potency slopes (q1*) used to calculate the standards have changed since the standards were first promulgated in 1990. (See part 7050.0218, subpart 6 and Exhibit T40 for details on how standards are determined.)

The RfDs or q1*s for 26 of the chemicals for which the Agency has Class 2 standards have undergone some change since 1990. The new RfDs and q1*s were obtained from the Health Risk Assessment Section of the Minnesota Department of Health (MDH). They are the latest values as of September 1992. Exhibit T54.

MDH obtains the Rfds and q1*s from the Integrated Risk Information System (IRIS) and the Health Effects Assessment Summary Tables (HEAST). IRIS and HEAST sources are maintained by the EPA, and the RfDs and q1*s represent a consensus of opinion within EPA on the toxicity and carcinogenicity of chemicals. As stated previously, Agency uses the same RfDs and q1*s the MDH uses to set their Recommended Allowable limits (RAL) and their proposed Health Risk Limits (HRL). Use of IRIS as the source for the RfDs and q1*s is specified in part 7050.0218, subpart 6.

The review of the 26 standards with new RfDs or q1*s resulted in nine chemicals needing to be updated. The reason many of the remaining standards are not changing is that the toxicity-based criteria remain lower than the human health-based criteria, and, therefore, the former control the standards. Some standards are being left unchanged for the reasons listed in Table 5, and as explained further below. The updated information for all human health-based criteria is contained in Exhibit T56.

Table 5. Review of Chemicals with Class 2 Standards
With new or Revised RfDs or q1*s

Chemical	Change	Status of Standard
Acenaphthene	new RfD	Remains toxicity-based
Anthracene	new RfD	Remains toxicity-based
Arsenic	revised RfD	**Updated standard
Benzene	revised q1*	Updated standard
Bromoform	revised RfD	Updated standard
Chlorpyrifos	new RfD,BAF	Remains toxicity-based
Chromium VI	revised RfD	Remains toxicity-based
1,2-Dichloroethane	revised q1*	**Remains unchanged
Di-n-octyl phthalate	new RfD	**Remains toxicity-based
Endosulfan	revised RfD	Updated standard
Ethyl benzene	revised RfD	Remains toxicity-based
Fluoranthene	revised RfD	Updated standard
Hexachlorobenzene	revised q1*	Updated standard
Lindane	new RfD	Remains based on 1990 q1*
Mercury	revised RfD	**Remains unchanged
Nickel	revised RfD	Updated standard
Parathion	new RfD	Remains toxicity-based
Pentachlorophenol	new q1*	**Updated standard
Selenium	revised RfD	Remains toxicity-based
Silver	new RfD	Remains toxicity-based
Tetrachloroethylene	revised q1*	**Remains unchanged
Toluene	revised RfD	Remains toxicity-based
Toxaphene	revised q1*	**Remains unchanged
2,4,6-Trichlorophenol	revised q1*	Remains organoleptic-based
Vinyl chloride	revised q1*	Updated standard
Zinc	new RfD	**Remains toxicity-based

** See further discussion in text

Of the nine updated standards, five are greater or less stringent, and four are lower or more stringent, than the current standards. The former category includes benzene, fluoranthene, hexachlorobenzene, nickel, and vinyl chloride. The latter category includes arsenic, bromoform, endosulfan, and pentachlorophenol; of these, arsenic and pentachlorophenol are significantly lower. Since these nine standards are being updated based only on new or revised RfDs or q1*s, according to established procedure, not all of them will be discussed individually. A comparison of the current and proposed chronic standards is shown in Table 6. None of the toxicity-based maximum standards or final acute values for the nine chemicals are proposed for change.

Table 6. Comparison of Current and Proposed Class 2 Chronic Standards
All units in ug/l Unless Noted

Chemical	Current Standards			Proposed Standards			Basis
	2A	2Bd	2B,C,D	2A	2Bd	2B,C,D	
Arsenic	50	50	70	2.0	2.0	53	Hs
Benzene	5.9	6.9	114T	9.7	11	114T	Hc,T
Bromoform	103	128	558	33	41	466	Hc
Endosulfan	0.044	0.15	0.15	0.0076	0.029	0.031	Hs
Fluoranthene	1.1	4.1	4.6	7.1	20T	20T	Hs,T
Hexachlorobenzene ng/l	0.056	0.22	0.22	0.061	0.24	0.24	Hc
Nickel*	88	88	158	297	297	NA	Hs&T
Pentachorophenol	5.7T	5.7T	5.7T	0.93	1.9	5.5	Hc
Vinyl chloride	0.14	0.15	7.6	0.17	0.18	9.2	Hc

NA = not applicable
Hc = standard is human health-based and chemical is considered a carcinogen
Hs = standard is human health-based and chemical is a systemic toxicant
T = standard is toxicity-based
* Values shown are human health-based; hardness related toxicity-based standard will be lower than the proposed standards for hardness values less than 212 mg/l.

The bioaccumulation factor (BAF) is the other major variable, besides the RfDs and q1*s, which can change with new information and can affect the human health-based criteria. BAFs are needed so that it can be determined whether the revised human health-based criteria will be lower than the current toxicity-based criteria. Most BAFs used in 1989 remain unchanged, but a few were changed based on new information, as shown below.

Chemical	1990 BAF	1992 BAF	Comments
Arsenic	4.4	4.4	no change justified after review
Chlorpyrifos	none	238	for Class 2B
		950	for Class 2A
Di-n-octyl phthalate	none	none	inadequate data
Nickel	47	1	new BAF based on fish
Parathion	none	71	
Pentachloro-phenol	467	35	for Class 2B
	467	142	for Class 2A
Silver	none	1	Great Lakes Initiative
Zinc	none	4.4	Great Lakes Initiative

1) Arsenic

The proposed new arsenic standard for Classes 2A and 2Bd waters of 2.0 ug/l is considerably lower than the current standard of 50 ug/l. The current Classes 2B and 2C standard of 70 ug/l is proposed to be lowered to 53 ug/l. This change is based on a lower (more stringent) RfD. The RfD is based on arsenic's noncarcinogenic human health effects. Arsenic is a well known human carcinogen based on inhalation studies. However, the evidence suggesting it is a carcinogen when ingested, either in water or with fish tissue, is less conclusive. The information the Agency has at this time is that EPA is reviewing the current primary drinking water standard for arsenic of 50 ug/l, and may propose a standard based on its carcinogenicity in the future.

The Recommended Allowable Limit (RAL) for arsenic, released by the MDH in 1990, is 0.2 ug/l, and is based on arsenic's carcinogenicity. RALs are used as drinking water or ground water criteria; i.e., they protect humans from the harmful effects of ingesting drinking water contaminants. However, because of the uncertainties about arsenic's carcinogenicity and concern about having a HRL below most natural background concentrations, the MDH is not proposing to include a HRL for arsenic in their pending HRL rule. Exhibit T62.

The bioaccumulation factor used to calculate the 1990 arsenic standard was 4.4. The Agency reviewed the bioaccumulation and bioconcentration data again and concluded that there was no need to change the BAF. The Great Lakes Initiative draft BAF for arsenic in fish is 1.0.

The Agency believes that, in spite of the uncertainties and pending review within EPA, the proposed arsenic standards will be protective of both human health and aquatic life. Use of the q1*, as used by the MDH for the 1991 RAL, to calculate the standard would lower the proposed standards by a factor of 10 (0.2 for Classes 2A and 2Bd waters and 3.3 ug/l for Class 2B waters). Standards in the 0.2 to 3.3 ug/l range would be below background concentrations in much of the state. Based on data from the routine surface water monitoring program, the proposed 2A and 2Bd standard of 2.0 ug/l will be below most background concentrations in some watersheds in the state, as shown in Table 7. The proposed 2B and 2C standard of 53 ug/l will not be exceeded by natural background levels. Where natural background concentrations exceed the standard, the natural background levels can be used as the standard (part 7050.0170).

Table 7. Summary of Background Data for Arsenic
For Rivers and Streams in Minnesota

Showing % of Values Above Proposed Class 2A and 2Bd Chronic Standard of 2.0 ug/l

Watershed	% Above Std.	Median Value ug/l	No. of Values
Big Sioux, Cedar, Des Moines	59	2.76	56
Minnesota	88	3.2	128
Red	76	3.3	78
Rainy	5	1.0	41
Lake Superior	2	1.0	123
St. Croix	--	--	--
Upper Mississippi	19	1.2	120
Lower Mississippi	19	1.3	137

In conclusion, the Agency is proposing a revised arsenic standard considerably more stringent than the current standard. The proposed 2A and 2Bd standard of 2.0 ug/l will be exceeded by background concentrations in the surface waters in some parts of the state. The uncertainties over arsenic's carcinogenicity may not be resolved soon. The promulgation of a new EPA primary drinking water standard often takes several years. Also, final MCLs for carcinogens are based on nonhuman health end points such as analytical detection limits, background concentrations, or treatability, which often makes the final MCLs less stringent.

2) 1,2-Dichloroethane

The change in potency slope was very slight (9.2 to 9.1), so the standard was left unchanged.

3) Di-n-Octyl Phthalate

Neither bioaccumulation or bioconcentration data are available for this chemical, and, therefore, a human health-based criterion can not be determined. If the BAF for di-2-ethylhexyl phthalate, a related chemical, is used to calculate a standard for di-n-octyl phthalate, the resulting criterion is within a factor of three of the current toxicity-based standard for this chemical (11 compared to 30 ug/l). In the absence of bioaccumulation data, the Agency believes the standard should be left unchanged.

4) Mercury

The latest RfD for mercury is roughly twice as large as the RfD used in 1990 (0.0003 to 0.00016). Consequently, use of the new RfD would result in a mercury standard about double the current standard of 0.0069 ug/l. The Agency believes a mercury standard of 0.013 ug/l would be under protective, and proposes to leave the current standard unchanged. For

example, it is known from the very low detection level mercury monitoring done in northern Minnesota lakes that even the current standard is not protective of the fish in these sensitive lakes. The mercury concentrations in these lakes is in the 0.001 to 0.002 ug/l range, but mercury concentrations in fish are high enough to require consumption advisories. Exhibit T63. Also, wildlife can be sensitive to mercury toxicity and it is believed a higher standard would not protect sensitive wildlife.

5) Pentachlorophenol

The proposed Class 2A and 2Bd pentachlorophenol (PCP) chronic standards of 0.93 and 1.9 ug/l, respectively, are lower than the current Class 2 standards. The proposed Class 2B chronic standard of 5.5 ug/l will be lower than the current standard for most Class 2B waters of the state. Only for those waters with average pH values less than 6.97 will the current standard be lower (more stringent). The current chronic standard varies with the pH of the ambient waters, and ranges from 3.5 to 26 ug/l over a pH range of 6.5 to 8.5. The reason the proposed standard is lower is that EPA now considers PCP a potential human carcinogen. PCP has been classified as a 2B carcinogen and has been given a potency slope of 0.12. Exhibit T54. EPA defines a class 2B carcinogen as a "probable human carcinogen based on a combination of sufficient evidence in animals and inadequate data in humans". Exhibit T35. The new q1* replaces a RfD which was used to calculate the human health-based criterion in 1990. However, the pH dependent toxicity-based criterion was lower than the RfD based human health criterion in 1990.

The bioaccumulation factor for PCP was reviewed for the proposed standard. Exhibit T56. BCF and BAF data are summarized and discussed in the 1986 EPA water quality criterion for PCP, in the draft Great Lakes Initiative documents, and in a paper by Niimi and Cho (1983). All three sources report BCFs or BAFs in the range of 23 to 40. These BAFs and BCFs are adjusted to account for the lipid (fat) content of the various test fish used. Niimi and Cho (1983) provide evidence that PCP does not biomagnify up the food chain. Biomagnification refers to an increase in the tissue concentrations of a bioaccumulative chemical with each step in the food chain, such that top predator fish have higher concentrations than small fish, small fish higher concentrations than zooplankton, and so on. The Agency proposes to use the BAF data in Niimi and Cho (1983) as the basis for the BAF used to calculate the proposed standard. Exhibit T57. Field measured BAF data is preferred over laboratory measured BCF data because BAFs take into account potential biomagnification, metabolism and other factors that affect bioaccumulation in nature. Also, since field measured BAF data are available, the BCF to BAF adjustment factor in part 7050.0218, subpart 7, item B. is not used.

The geometric mean of the four lipid normalized BAFs in Exhibit T57 is 23.6. The resulting BAFs are as follows:

Revised BAFs for PCP:

23.6 X 1.5 % lipid (for Class 2B, 2C and 2D waters) = 35
23.6 X 6 % lipid (for Class 2A waters) = 142

PCP was analyzed in river samples taken during the routine monitoring program in 1978 and 1979. In total, 78 samples from around the state were analyzed for PCP. Of these, one value was above the most stringent (Class 2A) proposed standard of 0.93 ug/l. This was 0.97 ug/l measured in the Red River four miles south of Georgetown. This value would be below the proposed standard for the Red River of 1.9 ug/l. The lowest analytical detection level achieved for these data was 0.1 ug/l.

6) Tetrachloroethylene

The change in potency slope was very slight (from 5.3 to 5.1 mg/kg/day) and, in addition, the new q1* has be withdrawn for HEAST since September, 1992. The Agency proposes to leave the standard unchanged.

7) Toxaphene

The change in the potency slope was very slight, apparently due to rounding off the value the Agency proposes to leave the standard unchanged.

8) Zinc

The new RfD for zinc results in a human health based criterion of 328 ug/l for zinc. This is calculated using a BAF of 4.4, which is the draft BAF from the Great Lakes Initiative. This human health-based criterion is only slightly lower than the hardness dependent toxicity-based standard of 343 ug/l calculated for the maximum hardness of 400 mg/l. The Agency believes this is not enough difference to warrant a human health-based "cap" in the standard.

Revisions unique to each item

A discussion of the proposed changes that are unique to each item follows.

3. Subparts 2, 3 and 4.

The following changes to the standards are proposed to correct several minor errors left over from the amendments to ch. 7050 completed in 1990.

The Agency proposes to round off three of the current Class 2 standards to two significant digits. This change is being made to make these standards consistent with the practice, started when the 53 standards for toxics were adopted in 1990, to round values off to two significant figures. The three standards are:

Class 2 maximum standards for Dieldrin, from 1.25 to 1.3 ug/l;
Class 2Bd chronic standard for 1,1,2,2 Tetrachloroethane, from 1.54 to 1.5 ug/l; and

Class 2A Final Acute Value for Cadmium at a hardness of 200 mg/l, from 17.1 to 17 ug/l.

These changes do not involve any reassessment of the basis for the three standards.

The Agency proposes to add to the Class 2Bd standards in part 7050.0222, subpart 3, the following:

Color value Pt.-Co units	none	none	none

This will correct an error that says that Class 2Bd waters have a color standard because all Class 2A standards, which includes a color standard, apply to Class 2B waters, except those standards listed in the current part 7050.0220, subpart 3, item B. The Class 2A color standard is a carry over from the rule prior to the amendments in 1990. Class 2B waters have never had a color standard. When the new class "2Bd" was created in 1990 to include nontrout waters protected for drinking, a use they have in common with Class 2A (trout) waters, the error was made in not excluding the color standard from Class 2Bd waters.

The chemical "Acenaphthene" is misspelled in the current rule as "Acenapthene". It is proposed to correct this error.

In the lists of Class 2 standards, the "(C)" designation is associated with substances that are carcinogenic, and for which the human health-based criterion is the basis for the standard. The Class 2A and 2Bd standards for some substances are human health-based due to the inclusion of drinking water in the determination of the standards. However, the Class 2B standard for the same substance may be toxicity-based because the human health-based criterion is based on fish consumption only. The "(C)" designation is erroneously associated with three Class 2B standards that are in this category. It is proposed to delete the "(C)" from the following toxicity-based Class 2B standards. The Class 2Bd and 2B standards are shown to illustrate the change from human health to toxicity-based standards.

Substance	Human Health-based Class 2Bd standard ug/L	Toxicity-based Class 2B standard ug/L
Benzene	11	114
Chloroform	55	224
Methylene chloride	46	1561

A third change to these subparts is proposed to make the rule easier to use. It is proposed to add to the top of each page that includes the Class 2A, 2Bd, and 2B standards the following headings:

Class 2A standards continued
CS MS FAV

A similar heading will appear at the top of the pages listing the Class 2Bd and 2B standards. This will help the reader identify the use class that the standards on each page pertain to, and it will help identify which standards are the CS, MS and FAV.

4. Subpart 2. Class 2A waters; aquatic life and recreation.

The Agency proposes to change the word "fisheries" to "aquatic life" in the name of designated use Class 2. This change is also proposed under subparts 3 to 4. See part 7050.0200, subpart 3 (Class 2) for a discussion of the need for and reasonableness of this change.

The Agency proposes to delete reference to warm water sport fish by deleting "warm or." The term warm is being removed from the description of Class 2A waters because, even though warm water fish may be present, it is the presence or potential presence of the cold water fish species that is used to classify a waterbody under Class 2A. For a more detailed explanation of the intent the use classification scheme and Class 2A, see the discussion of narrative biocriteria in the part 7050.0222 revision subject text.

The restructuring of part 7050.0220 has made it necessary to change the "part 7050.0220, subpart 3, item H" to "part 7050.0222, subpart 7, item E." This change is also proposed under subparts 3 and 4.

The Agency proposes to delete the phrase "this dissolved oxygen standard requires compliance with the." This phrase appears twice in the rule due to a word processing error made during the 1990 rule revision. This change will correct this error without causing a change in the standard. This correction also occurs under subparts 4 and 5.

5. Subpart 5. Class 2C waters.

The phrase "species commonly inhabiting waters of the vicinity under natural conditions" is proposed to be condensed to the word "indigenous." This change will eliminate a wordy statement without changing the meaning of the standard.

The restructuring of part 7050.0220 has made it necessary to change "item C" to "subpart 4."

6. Subpart 6. Class 2D waters.

The Agency proposes to establish a designated use Class 2D to protect indigenous species in wetlands. Narrative standards are proposed for dissolved oxygen, pH, and temperature. Wetland background ranges are proposed as benchmarks.

This addition is reasonable for the reasons summarized below. Currently, most wetlands are classified as Class 2B waters, because they are not listed in part 7050.0470. The existing Class 2 parameters do

not take into account the wide range of variability of dissolved oxygen, pH, and temperature wetlands can have. Wetland soils are anaerobic (without oxygen) at least a portion of the year and this can result in an accumulation of organic matter in the sediments. The presence of organic soils and active photosynthesis can result in large dissolved oxygen swings in the water column during a 24 hour period.

Therefore, the Agency is proposing "maintain background" standards for dissolved oxygen, when the background level is a daily minimum below 5 mg/l. Class 2B standards for other substances or characteristics will continue to apply. The narrative standard of maintaining 'background ' allows a natural assemblage of plants and animals.

In the same manner, some wetlands are characterized by low pH (bogs) or high pH (calcareous fens). Requiring a circumneutral pH could significantly impact the designated uses of those wetlands. Exhibits W56 and W58. The Agency is not aware of impacts to wetlands from temperature restraints. Using a narrative standard does not decrease protection but does allow flexibility in permitting as new information becomes available.

One respondent, Exhibit W24, was concerned with the difficulty of determining "background conditions" in a wetland. Background condition is an evaluation of a wetland in its present condition. The Agency uses water chemistry data gathered through monitoring programs or reference data from a similar wetland when data are unavailable for a specific wetland, and inventory plant and animal species and their diversity to determine background conditions. These evaluation techniques are similar to those used to determine natural water quality. See the discussion for part 7050.0170 for more discussion on natural water quality. The level of physical, biological, and chemical monitoring that will be required to determine background condition will be a case by case determination. The type of wetland, condition of the wetland, and the type of discharge being proposed vary greatly with each project and justify this case by case approach.

The EPA has suggested that the Agency plan to add numeric standards for wetlands in subsequent triennial revisions as data become available. Exhibit W3. This progression of narrative standards followed by numeric standards is the same as the progression for protection of rivers and lakes in previous water quality standard revisions.

a. Normal farm practices.

The following paragraph concerning normal farm practices is also proposed:

> "Activities in wetlands which involve the normal farm practices of planting with annually seeded crops or the utilization of a crop rotation seeding of pasture grasses or legumes, including the recommended applications of fertilizer and pesticides, are excluded from these standards and the standards in parts 7050.0224, 7050.0225, and 7050.0227. All other activities in these wetlands must meet water quality standards."

Normal farming activities are exempt from Clean Water Act Section 404 permitting requirement by 40 CFR 232.3(c)(1)(i). Exhibits W46 and W47. The normal farm practices of seeding, cultivating, and applying fertilizers and pesticides will not significantly or permanently alter seasonal wetland uses. Exhibit W51. These practices are likely to occur only in seasonal wetlands that have dried sufficiently as to allow farm equipment on them. These activities are allowable, but the water quality standards do not explicitly state this. The Agency was requested to add this paragraph. Exhibit W51. Since it is allowable and reasonable, the paragraph was added.

b. Reclassification of waters.

Waters that are presently listed as Class 2B waters but are fens or other wetlands contained within an ORVW geographic area are being proposed to be changed to 2D waters. It is reasonable to make this change because the 2B aquatic use description regarding sport fish and several of the accompanying standards (i.e. pH, temperature and dissolved oxygen) are not appropriate for these wetlands. As noted previously, the 2D designated use classification was developed to address the unique characteristics of wetlands. These changes in classification will appear under part 7050.0470.

7. Subpart 7. Additional standards.

The Agency is proposing to establish a separate subpart to address standards that are required for all Class 2 waters. This subpart will be comprised of existing text. Item A contains text that currently follows part 7050.0220, subpart 3, item D. Even though the first part of the text states "for all classes," the existing format made the text appear to be part of item D and apply only to Class 2C. Therefore, the language has been proposed to be moved to part 7050.0222, subpart 7, item A instead of subpart 5 with the rest of the text from item D.

The restructure made it necessary to change "above listed" classes to classes "in subparts 2 to 6."

8. Subpart 8. Site-specific modifications of standards.

The restructuring of part 7050.0220 made it necessary to change standards "listed in subpart 3" to standards in "subparts 2 to 6."

T. Part 7050.0223 SPECIFIC STANDARDS OF QUALITY AND PURITY FOR CLASS 3 WATERS OF THE STATE; INDUSTRIAL CONSUMPTION.

This part was created from part 7050.0220 as follows:

Proposed rules	Current rules
Subpart 2	7050.0220, subpart 4, item A
Subpart 3	7050.0220, subpart 4, item B
Subpart 4	7050.0220, subpart 4, item C
Subpart 6	7050.0220, subpart 4, item C

1. Subpart 5. Class 3D waters.

The Agency proposes to establish a new designated use Classification called "Class 3D." Class 3D will protect those wetlands that have pH values that deviate significantly from neutral. It also protects wetlands with naturally high concentrations of chloride or hardness.

This class has been added for reasons similar to Class 2D, proposed under part 7050.0222, subpart 6. The proposed class is reasonable because the narrative language does not decrease protection, but does allow flexibility for permitting discharges to a wide variety of wetlands. Without this flexibility, variances are required to avoid violating the water quality standards. The data are not available yet to list numeric standards for chlorides and hardness for all wetlands.

Wetlands with an industrial consumption designated use are currently classified as Class 3B waters. Specific water quality standards for Class 3B water include the following: chlorides, 100 mg/l; hardness, 250 mg/l; and pH, a range of 6 to 9. Some wetlands naturally have concentrations of chlorides and hardness that exceed these standards and "maintain background" standards are proposed under Class 3D to protect these wetlands. Levels of pH naturally vary widely in the different types of wetlands and a "maintain background" standard is proposed under Class 3D for all pH levels to provide protection to these diverse waters.

This approach is based on the general standard for discharges proposed under part 7050.0210, subpart 13a, wetland pollution prohibited, which states, in part, that wetlands will be protected from significant adverse chemical changes to wetland designated uses. See the part 7050.0210, subpart 13a, for a discussion of the reasonableness of this standard.

2. Subpart 6. Additional standards.

The Agency is proposing to establish a separate subpart to address standards that are required for all Class 3 waters. This subpart will be comprised of text that is currently follows part 7050.0220, subpart 4, item C. Even though the first part of the text states that these standards are in addition to the specialized Class standards, the existing format made the text appear to be part of item C and apply only to Class 3C. Therefore, the language has been proposed to be moved to part 7050.0223, subpart 6, instead of subpart 4 with the rest of the text from item C.

The restructuring of part 7050.0220 made it necessary to change "above listed" standards to standards "in subparts 2 to 5."

U. Part 7050.0224 SPECIFIC STANDARDS OF QUALITY AND PURITY FOR CLASS 4 WATERS OF THE STATE; AGRICULTURE AND WILDLIFE.

This part was created from part 7050.0220 as follows:

Proposed rules	Current rules
Subpart 2	7050.0220, subpart 5, item A
Subpart 3	7050.0220, subpart 5, item B

1. Subpart 4. Class 4C waters.

The Agency proposes to establish a new classification "Class 4C". Class 4C is proposed to protect wetland designated uses that enhance agriculture and wildlife. The specific designated uses proposed are erosion control, ground water recharge, low flow augmentation, storm water retention, and stream sedimentation. These uses are potentially important in the wetland and in downstream water resources. Not all wetlands have all these uses, but, where they do occur, they are valuable.

Erosion control by wetlands occurs because stream velocities decrease as the stream channel widens at the site of the wetland. The plants in the wetland provide increased friction to flows also. The decrease in erosion results in improved water quality downstream through reductions in bank erosion.

Ground water recharge in wetlands can be an important resource, both to people and as discharge points, such as springs and seeps. Water that is detained in wetlands is naturally cleansed of sediments and toxics and, because of the slowed velocities, given time to percolate into the aquifer, if there is appropriate geology below the wetland.

Low flow augmentation by wetlands can be important for maintaining flow in streams during droughty periods. Wetlands perform this function not only because of its larger basin, but also because its organic sediments have greater water-holding capacity than inorganic sediments. The augmented flows from wetlands help sustain aquatic organisms downstream and could lengthen the amount of time water is available for livestock and wildlife watering needs and for irrigation purposes.

The storm water retention potential provided by wetlands is important to moderate the peak flows after a storm event. The retention also enhances the other designated uses listed in subpart 4.

Stream sedimentation is a natural result of the reduced velocities that occur in wetlands. Nutrients and toxics, when present, are often associated with the particles in the water column. The filtering that wetlands perform by allowing these particles to settle can greatly improve water quality downstream, especially in lakes. However, excessive sedimentation can smother the natural organic wetland sediments, which can potentially result in an impact to other designated uses. Excessive sedimentation usually occurs only if the upstream river channel is significantly disturbed.

V. Part 7050.0225 SPECIFIC STANDARDS OF QUALITY AND PURITY FOR CLASS 5 WATERS OF THE STATE; AESTHETIC ENJOYMENT AND NAVIGATION.

This part was created from part 7050.0220 as follows:

Proposed rules	Current rules
Subpart 2	7050.0220, subpart 6

The substances proposed to be listed under subpart 2 for wetlands are pH and hydrogen sulfide, measured as sulfur. Changing pH to a narrative standard is discussed under part 7050.0222, subpart 6. In a parallel sense, the data are not yet available for numeric criteria in wetlands for hydrogen sulfide.

W. Part 7050.0226 SPECIFIC STANDARDS OF QUALITY AND PURITY FOR CLASS 6 WATERS OF THE STATE; OTHER USES.

This part was created from part 7050.0220 as follows:

Proposed rules	Current rules
Subpart 2	7050.0220, subpart 7

The proposed restructuring of part 7050.0220 made it necessary to change "the foregoing categories" to "parts 7050.0221 to 7050.0225."

X. Part 7050.0227 SPECIFIC STANDARDS OF QUALITY AND PURITY FOR CLASS 7 WATERS OF THE STATE; LIMITED RESOURCE VALUE WATERS.

This part was created from part 7050.0220 as follows:

Proposed rules	Current rules
Subpart 2	7050.0220, subpart 8

A format change is proposed for the list of Class 7 numerical standards. The text for the fecal coliform organisms, pH value, and dissolved oxygen standards is proposed to be formatted into a column under the heading "standard." This change is reasonable because it does not change the text or meaning of the rules, but will help readers differentiate "substance or characteristics" from "standards."

Y. Part 7050.0410 LISTED WATERS.

Part 7050.0410 functions as a key for part 7050.0470, which lists waters of the state by major surface water drainage basins, and allows the list of designated use classes for a listed water to be abbreviated. Existing text establishes the classifications that are designated to all waters listed under part 7050.0470, and a change is proposed to exclude wetlands from this list of classifications. Language is also proposed to establish that wetlands listed under part 7050.0470 are classified as Classes 3D, 4C, 5, and 6 in addition to the classifications specified in a part 7050.0470 entry for a wetland. These changes reflect the use classifications and standards being proposed for wetlands under parts 7050.0222, subpart 6; 7050.0223, subpart 5; 7050.0224, subpart 4, and part 7050.0225.

Z. Part 7050.0420 TROUT WATERS.

The Agency proposes to change part 7050.0420 to update reference to the MDNR list of designated trout waters and to designate MDNR-specified tributaries to trout waters as Class 2A waters.

The MDNR updated the list of designated trout waters by publishing the Commissioner's Order No. 2450 in the June 22, 1992, State Register (16 S.R. 2785, 2902-28). Exhibit C55. This list is referenced as Minn. Rules part 6262.0400, which is proposed to be added under this part. It is reasonable for the MPCA to update the list of waters identified under part 7050.0420 to match the list identified by the MDNR because the Agency and MDNR should be in coordination in their management and protection efforts and all MDNR designated trout waters should be identified as Class 2A waters under Chapter 7050 to receive the appropriate level of protection.

Minn. Rules part 6262.0400, subpart 5, also designates tributaries to trout waters as trout waters. The Agency is proposing to add these tributaries as trout waters under Minn. Rules ch. 7050 and designate them as 2A waters to be consistent with the MDNR Commissioner order.

Under the current rule, the MDNR designated trout streams and trout lakes were incorporated by reference into Ch. 7050. Under the proposed rule, these trout waters listed under the Commissioner's Order No. 2450, with the exception of Shakopee Mill Pond, are incorporated under the appropriate water basin within part 7050.0470. According to MDNR, Shakopee Mill Pond is not managed as a trout water and the entry for the pond in the Commissioner's Order as it appeared in the State Register was an error. Therefore, staff propose not to list Shakopee Mill Pond under part 7050.0470 as a trout water.

AA. Part 7050.0425 UNLISTED WETLANDS.

This subpart is proposed to be added to parallel the existing language in 7050.0430:

> "Those waters of the state that are wetlands as defined by part 7050.0130, item F, and that are not listed in part 7050.0470 are classified as Class 2D, 3D, 4C, 5, and 6 waters."

This part is needed to address the many wetlands that have not been listed under part 7050.0470. Adding this language is reasonable because it clarifies how these unlisted waters will be classified. Classes 2D, 3D, 4C and language under Classes 5 and 6 are being proposed during this rule revision to establish water quality standards that directly relate to wetlands and their unique characteristics and designated uses.

One respondent, Exhibit W48, disagreed with the concept of classifying wetlands according to their potential uses. In the Agency's current rules, all waters of the state, including wetlands, are assigned uses so this action does not change the use attainability process, which was defined in the NEED section of this SONAR.

BB. Part 7050.0430 UNLISTED WATERS.

Part 7050.0430 was modified to reflect that wetlands have been given the new Classes of 2D, 3D, and 4C. These changes are reasonable because, without this modification, wetlands would be placed in both wetland and non-wetland criteria, creating confusion.

CC. Part 7050.0465 MAP: MAJOR SURFACE WATER DRAINAGE BASINS.

The map label for Olmsted County is currently misspelled as "Olmstead." This spelling error is proposed to be corrected.

The map contained in part 7050.0465 identifies the nine (9) major surface water drainage basins under which the waters in part 7050.0470 are organized. The watershed boundaries separating these drainage basins was based on a hydrologic unit map developed by the United States Geological Survey (USGS) in 1974. The hydrologic units established on this map are divided into Regions, Subregions, Accounting, and Cataloging units. The bold drainage basin lines identified on the map correspond to the Subregional unit codes established for the state.

The use of the Subregional unit code boundaries in the southeastern corner of the state has led to some confusion when attempting to determine the water use classifications for waters in that area. Waters within Houston, Fillmore, and some waters in Mower Counties flow either directly into the Mississippi River or into either the Wapsipinicon River or the Upper Iowa River watershed, which are direct tributaries to the Mississippi River. They do not flow into the Cedar River basin as is inferred from the map. Therefore, the Agency is proposing to modify the map in part 7050.0465 to more accurately reflect the actual watershed drainage patterns for these three counties. In doing so, six watercourses that were specifically listed under the Cedar-Des Moines Rivers Basin in part 7050.0470, subpart 8, are proposed to be listed under Lower Mississippi River Basin in part 7050.0470, subpart 7. The water use classifications for these waters remain unchanged.

DD. Part 7050.0470 CLASSIFICATION FOR WATERS IN MAJOR SURFACE WATER DRAINAGE BASINS.

There are a number of proposed rule amendments that are reflected in changes to part 7050.0470. These amendments include: 1) the assignment of the Class 1C Domestic Consumption water use classification to certain waters that have been identified as drinking water sources; 2) the proposed reclassification of six watercourses as Class 7 Limited Resource Value waters; 3) the addition of entries for stream trout lakes and trout streams designated by the Commissioner of the Minnesota Department of Natural Resources; 4) removal of lake trout lake ORVW status at request of MDNR; 5) changes to entries for ORVW calcareous fens and addition of newly designated ORVWs; 6) changing the use class for fens; and 7) other minor organizational changes to the listing of waters. Each set of proposed amendments are explained in greater detail as follows.

1. Class 1C Domestic Consumption Classifications

The domestic consumption water use classification is assigned to waters of the state that serve as a source supply for drinking, culinary or

food processing or other domestic purposes. Agency staff, with the assistance of staff from the Minnesota Department of Health, Environmental Health Division, have identified surface waters that are used as source waters for public water systems but that are not currently assigned the domestic consumption use classification.

A public water supply system is a system supplying piped water for human consumption, and has a minimum of 15 service connections or 15 living units, or serves at least 25 persons daily for 60 days of the year. Minn. Rules pt. 4720.0100, subp. 16. Public water supplies are divided into three categories: community water supplies, noncommunity water supplies, and nontransient, noncommunity water supplies. Examples of public water supply systems within these three categories are listed below.

A community water supply system is a public water system that serves at least 15 service connections or living units used by year-round residents, or that regularly serves at least 25 year-round residents. Examples of these type of systems are: municipalities, mobile home parks, and apartments.

A noncommunity water system is a public water system that serves the traveling or transient population. Examples of such systems include: hotels, motels, resorts, restaurants, campgrounds, recreation areas, churches, and gas stations.

A noncommunity, nontransient water system is a public water supply system that regularly serves at least 25 of the same persons over six months per year. Examples include: schools, day-care facilities, factories, and businesses.

The Agency is proposing to classify 18 additional surface waters which have been identified by the Minnesota Department of Health as public water supply system sources as Class 1C waters. The quality of this class of waters of the state shall be such that with treatment consisting of coagulation, sedimentation, filtration, storage, and chlorination or other equivalent treatment processes, the treated water will meet the primary and secondary drinking water standards. Exhibit C42 is a listing of the surface waters proposed for the Class 1C use classification, the municipalities or facilities using these waters as supply sources, and the counties in which these cities or facilities are located.

It should be noted that one of the public water supply sources utilized by the Hibbing Taconite Company, the Scranton Mine Pit Lake, is not a discrete body of water at this time. Under current water level elevations, the Scranton is inundated by other surface waters within the Hull-Rust-Mahoning-Scranton-Susquehanna complex. Exhibit C43 contains an aerial photograph of this inundated mining complex. Hibbing Taconite has a floating barge within this waterbody which is reportedly used to dewater the pit at a current rate of approximately 12,000 gallons per minute (gpm). Once the water level is established at an elevation of

1290 feet, pumping rates will be re-evaluated. For the near future, the Scranton will continue to remain inundated. Based on this information, the Agency is proposing to classify the surface waters within this complex as Class 1C waters. The entry in Minn. Rules pt. 7050.0470, subp. 1 will read as follows:

Scranton Mine Pit Lake (Hull-Rust-Mahoning-Scranton-Susquehanna), (T.57, R.20, S.6,7; T.57, R.21, S.1,2,11,12): 1C, 2Bd, 3B;

Comments letters and oral statement submissions were received regarding the proposed classification of these public water supply sources as Class 1C waters. Many of the comments were specifically directed toward the mine pit lakes on the Iron Range, their uses, and concerns for their continued protection because of their important role as drinking water supplies. Several commenters proposed that all mine pit waters situated within the Biwabik Iron Formation Aquifer be classified as Class 1C waters. Exhibit C44. The Agency has considered this proposal and has concluded that assignment of the Class 1C use classification should be restricted to those mine pit lakes that are currently being used for drinking water purposes. The Agency therefore believes it is reasonable to designate those waters that have been identified by the Minnesota Department of Health as public water supply sources to be classified as Class 1C waters in Minn. Rules pt. 7050.0470.

2. Class 7 Limited Resource Value Water Use Reclassifications

The waters included in the Class 7 use classification include surface waters of the State which are of limited value as a fisheries and recreational resource and are generally either intermittent or have a flow at the once in ten year, seven day low flow (7Q10) of less than one cubic foot per second. Class 7 waters are protected so as to allow secondary body contact use, preserve the ground water for use as a potable water supply and to protect aesthetic qualities of the water. Discharges to Class 7 waters are regulated so that downstream waters are protected for their designated uses.

Stream assessment surveys are conducted on waters proposed for Class 7 reclassification and the information obtained during this assessment process is used to determine the extent to which these waters demonstrate the Class 7 criteria conditions which are set forth below:

a. The existing fishery and potential fishery are severely limited by natural conditions as exhibited by poor water quality characteristics, lack of habitat or lack of water;

b. The quality of the resource has been significantly altered by human activity and the effect is essentially irreversible; and

c. There are limited recreational opportunities (such as fishing, swimming, wading, or boating) in and on the water resource.

Conditions "a" and "c" or "b" and "c" must be established by the MPCA stream assessment procedure before a water can be classified as a Class 7 Limited Resource Value water. (Refer to Minn. Rules pt. 7050.0200, subp. 7)

Since the last revision of Minn. Rules ch. 7050, the Agency assessed nine watercourses for potential Class 7 reclassification. These nine watercourses, and the six watercourses proposed for reclassification are shown in the table below.

Existing or Potential Discharger	Assessed Watercourse	Present Use Classification	MPCA Recommended Use Classification
Rogers	Unnamed Ditch	Class 2B	Class 7
	Unnamed Creek	Class 2B	Class 7
Gaylord/M.G.Waldbaum	Lateral Ditch C	Class 2B	Class 7
	County Ditch # 55	Class 2B	Class 7
McGregor	County Ditch # 42	Class 2B	Class 7
New Auburn	Unnamed Ditch	Class 2B	Class 7
Wyoming	Unnamed Creek	Class 2B	No Change(Class 2B)
Boise Cascade (Int'l Falls)	Moon Light Rock Creek	Class 2B	No Change(Class 2B)
Fairmont	Center Creek	Class 2B	No Change(Class 2B)

Based on information gathered during the field assessments, comments provided by local residents living near the assessed watercourses, and comments from the MDNR Area Fisheries staff, six of the nine assessed waters are being proposed for Class 7 reclassification. Moonlight Rock Creek at International Falls, Center Creek at Fairmont, and an unnamed creek near Wyoming, Minnesota are not being proposed for reclassification as Class 7 waters based on information that indicates existing or potential fisheries and recreational uses of these waters.

The water assessment surveys performed on the waters proposed for reclassification serve to document whether the Class 7 criteria have been met on the assessed waters. These criteria are not a separate test for a limited fishery or limited recreational opportunities but instead are the factors that lead to the conclusion that these uses are limited. The following summaries discuss the reasons in support the recommended classifications of the assessed watercourses. Survey information, photographs of the assessed waters and site maps are part of the assessment surveys. Exhibits C45 to C51.

a. Unnamed creek and unnamed ditch at Rogers

The city of Rogers presently has a continuous discharging wastewater treatment facility (WWTF) which discharges to a ditch that connects to an unnamed creek which flows through a wetland and then to the Crow River. The city had explored an alteration of this discharge route which included a low flow diversion structure and diversion ditch around the wetland. There were some concerns as to the impacts to the wetland resulting from such a diversion, so this proposed discharge option was not pursued.

Both the unnamed ditch and the unnamed creek are proposed for Class 7 reclassification because their existing fisheries and recreational uses are limited due to the lack of water within these watercourses. The stream assessment survey was conducted in August of 1990 during a relatively wet period of time. The rainfall record from Rogers indicate that the area had received 2.3 inches of rain two weeks prior to the assessment survey. Prior to that, monthly rainfall totals for June and July 1990 were 8.4 inches and 8.3 inches respectively. Despite this, the unnamed creek was dry at an observation point three quarters of a mile south of the Interstate 94 culvert undercrossing. (Reference the site map in Exhibit C45).

While the Agency is proposing to designate the unnamed ditch and the unnamed creek as Class 7 waters, the wetland, through which the unnamed creek flows, will retain its Class 2B fisheries and recreational use classification.

b. Lateral Ditch C of County Ditch Number 55 and County Ditch Number 55 at Gaylord

The City of Gaylord operates a stabilization pond WWTF with a controlled discharge to Lateral Ditch C of County Ditch No. 55. Until recently, a major egg processing industrial facility located in Gaylord, the M.G. Waldbaum Co., was a major discharge to the city's WWTF. Discharges from the industrial facility contributed to an overloading condition of the city's treatment pond facility which resulted in exceedances in permit effluent limitations and odor problems from the WWTF. To correct these problems, the city proposed the construction of a separate wastewater treatment facility to service the treatment needs of the city's proposed industrial park, with M.G. Waldbaum Co. being a major contributor to this new WWTF. In order to assign appropriate effluent limits for this proposed facility, the two proposed receiving waters were assessed for potential Class 7 reclassification.

Lateral Ditch C of County Ditch Number 55 and County Ditch Number 55, also known as North Branch Rush River, have both been extensively channelized. The channelization of these watercourses has: 1) created a uniform depth and bottom substrate; 2) decreased the length of the stream and the stream's sinuosity; and 3) lead to abnormally low stream discharge during low flow periods. These impacts can decrease the habitat diversity of the watercourse and reduce the stream's fisheries and recreational use potential. Due to the channelized nature of these two watercourses, the Agency is recommending a Class 7 use classification for Lateral Ditch C and County Ditch Number 55 to a point approximately eight river miles below the new WWTF discharge. Downstream of this point, the watercourse would retain its present Class 2B water use classification.

Effluent limitations assigned to the treatment facility servicing the Gaylord Industrial Park have presently been assigned in accordance with a variance that has been granted to the city and its co-permittee the M.G. Waldbaum Co. These limitations are based on maintenance of the Class 7 instream standards as well as being protective of the downstream

Class 2B use classification. Additional instream ambient monitoring requirements have been included in the discharge permit for this facility in order to assure maintenance of the downstream Class 2B water quality standards. Exhibit C46 is a copy of the stream assessment worksheet for these two waters and it includes as an attachment a copy of the September 13, 1991, Agency Board item dealing with the discharge permit and variance request.

c. County Ditch Number 42 at McGregor

The city of McGregor operates a stabilization pond WWTF which now discharges directly to County Ditch Number 42 on a controlled basis. Prior to the construction of this new pond treatment facility, the city discharged their treated wastewater to an unnamed ditch which is tributary to County Ditch Number 42. Both of these watercourses were assessed in 1978 and subsequently designated as Class 7 waters in 1980. The new pond treatment facility is located southwest of the old system, further upstream on County Ditch Number 42. This portion of County Ditch Number 42 was not previously considered for reclassification since at the time of the 1978 survey it was upstream of the old treatment facility.

Conditions along the upper reaches of County Ditch Number 42 are similar to the conditions which were observed during the 1978 stream assessment survey in sections of the ditch that have been classified as Class 7 waters. The county ditch has been extensively channelized and the fisheries habitat within this ditch segment appears to be limited. Huntting was identified as a potential use along this watercourse. Due to the degree of channelization, the upper reach of County Ditch Number 42 is also recommended for Class 7 reclassification. Reference Exhibit C47.

d. Unnamed Ditch at New Auburn

The city of New Auburn operates a stabilization pond treatment facility followed by land application of the treated wastewater. Due to excessive inflow and infiltration, the city's pond system is hydraulically overloaded. This coupled with the fact that the land application site is not operating according to design has forced the city to explore different treatment and discharge options.

One option calls for an expansion of the treatment pond system with a controlled discharge to a county tile which outlets to an unnamed ditch that flows into High Island Lake. This ditch is roughly one half mile long and is located on the eastern side of the town. The flows in this ditch consist of water from the county tile system as well as storm water runoff from town and the surrounding area.

The unnamed ditch is 100 percent channelized. According to the city clerk, maintenance clean-out of the ditch occurred within the last couple of years. Due to the low topography of the area and the close proximity of the ditch to the lake, the depth of water in the ditch would appear to fluctuate with the level of the lake. High Island Lake experiences periodic fish winterkills. Based on this information and the channelized nature of the ditch, the Agency is proposing to classify the unnamed ditch as Class 7. Reference Exhibit C48.

e. Unnamed Creek near Wyoming

The city of Wyoming presently has a wastewater stabilization pond facility followed by land application of the treated wastewater. In conjunction with a planned expansion of the WWTF, the city is considering piping the treated wastewater 6.7 miles to an unnamed creek that is tributary to the Sunrise River. The treatment facility presently servicing Chisago City/Lindstrom discharges to this unnamed creek and the upper segment of the unnamed creek from the outlet from Wallmark Lake to a point approximately one (1) mile above its confluence with the Sunrise River is classified as a Class 7 water. (See the site map contained in Exhibit C49.) This reclassification occurred in 1980 based on an assessment survey conducted in 1978. Information from this survey indicated that the remaining one mile of creek should retain its Class 2B fisheries and recreational use classification.

The unnamed creek was assessed again in 1984, and at that time, Agency field staff recommended that the lower reach of the unnamed creek should be classified as a Class 7 water due to low dissolved oxygen concentrations, minimal flows, and the presence of a plant community more typical of a wetland than a free flowing stream. The issue of reclassifying this lower segment of the unnamed creek was not considered during the 1987 or 1990 revisions to chapter 7050.

In response to a request to reevaluate the use classification of the lower reaches of the unnamed creek, Agency staff assessed the unnamed creek in September 1992. At the time of this survey, the creek bed upstream of the Chisago City/Lindstrom WWTF was dry. At survey stations below this WWTF, which discharges to the unnamed creek approximately 2.7 miles upstream from its confluence with the Sunrise River, there was water present in the creek but the flow velocities were not perceptible. This was also the case at the point on the unnamed creek where the city of Wyoming is proposing to discharge treated wastewater from their proposed upgraded facility. These reductions in creek flow velocities appear in part to be due to beaver activity backing-up the creek, thereby creating more of a wetland condition along the creek. Between the area of the proposed point of discharge and the mouth of the unnamed creek, there is a shift to more of a riverine condition.

If the city of Wyoming obtains a discharge permit to pipe the wastewater effluent to the unnamed creek, a recommended condition of the discharge permit will be to insure that the unnamed creek be maintained as a free flowing watercourse from the point of discharge to the Sunrise River. At a minimum this would mean that periodic inspections of the area and removal of any beaver dams which may impede the flow of the unnamed creek. Under these circumstances, the lower reach of the unnamed creek is expected to revert back to a more riverine condition, similar to the conditions observed during the 1978 assessment survey. This fact plus local fisheries use of the unnamed creek at the road the culvert crossing closest to the mouth of the creek supports maintenance of the present Class 2B fisheries and recreational use classification of this lower reach of the creek. Exhibit C49 is the stream assessment worksheet for this creek.

f. Moon Light Rock Creek at Boise Cascade Industrial Landfill at International Falls.

Moon Light Rock Creek was originally assessed in 1983 for the purpose of potential reclassification as a Class 7 Limited Resource Value water. At that time, Agency staff concluded that it should not be reclassified as a Class 7 water and it was not proposed for reclassification during the 1984 revisions of Chapter 7050. Boise Cascade requested reconsideration of the designated use classification and this prompted a reassessment of the creek in October 1992.

The natural stream bed of the creek did, historically, flow through the area where the landfill is now situated. To divert the flow around the landfill, the creek flows were directed to a channelized watercourse adjacent to a set of railroad tracks on the south side of the landfill. The creek flow runs westerly along this channelized segment for approximately one-half mile before it is directed to the north to reconnect with the natural creek bed.

While there has been some physical changes that have taken place along this channelized reach since the 1983 survey, such as bank stabilization and the presence of more overhanging shrub and grass vegetation, fisheries habitat within this reach is still limited as a result of this channelization. Agency staff, however, do not believe it is reasonable to reclassify Moon Light Rock Creek as a Class 7 water when one considers that upstream of the channelized segment that the creek retains its natural character and that just downstream of the landfill site, the creek flows through a residential area where it does afford a fisheries and recreational use by local residents.

Based on the survey information obtained in 1983 and the observations and information obtained during the 1992 reassessment of the creek, no change in the assigned use classification of Moon Light Rock Creek is being proposed. Exhibit C50 contains the stream assessments from both the 1983 and 1992 surveys.

g. Center Creek at Fairmont

Center Creek originates at the outlet of Lake George, which is one in a series of a chain of lakes located south of the city of Fairmont. Like many other river systems in the southern and southwestern part of the state, stream flows along Center Creek can get very low and at times may dry-up completely or essentially freeze solid in the winter. Both these conditions have been documented on Center Creek.

The city of Fairmont operates a continuously discharging WWTF which discharges to Center Creek at a point approximately 28 river miles above the creek's confluence with the Blue Earth River. Average annual wet weather design flow for this WWTF is 3.9 million gallons per day (MGD) or approximately 6.0 cubic feet per second (cfs). The average annual design flow for this facility is 2.86 MGD or approximately 4.4 cfs.

According to Minn. Rules pt. 7050.0210, subp. 7, "Discharges of sewage, industrial waste, or other wastes shall be controlled so that the water quality standards will be maintained at all stream flows which are equal to or exceeded by 90 percent of the seven consecutive daily average flows of record (the lowest weekly flow with a once in ten-year recurrence interval) for the critical month(s)." This flow statistic is commonly referred to as the 7Q10 flow. The 7Q10 flow upstream of the Fairmont WWTF discharge has been estimated to be 0.0 cfs. Since there is no upstream dilution in Center Creek under 7Q10 conditions, the quality of the wastewater effluent being discharged from the Fairmont WWTF must meet the water quality standards applicable to the creek. Center Creek is classified as a Class 2B fisheries and recreational use water.

In March 1992, the city submitted a formal reclassification request to reclassify Center Creek as a Class 7 Limited Resource Value water from the outlet of Lake George to the creek's confluence with the Blue Earth River. The city contends that fisheries and recreational uses of Center Creek are limited due to lack of water, lack of habitat, and lack of public access to the creek. Exhibit C52. The Agency responded to the request by stating that based on available information, it was the staff's opinion that Center Creek was not a Class 7 water and that the Agency would be conducting a stream assessment survey of Center Creek to justify this position. Exhibit C53.

This stream assessment survey was conducted on September 21-22, 1992. Agency staff, with assistance from the Minnesota Department of Natural Resources (MDNR), assessed three stations along the creek at points above and below the WWTF discharge at Fairmont and at a site approximately 21 river miles below the WWTF outfall. The stream flows in the creek at the time of the survey ranged from 32 cfs above the treatment facility to 51 cfs at the most downstream station. Exhibit C51 contains the 1992 stream assessment survey and the fish electroshocking results, results from the August 1986 MDNR survey and a copy of a September 22, 1992 office memorandum from the MDNR Windom Area Fisheries Office.

To summarize this information, Agency staff believe that the survey data support the continued classification of this creek as a Class 2B fisheries and recreational use water. Game fish, as well as rough fish and minnow species, were electroshocked at stations throughout the various survey reaches of the creek. There is a minimal amount of channelization that has occurred along this creek and there is a diversity in the physical characteristics of the stream channel and bottom substrate composition which provide suitable fisheries habitat.

Habitat availability is most limited upstream of the WWTF discharge during periods of low stream flow. Downstream of the treatment facility, low flow impacts are less pronounced since the wastewater discharge provides a sustaining flow in the creek. One treatment option that the city is exploring calls for the removal of all or part of the wastewater effluent from Center Creek during low flow conditions. This proposed option indicates that the treated wastewater would be piped to another watercourse in the area with an existing Class 7 classification

during periods when there is insufficient upstream dilution in Center Creek. This option is being considered by the city in lieu of upgrading their nitrification capabilities at the WWTF. If this wastewater diversion option is instituted, downstream pool areas in Center Creek that presently serve as fish refuges during periods of low flow would decrease in numbers and size and may even be lost during extended periods of drought. This treatment option is not favored by the Agency because of the potential downstream physical impacts.

3. The addition of entries for Stream Trout Lakes and trout streams designated by the Commissioner of the Minnesota Department of Natural Resources.

   Under the part 7050.0420, the Agency incorporates by reference the most current MDNR Commissioner's Orders with respect to stream trout lakes and trout streams which are in effect at the time the proposed amendments to Minn. Rules ch. 7050 go to rulemaking hearings. While this does have the net affect of shortening the list of waters specifically listed in part 7050.0470, it has complicated the process by which one determines the applicable use classifications for a given water.

   The process as it currently stands requires a person to first determine what basin the waterbody is located in, check the listing of waters in the use classification section of part 7050.0470, and if it is not listed there, then one has to refer to the Commissioner's Orders to see it the water is list as a designated trout water. If it is not listed in either part 7050.0470 or the Commissioner's Orders, then the water is considered an unlisted water, and is classified under part 7050.0430. This generally is not a problem, so long as one has a copy of the appropriate Commissioner's Orders. If a copy is not available, at a minimum this can lead to time delays in determining the appropriate use classification.

   To make the process of determining the use classification less complicated, the Agency is proposing to specifically list the trout streams and lakes identified by the MDNR Commissioner in Minn. Rules pt. 7050.0470. There will still be a need to carefully reference the legal descriptions for the designated trout streams. Not only are the named stream segments of a trout stream classified by the Agency as trout waters, but the tributaries to these identified trout stream segments within the sections specified in the legal descriptions are classified as trout waters as well. This designation is consistent with MDNR's classification of these tributaries as trout streams in Minn. Rules pt. 6262.0400. To address this fact, rule language has been added to part 7050.0420 to classify these tributary segments to the identified trout streams as Class 2A waters as well. Entries for parts of these waters that are not designated as trout waters will also have to be altered to include the phrase "excluding trout waters."

4. Removal of lake trout lake ORVW status at request of MDNR.

   In 1987 the Agency proposed to designate lake trout lakes as ORVWs under the restricted discharges category of part 7050.0180. Included in the list of candidate lakes at that time were 48 lakes that were either

existing lake trout lakes or they were thought to have the potential for lake trout management. There were a considerable number of comments received during the public hearings on this proposal. As a result, 35 existing and potential lake trout lakes were designated as ORVWs in March 1988.

Additional information obtained from lake surveys conducted since 1988 and recommended alternate fisheries management goals for some of these lakes has prompted the MDNR to request that the following lakes be removed from the ORVW designation since they do not support self-sustaining lake trout populations (reference Exhibit C54).

Cook County	
Devilfish Lake	(16-29)
Esther Lake	(16-23)
Hungry Jack Lake	(16-227)
Jim (Jerry) Lake	(16-135)
Musquash Lake	(16-104)
Itasca County	
Trout Lake	(31-216)

Esther and Musquash Lakes are presently being managed as stream trout lakes. Survey information for Devilfish and Jim Lakes indicate marginal lake trout conditions and Devilfish Lake has a walleye management classification assigned to it. Trout Lake, near Coleraine, has been judged to no longer be suitable for trout management and is being managed as a walleye fishery. The 1992 Lake Management Plan for Hungry Jack Lake indicated that while temperature-oxygen conditions are suitable for lake trout in Hungry Jack Lake, the management goals for increased walleye and northern pike populations would preclude an attempt to manage for lake trout. It should be noted as a clarification, that while Big Watab Lake and Lower Hay Lake were proposed as ORVWs in 1987, these two lakes were not assigned the ORVW designation in 1988.

5. Revise the names of the ORVW calcareous fens to correspond to the names established by MDNR.

   See the SONAR discussion under part 7050.0180, subpart 6b.

6. Change the class designation for listed fens to Class 2D.

   See the SONAR discussion under part 7050.0222, subpart 6.

7. Minor Organizational Changes to Minn. Rules pt. 7050.0470.

   A new item is proposed to be added throughout this part. Waters in a major drainage basin are currently categorized under streams, item A; lakes, item B; or fens, item C, within this part. The Agency proposes to add a fourth category, as item D, called scientific and natural areas (SNAs). This category is needed to make scientific and natural areas easier to identify under part 7050.0470.

Currently SNAs appear at the end of existing categories and are overlooked because they are not alphabetized with the other entries. Scientific and natural areas are stringently protected as outstanding resource value waters under part 7050.0180. The proposed category is reasonable because it does not change how the waters are addressed in the rules but makes it easier for readers to identify them and their restricted use status.

Also, subitem numbers identified in the proposed rules under part 7050.0470 may change to incorporate the trout waters identified in MDNR Commissioner's Orders No. 2450 and to place other waters proposed to be listed in proper alphabetical order.

Changes are being made under specific items to address issues other than those listed above as follows:

8. Subpart 1. Lake Superior Basin.

   a. Item A. Streams.

      Subitem (15).

   The Agency proposes to delete subitem (15) "Unnamed Ditch, Eveleth, (T.57, R.17, S.6). This deletion is reasonable because it is a duplicate entry. This ditch is also listed as "Elbow Creek, Eveleth" under subitem (7). The following subitems will be renumbered to correspond with this change.

9. Subpart 2. Lake of the Woods Basin.

   a. Item B. Lakes.

      Subitem (115) and (129).

   The Agency proposes to change the entry for Lake of the Woods. The information proposed under subitem (129) for the new entry is currently listed under subitem (115) as "Woods, lake of the" with the exception of an added geographic range coordinate of "36." The additional range coordinate is needed to more completely identify the water body. It is reasonable to provide the best identification possible in the rule. Changing the format of the lake name is reasonable because it utilizes the most common form of the name, will make it easier for readers to find the water resource under this part and does not change the status of the lake under the rules. The proposed "Lake of the Woods" entry is proposed under subitem (129), but will be placed in proper alphabetical order and given a corresponding subitem number after the rule has been adopted.

10. Subpart 3. Red River of the North Basin.

   a. Item A. Streams.

      Subitem (34).

The Agency proposes to change "Tamarack" to "Tamarac." This change is reasonable because it corrects the spelling of river name.

Subitem (15).

The Agency proposes to delete the phrase "(excluding trout waters)" for the Hoover Creek listing. This phrase is no longer needed under this entry because portions of Hoover Creek are no longer designated trout waters. This change is part of the Agency's effort to list all the trout waters designated by the MDNR under Commissioner's Order No. 2450.

11. Subpart 4. Upper Mississippi River Basin.

a. Item A. Streams.

Subitem (97).

The Agency proposes to change the word "Brook" to "Branch." This change is reasonable because it corrects the name of the water body, which is Stanchfield Branch.

12. Subpart 5. Minnesota River Basin.

a. Item A. Streams.

Subitem (74).

The Agency proposes to add a new subitem (74) to add another entry for Judicial Ditch Number 10 that cross references Wood Lake Creek currently listed under subitem (158). Wood Lake Creek has been discovered to be the same water resource as a portion of Judicial Ditch Number 10. It is reasonable to add a cross reference to clarify the identification of a water body and to ensure readers looking for Judicial Ditch Number 10 find all of the information that concerns that resource. Subitems (74) through (161) are proposed to be renumbered to correspond with this change.

Subitem 153.

The Agency proposes to delete the name "Dawson Mills Soy Isolate" since there is no longer a discharge from this company to the unnamed stream which is a tributary to Lac qui Parle River.

Subitem 158.

The Agency proposes to add reference to Judicial Ditch Number 10 as part of the existing entry for Wood Lake Creek. This is reasonable because both Judicial Ditch Number 10 and Wood Lake Creek identify the same water body. A cross reference to Wood Lake Creek has also been proposed under the entry for Judicial Ditch Number 10 (see subitem 74).

13. Subpart 6. Saint Croix River Basin.

a. Item A. Streams.

Subitem 7

The Agency proposes to delete the entry for King Creek. The entire segment of King Creek in Township 47, Range 19, is identified as trout waters in the MDNR Commissioner Order No. 2540. The Agency is proposing to add entries under part 7050.0470 for all the waters listed in the Commissioner Order. Since the entire creek is trout water, it is reasonable to delete the existing entry for King Creek to avoid having duplicate entries.

b. Item C. Fens.

The Agency is proposing to add this item as a place holder. Throughout this part, item A lists streams; item B lists lakes; item C lists fens and the Agency is proposing that item D be created to list scientific and natural areas. Even though there are no fens currently listed under this subpart, this category may be used in the future. It is reasonable to add item C because it establishes a consistent format under this part and makes the organization easier to follow for the readers.

14. Subpart 7. Lower Mississippi River Basin.

a. Item A. Streams.

Subitem (7).

The Agency proposes to add "(Cold Spring Brook)" to the entry for Cold Creek because this creek is commonly referred to by this name too. The Agency also proposes to add "(excluding trout waters)" into this entry. See subitem (10) under this item for a discussion of the need and reasonableness for this addition.

Subitem (10).

The Agency proposes to add "(excluding trout waters)" after "Dakota Creek." The State of Minnesota Department of Natural Resources Commissioner's Order Number 2450 identifies Dakota Creek and its tributaries within township 105, range 4, section 7 and township 105, range 5, sections 1, 2, 3, 11, and 12, as "trout waters" in Winona County. Since this subitem currently does not reference this designation, a reader may not know to look for trout water restrictions. Trout waters are designated as Class 1B, 2A, 3B, 3C, 4A, 4B, 5, and 6 under part 7050.0420. The proposed language highlights an existing designation for the creek and alerts readers to the fact that portions of the creek have additional protection under the rules.

Subitem (13).

The Agency proposes to delete the existing entry for Gilmore Creek. See subpart 6, item A, subitem (7), for the discussion of need and reasonableness for this change.

Subitems (16), (19), (24), and (33).

The Agency proposes to add "(excluding trout waters)" in the existing entries for Indian Spring Creek, Long Creek, Pine Creek, and Snake Creek. See subitem (35) for the discussion of need and reasonableness for these changes.

Subitem (35).

The Agency proposes to add "(excluding trout waters)" after "Sullivan Creek." This addition is needed to alter readers to the fact that portions of the creek have additional classifications and protection under the rules. The Minnesota Department of Natural Resources Commissioner's Order Number 2450 identifies Sullivan Creek and its tributaries within township 103, range 5, sections 12, 13, 14, 23, 24, 25, and 26, as trout waters in Houston County. Without this exclusion, a reader may not know to look for trout water restrictions. Trout waters are designated as having user classifications 1B, 2A, 3B, 3C, 4A, 4B, 5, and 6 under part 7050.0420. The proposed language is reasonable because it highlights an existing designation and clarifies that portions of the creek are not classified as 2C as indicated in this subitem.

Subitem (38).

The Agency proposes to delete the township designation of "104" under the existing entry for Trout Run Creek (Trout Creek). This is reasonable because a new entry is proposed for Trout Run Creek (Trout Creek) (T.104, R. 10) because this portion of the creek is designated trout water. This is part of the Agency's effort to incorporate all trout waters listed in MDNR Commissioner's Order No. 2540

V. ECONOMIC CONSIDERATIONS

A. Economic Impact of the Proposed Amendments

1. In the exercise of its powers, the Agency is obligated by Minn. Stat. sec. 116.07, subd. 6 (1992) to give due consideration to economic factors. The statute provides:

> In exercising all its powers the pollution control agency shall give due consideration to the establishment, maintenance, operation and expansion of business, commerce, trade, industry, traffic, and other economic factors and other material matters affecting the feasibility and practicability of any proposed action, including, but not

> limited to, the burden on a municipality of any tax which may result therefrom, and shall take or provide for such action as may be reasonable, feasible and practical under the circumstances.

Minn. Stat. sec. 115.43, subd. 1 (1992) imposes a similar consideration of economic factors.

In proposing these amendments, the Agency has considered their impact on industry, municipalities, small business, and other regulated parties. But the Agency is not able to determine an overall cost, if any, that may be incurred because establishing numerical and narrative standards is only half of the regulatory process that ultimately determines the cost of meeting the standards. The other half of the regulatory process is the application of the standards to control pollution through the establishment of effluent limitations. While it is impossible to determine the exact costs, it is the opinion of the Agency that these amendments will not substantially change the overall economic burden to the regulated community. Some additional costs may be incurred as a result of the amendments, which will be described in detail in the following paragraphs. In most situations, treatment costs are unlikely to change. The remainder of this section will discuss in more detail the economic impacts that were considered.

2. Determination of Costs

These amendments deal with the establishment of numerical and narrative standards to provide protection of designated beneficial uses. Setting the standard is the first step of a two step regulatory process that ultimately determines treatment needs and costs. The second step is the determination of the effluent limitations or measures to minimize degradation of the states waters through water quality permits or certifications or, in the case of superfund remedial actions, cleanup requirements that will be required to meet the water quality standards. Water quality standards, rather than minimum technology-based treatment requirements, usually determine the need for treatment when receiving waters provide little or no dilution for discharges.

In practice, the "second step" of the process is always site-specific or discharge-specific, and it is carried out as part of the permit or certification process or cleanup evaluation. For this reason costs are best determined by looking at specific permits or remedial action sites and comparing the current limitations or cleanup requirements to what they would be based on the proposed standards or classification changes.

In summary, an overall cost can not be determined because it is the actual application of the standards on a case by case basis that determines the costs, and the number of situations where these amendments would alter the treatment or cleanup needs cannot be determined at this time. However, the economic effects are likely to be minimal even where the proposed amendments would have an impact. The following section addresses the major changes to the rule, and discusses the possible economic impact of those changes.

3. Economic Impact of Specific Amendments

a. Revising water quality standards to address wetlands specifically. The revisions to the 7050 Water Quality Standards regarding wetlands are intended to be clarifications of the Agency's existing standards.

1) Definition of wetlands: The proposed definition is consistent with the federal definition (40 CFR 230.41(a)(1)) and the Wetland Conservation Act definition. Exhibit 53. No additional costs will be incurred as a result of adding this definition to the standards.

2) Use classification changes: The proposed revisions to Parts 7050.0222 through Part 7050.0225 modify use classifications 2, 3, 4, and 5 to more appropriately identify specific designated uses for wetlands. Since the designated uses for all waters of the state are protected implicitly by part 7050.0185, subpart 1., explicitly listing wetland uses provides additional guidance but does not exceed the protection to uses already stated in part 7050.0185.

The parameters that are proposed as narrative standards are pH, dissolved oxygen, temperature, chlorides, hardness, settleable solids, and hydrogen sulfide. For point source dischargers, the pH and dissolved oxygen standards are most important.

Wetlands naturally have large dissolved oxygen variations on a daily basis because of their organic sediments. If a point source discharge is planned for a wetland determined to have naturally low oxygen concentrations, the effluent limitation would be set at a level such that the natural background level would not be lowered further, and at the level needed to maintain the dissolved oxygen concentration of the water resources downstream from the wetland that may require a minimum of 5.0 mg/l (Part 7050.0210 Subp. 13.). This assessment will be performed on a case-by-case basis as it has been in the past.

The same case-by-case analysis would be performed when considering pH. Just as an acidic discharge must be treated sufficiently so that the designated uses of the receiving water resource are not impacted, a neutral pH discharge to a low or high pH wetland may require treatment if a use is threatened.

There are currently approximately 600 municipal NPDES permits. Of these dischargers, it is estimated that about 40 discharge directly to a wetland. None of these dischargers incurred greater costs to meet the dissolved oxygen or pH standards. Although it is possible that a future discharger may incur added costs, most likely to treat a circumneutral pH being discharged to a bog, this situation would be very rare, based on the Agency's past 20 years history of issuing NPDES permits. It is possible to estimate what this hypothetical cost would be though. For example if a community of 500 people was required to modify its effluent pH concentration from 7 to 5, the added capital cost would be approximately $5000 and the added annual operation and maintenance cost would range from $4000 to $40,000, depending on the buffering capacity of the wastewater.

It is also possible that a discharger could permanently inundate a natural wetland to enhance treatment, especially for phosphorus. Depending on the wetland, the result could be an impact to wetland designated uses which would require wetland replacement. Wetland replacement costs vary widely, from a few hundred dollars to restore a degraded wetland by sealing off a tile line (plus land acquisition costs, if necessary) to thousands of dollars per acre to create a wetland at a non-wetland site. Since the Agency prefers restoration to creation, wetland replacement costs by point source dischargers are anticipated to be very low, and to occur very rarely.

The procedures noted above are required by Parts 7050.0185, 7050.0200, and 7050.0210 currently. For example, the Agency requires an effluent limit of 1.0 mg/l total phosphorus if the discharge is directly to a lake (part 7050.0211). The existing language, on a case-by-case basis, allows a stricter limit if it is determined that the 1.0 mg/l TP would still cause significant impacts to the lake's designated uses. Review of dissolved oxygen and pH impacts, and the result that additional treatment may be needed, is consistent with the processes followed for phosphorus under both the current rule and the proposed revisions in the existing rule and the proposed revisions.

Excess sediments in concentrations that threaten wetland designated uses are mainly the result of excess bank erosion or human disturbances upstream. Mitigation would be through the voluntary adoption of Best Management Practices in the affected watershed. Voluntary BMPs are being implemented through education, cost sharing, and other programs to reduce a broad range of pollutants.

3) Physical alterations of wetlands and the mitigative process: The use of the mitigative sequencing as a result of a proposed physical alteration to a wetland is limited to the following processes the Agency already has in place: Section 401 water quality certifications for Section 404 permits, NPDES permits, and state disposal system permits. The proposed mitigative sequencing procedures merely formalizes the environmental review process that has been used by the Agency since the 1982 promulgation of 40 CFR 230.

Incorporating mitigative sequencing into the 7050 water quality standards is important however. The Agency cannot presently positively certify that a fill activity covered by a CWA Section 404 permit will not cause violations of the water quality standards, because, without the mitigative process, non-degradation would be violated. Instead the Agency must require the mitigative process covered by 40 CFR 230.10(a) as a portion of the waiver to certification. Exhibits 27; 28. This revision makes it possible to provide a positive certification since non-degradation requirements will be met. Since the requirements are unchanged, this revision will not cause an increase in cost. For information purposes, during 1991 and 1992 the Agency reviewed 121 projects requiring Section 401 water quality certifications. The general breakdown of projects by type is as follows: transportation - 56; development - 17; agriculture - 4; and others - 44. Of the four agricultural permits, only one required replacement wetlands.

There is interest in comparing the 7050 mitigative sequencing with the Wetland Conservation Act (WCA) mitigative sequencing. Exhibits 10; 53. It is a very high priority for the Agency and the Board of Water and Soil Resources (BWSR) to have consistent guidelines to the extent possible.

Comparisons of the two mitigative processes reveal many similarities: both use the same sequencing of avoid, minimize, and replace and both have the same general reporting documentation. The main divergence is in the area of wetland replacement determinations. The WCA rule uses site-specific criteria while the Agency is required by the federal Clean Water Act and its associated rules to protect designated uses and to prevent cumulative impacts to the extent possible (40 CFR 230; 40 CFR 1508.7). As examples, the Agency might require the wetland mitigation replacement plan to be modified in the following cases:

(1) If, in the Agency's determination, there are cumulative impacts that will result in a significant adverse impact to a downstream water resource or to the wetland complex itself. The WCA rules only address site-specific impacts.

(2) If, in the Agency's determination, a wetland that removes sediment before it reaches a very sensitive downstream waterbody is being replaced with a wetland that would not protect the downstream resource such that downstream designated uses were threatened. The WCA rules replaces on an acreage basis without specifically focusing on designated uses.

The Agency has been using the mitigative process since 1982 without requiring a project modification because of cumulative impacts, so that situation would apparently occur only on a very rare basis. There is only a very short history regarding WCA mitigative requirements, but since BWSR and the Agency are coordinating very closely, it is anticipated that additional requirements to maintain unusual designated uses would occur very rarely also.

b. Amending the biological narrative standards. This part of the rule identifies the standard and procedure to identify whether a waterbody is meeting its designated use for aquatic life.

The incorporation of narrative biological criteria in this rule means that the biological condition of surface waterbodies will be determined by comparison to a reference condition. The assessments that will be conducted to establish the reference condition and biological surveys that are undertaken to measure biological condition of waters will be accomplished by the Agency staff or in cooperation with other governmental entities. These biological surveys will not result in any additional costs to the regulated community.

Biological surveys are part of an integrated diagnostic assessment that can be used to gain information about the condition of surface waters. In the process of conducting such assessments, waterbodies or waterbody segments may be found that are in nonattainment with their designated

aquatic life uses because their biological condition deviates significantly from the reference condition. When these situations arise, other information from the assessment including habitat conditions, surface water chemistry information, and proximity to pollution sources can assist in diagnosing the cause and source of the impairment.

Where the cause of the impairment is perceived to be due to a permitted discharge, then the Agency would need to determine if the permittee was in compliance with their permit. If the permittee is in compliance with their permit effluent limitations, they would not be considered out of compliance due to the biological impairment or measured exceedances of any chemical criteria in the receiving stream. The Agency may, however, request the permittee to conduct additional monitoring to further evaluate the nature of the discharger's effluent and its impact on the receiving water.

The Agency at the present, requests some dischargers to monitor up and downstream of their discharge points, conduct bioassays, and conduct toxicity reduction evaluations when questions arise regarding the toxicity of an effluent or the impact of the effluent on the receiving waterbody. The requirements for additional monitoring would be done on a case-by-case basis. The types of monitoring requested could vary considerably and would be dependent on what stream water chemistry information was already available, and what was already known about the nature of the effluent.

New monitoring requests or requirements will not arise solely from information from biological surveys but information from the total diagnosis of the situation. In this sense, it is very unlikely that the result of a biosurvey by itself would result in any additional monitoring costs. Likewise it is most likely that information from a biological survey would be the starting point of a more detailed evaluation to determine the potential need to modify a permit and establish different effluent limitations. The actual setting of the effluent limits and changes in treatment that would occur, however, are ultimately based on effluent toxicity evaluations and the numerical chemical criteria that is established. They are not a direct result of the biological survey.

When the cause of an impairment is attributable to a nonpoint source pollution that is not affected by a permit, the Agency could choose to mitigate through the implementation of projects involving voluntary measures. These projects involve promoting Best Management Practices through education, cost sharing and other voluntary mechanisms. In this case, costs would be voluntarily incurred.

c. Conditional exemptions from secondary treatment standards for TSS and phosphorus for some dredge disposal facility discharges. This provision relaxes the TSS and P standards for temporary or intermittent discharges from dredge disposal facilities when BMPs and BPT are employed. There will be no additional cost to permittees as a result of this change.

d. Adding eight new aquatic life standards for the following toxics: Alachlor, Antimony, Atrazine, Cobalt, Iron, Manganese, Naphthalene, and Thallium.

A part of the proposed amendments deals with the promulgation of eight new water quality standards for toxic pollutants. Water quality standards may be used as the basis for setting National Pollutant Disposal System Elimination System (NPDES) or State Disposal System (SDS) permit effluent limitations or, in the case of superfund and hazardous waste sites impacting surface waters, cleanup requirements or goals. In this regulatory context standards can have a direct economic impact on dischargers if the water quality standards, rather than minimum technology-based treatment requirements, determine the need for treatment. Standards often determine effluent limitations when receiving streams provide little or no dilution for the discharge.

In practice, the setting of effluent limitations and cleanup goals is a site-specific process as part of the permit or remedial evaluation process. Therefore, the examination of potential costs is best done using actual permits or sites as examples.

All eight of the proposed standards started as site-specific criteria, developed under part 7050.0218, specifically to set a permit limitation or to assess the need for remedial action for a particular facility or site. Most site-specific criteria have been used subsequently at other locations. In fact, the number of times the criteria have been used at new locations is one of the parameters used to select which criteria should be promulgated as standards. When the Agency requests the use of a criterion at a new location, the criterion is reviewed for applicability at the new site. The review looks at such questions as local water quality characteristics that might mitigate or enhance toxicity, local endangered or very sensitive species, and other factors that could justify raising or lowering the original criterion. However, rarely does the site-specific review result in a change to the original criterion. Thus, the original criteria are likely to be applied in the future at new locations without change. Under this scenario there will be no additional costs to the regulated community caused by the promulgation of the new standards because the site-specific criteria that would be used at a new location will very likely be the same as the statewide standards once the latter are promulgated. The treatment or cleanup costs would be the same because the goal is the same. Examples include the Kluver sanitary landfill and the Dakhue landfill sites where the same criteria, originally developed for another site, were used to assess the need for remedial action.

The situation described above will be true in many instances and no additional costs will be incurred. However, permittees that have limitations based on treatment technology for any pollutants for which standards are being proposed, additional costs are a possibility, if the proposed standards would result in lower effluent limitations. To assess possible costs, example permits or remedial actions containing limitations or cleanup goals for the proposed eight new standards are discussed below.

1) Herbicides

The Huntting Elevator near Lansing was the site of bulk storage and transfer of agricultural pesticides. Over the years the soil and ground water at this site became contaminated with herbicides including alachlor and atrazine. The contaminated ground water was moving toward an unnamed tributary of the Cedar River. The alachlor and atrazine criteria were developed for this site, and this is the only location where these criteria have been applied. Huntting Elevator is the first site involving ground water contaminated with agricultural pesticides that the Agency has dealt with. A complete Superfund investigation was done, in part, due to the lack of knowledge of the fate of pesticides in ground water at the time of the investigation.

Possibly due to better storage and handling of the pesticides on site, the ground water herbicide concentration levels have dropped to acceptable concentrations. As such, no further remediation or treatment is required and only monitoring is being done at the Huntting Elevator site.

The Minnesota Department of Agriculture (MDA) normally handles agricultural cleanup activities in Minnesota and they have dealt with several chemical spill sites. To date, the MDA has not had to pump out contaminated ground water for treatment and discharge into a surface water. Land application of contaminated soil and water, a treatment technology which enhances the natural degradation of the chemicals, has been the method used by MDA to remediate these sites.

Due to their wide spread use in agriculture, herbicides are a concern as a component of nonpoint source pollution (runoff) from agricultural lands. Atrazine has been found in Minnesota's surface waters in many locations (see page 65 of this document) but not in concentrations above the proposed standard of 3.4 (Class 2A and 2Bd) or 10 ug/l (Class 2B). If the concentrations of alachlor or atrazine were to exceed the proposed standards in a surface water due to nonpoint source runoff, mitigation would be through the voluntary adoption of Best Management Practices (BMPs) in the affected watershed. Voluntary BMPs are being implemented through education, cost sharing and other programs to reduce a broad range of pollutants in runoff including pesticides of all kinds. BMPs specifically to minimize atrazine in runoff have been developed by the MDA. Implementation of BMPs will be a cooperative effort between the MDA, the Agency, the Soil Conservation Service, and local land owners.

The Agency does not foresee any additional costs incurred by the promulgation of the alachlor and atrazine standards.

2) Metals

Effluent limitations for iron, manganese, cobalt are found in some NPDES permits, particularly those associated with the mining industry. Also, the criteria for these metals have been used in to evaluate several ground water contamination sites.

a) Iron

A technology-based effluent limitation of 1000 ug/l as a monthly average and 2000 ug/l as a daily maximum, for dissolved iron, are commonly put into NPDES permits for mine pit dewatering discharges. Three such permits will be examined as examples of the impact of the proposed standards on potential costs to these permittees.

The iron effluent limitations are specified as dissolved iron, whereas the proposed iron standards are stated as total iron. Total iron is all the iron dissolved or suspended in an unfiltered sample. Dissolved iron is the truly dissolved iron plus the suspended iron that will pass through a very fine filter. The Agency recognizes the inconsistency of having "total" standards and "dissolved" effluent limitations. Conceptually, a permittee could be in compliance with their permit limitation of 1000 ug/l dissolved iron and still exceed a background-based standard of 1000 ug/l total iron in the receiving stream (see discussion of the forms of iron in water on page 67 of this document). In this situation, if the permittee is in compliance with the permit effluent limitation, they would not be considered out of compliance due to a calculated or even measured exceedance of the standard in the receiving stream. The Agency would need to evaluate whether or not a permit modification is needed (see part 7050.0210, subpart 17). Allowance for the difference between total and dissolved would be part of the follow up analysis.

The Agency is not aware of any data that quantifies the ratio of total versus dissolved iron in effluents or natural waters. The Agency believes that the discrepancy between the water quality standard and effluent limitation is not an insurmountable problem, but do agree that total and dissolved analyses on the same sample are needed. The issue of whether to define metal standards as total, dissolved, or some other form, is very complex and needs a through review. This issue has recently become an important issue within the EPA, as well.

US Steel Corporation, Minntac (Permit No. MN 0052493)

The active Minntac taconite open pit mine near Mountain Iron has several permitted dewatering discharges. This example will focus on two outfalls, 030 and 060, both discharging to Kinney Creek. Kinney Creek is a designated trout stream (Section 11, T 58 N, R 19 W). The proposed iron chronic standard for Class 2A waters is 221 ug/l. As mentioned above, the iron limitation in the current permit is 1000 ug/l as monthly average.

Assuming Kinney Creek has a design low flow (7Q10) of zero, the discharger would normally be required to meet the chronic standard at the end of the pipe. If US Steel Corp. was given an effluent limitation of 221 ug/l, presumably additional treatment costs would be incurred. However, the Agency would not propose an effluent limitation of 221 ug/l because background concentrations of iron exceed this value. The Agency does not have iron data specifically for Kinney Creek, but it does have data for several watersheds in the iron range and north shore areas. These data are summarized in Table 10.

Table 10. Iron Concentrations in ug/l from Representative Watersheds

Station	mean	St.dev.	CV*	Max value	N	mean +2 St.dev.
East Swan R. near Hibbing	995	1014	1.02	4100	31	3023
St. Louis R. near Zim	831	564	0.68	3000	32	1959
Beaver R. near Beaver Bay	824	475	0.58	2600	35	1774
Miss. R. near Blackberry	276	134	0.49	580	32	544

*CV means coefficient of variation which is the standard deviation (St.dev.) divided by the mean. The larger the CV, the more variability in the data.

Limited data for other streams closer to Mountain Iron such as East Swan Creek southeast of Hibbing, Penobscott Creek near Hibbing, and West Two River near Iron Junction show iron values similar to those for the first three stations listed above. Iron concentrations appear to be lower in the Mississippi River watershed.

Part 7050.0170 allows the Agency to use the natural background as the standard when the natural concentrations exceed the standard. In applying the natural background as the standard, the Agency has accounted for natural variability in surface water concentrations, when there was adequate data to characterize the variability. The Agency uses a concentration near the high end of the range of values since high values occur naturally. This approach recognizes that occasional high values are a normal part of the natural system, whereas use of an average value, for example, sets up an unreasonable situation in which the standard would be exceeded about half the time. In the past the Agency has used the mean plus two standard deviations as a standard based on natural background. The mean plus two standard deviations approximates the 95 percentile value in the range of all values.

In a different context, the Agency has used a 95th percentile value of natural concentrations (e.g., roughly equal to the fifth highest value out of 100 values) to characterize background conditions. The 95th percentile is used to define natural background concentrations for assessing nondegradation to surface waters. Also, the use of a value which approximates a 95th percentile value as an effluent limitation is consistent with the common compliance strategy that a facility may be out of compliance about five percent of the time due to factors outside the control of operators.

Mean values plus two standard deviations for two rivers in the iron range area (the first two in Table 10.) are well above the current technology-based effluent limitation of 1000 ug/l.

While use of a 95 percentile value has precedence, it may not be appropriate in all cases. As stated above, the mean plus two standard deviations is comparable to the 95th percentile value; but this is true for data that are normally distributed. It appears that iron concentrations may not be normally distributed (mean values are consistently higher than median values). Exhibit T51. If the data are skewed toward the higher values, as appears to be the case for iron, using the mean plus two standard deviations in some situations may not be protective. However, the means plus one standard deviation (about equal to the 67th percentile) for the first three rivers in Table 10 are above 1000 ug/l as well.

In the situation of the Minntac discharge to Kinney Creek, while the Agency has no data for Kinney Creek, it is reasonable to assume that the iron concentrations in Kinney Creek will be similar to that of the surrounding watersheds. Effluent limitations based on the available background data, taking into account known variability, would not be lower than the current technology based limitations. Therefore, it is the conclusion of the Agency that there will be no additional cost to US Steel Corp. at Minntac as a result of the proposed iron standard. The Agency does not anticipate any cost savings as a result of the proposed standard either because the technology-based limitation will still be used.

Cyprus Northshore Mining Corporation (Permit No. MN 0055301)

Cyprus Mining Corp. (formally Reserve Mining) discharges from the large tailings basin at Milepost 7 to the Beaver River. The Beaver River is a tributary to Lake Superior, and, like Kinney Creek, is a designated trout stream. But unlike Kinney Creek, iron data are available for the Beaver River. Table 10. Also, the Beaver River may have a 7Q10 greater than zero, although in a situation where the background concentration potentially controls the quality of the discharge, knowing the 7Q10 is not critical.

The mean iron concentrations in the Beaver River plus one and two standard deviations are 1299 and 1774 ug/l, respectively. The discussion for Minntac regarding the use of the background levels as the standard (limitation) applies equally well to Cyprus Northshore, and no costs to Cyprus will result from the adoption of the iron standard.

The fact that the downstream lake is an Outstanding Resource Value Water may warrant being more protective in assessing the natural variability, but the outcome would be the same (i.e. no additional costs) because of the high natural levels of iron in the Beaver River.

LTV Steel/Erie Corporation. (Permit No. MN 0042579)

The LTV Steel Dunka pit near Babbitt discharges mine pit water to several non-trout waters (Class 2B). The most active of these discharges is to the Dunka River. These discharges have the technology-based limitation of 1000 ug/l as dissolved iron that was discussed above. No additional costs will be incurred by LTV because the proposed Class 2B standard of 1245 ug/l is less stringent than the technology-based limitation.

In addition to the mining permits, iron limitations are found in some permits for peat mining operations, coal fired steam electric generating plants (boiler blowdown or boiler cleaning water), and some contaminated ground water pump and treat operations. For example Michigan Peat (Permit # MN0055662) and Minnesota Sphagnum, Inc. (Permit # MN0057428) have monthly average total iron limitations of 300 ug/l or the natural background, whichever is lower. NSP Prairie Island (Permit # MN0004006) and Austin Utilities (Permit # MN0025810), for example, have daily maximum limitations of 1000 ug/l total iron for some types of discharges. The St. Louis Park (Reilly Tar Site) permit (# MN0045489) for the pumping, treatment and discharge of contaminated ground water to Minnehaha Creek has an iron limitation of 1000 ug/l as a quarterly average. All of the receiving waters in these examples are Class 2B waters and the proposed standard of 1245 ug/l will not increase costs for these dischargers.

b) Manganese

The St. Louis Park (Reilly Tar) permit mentioned above has a manganese limitation of 1000 ug/l as a quarterly mean. The proposed Class 2B standard is 491 ug/l. Since Minnehaha Creek provides no dilution at low flow (7Q10) conditions, reducing the manganese limitation to 491 or to background levels may be required. A review of the 1991 and 1992 discharge monitoring reports (DMR) for this facility indicates manganese effluent values in the range of 600 to 1300 ug/l. No monitoring data for manganese is available for Minnehaha Creek. Data from a nearby watershed, Elm Creek at Champlin, has a mean manganese concentration of 236 ug/l. Assuming a coefficient of variation of 0.8, the mean plus two standard deviations would be 614 ug/l. This is below the quarterly mean effluent limitation of 1000 ug/ in the current permit. Agency staff has reviewed the current St. Louis Park treatment system to determine if it can meet the proposed manganese standard, or if additional treatment may be needed.

The current treatment system is designed to remove iron and the organic contaminants in the ground water. The system was built in 1990 and consists of a potassium permanganate ($KMnO_4$) feed system to oxidize the manganese and iron, a static in-line mixer to mix the $KMnO_4$ with the ground water, a single sand filter to remove the manganese and iron precipitates, and, finally, two activated carbon filters units in series for removal of organic contaminants. The purpose of manganese and iron removal in the current system is to prevent precipitates of these metals from fouling the carbon filters.

The review of this system and the DMRs indicates that it is not functioning well, and the current manganese effluent limitation of 1000 ug/l is occasionally exceeded. Agency staff believe that some modifications to the system would produce an effluent in compliance with the current limitations and the proposed new manganese standard. Ironically, influent monitoring indicates that the raw ground water has an average manganese concentration of about 370 ug/l, which is below the proposed standard. The $KMnO_4$ addition and the operational problems are adding manganese to the current effluent in excess of the proposed

standard. However, the need to remove iron remains, in order to keep the carbon filters from becoming plugged. Agency staff suggests the following three options, with associated costs, to correct the current problems and to meet the proposed manganese standard.

(1) Replacement of the Existing Sand Filter Media with Greensand.

It may be possible to meet the standards by simply replacing the sand filter medium with a commercial greensand. Greensand is a naturally occurring sodium-aluminum silicate available commercially. Iron and manganese is oxidized and the precipitate is filtered out. Usually KMnO4 is fed continuously to the influent to recharge the greensand. An additional sand filter may be needed to assure compliance with standards. The costs outlined below include a second sand filter.

Capital Costs - $50,000 for one additional dual media - gravity filter, sized at 4 gpm/ft2, including pump and backwash equipment.

Operation and Maintenance (O&M) Costs - estimated to be about $1,500 per year

(2) Use of an Alternative Oxidant.

The use of an alternative oxidant, such as chlorine dioxide (ClO2), to oxidize the manganese and iron would solve the manganese carry over problem. An additional filter may be needed.

Capital Costs - $50,000 for the ClO2 generator plus feed equipment - automated - flow proportioned. This amount does not include a second filter.

O&M Costs - $4,000 per year total, chemical costs about $1,500 per year; O&M for ClO2 system should be about the same as the current O&M for the KMnO4 system.

(3) Aeration for Iron Removal

Oxygen will oxidize manganese and iron. A one horse power compressor would be adequate, but reaction time with oxygen is slower and 1,100 cubic foot holding tank would be needed.

Capital Costs - estimated to be $20,000 or less.

O&M Costs - Estimated to be about $1,000 per year, which would be a savings over the existing O&M costs.

Because the existing system is not consistently meeting the manganese effluent limitations in the current permit, and some improvements may be needed to correct these problems, it is difficult to isolate the costs attributable only to meeting the proposed manganese standard. As indicated, most of what is needed, in terms of buildings, piping, pumps, filters, etc., to meet the current and proposed standards is already in place. The total projected costs to correct the current problems and to meet the proposed manganese standard are not prohibitive. In fact, the less expensive alternatives could represent a cost savings to St. Louis Park over the long term.

Other permits such as those for the peat mining operations and mine pit dewatering permits have no manganese limitation, but they may require monitoring for manganese.

c) Cobalt

Cobalt is not a commonly encountered pollutant and the only permit containing a cobalt limitation is the LTV Steel/Erie Corporation permit for the Dunka pit discharges. The cobalt criterion was developed for this permit. The chronic criterion is 5 ug/l which is the same as the proposed chronic standard for Class 2B waters.

The source of cobalt and other trace metals in the Dunka pit is the lean copper-nickel ore which overlies the taconite. The lean ore has been removed and stock piled. Leachate from the stock piles contains concentrations of metals, including cobalt, that exceed applicable standards before treatment. The LTV Dunka permit contains limitations for these leachate seeps as well as limitations for mine pit dewatering.

Most pit water is discharged to the Dunka River, a Class 2B water. The cobalt limitation for this discharge is the same as the criterion and the proposed chronic standard, 5 ug/l. Because they are the same, no increased costs will result from the promulgation of this standard.

The cobalt limitation for the stock pile leachate discharges in the LTV permit is 50 ug/l. This limitation is based on a site-specific determination of the chronic criterion for the Dunka seeps, based on the very high total hardness concentrations in the seep water. Toxicity data for cobalt indicate that total hardness can mitigate cobalt toxicity, as is true for other trace metals (although the data are not complete enough to support a hardness dependent standard). Under part 7050.0222, subpart 8 of the rule, the same site-specific considerations can be applied to a site-specific modification of the proposed standard as were used to determine the site-specific criterion of 50 ug/l. Therefore, no additional costs are anticipated due the the promulgation of the cobalt standard.

d) Antimony and Thallium

The Agency found only monitoring requirements and no effluent limitations for antimony and thallium in permits. Promulgation of the proposed standards will not result in increased costs.

A few municipalities have monitoring requirements for some of the metals for which standards are being proposed, but none has a limitation for these metals. Municipalities will not incur any costs due to the proposed new metal standards.

3) Other Organics

a) Naphthalene

The proposed naphthalene standard was developed as a site-specific criterion for the Harvest States site. Harvest States is a grain elevator complex along the Mississippi River in St. Paul. Soil and

ground water on the site are contaminated with naphthalene. This site is unusual in that naphthalene is the only contaminant found in the ground water. Naphthalene is normally associated with other Polynuclear Aromatic Hydrocarbons (PAHs). Monitoring at the site shows that naphthalene concentrations are low enough that no pump out and treatment of the ground water is needed to protect the Mississippi River. The City of St. Paul removed the contaminated soil, mixed wood chips and fertilizer with it, and then thinly spread it on vacant land to allow natural degradation of the naphthalene. This remediation was carried out for reasons other than the removal of naphthalene.

Naphthalene is normally associated with other PAHs found at such sites as petroleum refineries, coal gasification facilities, wood treatment processes, and coking operations. Naphthalene is one of the easiest of the PAHs to remove when cleaning contaminated soils and ground water, and is removed along with the other PAHs normally present. No additional costs are anticipated as a result of the promulgation of the statewide naphthalene standard.

The Water Quality Division has a naphthalene effluent limitation of 50 ug/l (daily maximum) in a general NPDES permit used for a variety of dischargers likely to contain petroleum products. An example is the permit for the Simson Station-West in St. Cloud. They are pumping and treating ground water contaminated by a leaky under ground tank. Discharge is to the Sauk River. The proposed chronic standard for naphthalene is 81 ug/l. Since this is a higher value than the current effluent limitation of 50 ug/l, no additional costs are expected for dischargers that have this generalized permit.

4) Monitoring Costs

The addition of eight new standards may result in a very small increase in monitoring costs to permittees in the future. Presence of a standard in the rule might enter into the decision as to whether or not to have the permittee monitor for that pollutant. Relatively few dischargers monitor for any of these eight chemicals now, and most of the limited monitoring done is for iron. The analytical costs, as charged by the Minnesota Department of Health analytical laboratory, are shown below as an example of the cost to analyze these chemicals.

Chemical	Cost per Analysis in $
Alachlor and Atrazine	173
Antimony	43
Cobalt	63
Iron	26
Manganese	25
Naphthalene	369
Thallium	43

The monitoring frequency will not be increased for those dischargers that currently monitor for iron, or the other chemicals listed above, as a result of adopting the new standards. Thus, there should be no cost impact on these dischargers due to monitoring.

As the Agency staff review new discharge requests or remedial actions there is a small possibility that monitoring will be required that would not have been required prior to the promulgation of the standards. There is no way of knowing how many new situations will be reviewed by the Agency and how many of these will involve the need to monitor for these eight chemicals. But, assuming 100 analyses are required for each of the eight chemicals over the next year and five percent of the 100 analyses is a result of adding the standards to the rule, the total analytical cost would be $ 74,200 and $3,710 would be attributable to the proposed new standards. This "worst case" analysis illustrates that any increase in monitoring costs due to these proposed standards will be small.

e. Updating nine current aquatic life standards for the following toxics: Arsenic, Benzene, Bromoform, Endosulfan, Fluoranthene, Hexachlorobenzene, Nickel, Pentachlorophenol, and Vinyl chloride.

The Agency is proposing to update nine of the standards currently in part 7050.0220, subpart 3. Five of the nine proposed updated standards are less stringent than the current standards. No additional treatment costs will be incurred as a result of these changes. On the contrary, it is conceivable that some cost savings might result from raising these standards, but the Agency has not attempted to quantify possible savings.

The proposed updated standards for arsenic, bromoform, endosulfan and pentachlorophenol are more stringent than the current standards. Of these, arsenic and pentachlorophenol (PCP) are the most likely to result in increased treatment costs. No permits have limitations for bromoform or endosulfan.

1) Arsenic

The Hanna Mining Research Center permit (Permit # MN0020249) has an arsenic limitation of 40 ug/l (monthly average). The wastewater treatment for this research facility is a pond that discharges to Pickerel Creek, a designated trout stream. The proposed Class 2A arsenic chronic standard is 2.0 ug/l, which, assuming no dilution at 7Q10 flow, would be this facility's new effluent limitation when the permit is reissued. This pond has not discharged in five years, and the single arsenic monitoring value from the pond is less than 2 ug/l. It is unlikely this facility would incur any additional costs due to the proposed arsenic standard, if it continues to operate as it has over the last five years.

The Agency is not aware of other permits with arsenic limitations. Several permittees are required to monitor for arsenic. For example, the pumpout and treatment of contaminated ground water at the Ironwood landfill (Advance Transformer, permit # MN0053589), the quarry dewatering permit for Kraemer and Sons, Inc. (permit # MN0002224), and Minnesota Power at Cohasset (permit # MN0001007) monitor for arsenic but have no arsenic limitations. The Agency does not anticipate any increased costs due to the proposed change in the arsenic standard.

2) Pentachlorophenol

The Agency has reviewed the permits that have a pentachlorophenol (PCP) effluent limitation and believes there will be no additional treatment costs, but there is a possibility of modest additional operation and maintenance costs to some dischargers. The Champion International Corporation and Western Lake Superior Sanitary District discharges are used as examples to illustrate the potential costs.

Champion International Corporation (Permit # MN0056537) in Cass Lake operates a pumpout system to remove PCP from contaminated ground water due to former wood preservation activities on this site. Treatment is with granulated activated carbon at a maximum discharge rate of 200 gallons per minute (0.45 cubic feet per second). The limitation in the permit is 8 ug/l as a daily maximum. The discharge is to a channel connecting Pike Bay to Cass Lake which is a Class 2B water. The proposed updated Class 2B standard is 5.5 ug/l (assuming the mean pH of Pike Bay is 6.96 or greater, which is likely). Because no dilution is granted, the new effluent limitation would be 5.5 ug/l.

A review of the discharge monitoring reports for 1988 through 1992 (the record contains some gaps) shows two monthly values above their detection limit of 5 ug/l. A value of 9 and 7 ug/l were reported for January, 1990 and March, 1991, respectively. All other values reported were less than 5 ug/l (one sample per month). Since an effluent limitation of 5.5 ug/l is nearly the same as the detection limit of 5 ug/l in this case, compliance would be based on concentrations remaining below detection.

The granulated activated carbon filtration (GAC) system in place now at Cass Lake represents the best available treatment technology, and additional treatment should not be needed. However, the possibility of a lower effluent limitation in the future (from 8 to 5.5 ug/l) may mean some increase in operational and maintenance (O&M) costs to Champion in order for them to be assured of compliance with the potential lower limitation. With the exception of the single exceedance of the current limitation noted above and the measured value of 7 ug/l, PCP effluent concentrations have been below the 5 ug/l detection limit over the last five years. Thus, any increase in O&M costs should not be great.

The Agency believes additional costs could result from one or both of the two following situations:

Shorter "life span" of the carbon filters. Briefly, the three GAC units in series are monitored for rotation or replacement by measuring the PCP concentrations between units two and three. When the PCP concentration reaches 100 ug/l or above, replacement or rotation of the filters is needed some time in the following two or three months to prevent PCP break through in the final effluent. With a lower effluent limitation the threshold for filter change may be lower; and, over time, filters will be replaced more frequently, resulting in greater cost.

Lower detection level monitoring. The second possible additional cost is the use of an analytical procedure that provides a lower detection limit. The advantage of a lower detection limit to the company and the Agency would be, 1) to not have to use the detection limit as the compliance limit, 2) to have better data on exactly what the concentration of PCP is in the effluent, and 3) that compliance with a lower effluent limitation might be achieved without additional O&M costs. By providing more precise analytical results in the operational range of interest in this case (1 to 8 ug/l), a lower detection level method might show the current system is capable of consistently meeting a lower limitation when a less precise method, such as the one in use now, might not. This is because monitoring experience has shown that chemical concentrations at or just below the detection level for a given analytical method are often reported as higher than the true concentrations.

Gas chromatography with mass spectrometric detection (GC/MS) can achieve a detection limit of about 1 ug/l. This method costs $286.00 at the MDH analytical laboratory.

The advantages of a lower detection level method would be weighed against the added analytical cost, and the potential greater O&M costs if the latter is selected as the means to meet a potential lower limitation.

A more detailed examination of the treatment system and its operation, together with discussions with Company representatives and their consultants, will be carried out to determine the relative costs and the most cost effective option, or combination of options, given the proposed lower PCP standard.

Western Lake Superior Sanitary District (WLSSD) operates a large waste water treatment plant in Duluth. This 43.6 million gallon per day plant treats the sanitary waste from Duluth and surrounding communities and waste from Potlatch Corporation in Cloquet. WLSSD has a PCP effluent limitation of 11.6 ug/l as a daily maximum. This limitation is based on the acute toxicity of PCP at the low pH of the WLSSD discharge. The acute value used is an older PCP criterion and is slightly lower than the Final Acute Value (FAV) in the current rule (11.6 vs. 13.4 ug/l). The toxicity-based FAV and maximum standards are not proposed for change. Therefore, there will be no change to the PCP limitation for WLSSD and no costs incurred.

The Agency believes that the current permittees with PCP limitations will not have to provide additional treatment and will not incur additional treatment costs. Some costs may result if a discharger's limitation is reduced and they exceed the new limitation more frequently. Costs to possible future dischargers can not be determined, but any future discharger should have to provide BAT, independent of the standard.

f. Reclassifications.

For the purposes of the discussions relating to economic impacts, the proposed major amendments to the rule which deal with use reclassifications and ORVW designations can be divided into the following four groupings:

1) Class 1 Domestic Consumption classification
2) Outstanding Resource Value Waters
3) Class 2B waters reclassified as Class 2A waters
4) Class 7 reclassifications

Each grouping change will be discussed in greater detail as follows:

1) Class 1C Reclassification

In order to update the listing of surface waters in Minn. Rules pt. 7050.0470 used for domestic consumption purposes, the Agency is proposing to classify 18 surface water bodies as Class 1C waters. The waters proposed for this designation have been identified by the MDH as surface water source supplies for either community, noncommunity, or noncommunity, nontransient public water supply systems.

The present use classifications assigned to these waters are Class 2B, 3B, 4A, 4B, 5 and 6 class waters. By designating these waters for domestic consumption purposes, they will be classified as Class 1C, 2Bd, 3B, 4A, 4B, 5 and 6 class waters. With the addition of the class 1C designation, and the accompanying 2Bd classification, applicable water quality standards for these waters will be based on both the primary and secondary drinking water standards, as well as the aquatic life standards as specified in Minn. Rules pt. 7050.0222, subp. 3. Except for the total coliform bacteria and the turbidity standards, the primary and secondary drinking water standards will apply to these waters in their untreated state should they be designated as Class 1C waters.

The proposed Class 1C use classification of these waters does not impact the MDNR water appropriation permitting process nor does it affect the requirements of Minn. Rules ch. 4720, the Minnesota Department of Health rule dealing with public water supplies. By designating these waters as Class 1C waters, the Agency will evaluate and assign appropriate effluent limits for discharges to these waters so as to provide protection of their identified drinking water use.

Community Public Water Systems

The following four (4) mine pit lakes serve as community public water supply sources for the respective municipalities:

Canton Mine Pit Lake at Biwabik
Corsica Mine Pit Lake at McKinley
Fraser Mine Pit Lake at Chisholm
Missabe Mountain Mine Pit Lake at Virginia

These mine pit lakes have served and are projected to continue to serve as drinking water supply sources for these communities.

The proposed Class 1C use classification of these waters is a recognition of this fact and since there are no permitted discharges to these mine pit lakes, there are no identifiable economic impacts that result from the assignment of this use classification to these waters. Runoff from areas surrounding these mine pit lakes will continue to be managed through the implementation of best management practices to minimize the impacts associated with land erosion and other nonpoint source pollutant contributions.

Special monitoring requirements are contained in a permit issued to Minnesota Aquafarms, Inc. and Iron Range Aquafarms, Inc. which requires monitoring on a monthly basis of two sampling stations within Fraser Lake and twice monthly sampling of the untreated Chisholm public water supply intake from Fraser Lake (NPDES/SDS Permit No. MN0058190, Exhibit C 56). Minnesota Aquafarms, Inc. and Iron Range Aquafarms, Inc. operate an aquaculture fish production facility in the Sherman mine pit lake adjacent to the Fraser. This permit also contains a special requirement specifying that "The Permittee shall not construct, add fish, or conduct other activities in Fraser Lake, with the exception of maintenance feeding operations and fish removal operations for the trout present in the lake on June 28, 1988. " Exhibit C 56, Part I.C.5. This restriction remains applicable so long as the Fraser Lake is used as a drinking water source. At least in the near term, the city of Chisholm plans to use the Fraser Lake as its sole source of drinking water. Exhibit C 57.

Noncommunity Public Drinking Water Supplies

There are two wastewater treatment facilities (WWTF) that impact Lake Vermilion, a public water supply source for eight (8) noncommunity public water systems. The first WWTF discharge is from the Tower-Breitung Water and Sewage Commission facility and the second discharge is from the Boise Forte Reservation WWTF.

The city of Tower and the Breitung Water and Sewage Commission operate a wastewater stabilization pond facility which discharges on a controlled basis to a tributary to the East Two Rivers, NPDES permit number MN0056618. East Two Rivers flows to Lake Vermilion. The nearest noncommunity water supply system is located approximately 17 miles "down-lake" from this wastewater effluent discharge. While it is the policy of the MPCA to require year-round disinfection of sewage wastewater that is discharged within 25 miles upstream of a drinking water supply withdrawal, stabilization pond facilities can generally meet the fecal coliform effluent limitation of 200 org./100 ml without having to be chlorinated or disinfected through some other process. A review of the discharge monitoring reports for this facility have shown that the fecal coliform levels in the effluent have consistently been well below the 200 org./100 ml limit. Therefore, no additional treatment costs are anticipated as a result of the proposed Class 1C classification.

The Boise Fort Reservation WWTF currently discharges at an average effluent flow rate of approximately 0.015 MGD. Two facility upgrade options are being considered, a pond treatment facility with a controlled discharge, and a mechanical treatment facility with a continuous discharge of approximately 0.108 MGD.

If the pond treatment option is chosen, no additional costs are anticipated as a result of the Class 1C designation for the same reasons discussed previously for the Tower-Breitung discharge.

If the mechanical treatment facility operation is selected, year-round disinfection would be required. This would extend the period of required disinfection from eight (8) months to twelve (12) months. Assuming chlorination of the wastewater is the chosen method for disinfection at the upgraded facility, chemical costs for extending the disinfection requirement by four (4) months would be approximately $600 per year. This cost estimate includes the chemical costs for the chlorine and for the sulfur dioxide used to de-chlorinate the wastewater in order to meet the total residual chlorine effluent limitation.

Noncommunity, Nontransient Public Water Supplies

Four (4) mine pit lakes that have been identified as noncommunity, nontransient public water supplies are being proposed for Class 1C use classification. These mine pit lakes serve the following respective mining operations:

Enterprise Mine Pit Lake, Inland Steel Mining Company
Morton and Scranton Mine Pit Lakes, Hibbing Taconite Company
Mountain Iron Mine Pit Lake, USX

These waters are designated by the Minnesota Department of Health as public water supplies since they serve as sources of drinking waters for at least 25 of the same persons over six months per year. As noted in earlier discussions, the Scranton Mine Pit Lake, under existing water elevations, is part of a much larger surface water body encompassing the Hull-Rust-Mahoning-Scranton-Susquehana mining complex.

In addition to surface runoff from surrounding lands and ground water seepage to these mine pit lakes, these waters also receive mine pit dewatering discharges from active and/or non-active mining operations. As with the mine pit lakes utilized by the four communities discussed earlier under the section on community public water supplies, the Agency encourages the use of Best Management Practices (BMPs) in mining areas to minimize and control erosion. The Agency also recommends that special care is taken in the use of chemical dust suppressants, lubricants, fuels, drilling fluids, oils, fertilizers, explosives and blasting agents in the mining areas so to minimize their impact on surface and ground waters. Utilization of applicable BMPs has been and will continue to be the Agency's focus for storm water runoff and erosion control measures for flows from mining areas. While the designation of the four mine pit lakes as Class 1C waters will not result in a change in this management approach additional costs may be incurred due to increased implementation of BMPs if additional management controls are needed to protect the drinking water source.

The assignment of this use classification does have the potential to result in additional monitoring costs relative to discharges of process wastewater and dewatering flows from active mining areas that impact

these drinking water supply sources. Historically, the Agency has viewed some of these mine pit lakes within the boundaries of the permitted facility which receive process wastes and dewatering discharges from active mining areas as being part of the mining operation. Dewatering discharges from these particular mine pit lakes which discharge to waters of the state were permitted through the NPDES/SDS permitting process. Recognizing that drinking water supply is an existing use of these waters, the Agency will establish monitoring requirements, and if appropriate, set effluent limits on discharges to these waters so as to protect for the drinking water use.

The cost estimates for this additional monitoring are separated into two categories. The first category includes monitoring of the process and active mine dewatering discharges discharging into the proposed Class 1C mine pit lakes at the time of permit renewal. Parameters and parameter groupings to be analyzed include the following.

INORGANICS: aluminum, arsenic, antimony, barium, beryllium, boron, cadmium, chromium, cobalt, copper, fluoride, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, thallium, tin, titanium, zinc, nitrate + nitrite, nitrite, ammonia, total organic nitrogen, total phosphorus, sulfate and chloride

ASBESTOS

VOCs: benzene, vinyl chloride, carbon tetrachloride, 1,2-dichloroethane, trichloroethylene, 1,1-dichloroethylene, 1,1,1-trichloroethane, and para-dichlorobenzene

SYNTHETIC ORGANICS: glyphosate, herbicides (CH), base-neutrals, and carbamates

GENERAL CHEMISTRY/BACTERIOLOGICAL: total suspended solids, biochemical oxygen demand, chemical oxygen demand, total organic carbon, surfactants, fecal coliform, color

OIL AND GREASE

Based on analytical cost estimates from the Minnesota Department of Health, total costs per sample for the above noted parameters and parameter groupings is $2,975 per sample.

The second category of discharge parameters monitored on a semi-monthly basis include: ammonia, nitrate + nitrite, nitrite, chloride, total suspended solids, turbidity, pH, color, oil and grease, dissolved iron

The analytical costs for these parameters is estimated to be $194 per sample. Additional parameters may also be added to this list of parameters to be measured on a semi-monthly basis depending on the results of the monitoring for the parameters in category one as described above.

As an example, USX (NPDES/SDS permit #MN0052493) may be required to monitor two additional monitoring stations as a result of the Class 1C designation of the Mountain Iron mine pit lake. The monitoring stations

would be established to monitor the mine pit dewatering discharges from the eastern portion of the West Minntac mine and the western portions of the East Minntac mine. Additional parameter analyses would be required at a monitoring station already being sampled by USX. This station, identified in the permit as monitoring station 950, has been established to monitor surface flow of non-sewage wastewater from the Minntac and Pilotac Plant Areas on the south side of the Laurentian Divide. Over the life of the five-year permit, estimated added monitoring costs resulting from the Class 1C classification would be approximately $78,800.

Inland Steel Mining Company has indicated that it is currently pursuing an in-pit tailings disposal option where they intend to pump tailings into their depleted Minorca Pit rather than their current tailings basin Exhibit C 58. As the Minorca Pit fills with tailings, process water would have to be pumped out of the pit. This excess water would be pumped to the Sauntry and Enterprise Mine Pit Lakes. Once the dewatering of the Minorca Mine Pit begins, the company indicates that it would no longer use water from the Enterprise Mine Pit Lake for domestic consumption purposes and is therefore requesting that the Enterprise Mine Pit Lake not be classified as a Class 1C water pending approval of the proposed in pit tailings disposal proposal.

Agency staff has discussed this request with a company representative and have indicated that it will continue to include the Enterprise Mine Pit Lake as a Class 1C water based on its existing use as a drinking water source supply. As the plans and environmental reviews of the proposed in-pit tailings disposal option progress, and the company provides a schedule for the cessation of use of the Enterprise for drinking water purposes, the Agency will re-evaluate the need for continuing to propose this mine pit lake as a Class 1C water. The Agency anticipates that these discussions and submissions of information could occur prior to or during the public hearings on the proposed rule amendments.

In conclusion, the proposed Class 1C classification of these mine pit lakes will not necessarily result in additional treatment costs, but will result in some additional monitoring costs related to process waste discharges and dewatering discharges from mining operations that are discharged to these drinking water public supply sources.

2) Outstanding Resource Value Waters

The Agency is proposing to assign the ORVW designation to waters within the Falls Creek SNA and to 37 calcareous fens. Since the lands contained within the boundaries of the Falls Creek SNA are owned by the state, there are no identified economic impacts resulting from the proposed ORVW designation. There is a designated trout stream which flows through the SNA, portions of which lie outside the SNA boundaries. This trout stream is identified as Unnamed Stream (Falls Creek) in T.32, R. 19, 5.6,7; T.32, R.20, S.1, 12. Proposed discharges to the designated trout stream or its tributaries outside the boundaries of the SNA would be assessed and controlled in part through the provisions of Minn. Rules pt. 7050.0180, subp. 9. There are no permitted discharges

to these upstream segments at this time, nor is the Agency aware of any proposed discharges to these waters, so no economic impacts are anticipated because of this designation.

Due to their dependency on sustaining ground water flows of certain chemical and physical characteristics, calcareous fens have the potential for being impacted not only from discharges of wastewaters, but from other land use activities occurring on surrounding lands as well. The Agency is not aware of any existing or proposed discharges to the calcareous fens proposed for ORVW designation, therefore there are no identified costs to permittees as a result of this designation.

Economic impacts, however, may be realized by persons proposing certain land use activities that have the potential to impact calcareous fens. As noted in earlier discussions, the major threats to calcareous fens come from ditching, drainage and filling operations related to agricultural activities, commercial development, gravel mining activities and highway construction. Economic impact analysis relating to any of these activities and their potential impact to calcareous fens, can only be accomplished on a site specific basis. Attempts to quantify a general dollar amount associated with mitigative actions or avoidances in connection with any of these activities is almost impossible to do.

Some or all of these costs may be incurred by persons proposing an action which could degrade or impact a calcareous fen whether or not these calcareous fens are designated as ORVWs. These economic impacts may be realized as a result the Agency's Section 401 Water Quality Certification process that is already in existence, or the MDNR calcareous fen management plan in Minn. Stat. sec. 103G.223. Also, these economic impacts may be realized as a result of the added level of protections afforded calcareous fens through certain provisions of the Wetland Conservation Act, Minn. Stat. sec. 103G.223.

3) Class 2B Waters reclassified as Class 2A Waters

The Agency is proposing to list and incorporate by reference the trout waters identified by the MDNR that are listed pursuant to MDNR Commissioner's Order No. 2450. Streams and lakes identified under this order are proposed by the Agency to be classified as Class 2A cold water fisheries. Since the last time the commissioner's orders were incorporated into chapter 7050, changes made to the trout stream order have resulted in some added waters, some deletion of certain waters, and changes in the designated reaches of existing trout streams. The extension of the trout stream designations for Union Creek, Wadena County and Hay Creek, Goodhue County has the potential to impact two dischargers to these stream segments. The economic impacts resulting from this designation are discussed as follows.

Union Creek, Wadena

The city of Wadena operates a mechanical wastewater treatment facility (WWTF) designed to treat an influent flow of 0.750 MGD. The discharge from this facility is to Union Creek, which is tributary to the Leaf

River. In the existing Minn. Rules ch. 7050, Union Creek is designated as a trout stream upstream of the WWTF outfall. The MDNR trout stream designation has been extended down to Union Creek's confluence with the Leaf River. The city is currently discharging into a Class 2B segment of Union Creek. This same segment is being proposed for Class 2A reclassification by the Agency based on the latest commissioner's order for trout streams.

Instream standards for un-ionized ammonia and dissolved oxygen in Class 2A waters are more restrictive than they are for Class 2B waters. In general, this change in use classification would result in the assignment of more restrictive effluent limitations for WWTFs discharging to these waters. The assignment of these effluent limits would occur either at the time of permit reissuance or through the modification of the existing permit in effect at the time the water use classification change becomes effective.

The Wadena WWTF recently underwent a $3.2 million upgrade based on effluent limitations set to insure maintenance of the Class 2B instream water quality standards. As a result of this recent upgrade, the 1992 discharge monitoring reports indicate that this facility is currently meeting the limits applicable for a discharge to Union Creek based on maintenance of Class 2A instream standards. Options open to the city would include agreeing to the assignment of the more restrictive effluent limitations included in a modified NPDES/SDS permit, or request a variance to the Class 2A standards for ammonia and dissolved oxygen. If such a variance were submitted by the city and granted by the Agency, a likely condition of the variance would be instream monitoring both above and below the WWTF outfall. The parameters to be analyzed include ammonia nitrogen, dissolved oxygen, pH, and temperature. Estimated analytical costs to the city to meet the proposed instream monitoring requirements would be $2,500 over a five-year permit period.

Hay Creek, S.B. Foot Tanning Company and the city of Red Wing

S.B. Foot Tanning Company and the city of Red Wing operate a wastewater treatment facility that discharges into Hay Creek, a tributary to the Mississippi River. The principle activity of this facility is the processing of leather by re-tanning and leather finishing operations into shoe upper leather at a permit rate of approximately 130,000 pounds of raw product per day. Noncontact cooling water is also discharged from this facility to Hay Creek.

The trout stream designation of Hay Creek has been extended down to its confluence with the Mississippi River. S.B. Foot Tanning Company presently discharges to a Class 2B segment of the creek, but with the adoption of the latest MDNR Commissioner's Order for trout streams, this particular segment of the creek is proposed for Class 2A classification. The instream water quality standards for un-ionized ammonia will go from the present Class 2B standard of 0.04 mg/l to a Class 2A standard of 0.016 mg/l if this proposed reclassification becomes effective.

In order to meet this more restrictive un-ionized ammonia standard, facility upgrades and/or operational modifications may be necessary. The information needed to evaluate what additional treatment needs, if

any, would be required is not available at this time. Agency staff and S.B. Foot Tanning Company staff are cooperatively working on collecting this needed information. It is the intent of the Agency to submit an exhibit into the hearing record which provides an economic analysis of the projected costs which may be incurred by the company as a result of this proposed classification change.

4) Class 7 Reclassifications

Six waters are being proposed for Class 7 reclassification. In general, the assignment of this use classification will result in a net cost savings to the communities that discharge to these waters. The Class 7 use classification change applicable to the unnamed ditch at New Auburn and County Ditch No. 42 at McGregor will not result in any substantial cost savings for these cities with their present mode of wastewater treatment. It will, however, afford these cities greater operational flexibility in the timing of their controlled discharges.

Although not quantified, significant cost savings are projected for the city of Rogers and the Gaylord/M.G. Waldbaum facilities should their respective receiving waters be reclassified as Class 7 limited resource value waters. Some of these costs savings, however, are off-set by the instream monitoring requirements specified in the Gaylord/M.G. Waldbaum NPDES/SDS permit. These instream monitoring requirements are imposed in order to assure that the downstream Class 2B standards applicable for the North Branch Rush River are maintained.

g. Miscellaneous rule modifications. There are several minor amendments to Minn. Rules 7050 which serve to clarify current requirements, define undefined terms, update references to other rules and orders, provide consistent language and correct spelling and grammar. These changes are noted in the introduction of this document, Part I, section B, scope of proposed revisions, Minor Subjects, items 1, 4-16, 18-20, and 22-23. These changes will have no increased impact on economic factors for regulated communities.

B. Public Bodies.

Minn. Stat. sec. 14.11, subd. 1 (1992) requires the Agency to provide an estimate of the total cost associated with implementing the proposed amendments, if it is estimated that the total cost to all local public bodies exceeds $100,000 in either of the first two years following adoption of the rules. The Agency has reviewed all the proposed changes and determined that the changes which could potentially, directly or indirectly, increase costs to public bodies are, 1) the establishment of specific use classifications and standards for wetlands, 2) the eight proposed new aquatic life standards for toxics, and 3) the nine updated aquatic life standards for toxics.

1. Wetlands.

As discussed under the review of economic impacts expected from the proposed wetland amendments, only about 40 of the 600 permitted municipalities currently discharge to wetlands. There will be no

increased costs to the existing discharges over the next two years because their effluent limitations should already reflect the level of treatment needed to protect the wetland. Also, it is extremely unlikely that any municipality proposing a new or expanded discharge will incur any increased costs over the next two years given, 1) the unlikely event that the Agency will receive very many requests for new or expanded discharges to wetlands over the next two years, and 2) the fact that, if there are such requests, the unlikely event that treatment costs would be different as a result of these amendments as compared to what is required now. Thus, it seems very unlikely that municipalities will incur costs in excess of $100,000 in each of the next two years. It is determined that there will be minimal, if any, increased costs to discharges as a result of the proposed wetland amendments.

2. Proposed new Standards for Eight Toxics.

The review of the few municipal permits that contain limitations for any of the eight pollutants for which new standards are proposed shows no economic impact to municipalities; the $100,000 cap will not be exceeded.

3. Proposed Updated Nine Standards.

Of the nine updated standards, the new standards for arsenic and pentachlorophenol (PCP) have the potential to increase treatment costs. However, only the Western Lake Superior Sanitary District (WLSSD) permit has a limitation for PCP (none has a limitation for arsenic). WLSSD will not incur any additional costs due to the proposed PCP standard as discussed earlier; therefore, the $100,000 cap will not be exceeded.

The Agency has reviewed the potential costs to municipalities from the other parts of the rule being revised, such as the designation of new calcareous fens as Outstanding Resource Value Waters, the addition of narrative biocriteria, and the designation of certain mine pit lakes as Class 1C waters, and believes that municipalities will not incur $100,000 in costs in either of the next two years due to these proposed changes.

C. Small Business

Minn. Stat. sec. 14.11 subd. 2 (1992) requires the Agency to consider several factors that may reduce the potential impacts on small business when promulgating new or amending existing rules. The factors are:

1. The establishment of less stringent compliance or reporting requirements for small businesses;
2. the establishment of less stringent schedules or deadlines for compliance or reporting requirements for small businesses;
3. the consolidation of simplification of compliance or reporting requirements for small businesses;
4. the establishment of performance standards for small business to replace design or operational standards required in the rule; and
5. the exemption of small businesses from any or all requirements of the rule.

The standards and conditions in ch. 7050 are applicable to all dischargers regardless of size. Also, the EPA requires compliance with permit limitations for all dischargers. Likewise, the amendments being proposed by the Agency at this time, the wetland classifications and standards, the new and updated Class 2 standards, the other classification changes, biocriteria, etc., are statewide in their scope. The regulatory implications of these statewide standards are best defined when they are applied in a site-specific situation. For this reason, it is difficult to address the particular needs of one segment of the regulated community when promulgating such generally applicable standards. However, the Agency has the flexibility, and will use this flexibility, to address points one through four listed above on a case-by-case basis through the NPDES or SDS permit, the certification process, and through the enforcement process.

The permit and certification process provides the flexibility to tailor requirements to the size and resources of the permittee. For example, monitoring requirements in a permit for a small business can be scaled back to minimize the cost burden to the small business.

In taking enforcement action against a small business not in compliance with their permit, the Agency has considerable flexibility and discretion to, for example, reduce reporting requirements and adjust compliance schedules to minimize the cost burden to the small business while still achieving the Agency's primary function of protecting the environment.

Item number 5 above is best addressed through the variance process as outlined in part 7050.0190 and Minn. Rules part 7000.0700. In assessing the merits of a request for a variance from a water quality standard or effluent limitation, the Agency staff will consider the particular economic condition and vulnerability of the small business when making its recommendation to the Agency Board to grant or deny the variance.

D. Agricultural lands

Minn. Stat. sec. 17.83 (1992) requires the Agency to notice and describe in the SONAR any "direct or substantial impact" the proposed rule might have on agricultural land in the state. This requirement in also identified in Minn. Stat. sec. 14.11, subd. 2 (1992). The two areas being revised that might impact agricultural lands are the proposed narrative standards for wetlands, and the numerical water quality standards for atrazine and alachlor.

1. Classifications and standards for wetlands.

The proposed narrative standards, which essentially clarify existing Agency authority, will protect wetlands from point and nonpoint sources of pollution and physical alterations. Marginal or seasonal wetlands in agricultural lands (Type 1) can still be cultivated when conditions permit, as is the case now. This will not change as a result of these amendments. The process of mitigation or replacement if a wetland is physically altered will follow the same process currently in place.

These regulatory procedures do not have the effect of substantially restricting the agricultural use of the land.

2. Class 2 numerical standards for atrazine and alachlor.

Two of the eight proposed new standards are for the herbicides, atrazine and alachlor, which are commonly used to control weeds on agricultural lands. It is conceivable that the standards may encourage reductions in the use of these herbicides through alternative weed control practices, or reductions in runoff through the voluntary adoption of BMPs consistent with nonpoint source programs. However, the proposed standards will not substantially restrict the agricultural use of the land, nor will they take agricultural land out of production.

In conclusion, the proposed rules do not involve the acquisition, permitting, leasing, or funding for agricultural land.

VI. TECHNICAL ADVISORY COMMITTEE

As required by Minn. Stat. sec. 115.54 (1992), the Agency must consider the advice of the Technical Advisory Committee (TAC) when adopting or revising its rules concerning wastewater treatment. The TAC has had difficulty in the past two years in achieving a quorum for its meetings. Therefore, with the advice of the Chair and some members of the committee, the Agency has provided the TAC with rule language and information by mail. The TAC chair will call a meeting as necessary, or poll the committee for comments on the rule. No special concerns have been identified by the TAC as of the date of this SONAR, and the Agency anticipates receipt of their comments and advice prior to adopting the revisions to this rule.

VII. LIST OF WITNESSES, EXHIBITS AND ACRONYMS

A. Witnesses

In support of the need and reasonableness of the proposed amendments to the rule, the following Agency staff helped prepare this statement of need and reasonableness and will be available to explain the proposed amendments and answer questions at the rulemaking hearing.

1. David Maschwitz: aquatic life standards for toxics, drinking water standards and certain minor amendments.

2. Dann White: aquatic life standards for toxics.

3. Howard Markus: water quality standards for wetlands.

4. Gerald Blaha: outstanding resource value water designation for calcareous fens and scientific and natural areas; limited resource value water reclassifications; and certain minor amendments.

5. Patricia Bailey: biological criteria and use classifications.

6. Mary Knudsen: discharges from dredge disposal facilities.

7. Greg Gross: amendments in general.

8. Dave Belluck: Atrazine.

B. Exhibits

In support of the need for and reasonableness of the proposed rules, the following exhibits will be entered into the hearing record by the Agency.

Exhibit Number	Document
	B = Exhibits concerning biocriteria
B1	Rankin, E.T. and C.O, Yoder. 1990. A comparison of aquatic life use impairment detection and its causes between an integrated, biosurvey-based environmental assessment and its water column chemistry subcomponent. Appendix I-Ohio 1990 305(b).
B2	U.S. Environmental Protection Agency. 1990. Biological criteria national program guidance for surface waters. EPA/440-5-90-004. Office of Water, U.S. Environ. Prot. Agency, Washington, D.C.
B3	U.S. Environmental Protection Agency. 1992. Procedures for initiating narrative biological criteria. EPA/822-B-92-002. Office of Water, U.S. Environ. Prot. Agency, Washington, D.C.
B4	Plafkin, J.L. et al. 1989. Rapid bioassessment protocols for use in streams and rivers : benthic macroinvertebrates and fish. Chapter 8.3. EPA/444/4-89-001. Office of Water, U.S. Environ. Prot. Agency, Washington, D.C.
B5	Plafkin, J.L. et al. 1989. Rapid bioassessment protocols for use in streams and rivers : benthic macroinvertebrates and fish. Chapter 7.2 EPA/444/4-89-001. Office of Water, U.S. Environ. Prot. Agency, Washington, D.C.
	C = Exhibits concerning classifications of waters
C1	Falls Creek Scientific and Natural Area Project Evaluation report, Minnesota Department of Natural Resources.
C2	Element Abstract for Calcareous Fen Plant Communities. Natural Heritage Program, Minnesota Department of Natural Resources.
C3	Calcareous Fen Locations and Ownership in Minnesota Index. Minnesota Department of Natural Resources. February 17, 1993.
C4	Calcareous Fens in Minnesota Element Occurrence Record. Minnesota Department of Natural Resources.

C5 Seminary fen, 75 (T.116, R.23, S.35) site map.

C6 Barnesville Moraine fen, 44 (T.137, R.44, S.18) site map.

C7 Barnesville WMA fen, 43 (T.137, R.44, S.18) site map.

C8 Felton Prairie fen, 48 (T.142, R.45, S.31) site map.

C9 Felton Prairie fen, 53 (T.141, R.46, S.24) site map.

C10 Haugtvedt WPA North Unit fen, 54 (T.137, R.44, S.28, 29) site map.

C11 Holden 1 West fen, 3 (T.110, R.18, S.1) site map.

C12 Red Wing fen, 72 (T.113, R.15, S.21) site map.

C13 Houston fen, 62 (T.104, R.6, S.26) site map.

C14 Ottawa Bluffs fen, 56 (T.110, R.26, S.3) site map.

C15 Tamarac River fen, 71 (T.157, R.46, S.2) site map.

C16 Viking fen, 68 (T.155, R.45, S.18) site map.

C17 Viking fen, 70 (T.155, R.45, S.20) site map.

C18 Viking Strip fen, 69 (T.154, R.45, S.4) site map.

C19 Lost Timber Prairie fen, 13 (T.105, R.43, S.2) site map.

C20 Agassiz-Olson WMA fen, 17 (T.146, R.45, S.22) site map.

C21 Faith Prairie fen, 15 (T.144, R.43, S.26) site map.

C22 Faith Prairie fen, 16 (T.144, R.43, S.35) site map.

C23 Green Meadow fen, 14 (T.145, R.45, S.35, 36) site map.

C24 High Forest fen, 12 (T.105, R.14, S.14, 15) site map.

C25 Sanders East fen, 65 (T.153, R.44, S.7) site map.

C26 Sanders East fen, 74 (T.153, R.44, S.7) site map.

C27 Sanders fen, 64 (T.153, R.44, S.18, 19) site map.

C28 Chicog Prairie fen, 39 (T.148, R.45, S.28) site map.

C29 Kittleson Creek Mire fen, 55 (T.147, R.44, S.6, 7) site map.

C30 Blue Mounds fen, 1 (T.124, R.39, S.15, 14) site map.

C31 Lake Johanna fen, 4 (T.123, R.36, S.29) site map.

C32 Swedes Forest fen, 8 (T.114, R.37, S.19, 20) site map.

C33 Swedes Forest fen, 9 (T.114, R.37, S.22, 27) site map.

C34 Cannon River Wilderness Area Fen, 73 (T.111, R.20, S.22) site map.

C35 Anna Gronseth Prairie fen, 47 (T.134, R.45, S.15) site map.

C36 Anna Gronseth Prairie fen, 49 (T134, R.45, S.10) site map.

C37 Anna Gronseth Prairie fen, 52 (T.134, R.45, S.4) site map.

C38 Rothsay Prairie fen, 46 (T.136, R.45, S.33) site map.

C39 Rothsay Prairie fen, 50 (T.135, R.45, S.15, 16) site map.

C40 Rothsay Prairie fen, 51 (T.135, R.45, S.9) site map.

C41 Yellow Medicine fen, 30 (T.115, R.46, S.18) site map.

C42 Waterbodies Proposed for Class 1C, Domestic Consumption, Designation; Minnesota Department of Health summary sheets and accompanying maps.

C43 Aerial photo of Scranton Mine Pit Lake showing portions of the Hull-Rust-Mahoning-Scranton-Susquehanna Complex. 1989 Hibbing Public Utilities Annual Report cover page.

C44 Comment letters and records of oral comments regarding the proposal to classify mine pit lakes, being used as public water supply sources, as Class 1C waters.

C45 Rogers Stream Assessment Survey.

C46 Gaylord/M.G. Waldbaum Stream Assessment Survey.

C47 McGregor Stream Assessment Survey.

C48 New Auburn Stream Assessment Survey.

C49 Wyoming Stream Assessment Survey.

C50 Boise Cascade at International Falls Stream Assessment Survey.

C51 Fairmont Stream Assessment Survey.

C52 March 1992 Stream Reclassification Request from the City of Fairmont.

C53 Agency response to Fairmont's March 1992 Stream Reclassification Request.

C54 Minnesota Department of Natural Resources comment letter dated September 30, 1992, with a request to remove Outstanding Resource Value Waters designation from six lake trout lakes.

C55 Minnesota Department of Natural Resources Commissioner's Order No. 2450, Minnesota Rules part 6262.0400, subparts 3 to 5. State Register, Monday 22 June 1992, pages 2902 through 2928.

C56 NPDES/SDS Permit No. MN0058190, Iron Range Aquafarms, Inc.; Minnesota Aquafarms, Inc., dated July 26, 1988.

C57 Letter from the Mayor, City of Chisholm, dated September 24, 1992, regarding Fraser Mine Pit Lake.

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F1 U.S. Department of Agriculture. 1982. An evaluation system to rate feedlot pollution potential. ISSN 0193-3787. Agricultural Research Service, U.S. Department of Agriculture, Peoria, Illinois.

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G1 Notice to Solicit Outside Opinion, State Register, Monday 24 February 1992, Volume 16, Number 35, page 1958.

G2 Comments received during February 25, 1992 Period of Solicitation of Outside Opinions.

G3 Notice to Solicit Outside Opinion, State Register, Monday 31 August 1992, Volume 17, Number 9, page 449.

G4a Letter introducing the Chapter 7050 revision issues, dated September 10, 1992.

G4b Mailing list for September 10, 1992 letter introducing revision issues.

G5a Letter concerning effort to adopt eight new statewide toxic standards, date September 10, 1992.

G5b Mailing list for September 10, 1992 letter concerning eight new toxic standards.

G6a Letter concerning reclassification to Class 1C for public drinking water sources, dated September 11, 1992.

G6b Mailing list for September 11, 1992 letter concerning reclassification of public drinking water sources.

G7 Revision subject fact sheets.

G8 Comments received during September 1, 1992 Period of Solicitation of Outside Opinions.

G9 Order of Hearing.

G10 Certificate of Agency Board's Authorizing Resolution.

G11a Notice of Hearing mailed to persons registered with the Agency in accordance with Minn. Stat. sec. 14.14, subd. 1a (1992).

G11b Certification of Agency Mailing List.

G11c Affidavit of Mailing.

G12 Notice of Hearing as published in the State Register.

G13a Notice of Hearing published in newspapers in accordance with Minn. Stat. sec. 115.44, subd. 7, item (a) (1992).

G13b Newspaper publication list for Notice of Hearing.

G14a Notice of Hearing sent to municipalities in accordance with Minn. Stat. sec. 115.44, subd. 7, item (b) (1992).

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W7. May 1992 meeting handout package.

W8. Exhibit W8 does not exist.

W9. Exhibit W9 does not exist.

W10. Minnesota Rules Chapter 8420 - Rules related to the Wetland Conservation Act Chapter 354.

W11. The Statement of Need and Reasonableness for Chap. 354 - 1992.

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W14. National Audubon Society letter to MPCA dated September 30, 1992 re draft water quality standards.

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C. ACRONYMS

The following acronyms appear within the text of the SONAR.

ACR	Acute to Chronic Ratio
Agency	Minnesota Pollution Control Agency
BAF	BioAccumulation Factor
BCF	BioConcentration Factor
BMP	Best Management Practice
BPT	Best Practicable Technology
(C)	the chemical is considered Carcinogenic
CC	Chronic Criterion
CFR	Code of Federal Regulations
CS	Chronic Standard
CWA	Clean Water Act (federal)
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
EC50	Effect Concentration
EPA	U.S. Environmental Protection Agency
exp ()	the base e antilogarithm of the expression in the parenthesis

FAV	Final Acute Value
GAC	Granulated Activated Carbon
GC/MS	Gas Chromatograph/Mass Spectrometer
GMAV	Genus Mean Acute Value
HEAST	Health Effects Assessment Summary Table
HRL	Health Risk Limit
IBI	Index of Biotic Integrity
IRIS	Integrated Risk Information System
LC50	Lethal Concentration
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MDH	Minnesota Department of Health
MDNR	Minnesota Department of Natural Resources
MPCA	Minnesota Pollution Control Agency
MS	Maximum Standard
NOAEL	No Observed Adverse Effect Level
NPDES	National Pollutant Discharge Elimination System
NSP	Northern States Power
O&M	Operation and Maintenance
ORVW	Outstanding Resource Value Waters
PAH	Polynuclear Aromatic Hydrocarbon
q1*	potency slope
RAL	Recommended Allowable Limit
RfD	Reference Dose
RSC	Relative Source Contribution factor
(S)	secondary drinking water standard
SDS	State Disposal System
SNA	Scientific and Natural Area
SONAR	Statement Of Need And Reasonableness
TAC	Technical Advisory Committee
TCAAP	Twin City Army Ammunition Plant
TH	Total Hardness
TON	Threshold Odor Number
TSS	Total Suspended Solids
UAA	Use Attainability Analysis
USGS	U.S. Geological Survey
WCA	Wetland Conservation Act
WET	Whole Effluent Toxicity
WWTF	WasteWater Treatment Facility
7Q10	the lowest seven-day mean flow with a once in ten year recurrence interval

VIII. CONCLUSION

Based on the foregoing, the proposed Minn. Rules pts. _____ are both needed and reasonable.

Dated: _____ 1992

_____
Charles W. Williams
Commissioner