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MINNESOTA CODE OF AGENCY RULES

RULES OF THE MINNESOTA POLLUTION CONTROL AGENCY

1982 Reprint



All rules as in effect on September 15, 1982

Prepared by

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MINNESOTA POLLUTION CONTROL AGENCY.

- Chapter One: APC 1
- APC 1 Ambient air quality standards.
- Chapter Two: APC 2
- APC 2 Definitions, abbreviations, applicability of standards, access to premises, variances, circumvention, severability.
- Chapter Three: APC 3
- APC 3 Permits.
- Chapter Four
- 6 MCAR S 4.004 Standards of performance for fossil fuel burning indirect heating equipment.
- Chapter Five: APC 5
- APC 5 Standards of performance for industrial process equipment.
- Chapter Six: APC 6
- APC 6 Preventing particulate matter from becoming air-borne.
- Chapter Seven: APC 7
- APC 7 Standards of performance for incinerators.
- Chapter Eight: APC 8
- APC 8 Open burning.
- Chapter Nine: APC 9
- APC 9 Control of odors in the ambient air.

Chapter Ten: APC 10

APC 10 Control of odors from processing of animal matter.

Chapter Eleven: APC 11

APC 11 Restriction of emission of visible air contaminants.

Chapter Twelve: APC 12

APC 12 Standards of performance for motor vehicles and stationary internal combustion engines.

Chapter Thirteen: APC 13

APC 13 Standards of performance for storage vessels for petroleum liquids.

Chapter Fourteen: APC 14

APC 14 Emission of certain settleable acids and alkaline substances restricted.

Chapter Fifteen: APC 15

APC 15 Standards of performance for sulfuric acid plants.

Chapter Sixteen: APC 16

APC 16 Standards of performance for nitric acid plants.

Chapter Seventeen: APC 17

APC 17 Emission standards for asbestos.
APC 18 Emission standards for inorganic fibrous materials.
APC 19 Permits for indirect sources.
6 MCAR S 4.0021 Emission source monitoring, performance tests, reports, shutdowns and breakdowns.

- Chapter Twenty-Two: APC 22
- APC 22 Standards of performance for Portland cement plants.
- Chapter Twenty-Three: APC 23
- APC 23 Standards of performance for asphalt concrete plants.
- Chapter Twenty-Four: APC 24
- APC 24 Standards of performance for petroleum refineries.
- Chapter Twenty-Five: APC 25
- APC 25 Standard of performance for secondary lead smelters.
- Chapter Twenty-Six: APC 26
- APC 26 Standards of performance for secondary brass and bronze ingot production plants.
- Chapter Twenty-Seven: APC 27
- APC 27 Standards of performance for iron and steel plants.
- Chapter Twenty-Eight: APC 28
- APC 28 Standards of performance for sewage sludge incinerators.
- Chapter Twenty-Nine: APC 29
- APC 29 Standards of performance for grain handling facilities.
- Chapter Thirty: APC 30
- APC 30 Emission standards for beryllium.
- Chapter Thirty-One: APC 31
- APC 31 Emission standards for mercury.

APC 32	Standards of performance for fossil fuel-burning direct heating equipment.
6 MCAR S 4.0033	Standards of performance for coal handling facilities within designated areas.
6 MCAR S 4.0039	Emergency episodes.
6 MCAR S 4.0041	Offset rule.
NPC 1	Definitions, severability and variances for noise pollution control regulations.
NPC 2	Noise standards.
6 MCAR S 4.2004	Motor vehicle noise limits.

Chapter One: MPCA 1

MPCA 1 Duty of candor.

Chapter Two: MPCA 2

MPCA 2 Definitions.

Chapter Three: MPCA 3

MPCA 3 Agency meetings and officers.

Chapter Four: MPCA 4

MPCA 4 Declaration of emergency.

Chapter Five: MPCA 5

MPCA 5 Permits.

Chapter Six: MPCA 6

MPCA 6 Variances.

Chapter Seven: MPCA 7

MPCA 7 Stipulation agreements.

Chapter Eight: MPCA 8

MPCA 8 Informal complaints.

Chapter Nine: MPCA 9

MPCA 9 Hearings.

Chapter Ten: MPCA 10
MPCA 10 Inspection and confidential information.

Chapter Eleven: MPCA 11
MPCA 11 Sanctions.

Chapter Twelve: MPCA 12
MPCA 12 Conflict of interest.

Chapter Thirteen: MPCA 13
MPCA 13 Public participation in agency matters.
SR-1 Applicability and definition.
SR-2 Criteria.
SR-3 Review procedure.
SR-4 Exemptions.
SR-5 Information required for review.
SR-6 Confidentiality.

Solid Waste Disposal Regulations

SW 1 Applicability, definitions and general conditions for solid waste collection, transportation and disposal. Severability and variances.
SW 2 Solid waste storage.
SW 3 Collection and transportation of solid waste.
SW 4 Intermediate and final disposal of solid waste.
SW 5 Plan approval and permit issuance, denial and revocation.
SW 6 Sanitary landfill.
SW 7 Incineration.
SW 8 Composting.
SW 9 Other methods of solid waste handling, processing and disposal.
SW 10 Nonconforming sites and facilities.
6 MCAR S 4.6011 Exemptions for solid waste disposal facilities located in sparsely populated areas and county solid waste management plans.
SW 12 Solid waste land disposal site abandonment.

Regulations for the Disposal and Reuse of Abandoned Motor Vehicles and Other Scrap Metal

SW 75 Applicability and general conditions, definitions, and severability.

SW 76		Regional collection sites.
SW 77		Collection and sale.
SW 78		Reimbursable contracts.
SW 79		Licensing and revocation.
SW 80		Applicability and general conditions, definitions and severability.
SW 81		Application procedure for grants-in-aid.
SW 82		Criteria for eligibility.
SW 83		Administration of grants-in-aid.
6 MCAR S 4.6085		Rule for the administration of the Minnesota solid waste management planning assistance program.
6 MCAR S 4.6086		Rule for the administration of the Minnesota solid waste management demonstration program.

Rules Relating to Certification of Waste Disposal
Facility Operators and Inspectors

6 MCAR S 4.6088	Certification of operators and inspectors of waste disposal facilities.
6 MCAR S 4.6089	Definitions.
6 MCAR S 4.6090	Classification of disposal facilities.
6 MCAR S 4.6091	Certification committee.
6 MCAR S 4.6092	Individuals required to be certified.
6 MCAR S 4.6093	Certification of facility operators.
6 MCAR S 4.6094	Certification of facility inspectors.
6 MCAR S 4.6095	Application for examination.
6 MCAR S 4.6096	Examinations.
6 MCAR S 4.6097	Certificates.
6 MCAR S 4.6098	Fees.
6 MCAR S 4.6099	Sanctions.
6 MCAR S 4.6100	Certification deadline.

Chapter Five: General Provisions

6 MCAR S 4.6101	Purpose and scope.
6 MCAR S 4.6102	Permit and letter of approval requirements.
6 MCAR S 4.6103	Definitions.
6 MCAR S 4.6104	Variance.
6 MCAR S 4.6105	Application requirements for landspreading sites.
6 MCAR S 4.6106	Application requirements for landspreading facilities.
6 MCAR S 4.6107	Administration of letters of approval.
6 MCAR S 4.6108	Administration of site disposal system permits.

Chapter Six: Landspreading Sites

6 MCAR S 4.6111	Requirements and limitations.
6 MCAR S 4.6112	Record keeping and annual reporting.

Chapter Seven: Landspreading Facilities

- 6 MCAR S 4.6121 Requirements and limitations.
- 6 MCAR S 4.6122 Record keeping and annual reporting.

Chapter Eight: Appendices

- 6 MCAR S 4.6131 Collection and analysis of sewage sludge samples.
- 6 MCAR S 4.6132 Collection and analysis of soil samples.
- 6 MCAR S 4.6133 Collection and analysis of vegetative tissue samples.
- 6 MCAR S 4.6134 Collection and analysis of ground water samples.
- 6 MCAR S 4.6135 Determination of sewage sludge application rate based on crop nitrogen requirements.
- 6 MCAR S 4.6136 Pathogen reduction process.

Chapter One: WPC 1

- WPC 1 Classification and standards for the Mississippi River and tributaries from the Rum River to the upper lock and dam at St. Anthony Falls.

Chapter Four: WPC 4

- WPC 4 Regulation relating to storage or keeping of oil and other liquid substances capable of polluting waters of the state.
- 6 MCAR S 4.8014 Criteria for the classification of the intrastate waters of the state and the establishment of standards of quality and purity.
- 6 MCAR S 4.8015 Criteria for the classification of the interstate waters of the state and the establishment of standards of quality and purity.

Chapter Twenty-Two: WPC 22

- WPC 22 Classification of underground waters of the state and standards for waste disposal.
- 6 MCAR S 4.8024 Classifications of intrastate waters of Minnesota.
- 6 MCAR S 4.8025 Classifications of interstate waters of Minnesota.

Chapter Twenty-Seven: WPC 27

WPC 27 Effluent standards for disposal systems discharging to the intrastate waters of the Lake Superior Basin, and to the interstate waters of Lake St. Croix.

Chapter Twenty-Eight: WPC 28

WPC 28 Effluent standards for disposal systems discharging to the St. Louis River from its source to and including St. Louis Bay and Superior Bay; the Mississippi River from its source to the Blandin Dam in Grand Rapids including Lakes Andrusia, Bemidji, Cass, Itasca, Pokegama, and Winibigoshish; and the Little Minnesota River and Big Stone Lake, and Albert Lea Lake.

Chapter Thirty: WPC 30

WPC 30 Effluent standards for disposal systems discharging to the St. Croix River from the Wisconsin border crossing to Taylors Falls.
6 MCAR S 4.8034 Rule for the administration of the Minnesota state water pollution control fund and federal grant funds allotted to Minnesota.

Chapter Thirty-Six: WPC 36

WPC 36 Regulation for administration of the national pollutant discharge elimination system (NPDES) and state disposal system permit programs.

Chapter Thirty-Seven: WPC 37

WPC 37 Standards for the limitation of the amount of phosphorus in various cleaning agents and chemical water conditioners.

Chapter Thirty-Eight

- 6 MCAR S 4.8038 Requirements for labeling of products containing PCB and for issuing certificates of exemption for use, possession, sale, purchase, or manufacture of PCB or products containing PCB.
- 6 MCAR S 4.8040 Individual sewage treatment systems standards.

Chapter Forty-One: WPC 41

- WPC 41
- 6 MCAR S 4.8043 Effluent standards for disposal systems discharging to the south fork of the Zumbro River.

Rules for the Control of Pollution from Animal Feedlots.

- 6 MCAR S 4.8051 Rules for the control of pollution from animal feedlots.
- 6 MCAR S 4.8052 Rules for the processing of animal feedlot permit applications by counties.
- 6 MCAR S 4.9001 General applicability, definitions, abbreviations, incorporations, severability, and variances.
- 6 MCAR S 4.9002 Classification, evaluation and certification of waste.
- 6 MCAR S 4.9003 Generation of hazardous waste.
- 6 MCAR S 4.9004 Location, operation and closure of a hazardous waste facility.
- 6 MCAR S 4.9005 Transportation of hazardous waste.
- 6 MCAR S 4.9006 Hazardous waste facility permit program.
- 6 MCAR S 4.9007 Contents of hazardous waste facility permit applications.
- 6 MCAR S 4.9008 Hazardous waste shipping papers.
- 6 MCAR S 4.9009 County regulation of hazardous waste management.
- 6 MCAR S 4.9010 Spillages and leakages of hazardous waste.

PREFACE

Background, Charter, Objective and Policy of the MINNESOTA POLLUTION CONTROL AGENCY (Air Quality Division)

1. Background

The following air quality standards and emission regulations apply to any source or emission located partially or wholly within the State of Minnesota. Regulations are of general application throughout the state unless specifically indicated otherwise by their context. The official policy and purpose of the State of Minnesota in regard to air quality control is set forth in Minnesota Statutes 1967.

2. Charter and Objectives

- (a) Section 116.07, Subd. 2. The Pollution Control Agency shall adopt standards of air quality, including maximum allowable standards of emission of air contaminants from motor vehicles, recognizing that due to variable factors, no single standard of purity of air is applicable to all areas of the state. In adopting standards, the Pollution Control Agency shall give due recognition to the fact that the quantity or characteristics of air contaminants or the duration of their presence in the atmosphere, which may cause air pollution in one area of the state, may cause less or not cause any air pollution in another area of the state, and it shall take into consideration in this connection such factors, including others which it may deem proper, as existing physical conditions, zoning classifications, topography, prevailing wind direction and velocities, and the fact that a standard of air quality which may be proper as to an essentially residential area of the state, may not be proper as to a highly developed industrial area of the state. Such standards of air quality shall be premised upon scientific knowledge of causes as well as effects based on technically substantiated criteria and commonly accepted practices.
- (b) Subd. 4. Pursuant and subject to the provisions of chapter 15, and the provisions hereof, the Pollution Control Agency may adopt, amend, and rescind regulations and standards having the force of law relating to any purpose within the provisions of this act for the prevention, abatement, or control of air pollution. Any such regulation or standard may be of general application throughout the state or may be limited as to times, places, circumstances, or conditions in order to make due allowance for variations therein. Without limitation, regulations or standards may relate to sources of emissions of air contamination or air pollution, to the quality or composition of such emissions, or to the quality of or composition of the ambient air or outdoor atmosphere or to any other matter relevant to the prevention, abatement, or control of air pollution.
- (c) Subd. 5. The Pollution Control Agency may grant variances from the requirements of regulations or standards upon such procedure and conditions as it may by regulation prescribe in order to avoid undue hardship and promote the effective and reasonable application and enforcement of the laws, regulations, and standards for prevention, abatement, and control of air pollution.

(d) Subd. 6. 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.

3. Policy

Consistent with these objectives, it shall be the policy of the Pollution Control Agency that new equipment capable of becoming a source of air pollution be provided with the maximum control capability which is technically practicable and economically reasonable. The Pollution Control Agency shall encourage the development and expansion of air pollution control programs in cities, counties and other political subdivisions of the state and provide planning, technical and enforcement assistance.

CHAPTER ONE: APC 1

APC 1 Ambient Air Quality Standards

(a) The "primary" air quality standards are levels of air pollutants above which, on the basis of present knowledge, health hazards or impairment may be produced. Health hazards include not only production, aggravation or possible production of disease, but also interference with function. Health impairment includes sensory irritation and impairment of well being by such phenomena as odor. The "secondary" air quality standards are levels which are desirable to protect the public welfare from any known or anticipated adverse effects, such as injury to agricultural crops and livestock, damage to or deterioration of property, annoyance and nuisance of person, sensory impairment and obstruction, or hazards to air and ground transportation.

(b) No person shall emit any pollutant in such an amount or in such a manner as to exceed any ambient air quality standard herein beyond such person's property line, without respect to whether emission regulations stated in other air pollution control regulations of the Agency are also being violated.

(c) State Ambient Air Quality Standards^(a) (b) (c)

Pollutant/ Air Contaminant	Concentration	Remarks
(1) Hydrogen Sulfide^(d) (primary standards)	0.05 ppm by volume (70.0 micrograms per cubic meter)	½ hr. average not to be exceeded over 2 times per yr.
	0.03 ppm by volume (42.0 micrograms per cubic meter)	½ hr. average not to be exceeded over 2 times in any 5 consecutive days
(2) Photochemical^(e) Oxidants (primary and secondary standards)	0.07 ppm by volume (130 micrograms per cubic meter)	maximum 1 hr. concentration not to be exceeded more than once per yr.
(3) Carbon Monoxide^(f) (primary and secondary standards)	9 ppm by volume (10 milligrams per cubic meter)	maximum 8 hr. concentration not to be exceeded more than once per yr.
	30 ppm by volume (35 milligrams per cubic meter)	maximum 1 hr. concentration not to be exceeded more than once per yr.
(4) Hydrocarbons^(g) (primary and secondary standards)	0.24 ppm by volume (160 micrograms per cubic meter)	maximum 3 hr. concentration (6 to 9 a.m.) not to be exceeded more than once per yr., corrected for methane

Pollution/Air Contaminant	Concentration	Remarks
(5) Sulfur Oxides ^(h) (primary and secondary standards)	0.02 ppm by volume (60 micrograms per cubic meter)	maximum annual arithmetic mean
	0.1 ppm by volume (260 micrograms per cubic meter)	maximum 24 hr. concentration not to be exceeded more than once per yr.
	0.25 ppm by volume (655 micrograms per cubic meter)	maximum 3 hr. concentration not to be exceeded more than once per yr.
(6) Particulate ⁽ⁱ⁾ Matter (primary standard)	75 micrograms per cubic meter	maximum annual geometric mean
	260 micrograms per cubic meter	maximum 24 hr. concentration not to be exceeded more than once per yr.
Particulate Matter (secondary standard)	60 micrograms per cubic meter	maximum annual geometric mean
	150 micrograms per cubic meter	maximum 24 hr. concentration not to be exceeded more than once per yr.
(7) Nitrogen Oxides ^(j) (primary and secondary standards)	0.05 ppm (100 micrograms per cubic meter)	maximum annual arithmetic mean

Footnotes:

- (a) All standards apply throughout the State of Minnesota.
- (b) All measurements of ambient air quality are corrected to a reference temperature of 25° C. and a reference pressure of 760 mm of mercury.
- (c) All measurements and tests shall be conducted by the methodology referenced herein, or other methodology as the Director shall hereafter approve.
- (d) By methylene blue, or other method approved by the Director.
- (e) Neutral-buffered one percent potassium iodide colorimetric detection technique corrected for SO₂ and NO₂ interference, gas phase chemiluminescence, or other method approved by the Director.
- (f) Nondispersive infrared spectrometry (N.D.I.R.), or other method approved by the Director.
- (g) Flame ionization, or other method approved by the Director.
- (h) By pararosaniline, coulometric, or other method approved by the Director.
- (i) High volume method, or other method approved by the Director.
- (j) Jacobs-Hochheiser, or other method approved by the Director.

[July 7, 1969; amended June 3, 1970; amended February 18, 1971; amended April 13, 1972]

CHAPTER TWO: APC 2

H105
APC 2 Definitions, Abbreviations, Applicability of Standards, Access to Premises, Variances, Circumvention, Severability

(a) Definitions. As used in the air pollution control regulations the following words shall have the meanings defined herein:

(1) "Agency" means the Minnesota Pollution Control Agency as constituted pursuant to Minn. Stat. § 116.02 subd. 1.

(2) "Alternative method" means any method of sampling and analyzing for an air pollutant which is not a reference or equivalent method but which has been demonstrated to the Agency's satisfaction to, in specific cases, produce results adequate for its determination of compliance.

(3) "Breakdown" means any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or usual manner. Failures that are caused entirely or in part by poor maintenance, careless operation, or any other preventable upset condition or preventable equipment breakdown shall not be considered breakdowns.

(4) "Construction" means fabrication, erection, or installation of an affected facility or an emission facility of which an affected facility is a part.

(5) "Continuous monitoring system" means the total equipment used to sample and condition (if applicable), to analyze, and to provide a permanent record of emissions or process parameters.

(6) "Commenced" means that an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

(7) "Control equipment" means an "air containment treatment facility" or a "treatment facility" as those terms are defined in Minn. Stat. § 116.06 subd. 6.

(8) "Director" means the Executive Director and Chief Executive Officer of the Agency.

(9) "Emission facility" means any building, facility, installation, structure, work, equipment, machinery, device, apparatus or other means whereby an emission is caused to occur.

(10) "Equivalent method" means any method of sampling and analyzing for an air pollutant which has been demonstrated to the Agency's satisfaction to have under specified conditions a consistent and quantitatively known relationship to the Reference Methods set forth in 40 C.F.R. Part 60, Appendix A.

(11) "Isokinetic sampling" means sampling in which the linear velocity of the gas entering the sampling nozzle is equal to that of the undisturbed gas stream at the sample point.

(12) "Method 1" means the test method for Sample and Velocity Traverses for Stationary Sources, set forth in 40 C.F.R. Part 60, Appendix A — Reference Methods.

(13) "Method 2" means the test method for Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube), set forth in 40 C.F.R. Part 60, Appendix A — Reference Methods.

(14) "Method 3" means the test method for Gas Analysis for Carbon Dioxide, Excess Air, and Dry Molecular Weight, set forth in 40 C.F.R. Part 60, Appendix A — Reference Methods.

(15) "Method 4" means the test method for Determination of Moisture in Stack Gases, set forth in 40 C.F.R. Part 60, Appendix A — Reference Methods.

(16) "Method 5" means the test method for Determination of Particulate Emissions from Stationary Sources, set forth in 40 C.F.R. Part 60, Appendix A — Reference Methods.

(17) "Method 6" means the test method for Determination of Sulfur Dioxide Emissions from Stationary Sources, set forth in 40 C.F.R. Part 60, Appendix A — Reference Methods.

(18) "Method 7" means the test method for Determination of Nitrogen Oxide Emissions from Stationary Sources, set forth in 40 C.F.R. Part 60, Appendix A — Reference Methods.

(19) "Method 8" means the test method for Determination of Sulfuric Acid Mist and Sulfur Dioxide Emissions from Stationary Sources, set forth in 40 C.F.R. Part 60, Appendix A — Reference Methods.

(20) "Method 9" means the test method for Visual Determination of the Opacity of Emissions from Stationary Sources, set forth in 40 C.F.R. Part 60, Appendix A — Reference Methods.

(21) "Method 10" means the test method for Determination of Carbon Monoxide Emissions from Stationary Sources, set forth in 40 C.F.R. Part 60, Appendix A — Reference Methods.

(22) "Method 11" means the test method for Determination of Hydrogen Sulfide Emissions from Stationary Sources, set forth in 40 C.F.R. Part 60, Appendix A — Reference Methods.

(23) "Minneapolis-St. Paul Air Quality Control Region" means the territorial area encompassed by the boundaries of the following counties: Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington. See 40 C.F.R. § 81.27.

(24) "Monitoring device" means the total equipment used to measure and record (if applicable) process parameters.

(25) "New source performance standard" means a standard of performance for a new affected facility.

(26) "Nitrogen oxides" means all oxides of nitrogen except nitrous oxide.

(27) "One-hour period" means any 60 minute period commencing on the hour.

(28) "Opacity" means the degree to which emissions reduce the transmission of light and obscure the view of an object in the background.

(29) "Owner or operator" means any person who owns, leases, operates, controls, or supervises an affected facility or an emission facility of which an affected facility is a part.

(30) "Particulate matter" means material, except uncombined water, which exists at standard conditions in a finely divided form as a liquid or solid.

(31) "Performance Specification 1" means Performance Specifications and Specification Test Procedures for Transmission Systems for Continuous Measurement of the Opacity of Stack Effluents, set forth in 40 C.F.R. Part 60, Appendix B — Performance Specifications.

(32) "Performance Specification 2" means Performance Specifications and Specification Test Procedures for Monitors of SO₂ and NO_x from Stationary Sources, set forth in 40 C.F.R. Part 60, Appendix B — Performance Specifications.

(33) "Performance Specification 3" means Performance Specifications and Specification Test Procedures for Monitors of CO and O₂ from Stationary Sources, set forth in 40 C.F.R. Part 60, Appendix B — Performance Specifications.

(34) "Person" means person as defined in Minn. Stat. § 116.06 subd. 8.

(35) "Proportional sampling" means sampling at a rate that produces a constant ratio of sampling rate to stack gas flow rate.

(36) "Shutdown" means the cessation of operation of an emission facility, an affected facility or process equipment for any purpose.

(37) "Six minute period" means any one of the ten equal parts of a one-hour period.

(38) "Smoke" means small gas-borne particles resulting from incomplete combustion, consisting predominantly, but not exclusively of carbon and other combustible material, or ash, that form a visible plume in the air.

(39) "Startup" means the setting in operation of an emission facility, an affected facility or process equipment for any purpose.

(40) "Standard Conditions" means a temperature of 20°C (68°F) and a pressure of 760 mm of Hg (29.92 in. of Hg).

(41) "Standard of Performance" means a restriction on the amount of air pollutants which may be emitted by an affected facility.

(42) "Run" means the net period of time during which an emission sample is collected. Unless otherwise specified, a run may be either intermittent or continuous within the limits of good engineering practice.

(b) Abbreviations

The abbreviations used in these air pollution control regulations have the following meanings:

(1) avg. — average	(19) g eq — gram equivalents
(2) A.S.T.M. — American Society for Testing and Materials	(20) gr — grain(s)
(3) Be — Beryllium	(21) hr — hour(s)
(4) Btu — British thermal unit	(22) HCl — hydrochloric acid
(5) °C — degree Celsius (centigrade)	(23) Hg — mercury
(6) cal — calorie	(24) H ₂ O — water
(7) CdS — cadmium sulfide	(25) H ₂ S — hydrogen sulfide
(8) cfm — cubic feet per minute	(26) H ₂ SO ₄ — sulfuric acid
(9) CO — carbon monoxide	(27) I.D. — inside diameter
(10) CO ₂ — carbon dioxide	(28) in. — inch(es)
(11) dscm — dry cubic meter(s) at standard conditions	(29) in. H ₂ O — inches of water
(12) dscf — dry cubic feet at standard conditions	(30) in. Hg — inches of mercury
(13) eq — equivalents	(31) °K — degree Kelvin
(14) °F — degree Fahrenheit	(32) k — 1,000
(15) ft ² — square feet	(33) kg — kilogram(s)
(16) ft ³ — cubic feet	(34) l — liter(s)
(17) g — gram(s)	(35) lpm — liter(s) per minute
(18) gal — gallon(s)	(36) lb — pound(s)
	(37) M — molar
	(38) m — meter(s)
	(39) m ³ — cubic meter(s)

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| <ul style="list-style-type: none"> (40) meq — milliequivalent(s) (41) mg — milligram(s) (42) min — minute(s) (43) ml — milliliter(s) (44) mm — millimeter(s) (45) mol. wt. — molecular weight (46) mV — millivolt (47) N — normal (48) N₂ — nitrogen (49) nm — nanometer(s) — 10⁻⁹ meter (50) NO — nitric oxide (51) NO₂ — nitrogen dioxide (52) NO_x — nitrogen oxides (53) O₂ — oxygen | <ul style="list-style-type: none"> (54) O.D. — outside diameter (55) oz — ounce(s) (56) ppb — parts per billion (57) ppm — parts per million (58) psia — pounds per square inch absolute (59) °R — degree Rankine (60) s — at standard conditions (61) sec — second (62) SO₂ — sulfur dioxide (63) SO₃ — sulfur trioxide (64) ug — microgram(s) — 10⁻⁶ gram (65) v/v — volume per volume (66) w.g. — water gauge (67) yd² — square yard(s) |
|--|--|

(c) Applicability of Standards of Performance

(1) **Affected Facilities.** An “affected facility” is any equipment, apparatus, or process to which a standard of performance set forth in these air pollution control regulations is applicable. An affected facility may be an individual unit of process equipment, e.g., the clinker cooler in a portland cement plant, or an entire process, e.g., a nitric acid production unit. An affected facility may be an emission facility for which a permit is required under Minnesota Regulation APC 3.

(2) **Existing Facilities.** An affected facility is an existing facility if:

(aa) It was in operation on the effective date of the applicable new source performance standard; or

(bb) The owner or operator of the affected facility commenced construction or modification of the affected facility prior to the effective date of the applicable new source performance standard for the affected facility.

(3) **New Facilities.** An affected facility which is not an existing facility is a new facility.

(4) **Effective Date.** The effective date for new source performance standards for affected facilities shall be as follows:

(aa) Fossil Fuel-Fired Steam Generators (APC 4)—August 17, 1971.

(bb) Incinerators (APC 7) — August 17, 1971.

(cc) Storage Vessels for Petroleum Liquids (APC 13) — June 11, 1973.

(dd) Sulfuric Acid Plants (APC 15) — August 17, 1971

(ee) Nitric Acid Plants (APC 16) — August 17, 1971

(ff) Portland Cement Plants (APC 22) — August 17, 1971

(gg) Asphalt Concrete Plants (APC 23) — June 11, 1973

(hh) Petroleum Refineries (APC 24) — June 11, 1973

(ii) Secondary Lead Smelters (APC 25) — June 11, 1973

(jj) Secondary Brass and Bronze Ingot Production Plants (APC 26) — June 11, 1973

(kk) Iron and Steel Plants (APC 27) — June 11, 1973

(ll) Sewage Sludge Incinerators (APC 28) — June 11, 1973

(mm) All others — the date the applicable new source performance standard became law.

(5) **Modifications**

(aa) A modification to an existing affected facility is any physical change in, or change in the method of operation of, an affected facility which increases the amount of emissions into the atmosphere of any air pollutant

to which a new source performance standard applies or which results in the emission of any air pollutant not previously emitted, to which a new source performance standard applies.

(bb) Any owner or operator who modifies an existing affected facility after the effective date of an applicable new source performance standard shall comply with the new source performance standard for the affected facility for each pollutant to which a standard applies and for which there is an increase in the emission rate to the atmosphere.

(cc) Emission rate shall be expressed as kg/hr of any pollutant discharged into the atmosphere for which a standard is applicable. The Agency shall use the following to determine emission rate:

(i) Emission factors as specified in the latest issue of "Compilation of Air Pollutant Emission Factors," EPA Publication No. AP-42, or other emission factors determined by the Agency to be superior to AP-42 emission factors, in cases where utilization of emission factors demonstrate that the emission level resulting from the physical or operational change will either clearly increase or clearly not increase.

(ii) Material balances, continuous monitor data, or manual emission tests in cases where utilization of emission factors as referenced in paragraph (i) does not demonstrate to the Agency's satisfaction whether the emission level resulting from the physical or operational change will either clearly increase or clearly not increase, or where an owner or operator demonstrates to the Agency's satisfaction that there are reasonable grounds to dispute the result obtained by the Agency utilizing emission factors as referenced in paragraph (i). When the emission rate is based on results from manual emission tests or continuous monitoring systems, the procedures specified in Appendix C—Determination of Emission Rate Change, set forth in 40 C.F.R. Part 60, shall be used to determine whether an increase in emission rate has occurred. Tests shall be conducted under such conditions as the Agency shall specify to the owner or operator based on representative performance of the facility. At least three valid test runs must be conducted before and at least three after the physical or operational change. All operating parameters which may affect emissions must be held constant to the maximum feasible degree for all test runs.

(dd) The requirements of subsection (5)(bb) shall not apply if the owner or operator who modifies an existing affected facility can demonstrate to the Agency that modification of the affected facility will not result in an increase in total emissions from all existing emission sources in the process. The required reduction may be accomplished through the installation or improvement of a control system or through physical or operational changes to facilities including reducing the production of a facility or closing a facility. The Director may require the submission of such information as the Director deems necessary to a determination whether there will be an increase in total emissions.

(ee) The owner or operator of an existing affected facility may undertake any of the following modifications without being required to comply with the new source performance standard for the affected facility:

(i) Maintenance, repair, and replacement which the Agency determines to be routine.

(ii) An increase in production rate, if that increase can be accomplished without a major capital expenditure. "Capital expenditure" means an expenditure for a physical or operational change to an existing facility which exceeds the product of the applicable "annual asset guideline repair allowance percentage" specified in Internal Revenue Service Publication 534 and the

existing facility's basis, as defined by section 1012 of the Internal Revenue Code.

(iii) An increase in the hours of production.

(iv) Use of an alternative fuel or raw material if, prior to the effective date of the applicable new source performance standard, the existing facility was designed to accommodate that alternative use. A facility shall be considered to be designed to accommodate an alternative fuel or raw material if provisions for that use were included in the final construction specifications.

(v) Conversion to coal required by state or federal law for energy considerations.

(vi) The addition or use of any control equipment, except when control equipment is replaced with other control equipment which the Agency determines to be less environmentally beneficial.

(vii) The relocation or change in ownership of an existing facility.

(ff) The modification of an affected facility or the addition of a new affected facility shall not by itself require the owner or operator to comply with the new source performance standards for other existing facilities.

(gg) Any owner or operator who modifies a new affected facility shall comply with the new source performance standard.

(hh) Nothing in this subsection (c) shall affect the requirement of Minnesota Regulation APC 3(e) that a permit be obtained from the Agency to undertake certain alterations and modifications to emission facilities and control equipment.

(6) Reconstruction

(aa) The owner or operator of an existing affected facility who reconstructs the facility shall comply with the applicable new source performance standard for the reconstructed affected facility.

(bb) "Reconstruction" means the replacement of components of an existing facility to such an extent that:

(i) The fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility, and

(ii) It is technologically and economically feasible to meet the applicable standards set forth in this part.

(iii) "Fixed capital cost" means the capital needed to provide all the depreciable components.

(iv) If an owner or operator of an existing facility proposes to replace components, and the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility, he shall notify the Agency of the proposed replacements. The notice must be postmarked 60 days (or as soon as practicable) before construction of the replacements is commenced and must include the following information:

1. Name and address of the owner or operator.
2. The location of the existing facility.
3. A brief description of the existing facility and the components which are to be replaced.
4. A description of the existing air pollution control equipment and the proposed air pollution control equipment.

5. An estimate of the fixed capital cost of the replacements and of constructing a comparable entirely new facility.

6. The estimated life of the existing facility after the replacements.

7. A discussion of any economic or technical limitations the facility may have in complying with the applicable standards of performance after the proposed replacements.

(cc) The Agency shall consider the following in determining whether an existing facility has been reconstructed:

(i) The fixed capital cost of the replacements in comparison to the fixed capital cost that would be required to construct a comparable entirely new facility;

(ii) The estimated life of the facility after the replacements compared to the life of a comparable entirely new facility;

(iii) The extent to which the components being replaced cause or contribute to the emissions from the facility; and

(iv) Any economic or technical limitations on compliance with applicable standards of performance which are inherent in the proposed replacements.

(d) Access to Premises and Information

(1) The owner or operator of an emission facility shall allow the Agency, or any authorized employee or agent of the Agency, upon presentation of proper credentials, to examine and copy any books, papers, records or memoranda pertaining to the operation of the emission facility.

(2) The owner or operator of an emission facility shall allow the Agency, or any authorized employee or agent of the Agency, upon presentation of proper credentials, to enter upon the property of the owner or operator for the purpose of obtaining information or examining records or conducting surveys or investigations, whenever such entrance is necessary for the purpose of these regulations.

(e) Variances. Whereupon written application of the responsible person or persons the Agency finds that by reason of exceptional circumstances strict conformity with any provisions of the emission standards contained herein would cause undue hardship, would be unreasonable, impractical or not feasible under the circumstances, the Agency may permit a variance from these emission standards upon such conditions and within such time limitations as it may prescribe for prevention, control or abatement of air pollution in harmony with the intent of the State and any applicable Federal laws.

(f) Circumvention. No person shall cause or permit the installation or use of any device or any means which, without resulting in reduction in the total amount of air contaminants emitted, conceals or dilutes an emission of air contaminant which would otherwise violate an air pollution control regulation.

(g) Severability. If any provision of any regulation or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions or application of any other part of such regulation or any other regulation which can be given effect without the invalid provision or application, and to this end the provisions of all regulations and the various applications thereof are declared to be severable.

[July 7, 1969; amended June 5, 1970; amended June 28, 1974; amended May 7, 1976]

CHAPTER THREE: APC 3**APC 3 Permits****(a) Installation Permits**

(1) **Permit Required.** No person shall install or construct any emission facility or control equipment without an installation permit therefor from the Agency.

(2) **Permit Application.** Any person who is required to obtain an installation permit under this regulation shall submit to the Director plans and specifications of the emission facility or control equipment containing the following information:

(aa) **Expected composition of the effluent stream, both before and after the installation of an air cleaning device, including emission rate, concentration, volume and temperature;**

(bb) **Expected physical characteristics of particulates;**

(cc) **Type of cleaning device, if any;**

(dd) **Location and elevation of the emission point and other factors relating to dispersion and diffusion of the contaminant in the outer air, and the relation of the emission point to nearby structures, window openings, and other information necessary to appraise the possible effects of the effluent;**

(ee) **Any other reasonable and pertinent information that may be required by the Director.**

(3) **Decision.** The Agency shall not grant an installation permit unless the Agency determines that the emission facility or control equipment will comply with the requirements of applicable pollution control statutes and regulations.

(b) Operating Permits

(1) **Permit Required.** No person shall operate any emission facility or control equipment without an operating permit therefor from the Agency. Any person operating an emission facility or control equipment for which an installation permit has been obtained shall be permitted to operate without an operating permit for a period of ninety (90) days following commencement of operation of the emission facility or control equipment. The Agency may extend this time for good cause.

(2) **Permit Application.** Any person who is required to obtain an operating permit under this regulation shall submit to the Director plans and specifications of the emission facility or control equipment containing the following information:

(aa) **Composition of the effluent stream, both before and after the installation of an air cleaning device, including emission rate, concentration, volume and temperature;**

(bb) **Physical characteristics of particulates;**

(cc) **Type of cleaning device, if any;**

(dd) Location and elevation of the emission point and other factors relating to dispersion and diffusion of the contaminant in the outer air, and the relation of the emission point to nearby structures, window openings, and other information necessary to appraise the possible effects of the effluent;

(ee) Any other reasonable and pertinent information that may be required by the Director.

(3) Agency Decision. The Agency shall not grant an operating permit unless the Agency determines that operation of the emission facility or control equipment will comply with the requirements of applicable pollution control statutes and regulations.

(c) Delegation of Permit Authority. The Agency may delegate to any city, county, or other political subdivision of the State of Minnesota, the authority to issue installation and operating permits required under this regulation.

(d) Exemptions

(1) Installation and Operating Permits. The following emission facilities are exempt from the requirements of paragraphs (a) and (b) of this regulation:

(aa) All fuel-burning installations of less than 1,000,000 BTU per hour input;

(bb) All fuel-burning installations of less than 10,000,000 BTU per hour input burning only natural gas, liquified petroleum gas, or No. 1 or No. 2 fuel oil;

(cc) Comfort air conditioning or comfort ventilating systems not designed to remove air contaminants generated by or released from specific units or equipment;

(dd) Incinerators of less than 100 pounds per hour burning capacity.

(e) Permits for Alterations and Modifications. The requirements of subparagraphs (a) and (b) of this regulation shall apply to any change in, addition to, or extension of any emission facility or control equipment that would materially alter the method or effect of treating or disposing of any air contaminant.

(f) Anti-degradation. Notwithstanding any other provisions of these rules and regulations, an installation permit or an operating permit shall not be issued if the planned construction, installation, reconstruction, alteration or operation would result in emissions of air contaminants causing the violation of the ambient air quality standards established in APC 1.

(g) Permit Conditions

(1) The following conditions apply to all permits issued under this regulation:

(aa) A permit shall not release the Permittee from any liability, penalty, or duty imposed by Minnesota or federal statutes or regulations or local ordinances except the obligation to obtain the permit;

(bb) A permit shall not prevent the future adoption by the Agency of any pollution control regulations, standards, or orders more stringent than those now in existence or prevent the enforcement of such regulations, standards or orders against the Permittee;

(cc) The Permittee shall install and operate the emission facility or control equipment covered by the permit in accordance with plans and specifications submitted to the Agency and referenced in the permit;

(dd) The Permittee shall not knowingly make any false statement, representation or certification in any record, report, plan, or other document required to be submitted to the Agency under this permit. The Permittee shall immediately upon discovery report to the Agency any errors in such records, reports, plans, or other documents;

(ee) The Permittee shall allow the Agency, or any authorized employee or agent of the Agency, when authorized by law and upon the presentation of proper credentials, to examine and copy any books, papers, records or memoranda pertaining to the installation or operation of the emission facility or control equipment covered by the permit;

(ff) The Permittee shall allow the Agency, or any authorized employee or agent of the Agency, when authorized by law and upon presentation of proper credentials, to enter upon the property of the permittee for the purpose of obtaining information or examining records or conducting surveys or investigations pertaining to the installation or operation of the emission facility or control equipment covered by the permit.

(2) The following conditions apply to all Installation Permits issued under this regulation:

(aa) The Permittee shall submit periodic progress reports to the Agency reciting progress and problems occurring in the installation of the emission facility or control equipment covered by the permit. A time schedule for submission of these reports shall be included in the permit;

(bb) The Permittee shall advise the Agency immediately upon completion of installation of the emission facility or control equipment;

(cc) Installation permits shall expire ninety (90) days after installation of the emission facility or control equipment is completed or twelve (12) months after the day it is issued if installation has not begun. Installation shall be deemed to have begun if a continuous program of construction has been undertaken. Interruptions resulting from matters beyond the control of the Permittee shall be considered by the Agency in determining whether installation has begun;

(dd) Such other conditions as the Agency may prescribe for the prevention of pollution.

(3) The following conditions apply to all Operating Permits issued under this regulation:

(aa) The Permittee shall, when requested by the Agency, submit such information and reports which are relevant to control of pollution regarding the operation of the emission facility or control equipment covered by the permit;

(bb) The Permittee shall notify the Agency immediately of a breakdown of more than one hour duration of the control equipment covered by the permit and, if the breakdown causes an increase in the emission of air contaminants, of the breakdown of any process equipment included in the emission facility covered by the permit;

(cc) The Permittee shall notify the Agency at least 24 hours in advance of a shutdown of any control equipment covered by the permit and, if the shutdown would cause an increase in the emission of air contaminants, of a shutdown of any process equipment included in the emission facility covered by the permit;

(dd) Operating Permits shall have a fixed term which shall not exceed five (5) years;

(ee) Such other conditions as the Agency may prescribe for the prevention of pollution.

(h) Permit Procedure. The Agency shall follow the procedure set out below on all permit applications for an installation permit for an emission facility or modification which emits a single air contaminant or air pollutant in excess of one thousand (1000) tons per year.

(1) Within thirty (30) days after receipt of a completed permit application, the Agency shall:

(aa) Make a preliminary evaluation of the effect of the emission facility or modification on the air quality;

(bb) Make available for public inspection in at least one location in the air quality control region in which the emission facility is located, a copy of all materials submitted by the permit applicant and a copy of the Agency's preliminary evaluation of the effect on air quality;

(cc) Give notice by prominent advertisement in a newspaper in the air quality control region affected of the location where the information required in subparagraph (bb) is available and of the opportunity to submit written comment on the permit application for a period of thirty (30) days;

(dd) Provide a thirty (30) day time period for submittal of written public comment;

(ee) Send a copy of the notice specified in subparagraph (cc) to the Region V office of the United States Environmental Protection Agency, to State and local air pollution control agencies having jurisdiction in the air quality control region affected, to city and county officials in the region affected, to the appropriate regional development commissions, to the State Planning Agency, to the applicant, and to all other persons deemed by the Director to have an interest in the permit application.

(2) Public comments submitted in writing within the thirty (30) day comment period shall be considered by the Agency in making its final decision on the permit application. All comments shall be made available for public inspection in at least one location in the region affected.

(3) The Agency shall take final action on the permit application within forty-five (45) days after the close of the public comment period. Notice of the final decision shall be made available for public inspection in at least one location in the region affected.

(4) The Agency may extend each of the time periods specified in paragraph (h) of this regulation for a period not to exceed thirty (30) days or such other period as agreed to by the applicant. Nothing herein, however, shall preclude the Agency from extending any of these time periods for an appropriate length of time if it decides to hold a public hearing or public meeting on any permit application, or if an environmental impact statement on the emission facility or modification is prepared.

(5) Nothing in paragraph (h) of this regulation shall preclude the Agency from following this procedure on any installation permit application for an emission facility or modification not described herein, or for an installation permit for control equipment, or for any operating permit.

(i) Reissuance of Operating Permits

(1) No sooner than 180 days nor later than 90 days prior to the expiration of an operating permit issued pursuant to paragraph (b) of this regulation, a Permittee who wishes to continue operating his emission facility or control equipment shall submit a written request to the Director for reissuance of the operating permit.

(2) After receipt of a written request for reissuance of an operating permit, the Agency shall review the request to determine whether the permittee has complied with all conditions of his existing permit and with all other applicable pollution control statutes and regulations. The Agency or the Director may request the Permittee to submit such information as is deemed necessary to determine compliance. Unless the Agency determines that the Permittee has not complied with all permit conditions and other applicable pollution control statutes and regulations, the Agency shall reissue the operating permit subject to such conditions as the Agency may impose. If the Agency denies the request for reissuance of the permit, the Permittee may reapply pursuant to paragraph (b) of this regulation.

(3) The Agency shall act on a request for reissuance of an operating permit within ninety (90) days after the request is submitted.

[July 7, 1969; amended June 5, 1970; amended April 13, 1972; amended July, 1972; amended June 28, 1974; amended June 4, 1976]

6 MCAR § 4.004 Standards of performance for fossil fuel burning indirect heating equipment.

A. Definitions. As used in this regulation, the following words shall have the meanings defined herein:

1. "Actual heat input" means the number of BTU per hour (cal/hr) determined by multiplying the gross heating value of the fuel by the rate of fuel burned.

2. "Coal refuse" means waste-products of coal mining, cleaning, and coal preparation operations (e.g. culm, gob, etc.) containing coal, matrix material, clay and other organic and inorganic material.

3. "Direct heating equipment" means a furnace, kiln, dryer, or other combustion equipment used in the burning of a fossil fuel for the purpose of processing a material where the products of combustion have direct contact with the heated material.

4. "Distillate oil" means grades of oils known as No. 1 & No. 2, as defined in the A.S.T.M. D 396 (1973).

5. "Fossil fuel" means natural gas, petroleum, coal, wood, peat, and any form of solid, liquid, or gaseous fuel derived from such materials for the purpose of creating useful heat.

6. "Gross heating value" means the gross calorific value (cal/g or BTU/lb) of the fuel combusted as determined by A.S.T.M. test methods D 2015-66(72) for solid fuels; D 1826-64(70) for gaseous fuels, and D 240-64(73) for liquid fuels.

7. "Indirect heating equipment" means a furnace, a boiler or other unit of combustion equipment used in the process of burning fossil fuel for the purpose of producing steam, hot water, hot air, or other hot liquid, gas, or solid, where the products of combustion do not have direct contact with the heated medium.

8. "Rated heat input" means the number of BTU per hour (cal/hr) which the manufacturer has determined to be the continuous rated capability of the indirect heating equipment, or, where the rated heat input is not specified by the manufacturer, the number of BTU per hour (cal/hr) determined by dividing the rated heat output by the overall thermal efficiency.

9. "Residual oil" means grades of oils known as No. 4, No. 5 (Light), No. 5 (Heavy), and No. 6, as listed in A.S.T.M. D 396 (1973).

10. "Steam generating unit" means indirect heating equipment used to produce steam.

11. "Derating" means limitation of heat input and corresponding steam output capacity.

B. Determination of applicable standards of performance.

1. This regulation shall apply to indirect heating equipment for which a standard of performance has not been promulgated in a specific regulation.

2. The applicable standards of performance in Table I or Table II shall be determined by using the rated heat input of the specific indirect heating equipment and the total rated heat inputs of all indirect heating equipment and all direct heating equipment of one owner or operator at that particular location.

3. When different fossil fuels are burned simultaneously in any combination, the applicable sulfur dioxide standard shall be determined by proration using the following formula:

$$w = \frac{y(a) + z(b)}{x + y + z}$$

where:

w is the maximum allowable emissions of sulfur dioxide gases in lbs. per million BTU (nanograms/joule), and

x is the percentage of total heat input derived from gaseous fossil fuel, and

y is the percentage of total heat input derived from liquid fossil fuel,

z is the percentage of total heat input derived from solid fossil fuel, and

a is the allowable SO₂ standard for liquid fossil fuels expressed in lbs per million BTU (nanograms/joule), and

b is the allowable SO₂ standard for solid fossil fuels expressed in lbs per million BTU (nanograms/joule).

4. When different fossil fuels are burned simultaneously in any combination, the applicable nitrogen oxides standard shall be determined by proration using the following formula:

$$w = \frac{x(c) + y(a) + z(b)}{x + y + z}$$

where:

w, x, y and z mean the same as in the formula in paragraph 3, for determining the applicable sulfur dioxide standard; and

a is the allowable NO_x standard for liquid fossil fuels expressed in lbs per million BTU (nanograms/joule); and

b is the allowable NO_x standard for solid fossil fuels expressed in lbs per million BTU (nanograms/joule); and

c is the allowable NO_x standard for gaseous fossil fuels expressed in lbs per million BTU (nanograms/joule).

5. When lignite or a solid fossil fuel containing 25 percent by weight, or more, of coal refuse is burned in combination with gaseous, liquid, or other solid fossil fuel, the standard of performance for nitrogen oxides shall not apply.

C. Standards of performance for existing indirect heating equipment.

1. No owner or operator of indirect heating equipment shall cause to be discharged into the atmosphere from said equipment any gases which contain particulate matter or sulfur dioxide in excess of the standards of performance shown in Table I.

2. No owner or operator of indirect heating equipment shall cause to be discharged into the atmosphere from said equipment any gases which exhibit greater than 20 percent opacity; except that a maximum of 60 percent opacity shall be permissible for four (4) minutes in any 60 minute period and that a maximum of 40 percent opacity shall be permissible for four (4) additional minutes in any 60 minute period.

D. Standards of performance for new indirect heating equipment.

1. No owner or operator of new indirect heating equipment shall cause to be discharged into the atmosphere from said equipment any gases which contain particulate matter, sulfur dioxide or nitrogen oxides in excess of the standards of performance shown in Table II.

2. No owner or operator of new indirect heating equipment or greater than 250 million BTU per hour rated heat input shall cause to be discharged into the atmosphere from said equipment any gases which exhibit greater than 20% opacity; except that a maximum of 40% opacity shall be permissible for not more than two (2) minutes in any 60 minute period.

3. No owner or operator of new indirect heating equipment of 250 million BTU per hour or less rated heat input shall cause to be discharged into the atmosphere from said equipment any gases which exhibit greater than 20% opacity; except that a maximum of 60% opacity shall be permissible for four (4) minutes in any 60 minute period and that a maximum of 40% opacity shall be permissible for four (4) additional minutes in any 60 minute period.

E. Allowance for stack height for indirect heating equipment.

1. The owner or operator of any indirect heating equipment shall determine and install a stack of such height that will not cause pollutant concen-

trations at ground levels to exceed any applicable ambient air quality standard or regulation.

2. The determination of the ground level concentrations shall be based upon applicable dispersion calculations approved by the agency.

F. High heating value. The high heating value of a fossil fuel shall mean the same as the gross heating value.

G. Performance test methods. Unless another method is approved by the director, any person required to submit performance tests for indirect heating equipment shall utilize the following test methods:

1. Method 1 for selection of sampling site and sample traverses.
2. Method 3 for gas analysis.
3. Method 5 for concentration of particulate matter and the associated moisture content.
4. Method 6 for concentration of SO₂.
5. Method 7 for concentration of NO_x.
6. Method 9 for visual determination of opacity.

H. Performance test procedures.

1. The sampling site, as selected by Method 1, shall be the same for each pollutant during a performance test.

2. For Method 5, the sampling time for each run shall be at least 60 minutes and the minimum sampling volume shall be 0.85 dscm (30 dscf) except that smaller sampling times or volumes, when necessitated by process variables or other factors, may be approved by the agency. The probe and filter holder heating systems in the sampling train shall be set to provide a gas temperature between 120°C and 160°C (250°F and 320°F).

3. For Methods 6 and 7, the sampling point in the duct shall be at the center of the cross section or at a point no closer to the walls than 1 m (3.28 ft.). For method 6 the sample shall be extracted at a rate proportional to the gas velocity at the sampling point.

4. For Method 6, the minimum sampling time shall be 20 minutes and the minimum sampling volume 0.02 dscm (0.71 dscf) for each sample. The arithmetic mean of two samples shall constitute one run. Samples shall be taken at approximately 30-minute intervals.

5. For Method 7, each run shall consist of at least four grab samples taken at approximately 15-minute intervals. The arithmetic mean of the samples shall constitute the run value.

6. For each performance test, the emissions expressed in nanograms/joule (lb/million BTU) shall be determined by the following procedure:

$$E = CF \left(\frac{20.90}{20.9 - \%O_2} \right)$$

where:

a. E = pollutant emission, g/million cal nanograms/joule (lb/million BTU).

b. C = pollutant concentration g/dscm (lb/dscf), determined by methods 5, 6 or 7.

c. %O₂ = oxygen content by volume (expressed as percent), dry basis. Percent oxygen shall be determined by using the integrated sampling procedures of method 3 and by analyzing the sample with a continuous monitoring system, or with the Orsat analyzer. The sample shall be obtained as follows:

(1) For determination of sulfur dioxide and nitrogen oxides emissions, the oxygen sample shall be obtained at approximately the same point in the duct as used to obtain the samples for Methods 6 and 7 determinations, respectively.

(2) For determination of particulate emissions, the oxygen sample shall be obtained simultaneously by traversing the duct at the same sampling location used for each run of Method 5 in accordance with Method 1, except that 12 sample points shall be used in all cases.

d. F = factor representing a ratio of the volume of dry flue gases generated to the calorific value of the fuel combusted. Values of F are given as follows:

(1) For anthracitic coal according to A.S.T.M. D388-66, $F = 2.723 \times 10^{-7}$ dscm/j (10140 dscf/10⁶ BTU).

(2) For subbituminous and bituminous coal according to A.S.T.M. D388-66, $F = 2.637 \times 10^{-7}$ dscm/j (9820 dscf/10⁶ BTU).

(3) For liquid fossil fuels including crude, residual, and distillate oils, $F = 2.476 \times 10^{-7}$ dscm/j (9220 dscf/10⁶ BTU).

(4) For gaseous fossil fuels including natural gas, propane, and butane, $F = 2.347 \times 10^{-7}$ dscm/j (8740 dscf/10⁶ BTU).

e. An owner or operator may use the following equation to determine an F factor (dscf/10⁶ BTU) in lieu of the F factors specified by paragraph 6.d. of this section:

$$F = \frac{10^6 [3.64(\%H) + 1.53(\%C) + 0.57(\%S) + 0.14(\%N) - 0.46(\%O)]}{GHV}$$

where:

(1) H, C, S, N and O are content by weight of hydrogen, carbon, sulfur, nitrogen, and oxygen (expressed as percent), respectively, as determined by ultimate analysis of the fuel fired, dry basis, using A.S.T.M. methods D3168-74 or D3176 (solid fuels) or D240-64(73) (liquid fuels) or computed from results using A.S.T.M. method D1137-53(70), D1945-64(73) or D1946-67(72) (gaseous fuels) as applicable.

(2) GHV is the gross heating value (BTU/lb dry basis).

f. When combinations of fuels are fired, the F factors determined by paragraph 6.d. or e. of this section shall be prorated in accordance with the following formula:

$$F = \frac{x F_1 + y F_2 + z F_3}{100}$$

where:

x = the percentage of total heat input derived from gaseous fossil fuel.

y = the percentage of total heat input derived from liquid fossil fuel.

z = the percentage of total heat input derived from solid fossil fuel.

F₁ = the value of F for gaseous fossil fuels according to subsection 6.d. or e. of this regulation.

F₂ = the value of F for liquid fossil fuels according to subsection 6.d. or e. of this regulation.

F₃ = the value of F for solid fossil fuels according to subsection 6.d. or e. of this regulation.

g. When combinations of fossil fuels are fired, the actual heat input, expressed in cal/hr (BTU/hr), shall be determined during each testing period. The rate of fuels burned during each testing period shall be determined by suitable methods and shall be confirmed by a material balance over the indirect heating system.

7. When the emission factor cannot be calculated by means of the method outlined in section H.6., the emission factors for all pollutants for all new and existing indirect heating equipment expressed in nanograms/joule (lb./million BTU) shall be determined by the following procedure:

$$E = \frac{E_t}{Z}$$

where:

E = pollutant emissions, in nanograms/joule (lb./million BTU).

E_t = pollutant emission rate, in nanograms/hr. (lb./hr), determined by Method 5.

Z = actual heat input, in joules/hr., (million BTU/hr).

8. The indirect heating equipment shall be operated during the performance test at ninety (90) percent or more of the rated heat input, or at 100 percent of peak operating load if an owner or operator intends to achieve compliance by derating.

I. Derate. The owner or operator of indirect heating equipment who elects to achieve compliance with an applicable standard of performance by derating shall:

1. Advise the director of the agency in writing of the intent to achieve compliance by derating and the capacity level at which the owner or operator intends to operate this equipment; and

2. Agree to a permit condition in the required operating permit that prohibits operation of the equipment in excess of the derate level; and

3. Install a boiler steam flow meter to continuously record, indicate, and integrate boiler steam flow, and shall:

a. Submit a written report to the director of the agency within ten (10) days of any excess steam flow occurrence above the specified derate load.

b. Use a one (1) hour averaging period in determining an excess above derate with corrections for deviations in steam pressure or temperature if required.

c. Submit written yearly reports to the director of the agency confirming that no excesses have occurred during normal operations.

d. Retain and make available for inspection by the agency or its authorized employees or agents steam flow charts for a minimum period of two (2) years following the date of measurement.

4. An effective method of physical limitation of boiler load shall be submitted for approval by the director of the agency prior to authorization of a boiler derate. Such limitation may include but is not limited to, a tie-back signal from the steam flow meter to the combustion control system cutting back fuel input at the derate load, a maximum limit stop on the fuel input control drive or valve, or such other equivalent physical means.

TABLE I—EXISTING SOURCES

RATED HEAT INPUT OF THE INDIRECT HEATING EQUIPMENT	RATED HEAT INPUT OF ALL DIRECT AND INDIRECT HEATING EQUIPMENT AT THE PARTICULAR LOCATION	EMISSION LIMITATIONS LBS. PER MILLION BTU		
		Particulate Matter All Fuels	SO ₂ Solid Fuels	Liquid Fuels
Million BTU/Hr.	Million BTU/Hr.			
A. Within Minneapolis-St. Paul Air Quality Control Region				
Greater than 250	Greater than 250	0.4	3.0	1.6
Less than or equal to 250	Greater than 250	0.4	3.0	1.6
Less than or equal to 250	Less than or equal to 250	0.4	4.0	2.0
B. Within the City of Duluth				
Greater than 250	Greater than 250	0.4	4.0	2.0
Less than or equal to 250	Greater than 250	0.4	4.0	2.0
Less than or equal to 250	Less than or equal to 250	0.4	N.A.*	N.A.
C. Outside Minneapolis-St. Paul Air Quality Control Region and Outside the City of Duluth				
Greater than 250	Greater than 250	0.6	4.0	2.0
Less than or equal to 250	Greater than 250	0.6	4.0	2.0
Less than or equal to 250	Less than or equal to 250	0.6	N.A.	N.A.

*N.A.—Not applicable

[July 1969; amended April 13, 1972; amended November 24, 1976; amended January 8, 1980.]

TABLE II—NEW SOURCES

RATED HEAT INPUT OF THE INDIRECT HEATING EQUIPMENT	RATED HEAT INPUT OF ALL DIRECT AND INDIRECT HEATING EQUIPMENT AT THE PARTICULAR LOCATION	EMISSION LIMITATIONS LBS. PER MILLION BTU					
		Particulate Matter All Fuels	Solid Fuels	SO ₂ Liquid Fuels	Solid Fuels	NO _x * Gaseous Fuels	Liquid Fuels
Million BTU/Hr.	Million BTU/Hr.						
A. Within Minneapolis-St. Paul Air Quality Control Region							
Greater than 250	Greater than 250	0.1	1.2	0.8	0.7	0.2	0.3
Greater than 100 but less than or equal to 250	Greater than 250	0.1	3.0	1.6	N.A.**	N.A.	N.A.
Less than or equal to 100	Greater than 250	0.4	3.0	1.6	N.A.	N.A.	N.A.
Less than or equal to 250	Less than or equal to 250	0.4	4.0	2.0	N.A.	N.A.	N.A.
B. Within the City of Duluth							
Greater than 250	Greater than 250	0.1	1.2	0.8	0.7	0.2	0.3
Greater than 100 but less than or equal to 250	Greater than 250	0.1	4.0	2.0	N.A.	N.A.	N.A.
Less than or equal to 100	Greater than 250	0.4	4.0	2.0	N.A.	N.A.	N.A.
Less than or equal to 250	Less than or equal to 250	0.4	N.A.	N.A.	N.A.	N.A.	N.A.
C. Outside Minneapolis-St. Paul Air Quality Control Region and Outside the City of Duluth							
Greater than 250	Greater than 250	0.1	1.2	0.8	0.7	0.2	0.3
Less than or equal to 250	Greater than 250	0.4	4.0	2.0	N.A.	N.A.	N.A.
Less than or equal to 250	Less than or equal to 250	0.4	N.A.	N.A.	N.A.	N.A.	N.A.

*NO_x expressed as NO₂

**N.A.—Not applicable

CHAPTER FIVE: APC 5

APC 5 Standards of Performance for Industrial Process Equipment

(a) Definitions. As used in this regulation, the following words shall have the meanings defined herein:

(1) "Collection efficiency" means the percent of the total amount of particulate matter entering the control equipment which is removed from the exhaust stream by the control equipment and is calculated by the following equation:

$$\text{collection efficiency} = \frac{100(A-B)}{A}$$

Where

A = the amount (grams or pounds) or the concentration (gr/SCF) of particulate matter entering the collection equipment

B = the amount (grams or pounds) or the concentration (gr/SCF) of particulate matter leaving the control equipment

(2) "Industrial process equipment" means any equipment, apparatus, or device embracing chemical, industrial, or manufacturing facilities such as ovens, mixing kettles, heating and reheating furnaces, kilns, stills, dryers, roasters, and equipment used in connection therewith, and all other methods or forms of manufacturing or processing that may emit any air contaminant such as smoke, odor, particulate matter, or gaseous matter. Industrial process equipment is an "affected facility." An emission facility may consist of more than one unit of industrial process equipment.

(3) "Process weight" means the total weight in a given time period of all materials introduced into any industrial process equipment that may cause any emission of particulate matter. Solid fuels charged are considered as part of the process weight, but liquid and gaseous fuels and combustion air are not. For a cyclical or batch operation, the process weight per hour is derived by dividing the total process weight by the number of hours in one complete operation from the beginning of any given process to the completion thereof, excluding any time during which the equipment is idle. For a continuous operation, the process weight per hour is derived by dividing the process weight for a typical period of time.

(b) Applicability. This regulation shall apply to industrial process equipment for which a standard of performance has not been promulgated in a specific regulation.

(c) Standards of Performance for Pre 1969 Industrial Process Equipment

(1) No owner or operator of any industrial process equipment which was in operation before July 9, 1969, shall cause to be discharged into the atmosphere from the industrial process equipment any gases which:

(aa) In any one hour contain particulate matter in excess of the amount permitted in Table 1 for the allocated process weight; provided that the owner or operator shall not be required to reduce the particulate matter emission below the concentration permitted in Table 2 for the appropriate source gas volume; provided further that regardless of the mass emission permitted by Table 1, the owner or operator shall not be permitted to emit particulate matter in a concentration in excess of 0.30 grains per standard cubic foot of exhaust gas; or

(bb) Exhibit greater than 20 percent opacity, except that a maximum of 60 percent opacity shall be permissible for 4 minutes in any 60 minute period and a maximum of 40 percent opacity shall be permissible for 4 additional minutes in any 60 minute period.

(2) The owner or operator of any industrial process equipment which was in operation before July 9, 1969, which has control equipment with a collection efficiency of not less than 99 percent by weight shall be considered in compliance with the requirements of subsection (c)(1)(aa) of this regulation.

(3) The owner or operator of any industrial process equipment which was in operation before July 9, 1969, which is located outside the Minneapolis-St. Paul Air Quality Control Region and the City of Duluth, which is located not less than one-fourth mile from any residence or public roadway, and which has control equipment with a collection efficiency of not less than 85 percent by weight, and the operation of the entire emission facility does not cause a violation of the ambient air quality standards, shall be considered in compliance with the requirements of subsection (c)(1)(aa) of this regulation.

(d) Standards of Performance for Post 1969 Industrial Process Equipment

(1) No owner or operator of any industrial process equipment which was not in operation before July 9, 1969, shall cause to be discharged into the atmosphere from the industrial process equipment any gases which:

(aa) In any one hour contain particulate matter in excess of the amount permitted in Table 1 for the allocated process weight; provided that the owner or operator shall not be required to reduce the particulate matter emission below the concentration permitted in Table 2 for the appropriate source gas volume; provided that regardless of the mass emission permitted by Table 1, the owner or operator shall not be permitted to emit particulate matter in a concentration in excess of 0.30 grains per standard cubic foot of exhaust gas; or

(bb) Exhibit greater than 20 percent opacity.

(2) The owner or operator of any industrial process equipment which was not in operation before July 9, 1969, which has control equipment with a collection efficiency of not less than 99.7 percent by weight shall be considered in compliance with the requirements of subsection (d)(1)(aa) of this regulation.

(3) The owner or operator of any industrial process equipment which was in operation after July 9, 1969, which is located outside the Minneapolis-St. Paul Air Quality Control Region and the City of Duluth, which is located not less than one-fourth mile from any residence or public roadway, and which has control equipment with a collection efficiency of not less than 85 percent by weight, and the operation of the entire emission facility does not cause a violation of the ambient air quality standards, shall be considered in compliance with the requirements of subsection (d)(1)(aa) of this regulation.

(e) Performance Test Methods. Unless another method is approved by the Agency, any owner or operator required to submit performance tests for any industrial process equipment shall utilize the following test methods:

- (1) Method 1 for sample and velocity traverses,
- (2) Method 2 for velocity and volumetric flow rate,
- (3) Method 3 for gas analysis,

(4) Method 5 for the concentration of particulate matter and associated moisture content,

(5) Method 9 for visual determination of the opacity of emissions from stationary sources.

(f) Performance Test Procedures. In the event that emissions from any industrial process equipment contain organic vapors which condense at standard conditions of temperature and pressure, the following changes in Method 5 for determining particulate emissions shall be made:

(1) Paragraph 4.2 (Sample Recovery) in Method 5 is amended to read as follows:

4.2 Sample Recovery. Exercise care in moving the collection train from the test site to the sample recovery area so as to minimize the loss of collected sample or the gain of extraneous particulate matter. Set aside a portion of the acetone and water used in the sample recovery as a blank for analysis. Place the samples in containers as follows:

Container #1. Remove the filter from its holder, place in this container, and seal.

Container #2. Place loose particulate matter and water and acetone washings from all sample-exposed surfaces preceding the filter paper in this container and seal. The probe and nozzle should be scrubbed with a stiff brush and distilled water, followed by an acetone rinse. If these solvents do not do a good cleaning job, an adequate solvent must be found and used. Use a razor blade or rubber policeman to loosen adhering particles if necessary.

Container #3. Measure the volume of water from the first three impingers and place the water in this container. Place water rinsings of all sample-exposed surfaces between the filter and fourth impinger in this container prior to sealing.

Container #4. Transfer the silica gel from the fourth impinger to the original container and seal. Use a rubber policeman as an aid in removing silica gel from the impinger.

Container #5. Thoroughly rinse all sample-exposed surfaces between the filter paper and fourth impinger with acetone, place the washings in this container and seal.

(2) Paragraph 4.3 (Analysis) in Method 5 is amended to read as follows:

4.3 Analysis. Record the data required on the example sheet shown in figure 5-3. Handle each sample container as follows:

Container #1. Transfer the filter and any loose particulate matter from the sample container to a tared glass weighing dish, desiccate, and dry to a constant weight. Report results to the nearest 0.5 mg.

Container #2. Transfer the washings to a tared beaker and evaporate to dryness at ambient temperature and pressure. Desiccate and dry to a constant weight. Weigh to the nearest 0.5 mg.

Container #3. Extract organic particulate from the impinger solution with three 25 ml portions of chloroform. Complete the extraction with three 25 ml portions of ethyl ether. Combine the ether and chloroform extracts, transfer to a tared beaker and evaporate at 70°F until no solvent remains. Desiccate, dry to a constant weight, and report the results to the nearest 0.5 mg.

Container #4. Weigh the spent silica gel and report to the nearest gram.

Container #5. Transfer the acetone washings to a tared beaker and evaporate to dryness at ambient temperature and pressure. Desiccate, dry to a constant weight, and report the results to the nearest 0.5 mg.

TABLE 1

Process Weight Rate (lbs./hr.)	Emission Rate (lbs./hr.)
50	0.08
100	0.55
500	1.53
1,000	2.25
5,000	6.34
10,000	9.73
20,000	14.99
60,000	29.60
80,000	31.19
120,000	33.28
160,000	34.85
200,000	36.11
400,000	40.35
1,000,000	46.72

Interpolation of the data in Table 1 for the process weight rates up to 60,000 lbs./hr. shall be accomplished by the use of the equation:

$$E = 3.59P^{0.62}$$

$$P < 30 \text{ tons/hr.}$$

and interpolation and extrapolation of the data for process weight rates in excess of 60,000 lbs/hr shall be accomplished by use of the equation:

$$E = 17.31P^{0.16}$$

$$P > 30 \text{ tons/hr.}$$

Where E = Emissions in pounds per hour

P = Process weight rate in tons per hour

TABLE 2

(8)

Source Gas Volume, SCFM ^a	Concentration GR/SCF ^b	Source Gas Volume, SCFM ^a	Concentration GR/SCF ^b
7,000 or less	0.100	140,000	0.038
8,000	0.096	160,000	0.036
9,000	0.092	180,000	0.035
10,000	0.089	200,000	0.034
20,000	0.071	300,000	0.030
30,000	0.062	400,000	0.027
40,000	0.057	500,000	0.025
50,000	0.053	600,000	0.024
60,000	0.050	800,000	0.021
80,000	0.045	1,000,000 or more	0.020
100,000	0.042		
120,000	0.040		

^a Standard cubic feet per minute

^b Grains per standard cubic foot.

[July 7, 1969; amended June 4, 1976]

CHAPTER SIX: APC 6**APC 6 Preventing Particulate Matter from Becoming Air-Borne**

(a) No person shall cause or permit the handling, use, transporting, or storage of any material in a manner which may allow avoidable amounts of particulate matter to become air-borne.

(b) No person shall cause or permit a building or its appurtenances or a road, or a driveway, or an open area to be constructed, used, repaired or demolished without applying all such reasonable measures as may be required to prevent particulate matter from becoming air-borne. The Director may require such reasonable measures as may be necessary to prevent particulate matter from becoming air-borne including, but not limited to, paving or frequent clearing of roads, driveways and parking lots; application of dust-free surfaces; application of water; and the planting and maintenance of vegetative ground cover.

[July 7, 1969]

CHAPTER SEVEN: APC 7

APC 7 Standards of Performance for Incinerators

(a) **Definitions.** As used in this regulation the following words shall have the meanings defined herein:

(1) "Incinerator" means any furnace or other device used in the process of burning solid waste for the purpose of reducing the volume of the waste by removing combustible matter.

(2) "Solid waste" means garbage, refuse, and other discarded solid materials, except animal waste used as fertilizer, including solid waste materials resulting from industrial, commercial and agricultural operations, and from community activities. Solid waste does not include earthen fill, boulders, rock and other materials normally handled in construction operations, solids or dissolved material in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial waste water effluents, dissolved materials in irrigation return flows, or other common water pollutants.

(3) "Burning capacity" means the manufacturer's or designer's maximum rate or such other rate that is considered good engineering practice and accepted by the Director.

(b) Standards of Performance for Existing Incinerators

(1) No owner or operator of an existing incinerator with a maximum refuse burning capacity of less than 200 pounds per hour shall cause to be discharged into the atmosphere from the incinerator any gases which contain particulate matter in excess of 0.3 gr/dscf corrected to 12 percent CO₂.

(2) No owner or operator of an existing incinerator with a maximum refuse burning capacity of 200 to 2000 pounds per hour shall cause to be discharged into the atmosphere from the incinerator any gases which contain particulate matter in excess of 0.2 gr/dscf corrected to 12 percent CO₂.

(3) No owner or operator of an existing incinerator with a maximum refuse burning capacity of more than 2000 pounds per hour shall cause to be discharged into the atmosphere from the incinerator any gases which contain particulate matter in excess of 0.1 gr/dscf corrected to 12 percent CO₂.

(4) No owner or operator of an existing incinerator of any burning capacity shall cause or permit the emission of smoke or any other air contaminant which is:

(aa) Greater than 20 percent opacity.

(bb) Except that a maximum of 40 percent opacity shall be permissible for four (4) minutes in any 60 minute period.

(5) No owner or operator of an existing incinerator of any burning capacity shall burn type 2, 3, 4, 5, or 6 waste as classified by the Incinerator Institute of America unless said incinerator utilizes auxiliary fuel burners that maintain a minimum temperature of 1200°F for a minimum retention time of 0.3 second.

(c) Standards of Performance for New Incinerators

(1) No owner or operator of a new incinerator with a maximum refuse burning capacity of less than 200 pounds per hour shall cause to be discharged into the atmosphere from the incinerator any gases which contain particulate matter in excess of 0.2 gr/dscf corrected to 12 percent CO₂.

(2) No owner or operator of a new incinerator with a maximum refuse burning capacity of 200-2000 pounds per hour shall cause to be discharged into the atmosphere from the incinerator any gases which contain particulate matter in excess of 0.15 gr/dscf corrected to 12 percent CO₂.

(3) No owner or operator of a new incinerator with a maximum refuse burning capacity of more than 2000 but less than 4000 pounds per hour shall cause to be discharged into the atmosphere from the incinerator any gases which contain particulate matter in excess of 0.1 gr/dscf corrected to 12 percent CO₂.

(4) No owner or operator of a new incinerator with a maximum refuse burning capacity of 4000 pounds per hour or more shall cause to be discharged in the atmosphere from the incinerator any gases which contain particulate matter in excess of 0.08 gr/dscf corrected to 12 percent CO₂.

(5) No owner or operator of a new incinerator of any burning capacity shall cause or permit the emission of smoke or any other contaminant which is:

(aa) Greater than 20 percent opacity.

(6) No owner or operator of a new incinerator of any burning capacity shall burn type 2, 3, 4, 5, or 6 waste as classified by the Incinerator Institute of America unless said incinerator utilizes auxiliary fuel burners that maintain a minimum temperature of 1200°F for a minimum retention time of 0.3 second.

(d) Monitoring of Operations. The owner or operator of any incinerator shall record the daily charging rate and hours of operation.

(e) Performance Test Methods. Unless another method is approved by the Agency, any owner or operator required to submit performance tests for an incinerator shall utilize the following methods (defined in APC 2):

(1) Method 5 for the concentration of particulate matter and the associated moisture content.

(2) Method 1 for sample and velocity traverses.

(3) Method 2 for velocity and volumetric flow rate.

(4) Method 3 for gas analysis and calculation of excess air, using the integrated sample technique.

(5) Method 9 for visual determination of opacity.

(f) Performance Test Procedures

(1) For Method 5, the sampling time for each run shall be at least 60 minutes and the minimum sample volume shall be 0.85 dscm (30.0 dscf) except that smaller sampling times or sample volumes, when necessitated by process variables or other factors, may be approved by the Agency.

(2) If a wet scrubber is used, the gas analysis sample shall reflect flue gas conditions after the scrubber, allowing for carbon dioxide absorption by sampling the gas on the scrubber inlet and outlet sides according to the following procedure:

(aa) The outlet sampling site shall be the same as for the particulate matter measurement. The inlet site shall be selected according to Method 1, or as specified by the Agency.

(bb) Randomly select 9 sampling points within the cross section at both the inlet and outlet sampling sites. Use the first set of three for the first run, the second set for the second run, and the third set for the third run.

(cc) Simultaneously with each particulate matter run, extract and analyze for CO₂ an integrated gas sample according to Method 3, traversing the three sample points and sampling at each point for equal increments of time. Conduct the runs at both inlet and outlet sampling sites.

(dd) Measure the volumetric flow rate at the inlet during each particulate matter run according to Method 2, using the full number of traverse points. For the inlet make two full velocity traverses approximately one hour apart during each run and average the results. The outlet volumetric flow rate may be determined from the particulate matter run (Method 5).

(ee) Calculate the adjusted CO₂ percentage using the following equation:

$$(\% \text{CO}_2) \text{ adj} = (\% \text{CO}_2) \text{ di} (Q_{\text{di}}/Q_{\text{do}})$$

where:

(% CO₂) adj is the adjusted CO₂ percentage which removes the effect of CO₂ absorption and dilution air,

(% CO₂) di is the percentage of CO₂ measured before the scrubber, dry basis,

Q_{di} is the volumetric flow rate before the scrubber, average of two runs, dscf/min (using Method 2), and

Q_{do} is the volumetric flow rate after the scrubber, dscf/min (using Methods 2 and 5).

(3) The following procedures may be substituted for the procedures under subsections 2(cc), (dd), and (ee) above:

(aa) Simultaneously with each particulate matter run, extract and analyze for CO₂, O₂, and N₂ an integrated gas sample according to Method 3, traversing the three sample points and sampling for equal increments of time at each point. Conduct the runs at both the inlet and outlet sampling sites.

(bb) After completing the analysis of the gas sample, calculate the percentage of excess air (EA) for both the inlet and outlet sampling sites using the following equation:

$$\% \text{EA} = \frac{(\% \text{O}_2) - 0.5 (\% \text{CO})}{0.264 (\% \text{N}_2) - (\% \text{O}_2) + 0.5 (\% \text{CO})} \times 100$$

where:

% EA = percent excess air

% O₂ = percent oxygen by volume, dry basis

% N₂ = percent nitrogen by volume, dry basis

% CO = percent carbon monoxide volume, dry basis

0.264 = ratio of oxygen to nitrogen in air by volume

(cc) Calculate the adjusted CO₂ percentage using the following equation:

$$(\% \text{CO}_2) \text{ adj} = (\% \text{CO}_2) \text{ di} \frac{100 + (\% \text{EA})_i}{100 + (\% \text{EA})_o}$$

where:

- (% CO₂) adj is the adjusted outlet CO₂ percentage,
- (% CO₂) di is the percentage of CO₂ measured before the scrubber, dry basis,
- (% EA)₁ is the percentage of excess air at the inlet, and
- (% EA)₀ is the percentage of excess air at the outlet.

(4) Particulate matter emissions, expressed in g/dscm, shall be corrected to 12 percent CO₂ by using the following formula:

$$c_{12} = \frac{12c}{\%CO_2}$$

where:

- c₁₂ is the concentration of particulate matter corrected to 12 percent CO₂,
- c is the concentration of particulate matter as measured by Method 5, and
- % CO₂ is the percentage of CO₂ as measured by Method 3, or when applicable, the adjusted outlet CO₂ percentage as determined by subsection (2) or (3) above.

[July 7, 1969, amended March 12, 1976]

AIR POLLUTION CONTROL RULES

CHAPTER EIGHT: APC 8

APC 8 Open Burning

(a) Definitions. As used in this regulation the following words shall have the meanings defined herein.

(1) "Approved waste burner" means an incinerator or other burner constructed of fire resistant material having a capacity of not less than three bushels, a cover which is closed when in use, and maximum openings in the top or sides no greater than one inch in diameter.

(2) "Building material" means lumber, wood shakes and other wood products but shall not include composite shingles, tar paper, insulation, wall board, wiring or other similar smoke producing materials.

(3) "Diseased shade tree" means any tree infected by Dutch elm disease or oak wilt disease or any tree constituting a hazard to a disease control program established by the Department of Agriculture pursuant to Minn. Stat. § 18.023.

(4) "Disposal facility" means a facility or site permitted by the Minnesota Pollution Control Agency for the intermediate or final disposal of solid waste.

(5) "Garbage" means discarded material resulting from the handling, processing, storage, preparation, serving and consumption of food.

(6) "Metropolitan Area" means the area included within the counties of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington.

(7) "Open Burning" means the burning of any matter whereby the resultant combustion products are emitted directly to the atmosphere without passing through an adequate stack, duct, or chimney.

(8) "Refuse collection service" means a public or private operation engaged in solid waste collection and transportation.

(9) "Rubbish" means nonputrescible solid waste, such as paper, cardboard, yard clippings and other natural matter not including garbage.

(10) "Wetland" means natural marsh where water stands near, at or above the soil surface during a significant portion of most years.

(b) Open Burning Restrictions. No person shall cause, allow or permit open burning.

(c) Exemptions

(1) In unincorporated areas where no refuse collection service is available, the open burning of rubbish originating from single residential premises may be conducted in approved waste burners.

(2) In any city where no refuse collection service is available, the local unit of government may apply to the Director for permission to allow the open burning of rubbish originating from single residential premises in approved waste burners.

(3) Refuse collection service shall be deemed available as delineated in the County Solid Waste Management Plan, as adopted by the county and approved by the Agency.

(d) Prohibition of Salvage Operations by Open Burning

(1) No person shall conduct, cause or permit salvage operations by open burning.

(2) No person shall possess, transport or process motor vehicles or scrap metals which have been reduced by open burning or incineration in

a device or equipment which has not received an Operating Permit from this Agency.

(e) **Open Burning by Permit.** Open burning may be conducted if an open burning permit is obtained pursuant to this regulation and the open burning is conducted in accordance with the requirements of this regulation and the conditions of the permit.

(f) Permit Applications

(1) **Application.** Application for open burning permits may be made in cases where fires are proposed to be set for the following purposes:

(aa) Bona fide instruction and training of fire fighting personnel and for the testing of fire extinguishing equipment.

(bb) Elimination of fire or health hazards which cannot be abated by any other practicable means.

(cc) Activities in accordance with accepted forest or game management.

(dd) Ground thawing for utility repair and construction.

(ee) The disposal of trees, brush, grass and other vegetative matter in the development of land and right-of-way maintenance.

(ff) The disposal of diseased shade trees.

(gg) The disposal of trees and brush in areas outside the Metropolitan Area.

(hh) Activities in accordance with accepted agricultural practices.

(ii) The disposal of building material generated by construction.

(jj) The disposal of building material generated by the demolition of non-commercial or non-institutional structures.

(2) **Restrictions.** A burning permit shall be issued on a prescribed form to the applicant if the burning is for one of the purposes set forth in subsection (f)(1) and the applicant agrees that all burning shall be conducted under the following circumstances:

(aa) The prevailing wind at the time of the burning shall be away from nearby residences.

(bb) The burning shall be conducted as far away as practical from any highway or public road and controlled so that a traffic hazard is not created.

(cc) The burning may not be conducted during the duration of an air pollution alert, warning or emergency.

(dd) The recipient of the permit or his authorized representative shall be present for the duration of any fire authorized by the permit.

(ee) Prior notice shall be given to the local Department of Natural Resources Forest Officer, local fire marshal, or local fire chief of the time and location of any fire authorized by the permit.

(ff) Open burning for ground thawing shall be conducted in accordance with the following additional restrictions:

(i) Fuels and starting materials shall be of a kind which do not generate appreciable smoke.

(ii) Coke used for ground thawing within 500 feet of dwellings or occupied buildings shall contain less than 1% sulfur.

(iii) Ambient air quality standards for sulfur dioxide and carbon monoxide shall not be exceeded at occupied residences other than those located on the property on which the burning is being conducted.

(iv) Propane gas thawing torches or other devices causing minimal pollution shall be used when practicable.

(gg) Open burning of materials pursuant to paragraph (f)(1)(ee), (ff), (gg), (hh), (ii), and (jj) shall be conducted in accordance with the following additional restrictions:

(i) The location of the burning shall not be within 600 feet of an occupied residence other than those located on the property on which the burning is conducted.

(ii) Oils, rubber and other similar smoke producing materials shall not be burned or used as starting materials.

(iii) The burning shall not be conducted within one mile of any airport or landing strip, unless approved by the Director.

(hh) Open burning of materials pursuant to paragraph (f)(1)(ii) shall also only be conducted under controlled burning methods approved by the Director.

(ii) The burning is conducted under such other reasonable conditions as the permit issuing authority may impose.

(3) Permit Issuers. In addition to the Agency, the following persons are authorized to accept applications and issue open burning permits:

(aa) A Department of Natural Resources forest officer for locations within his jurisdiction.

(bb) A local Department of Natural Resources Fire Warden for locations within his jurisdiction.

(cc) Upon approval of the Agency, a local pollution control agency for locations within its jurisdiction.

(dd) A person(s) designated by the county board of commissioners and approved by the Director for locations within the county but outside the corporate limits of cities within the county.

(ee) Upon the approval of the Director, either a fire chief or a person designated by a township or city for locations within the jurisdiction of said governmental unit.

(ff) A Regional Director of the Agency or an employee of the Agency authorized by the Director, who may in their discretion refer the applicant to a local permit issuing authority.

(4) Permit Denial. Any permit application submitted pursuant to this regulation shall be denied if:

(aa) A reasonable, practical alternative method of disposal of the material is available.

(bb) A nuisance condition would result from the burning.

(5) Permit Revocation. Any permit is subject to revocation at the discretion of the Director, a Department of Natural Resources Forest Officer, the local fire marshal or fire chief, or the permit issuer, if:

(aa) A reasonable practical method of disposal of the material is found;

(bb) A fire hazard exists or develops during the course of the burning; or

(cc) Any of the conditions of the permit are violated.

(g) Liability. Exemption to conduct open burning or the granting of an open burning permit under any provisions of this regulation does not excuse a person from the consequences, damages or injuries which may result therefrom.

(h) Conflicting Laws. Nothing in this regulation shall be construed to

allow open burning in those areas in which open burning is prohibited by other laws, regulations or ordinances.

(i) **Recreational Fires.** Fires set for recreational, ceremonial, food preparation, or social purposes are permitted provided only wood, coal, or charcoal is burned.

(j) **Diseased Shade Tree Open Burning Sites.** Open burning of diseased shade trees shall be permitted provided no reasonable alternate method of disposal exists as determined by the Agency, a permit is obtained pursuant to this regulation, and the open burning is conducted in accordance with the requirements of this regulation and the conditions of the permit.

(1) **Site Location.** The site shall be located in accordance with the following conditions or as approved by the Director of Air Quality:

(aa) Not less than 1,000 feet from an occupied building.

(bb) Not less than 1,000 feet from a public roadway.

(cc) Not less than one mile from an airport or landing strip.

(dd) Not less than 300 feet from a stream.

(ee) Not within wetland.

(2) **Site Preparation.** The site shall be prepared in accordance with the following:

(aa) Access to the site shall be controlled by a gate which shall be locked when an attendant is not on duty.

(bb) Approach roads to the disposal site and access roads on the site shall be maintained so that they shall be passable at all specified times.

(cc) A permanent sign identifying the operation indicating the hours and days the site is open for use, rates, the penalty for non-conforming dumping and other pertinent information shall be posted at the site entrance.

(dd) Surface water drainage shall be diverted around and away from the operating area and ash storage areas.

(3) **Site Operation.** The site shall be operated in accordance with the following conditions:

(aa) Only diseased shade trees and/or tree trimmings shall be disposed of on the site.

(bb) Qualified personnel for general direction and operation of the site shall be on duty at all times while the site is open for use and for the duration of any fire on the site.

(cc) Burning shall be conducted only when weather conditions are such that a nuisance, health or safety hazard will not be created.

(dd) Prior notice shall be given to the local fire authority of the time and duration of each fire.

(ee) Adequate dust control shall be provided on the site and on the roads leading to the site.

(ff) Ash residue shall be collected on a periodic basis and disposed of in an Agency-permitted sanitary landfill.

(4) **Site Termination.** The site shall be terminated in accordance with the following:

(aa) All materials extraneous to the site shall be removed and disposed of in an appropriate manner.

(bb) The site shall be returned to a state equal to its surroundings.

[July 7, 1969; amended June 5, 1970; amended September 14, 1971; amended March 12, 1976; amended May 13 1976]

CHAPTER NINE: APC 9

APC 9 Control of Odors in the Ambient Air

(a) **Definitions.** The following definitions shall apply in the interpretation and enforcement of this regulation and the following words and terms wherever they occur in this regulation are defined as follows:

(1) **Ambient air** shall mean that portion of the atmosphere external to buildings to which the general public has access.

(2) **Odor concentration unit** shall mean the number of standard cubic feet of odor-free air needed to dilute each cubic foot of contaminated air so that at least 50 percent of the odor concentration test panel does not detect any odor in the diluted mixture.

(3) **Odor emission rate** shall mean the product of the number of standard cubic feet per minute of air or other gases emitted from a suspected odor pollution source and the number of odor concentration units determined for that source.

(4) **Odor source** shall be defined as to include but not be limited to any stack, chimney, vent, window, opening, lagoon, basin, catch-basin, pond, open tank, storage tank, storage pile, or any organic or inorganic discharge and/or application which emits odorous gas, gases or particulates.

(b) **Odorous Air Pollution Prohibited.** No person shall cause, permit or allow emission into the ambient air of odorous air contaminants in excess of the standards and parameters of section (c). Such excessive emissions are air pollution in one or more of the ways enumerated in Minnesota Statutes, Section 116.06, Subdivisions 2 and 3.

(c) **Odor Emission Limits.** Violation of APC 9 shall be any discharge of air contaminants in excess of the following odor emission limits:

(1) Odor sources emitting from well-defined stacks 50 feet or more above grade elevation and with adequate dispersion characteristics as determined by the Agency shall not emit odors in greater than 150 odor concentration units.

(2) Odor sources of less than 50 feet elevation above grade or otherwise failing to create good dispersion conditions as determined by the Agency shall not emit more than 25 odor concentration units.

(3) No odor source shall have an odor emission rate in excess of 1,000,000 odor concentration units per minute.

(4) No odor source shall emit air contaminants into the ambient air which cause odor outside the alleged polluter's property line in excess of the following limitations:

(aa) One odor unit in areas zoned residential, recreational, institutional, retail sales, hotel or educational.

(bb) Two odor units in areas zoned light industrial.

(cc) Four odor units in areas zoned other than in subsections (aa) and (bb) above.

(d) **Odor Testing.** Odor testing shall be conducted as follows:

(1) Odor tests shall be conducted by the Agency or under Agency supervision and advisement.

(2) Odor test panel members shall be selected or approved by the Agency.

(3) Ambient air samples containing the alleged odorous air pollution obtained downwind and outside the property line of the alleged polluter, and samples of the air contaminant from the odor source allegedly causing the odorous air pollution shall be obtained.

(4) Procedures for obtaining such samples and presenting such samples to the test panel for tests shall be accomplished according to American Society for Testing Materials Method D-1391-57, or by other method approved by the Agency. The panel testing procedure shall be conducted by the method described by D. M. Benforado, W. J. Rotella and D. L. Horton, "Development of an Odor Panel for Evaluation of Odor Control Equipment", Journal of the Air Pollution Control Association, Volume 19, Number 2, Pages 101-105, February 1969; or by other method approved by the Agency.

(5) All odor test panel members shall have a smell exposure to determine the odor concentration of the alleged air contaminant at the odor source and in the ambient air sample, and shall be questioned as to whether the air contaminant in the ambient air sample is contained in the sample obtained from the odor source of the alleged discharger. All responses shall be recorded under oath and notarized.

(e) **Equipment Breakdown.** No person shall operate any process, process equipment, fuel-burning equipment or refuse-burning equipment when such process or equipment is out of repair and causing or permitting odorous air pollution. Emissions violating this regulation as a direct result of upset conditions in, or breakdown of any process, process equipment, fuel-burning equipment, or control equipment or related operating equipment beyond the control of the person owning or operating such equipment, shall not be deemed to be in violation of this regulation, provided that the owner or operator advises the Agency of the circumstances within 24 hours of the breakdown, and outlines a corrective program within 7 days of the breakdown. The Agency may permit operation on a temporary basis during the period of such an emergency shutdown not to exceed 30 days from the breakdown if such operation will not create an immediate serious public health or safety hazard. No equipment as defined above shall be operated which has an unreasonable breakdown frequency as determined by the Agency.

(f) **Agri-business Exception.** The odor of growing vegetation shall not be considered odorous air pollution. The odor of domestic (organic) fertilizer, industrial (inorganic) fertilizer, and pesticides shall not be considered odorous air pollution if such substances are used effectively according to their intended purposes and application. The open storage (piling) of such materials shall be accomplished in a nuisance-free manner and in compliance with the regulations of federal, state and local government and their regulatory agencies.

(g) Compliance with the provisions of this regulation shall not operate as a defense to an action at law based upon a public and/or private nuisance theory.

[July 7, 1969; amended September 14, 1971]

CHAPTER TEN: APC 10**APC 10 Control of Odors from Processing of Animal Matter****(a) General**

(1) For purposes of this regulation the word "reduction" is defined as any heated process, including rendering, cooking, drying, dehydrating, digesting, evaporating, and protein concentrating. Animal matter is defined as any product or derivative of animal life.

(2) The provisions of this regulation shall not apply to any device, machine, equipment, or other contrivance used exclusively for the processing of food for human consumption in food service establishments.

A food service establishment shall include: any fixed or mobile restaurant; coffee shop; cafeteria; short-order cafe; luncheonette; grill; tea-room; sandwich shop; soda fountain; tavern; bar; cocktail lounge; night club; roadside stand; industrial feeding establishment; private, public or nonprofit organization or institution routinely serving food; catering kitchen, commissary, or similar place in which food or drink is placed for sale or for service on the premises or elsewhere; and any other eating or drinking establishment or operation where food is served or provided for the public with or without charge.

(b) Odor control equipment required on reduction processes

No person shall operate or use any device, machine, equipment or other contrivance for the reduction of animal matter unless all gases, vapors, and gas-entrained effluents from such facility are incinerated at a temperature of not less than 1500°F for a period of not less than 0.3 second, or processed in such manner as determined by the Director to be equally or more effective for the purpose of air pollution control.

A person incinerating or processing gases, vapors or gas-entrained effluents pursuant to this rule shall provide, properly install and maintain, in good working order and in operation, devices as specified by the Director for indicating temperature, pressure, or other operating conditions.

(c) Other odor control measures required

(1) Effective devices and measures shall be installed and operated such that no vent, exhaust pipe, blow-off pipe or opening of any kind shall discharge into the outdoor air any odorous matter, vapors, gases, dusts, or any combination thereof which create odors or other nuisances in the neighborhood of the plant.

(2) Odor-producing materials shall be stored and handled in such a manner that odors produced from such materials are confined. Accumulation of odor-producing materials resulting from spillage or other escape is prohibited.

(3) Odor-bearing gases, vapors, fumes or dusts arising from materials in process shall be confined at the point of origin so as to prevent liberation of odorous matter. Confined gases, vapors, fumes or dusts shall be treated before discharge to the atmosphere, as required in subsection (c) (1).

(d) Enclosure of building may be required

Whenever dust, fumes, gases, mist, odorous matter, vapors, or any combination thereof escape from a building used for processing of animal matter in such manner and amount as to cause a violation of Regulation APC 9, the Director may instruct that the building or buildings utilized for processing, handling and storage be tightly closed and ventilated so that all air, and gases and air or gas-borne material are treated by incineration or other effective means before discharge into the open air.

[July 7, 1969]

APC 11 Restriction of emission of visible air contaminants.

A. Applicability. The standards of performance in this regulation apply to any emission facility for which a specific standard of performance has not been promulgated in another regulation.

B. Visible emission restrictions for existing facilities. No owner or operator of an existing emission facility to which this regulation is applicable shall cause to be discharged into the atmosphere from the facility any gases which exhibit greater than 20% opacity; except that a maximum of 40% opacity shall be permissible for four minutes in any 60 minute period.

C. Visible emission restrictions for new facilities. No owner or operator of a new emission facility to which this regulation is applicable shall cause to be discharged into the atmosphere from the facility any gases which exhibit greater than 20% opacity.

D. Performance tests. Unless another method is approved by the Agency, any person required to submit performance tests for emission facilities for which this regulation is applicable shall utilize Method 9 for visual determination of opacity.

CHAPTER TWELVE: APC 12

APC 12 Standards of Performance for Motor Vehicles and Stationary Internal Combustion Engines

(a) **Definitions.** As used in this regulation, the following words shall have the meanings defined herein:

(1) "Air pollution control system" means any device or element of design installed on or in any motor vehicle or motor vehicle engine in order to comply with pollutant emission restrictions established for the motor vehicle or motor vehicle engine by federal statute or regulation.

(2) "Motor vehicle" means any self-propelled vehicle powered by an internal combustion engine and designed for use on the public highways including, but not limited to, automobiles, trucks, and buses.

(b) **Standards of Performance for Motor Vehicles**

(1) No person shall cause or permit the emission of visible air contaminants from a motor vehicle, other than one powered by a diesel cycle engine, for more than ten (10) consecutive seconds.

(2) No person shall cause or permit the emission of visible air contaminants from a motor vehicle powered by a diesel cycle engine:

(aa) In excess of 20 percent opacity for more than 20 consecutive seconds if the engine was manufactured prior to January 1, 1973; or

(bb) In excess of 10 percent opacity for more than 20 consecutive seconds if the engine was manufactured after January 1, 1973.

(c) **Standards of Performance for Trains, Boats, and Construction Equipment.** No person shall cause or permit the emission of visible air contaminants from a train, boat, or construction equipment, which is powered by an internal combustion engine, in excess of the limits set forth in subsection (b) of this regulation.

(d) **Exemption.** The provisions of this regulation do not apply to two-cycle internal combustion engines.

(e) **Air Pollution Control Systems**

(1) No person shall remove, alter, or otherwise render inoperative any air pollution control system.

(2) No person shall operate a motor vehicle unless all air pollution control systems are in place and in operating condition.

(3) No person shall rent, lease, offer for sale, or in any manner transfer ownership of a motor vehicle unless all air pollution control systems are in place and in operating condition.

(4) The requirements of subsection (e) shall not restrict or prohibit the removal of any air pollution control system for repair or replacement.

(f) **Standards of Performance for Stationary Internal Combustion Engines**

(1) No owner or operator of any stationary internal combustion engine shall cause or permit the emission of visible air contaminants from the engine in excess of 20 percent opacity for more than ten (10) consecutive seconds once operating temperatures have been obtained.

(2) No owner or operator of any stationary internal combustion engine shall cause to be discharged into the atmosphere from the engine any gases which contain sulfur dioxide in excess of 1.75 pounds per million BTU actual heat input if the engine is located in the Minneapolis-St. Paul Air Quality

Control Region or if the engine is located outside the Minneapolis-St. Paul Air Quality Control Region but has a total rated heat input greater than 250 million BTU per hour.

(3) The actual heat input and rated heat input of an internal combustion engine shall be determined in accordance with the provisions set forth in APC-4.

[July 7, 1969; amended September 14, 1971; amended June 4, 1976]

CHAPTER THIRTEEN: APC 13**APC 13 Standards of Performance for Storage Vessels for Petroleum Liquids**

(a) Definitions. As used in this regulation the following words shall have the meanings defined herein:

(1) "Storage vessel" means any tank, reservoir, or container used for the storage of petroleum liquids, but does not include:

(aa) Pressure vessels which are designed to operate in excess of 15 pounds per square inch gauge without emissions to the atmosphere except under emergency conditions.

(bb) Subsurface caverns or porous rock reservoirs, or

(cc) Underground tanks if the total volume of petroleum liquids added to and taken from a tank annually does not exceed twice the volume of the tank.

(2) "Petroleum liquids" means petroleum, condensate, and any finished or intermediate products manufactured in a petroleum refinery but does not mean Number 2 through Number 6 fuel oils as specified in A.S.T.M. D396-69, gas turbine fuel oils Numbers 2-GT through 4-GT as specified in A.S.T.M. D2880-71, or diesel fuel oils Numbers 2-D and 4-D as specified in A.S.T.M. D975-68.

(3) "Petroleum refinery" means any facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, or other products through distillation of petroleum or through redistillation, cracking, or reforming of unfinished petroleum derivatives.

(4) "Petroleum" means the crude oil removed from the earth and the oils derived from tar sands, shale, and coal.

(5) "Hydrocarbon" means any organic compound consisting predominantly of carbon and hydrogen.

(6) "Condensate" means hydrocarbon liquid separated from natural gas which condenses due to changes in the temperature and/or pressure and remains liquid at standard conditions.

(7) "Custody transfer" means the transfer of produced petroleum and/or condensate, after processing and/or treating in the producing operations, from storage tanks or automatic transfer facilities to pipelines or any other forms of transportation.

(8) "Drilling and production facility" means all drilling and servicing equipment, wells, flow lines, separators, equipment, gathering lines, and auxiliary nontransportation-related equipment used in the production of petroleum but does not include natural gasoline plants.

(9) "True vapor pressure" means the equilibrium partial pressure exerted by a petroleum liquid as determined in accordance with methods described in American Petroleum Institute Bulletin 2517, Evaporation Loss from Floating Roof Tanks, 1962.

(10) "Floating roof" means a storage vessel cover consisting of a double deck, pontoon single deck, internal floating cover or covered floating roof, which rests upon and is supported by the petroleum liquid being contained, and is equipped with a closure seal or seals to close the space between the roof edge and tank wall.

(11) "Vapor recovery system" means a vapor gathering system capable of collecting all hydrocarbon vapors and gases discharged from the storage vessel and a vapor disposal system capable of processing such hydrocarbon vapors and gases so as to prevent their emission to the atmosphere.

(12) "Reid vapor pressure" is the absolute vapor pressure of volatile crude oil and volatile non-viscous petroleum liquids, except liquified petroleum gases, as determined by A.S.T.M.-D-323-58 (reapproved 1968).

(13) "Submerged fill pipe" means any fill pipe the discharge opening of which is entirely submerged when the liquid level is six inches above the bottom of the storage vessel. When applied to a storage vessel which is loaded from the side, "submerged fill pipe" means any fill pipe the discharge opening of which is entirely submerged when filling except for filling after the vessel has been emptied for cleaning and repairs.

(b) Standards of Performance for Storage Vessels

(1) Pre 1969 Storage Vessels. There are no standards of performance promulgated in this regulation for storage vessels for which construction was commenced prior to July 7, 1969.

(2) July 7, 1969, to June 11, 1973, Storage Vessels.

(aa) There are no standards of performance promulgated in this regulation for storage vessels with a storage capacity of 2,000 gallons (7,571 liters) or less for which construction was commenced after July 7, 1969, but prior to June 11, 1973.

(bb) The owner or operator of any storage vessel with a storage capacity of greater than 2,000 gallons (7,571 liters) but less than or equal to 65,000 gallons (246,405 liters) for which construction was commenced after July 7, 1969, but prior to June 11, 1973, shall equip the storage vessel with a permanent submerged fill pipe or comply with the requirements of paragraph (b)(3)(cc) of this regulation.

(cc) The owner or operator of any storage vessel with a storage capacity of greater than 65,000 gallons (246,405 liters) for which construction was commenced after July 7, 1969, but prior to June 11, 1973, shall comply with the following requirements:

(i) If the true vapor pressure of the petroleum liquid, as stored, is equal to or greater than 128 mm Hg (2.5 psia) but not greater than 642 mm Hg (12.5 psia) the storage vessel shall be equipped with a floating roof, a vapor recovery system or their equivalents.

(ii) If the true vapor pressure of the petroleum liquid, as stored, is greater than 642 mm Hg (12.5 psia), the storage vessel shall be equipped with a vapor recovery system or its equivalent.

(3) Post June 11, 1973, Storage Vessels.

(aa) There are no standards of performance promulgated in this regulation for storage vessels with a storage capacity of 2,000 gallons (7,571 liters) or less for which construction was commenced on or after June 11, 1973.

(bb) The owner or operator of any storage vessel with a storage capacity of greater than 2,000 gallons (7,571 liters) but less than or equal to 40,000 gallons (151,412 liters) for which construction was commenced on or after June 11, 1973, shall equip the storage vessel with a permanent submerged fill pipe or comply with the requirements of paragraph (b)(3)(cc) of this regulation.

(cc) The owner or operator of any storage vessel with a storage capacity of greater than 40,000 gallons (151,412 liters) for which construction was commenced on or after June 11, 1973, shall comply with the following requirements:

(i) If the true vapor pressure of the petroleum liquid, as stored, is equal to or greater than 78 mm Hg (1.5 psia) but not greater than 570 mm Hg (11.1 psia), the storage vessel shall be equipped with a floating roof, a vapor recovery system, or their equivalents.

(ii) If the true vapor pressure of the petroleum liquid as stored is greater than 570 mm Hg (11.1 psia), the storage vessel shall be equipped with a vapor recovery system or its equivalent.

(c) Monitoring of Operations

(1) The owner or operator of any storage vessel, the construction or modification of which commenced on or after June 11, 1973, which has a storage capacity of greater than 40,000 gallons (151,412 liters) shall for each storage vessel:

(aa) Maintain a file of each type of petroleum liquid stored, of the typical Reid vapor pressure of each type of petroleum liquid stored, of the dates of storage and withdrawals, and of the dates on which the storage vessel is empty.

(bb) Determine and record the average monthly storage temperature and true vapor pressure of the petroleum liquid stored at such temperature if:

(i) The petroleum liquid has a true vapor pressure, as stored, greater than 26 mm Hg (0.5 psia) but less than 78 mm Hg (1.5 psia) and is stored in a storage vessel other than one equipped with a floating roof, a vapor recovery system or their equivalents; or

(ii) The petroleum liquid has a true vapor pressure, as stored, greater than 470 mm Hg (9.1 psia) and is stored in a storage vessel other than one equipped with a vapor recovery system or its equivalent.

(2) The average monthly storage temperature is an arithmetic average calculated for each calendar month, or portion thereof if storage is for less than a month, from bulk liquid storage temperatures determined at least once every 7 days.

(3) The true vapor pressure shall be determined by the procedure in American Petroleum Institute Bulletin 2517. This procedure is dependent upon determination of the storage temperature and the Reid vapor pressure, which requires sampling of the petroleum liquids in the storage vessels. Unless the Agency or the Director requires in specific cases that the stored petroleum liquid be sampled, the true vapor pressure may be determined by using the average monthly storage temperature and the typical Reid vapor pressure. For those liquids for which certified specifications limiting the Reid vapor pressure exist, that Reid vapor pressure may be used. For other liquids, supporting analytical data must be made available on request of the Agency or the Director when typical Reid vapor pressure is used.

(d) Exception. The provisions of this regulation do not apply to storage vessels for petroleum or condensate stored, processed, or treated at a "drilling and production" facility prior to custody transfer.

[July 7, 1969; amended March 12, 1976]

CHAPTER FOURTEEN: APC 14**APC 14 Emission of Certain Settleable Acids and Alkaline Substances Restricted**

(a) **General Provisions.** This regulation shall apply to all emissions from any sources or premises.

(b) **Method of Measurement**

(1) In determining compliance with this regulation, fallout sampling devices shall consist of circular glass dishes 15 centimeters in diameter which shall be supported on a nearly horizontal surface not larger than the dish. The dish bottom shall be at least three feet above the earth or other surface on which its support is resting and the dish shall be coated with a solution of thymol blue, ammonia water solution and gelatin dried to a yellow color in a vacuum oven at room temperature: prepared dishes shall be stored in a desiccator at 40 percent relative humidity, or in plastic bags.

(2) Fallout sampling devices shall be placed at one or more locations beyond the premises on which a source or sources are located, up-wind and down-wind of such premises. The sampling devices shall be exposed to substances settling out of the ambient air for a period of one hour. The presence of red-colored spots on the gelatin indicates that acidic substances have settled out of the air while the presence of blue-colored spots on the gelatin indicates that alkaline substances have settled out of the air. The number of spots visible on samplers exposed up-wind of premises to be subtracted from the number of spots visible on samplers exposed down-wind of the same premises. The difference in the number of spots, if any, shall be construed to be attributable to emissions occurring on the premises under investigation.

(3) In lieu of the test methods specified in (b) (1) and (2), any other method approved by the Director may be used.

(c) **Emissions Restricted.** No person shall cause or permit the emission from any source or premises of substances having acidic or alkaline properties in such amounts that the down-wind fallout rate of acidic or alkaline substances at any place where an adverse effect could occur, exceeds the up-wind fallout rate by five or more spots per hour, measured in the manner prescribed in Section (b) of this regulation.

[July 7, 1969]

CHAPTER FIFTEEN: APC 15

APC 15 Standards of Performance for Sulfuric Acid Plants

(a) **Definitions.** As used in this regulation the following words shall have the meanings defined herein:

(1) "Sulfuric acid production unit:" Means any emission facility producing sulfuric acid by the contact process by burning elemental sulfur, alkylation acid, hydrogen sulfide, organic sulfides and mercaptans, or acid sludge, but does not include facilities where conversion to sulfuric acid is utilized primarily as a means of preventing emissions to the atmosphere of sulfur dioxide or other sulfur compounds.

(2) "Acid Mist:" Means sulfuric acid mist as measured by Method 8.

(b) Standards of Performance of Existing Sulfuric Acid Production Units

(1) Prior to July 1, 1977, no owner or operator of an existing sulfuric acid production unit shall cause to be discharged into the atmosphere from any sulfuric acid production unit any gases which contain sulfur dioxide in excess of 42 pounds per ton of acid produced (21 kg per metric ton), production being expressed as 100 percent H_2SO_4 .

(2) After July 1, 1977, no owner or operator of an existing sulfuric acid production unit shall cause to be discharged into the atmosphere from any sulfuric acid production unit any gases which contain sulfur dioxide in excess of 30 pounds per ton of acid produced (15 kg per metric ton), production being expressed as 100 percent H_2SO_4 .

(3) No owner or operator of an existing sulfuric acid production unit shall cause to be discharged into the atmosphere from any sulfuric acid production unit any gases which contain acid mist, expressed as H_2SO_4 , in excess of 1.70 pounds per ton of acid produced (0.85 kg per metric ton), the production being expressed as 100 percent H_2SO_4 .

(c) Standards of Performance for New Sulfuric Acid Production Units

(1) No owner or operator of a new sulfuric acid production unit shall cause to be discharged into the atmosphere from any sulfuric acid production unit any gases which contain sulfur dioxide in excess of 4 pounds per ton of acid produced (2 pounds per metric ton), the production being expressed as 100 percent H_2SO_4 .

(2) No owner or operator of a new sulfuric acid production unit shall cause to be discharged into the atmosphere from any sulfuric acid production unit any gases which:

(i) Contain acid mist, expressed as H_2SO_4 , in excess of 0.15 pounds per ton of acid produced (0.075 kg per metric ton), the production being expressed as 100 percent H_2SO_4 ; or

(ii) Exhibit 10 percent opacity, or greater.

(d) Continuous Emission Monitoring

(1) The owner or operator of a sulfuric acid production unit shall install, calibrate, maintain, and operate an instrument for continuously monitoring and recording emissions of sulfur dioxide.

(2) The pollutant gas used to prepare calibration gas mixtures and for calibration check shall be sulfur dioxide.

(3) When conducting monitoring system performance evaluations only the sulfur dioxide portion of the Method 8 results shall be used.

(4) The span shall be set at 1,000 ppm of sulfur dioxide.

(5) The owner or operator of a sulfuric acid production unit shall establish a conversion factor for the purpose of converting monitoring data into units of the applicable standard (kg/metric ton, lb/short ton). The conversion factor shall be determined, as a minimum, three times daily by measuring the concentration of sulfur dioxide entering the converter using suitable methods (e.g., the Reich test, National Air Pollution Control Administration Publication No. 999-AP-13) and calculating the appropriate conversion factor for each eight-hour period as follows:

$$CF = k \left[\frac{1,000 - 0.015r}{r - s} \right]$$

where:

CF = conversion factor (kg/metric ton per ppm, lb/short ton per ppm).

k = constant derived from material balance. For determining CF in metric units, k = 0.0653. For determining CF in English units, k = 0.1306.

r = percentage of sulfur dioxide by volume entering the gas converter. Appropriate corrections must be made for air injection.

s = percentage of sulfur dioxide by volume in the emissions to the atmosphere determined by the continuous monitoring system required under paragraph (d)(1) of this regulation.

(6) The owner or operator of a sulfuric acid production unit shall record all conversion factors and values under subparagraph (5) above, i.e., CF, r, and s.

(7) The owner or operator of a sulfuric acid production unit shall record daily the production rate and hours of operation.

(8) For the purpose of reports under APC-21(c)(1)(bb)(ii), periods of excess emissions shall be all three-hour periods (or the arithmetic average of three consecutive one-hour periods) during which the integrated average sulfur dioxide emissions exceed the applicable standards under this regulation.

(e) Performance Test Methods. Unless another method is approved by the Director, any person required to submit performance tests for a sulfuric acid production unit shall utilize the following test methods:

- (1) Method 8 for the concentrations of SO₂ and acid mist;
- (2) Method 1 for sample and velocity traverses;
- (3) Method 2 for velocity and volumetric flow rate; and
- (4) Method 3 for gas analysis.

(f) Performance Test Procedures

(1) In testing for sulfur dioxide and acid mist, the sampling time for each run shall be at least 60 minutes and the minimum sample volume shall be 40.6 dscf (1.15 dscm) except that smaller sampling times or sample volumes, when necessitated by process variables or other factors, may be approved by the Agency.

(2) Acid production rate, expressed in tons per hour of 100 percent H_2SO_4 , shall be determined during each testing period by a suitable method approved by the Agency. The Agency may require the production rate to be confirmed by a material balance over the production system.

(3) Unless the Director approves another method, acid mist and sulfur dioxide emissions, expressed in pounds per ton of 100 percent H_2SO_4 , shall be determined by dividing the emission rate in lb/hr (g/hr) by the acid production rate. The emission rate shall be determined by the equation, $lb/hr = Q_s \times c$, where Q_s = volumetric flow rate of the effluent in dscf/hr (dscm/hr) as determined in accordance with subsection (e)(3), and c = acid mist and sulfur dioxide concentrations in lb/dscf (g/dscm) as determined in accordance with subsection (e)(1).

(g) Exceptions. Shutdowns and breakdowns of control equipment at any sulfuric acid production unit shall be governed by the provisions of APC 21.

[July 7, 1969; amended April 13, 1972; amended December 18, 1975]

CHAPTER SIXTEEN: APC 16**APC 16 Standards of Performance for Nitric Acid Plants**

(a) **Definitions.** As used in this regulation the following words shall have the meanings defined herein:

(1) "Nitric acid production unit" means any facility producing weak nitric acid by either the pressure or atmospheric pressure process.

(2) "Weak nitric acid" means acid which is 30 to 70 percent in strength.

(b) **Standards of Performance for Existing Nitric Acid Production Units**

(1) Prior to July 1, 1977, no owner or operator of an existing nitric acid production unit shall cause to be discharged into the atmosphere from any nitric acid production unit any gases which contain nitrogen oxides, expressed as NO_2 , in excess of 50 pounds per ton of acid produced (25 kg per metric ton), the production being expressed as 100 percent nitric acid.

(2) After July 1, 1977, no owner or operator of an existing nitric acid production unit shall cause to be discharged into the atmosphere from any nitric acid production unit any gases which contain nitrogen oxides, expressed as NO_2 , in excess of 40 pounds per ton of acid produced (20 kg per metric ton), the production being expressed as 100 percent nitric acid.

(3) No owner or operator of an existing nitric acid production unit shall cause to be discharged into the atmosphere from any nitric acid production unit any gases which exhibit greater than 10 percent opacity.

(c) **Standards of Performance for New Nitric Acid Production Units.** No owner or operator of a new nitric acid production unit shall cause to be discharged into the atmosphere from the nitric acid production unit any gases which:

(1) Contain nitrogen oxides, expressed as NO_2 , in excess of 3.0 lb. per ton of acid produced (1.5 kg per metric ton), the production being expressed as 100 percent nitric acid,

(2) Exhibit 10 percent opacity, or greater.

(d) **Emission Monitoring**

(1) The owner or operator of a nitric acid production unit shall install, calibrate, maintain, and operate a continuous monitoring system for the measurement and recording of nitrogen oxides emissions.

(2) The pollutant gas used to prepare calibration gas mixtures and for calibration checks shall be nitrogen dioxide (NO_2).

(3) Reference Method 7 shall be used for conducting monitoring system performance evaluations.

(4) The span shall be set at 500 ppm of nitrogen dioxide.

(5) The owner or operator of a nitric acid plant shall establish a conversion factor for the purpose of converting monitoring data into units of the applicable standard (kg/metric ton, lb/ton). The conversion factor shall be established by measuring emissions with the continuous monitoring system concurrent with measuring emissions with the applicable reference method tests. Using only that portion of the continuous monitoring emission data

that represents emission measurements concurrent with the reference method test periods, the conversion factor shall be determined by dividing the reference method test data averages by the monitoring data averages to obtain a ratio expressed in units of the applicable standard to units of the monitoring data, i.e., (kg/metric ton per ppm, lb/ton per ppm). The conversion factor shall be reestablished during any performance test or any continuous monitoring system performance evaluation.

(6) The owner or operator of a nitric acid production unit shall record the daily production rate and hours of operation.

(7) For the purpose of reports under APC-21(c)(1)(bb)(ii), periods of excess emissions that shall be reported are defined as any three-hour period during which the average nitrogen oxides emissions (arithmetic average of three contiguous one-hour periods) as measured by a continuous monitoring system exceed the applicable standards under this regulation.

(e) Performance Test Methods. Unless another method is approved by the Director, any person required to submit performance tests for a nitric acid production unit shall utilize the following test methods:

- (1) Method 7 for the concentration of NO₂;
- (2) Method 1 for sample and velocity traverses;
- (3) Method 2 for velocity and volumetric flow rate; and
- (4) Method 3 for gas analysis.

(f) Performance Test Procedures

(1) For Method 7, the same site shall be selected according to Method 1 and the sampling point shall be the centroid of the stack or duct or at a point no closer to the walls than 1 m (3.28 ft). Each run shall consist of at least four grab samples taken at approximately 15-minute intervals. The arithmetic mean of the samples shall constitute the run value. A velocity traverse shall be performed once per run.

(2) Acid production rate, expressed in metric tons per hour of 100 percent nitric acid, shall be determined during each testing period by suitable methods and shall be confirmed by a material balance over the production system.

(3) For each run, nitrogen oxides, expressed in lb/ton of 100 percent nitric acid (g/metric ton), shall be determined by dividing the emission rate in lb/hr (g/hr) by the acid production rate. The emission rate shall be determined by the equation,

$$\text{lb/hr} = Q_s \times c$$

where Q_s = volumetric flow rate of the effluent in dscf/hr (dscm/hr), as determined in accordance with paragraph (e)(3) of this section, and $c = \text{NO}_2$ concentration in lb/dscf (g/dscm), as determined in accordance with subsection (e)(1) of this regulation.

[April 13, 1972; amended December 18, 1975]

CHAPTER SEVENTEEN: APC 17

APC 17 Emission Standards for Asbestos

(a) Definitions: The following definitions of words and phrases are controlling for the purposes of this regulation:

(1) "Air flow permeability" means the volumetric rate of air flow in cfm, produced by a pressure decrease of 0.5 inches water gage across a new, clean filtering fabric, divided by the area of the fabric in ft². Tests of air flow permeability must be performed as specified in ASTM Designation D737-69.

(2) "Agency" means the Minnesota Pollution Control Agency as constituted pursuant to Minn. Stat. § 116.02 (1971).

(3) "Asbestos" means any of six naturally occurring, hydrated mineral silicates: Actinolite, amosite, anthophyllite, chrysotile, crocidolite, and tremolite.

(4) "Debris" means waste produced by the demolition of a building or structure.

(5) "Director" means the Executive Director of the Agency.

(6) "Local exhaust ventilation system" means the capture of particulate matter generated by a process through the application of an air stream induced at the process and a device which encloses the process, partially encloses the process, or guides the capturing air flow at the process. The design and operation of ventilation devices must conform with ANST Z9.2-1971, published by the American National Standards Institute.

(7) "Manufacturing operation" means the processing of asbestos or the production of any product containing asbestos, with the exception of any process in which an asbestos containing material is sprayed.

(8) "Particulate matter" means any material, other than uncombined water, which exists in a finely divided form as a liquid or solid.

(9) "Spraying" means any operation in which material is conveyed in the form of, or by the means of, a fluid stream from an application device to a receiving surface.

(10) "Visible emission" means any emission which is visually detectable.

(11) For purposes of this regulation a product shall be deemed to contain asbestos if a detectable amount of asbestos is present in the product or in any material that goes into the product. A detectable amount of asbestos is defined as that amount detectable by the methods of x-ray diffraction, petrographic optical microscopy, or other method approved by the Director.

(b) Emission Standards for Asbestos.

(1) Manufacturing operations.

(aa) Emissions of particulate matter to the atmosphere from a local exhaust ventilation system in a building, structure, facility or installation within which any manufacturing operation is carried on shall not exceed the amount which would be emitted if such emissions were treated in a fabric filter installation as described in subsection (c).

(bb) All other visible emissions of particulate matter to the atmosphere from a building, structure, facility, or installation within which any

manufacturing operation is carried on shall not exceed the amount which would be emitted if such emissions were treated in a fabric filter installation as described in subsection (c).

(cc) Visible emissions of particulate matter to the atmosphere from any manufacturing operation located outside a building, structure, facility, or installation are prohibited.

(2) Spraying.

(aa) The spraying in any area open to the outdoor atmosphere of any acoustical insulating, thermal insulating, or fireproofing product which contains asbestos is prohibited.

(bb) Emissions to the outdoor atmosphere of particulate matter from the spraying of any acoustical insulating, thermal insulating, or fireproofing product which contains asbestos, if such spraying is not otherwise prohibited by law, shall not exceed the amounts which would be emitted to the atmosphere if the area containing such emissions were treated by a fabric filter installation as described in subsection (c).

(3) Demolition. The demolition of any building or structure, except single family and two family dwellings, involving the dislodging of asbestos-containing materials, shall occur only under the following conditions and procedures:

(aa) Boilers, pipes, steel members, ducts, and where practicable, all other surfaces covered or lined with asbestos-containing materials, shall be thoroughly wetted before demolition. All surfaces likely to come in contact with such asbestos-containing materials during toppling of walls, roofs and floors shall be thoroughly wetted before toppling is begun.

(bb) In all cases, and at all stages, of demolition and of loading, transportation and unloading of debris, wetting procedures shall be sufficient to prevent particulate matter from becoming airborne. Trucks shall be adequately covered or enclosed to prevent particulate matter from becoming airborne while in transit.

(cc) Asbestos-containing debris shall not be dropped or thrown from any floor of the building, but shall be lowered to the ground by dust-tight chutes or buckets. Asbestos-containing debris in chutes or buckets shall be sufficiently wetted to preclude particulate matter from becoming airborne.

(dd) In the event particulate matter becomes airborne for a continuous period of 15 minutes, despite the application of the above procedures, or because freezing temperatures preclude the use of water for wetting, the demolition shall cease at once until alternative procedures can be taken to prevent particulate matter from becoming airborne. Such procedures shall be evaluated and approved by the Director and these procedures shall be effected before the demolition is continued.

(ee) The Director shall be notified in writing of all planned demolition at least twenty (20) days prior to commencement of the demolition. Such notification shall include:

- (i) The location of the building or structure;
- (ii) The date of commencement of demolition;
- (iii) The method of demolition, whether by toppling or other means;
- (iv) A description and general location of the asbestos-containing materials in the building or structure;

(v) A statement of the method by which the above procedures shall be effected to prevent asbestos particulate matter from becoming airborne; and

(vi) Such other items as the Director deems necessary to determine that the above procedures will be followed to prevent asbestos particulate matter from becoming airborne.

(ff) The Director may disapprove the demolition of any building or structure and order that the demolition cease. The demolition shall not occur until subsequent approval by the Director of the Agency.

(c) Fabric Filter Specifications.

(1) Fabric filter collection devices referred to in subsection (b)(1)(aa), (b)(1)(bb) and (b)(2)(bb) shall be operated at not more than 4 inches water gage pressure decrease as measured across the filter fabric. No bypass devices are permitted. Such collection devices shall be equipped with either of the following classes of fabrics:

(aa) Woven fabrics which have an air flow permeability not exceeding 30 cfm/ft² and which, if constructed of synthetic materials, contain no fill yarn other than that which is spun.

(bb) Felted fabrics which have an average density of not less than 14 oz/yd², an average thickness of not less than 1/16 inch, and an air flow permeability of not more than 35 cfm/ft².

(2) Fabric filter devices do not meet the requirements of subsection (c)(1) if any of the following conditions exist:

(aa) Leakage of gases, containing particulate matter, from the control system prior to filtration;

(bb) Torn or ruptured bags;

(cc) Improperly positioned bags;

(dd) Badly worn or threadbare bags; or

(ee) Presence of visible emissions of particulate matter during the emptying of collection hoppers.

(d) Substitute Devices for Fabric Filters.

(1) Wet collectors

(aa) Where an owner or operator deems that the use of fabric filter installations for operations subject to subsections (b)(1)(aa), (b)(1)(bb) and (b)(2)(bb) would create a fire or explosive hazard, application for approval to use wet collectors shall be made to the Director. Such application shall include sufficient information to demonstrate that fabric filters cannot be used. The Director shall authorize the use of wet collectors if the Director determines that fabric filters cannot be used.

(bb) Wet collectors must be operated with a unit contacting energy of not less than 40 inches water gage. Unit contacting energy is the sum of the gas static pressure head decrease across the contact chamber of the collector, the energy per unit weight of gas handled which is required to introduce scrubbing liquid into the contact chamber, and the shaft energy per unit weight of gas handled which is applied to effect contact between the scrubbing liquid and the gas stream. No bypass devices are permitted.

(cc) Wet collectors do not meet the requirements of subsection (d)(1)(bb) if either of the following conditions exist:

(i) Leakage of gases, containing particulate matter, from the con-

trol system prior to passage through the wet collector; or

(ii) Operation at a gas static pressure head decrease, a scrubbing medium flow rate, or a mechanical energy level less than specified by the manufacturer for optimum collection efficiency.

(2) Other Control Equipment

(aa) Compliance with any applicable provision of this regulation which refers to a control equipment specification shall be demonstrated in accordance with this section if the referenced control equipment is not used.

(i) The owner or operator of the emission source, or vendor of emission control equipment, shall make available to the Director sufficient information as may be required to demonstrate that the substitute equipment will provide the degree of emission control which, in the judgment of the Director, is at least as stringent as that which would be achieved by using the equipment specified in the applicable standard. To the maximum extent practicable, the determination of equivalent degree of emission control will be based upon operation at the actual conditions at which the substitute device is, or will be, operated on the emission source. Factors which will be considered include, but are not limited to, total mass collection efficiency, collection efficiency versus particle size reliability, and maintenance practices associated with proper operation of the substitute device. The method used to determine the total mass collection efficiency and particle size distribution must be approved by the Director.

(ii) The owner or operator of the emission source, or vendor of emission control equipment, shall submit to the Director performance data including, but not limited to, total mass collection efficiency and collection efficiency versus particle size of the substitute control device under actual operating conditions which are representative of those of the existing or planned operating conditions.

(iii) In cases for which it is not reasonable, in the judgment of the Director, to submit performance data which are based upon actual operating conditions which are representative thereof, the owner or operator, or vendor of emission control equipment, shall submit to the Director performance data on comparative tests, using subtle standard test aerosols, of the substitute device and the device specified by the applicable standard. The performance data shall include, but is not limited to, the total mass collection efficiency and the collection efficiency versus particle size of the substitute device and the device specified by the applicable standard.

(bb) Collection efficiency

(i) The total mass collection efficiency of any substitute device for a fabric filter shall not be less than 99.9 per cent.

(ii) The total mass collection efficiency of any substitute device for a wet collector shall not be less than 99.5 per cent.

(e) Installation and Operation of Control Equipment. Whenever a fabric filter, wet collector, or other control device is required by this regulation, the filter, collector, or other device shall be properly installed, used, and maintained at all times during the operation of the asbestos generating facility.

[July 6, 1973]

APC 18 Emission Standards for Inorganic Fibrous Materials

(a) **Definitions:** The following definitions of words and phrases are controlling for purposes of this regulation:

(1) "Inorganic fibrous material" means glass fibers, glass wool, rock wool, and aluminum oxide fibers having a length-to-diameter ratio of equal to or greater than three to one.

(2) "Spraying" means an operation in which material is conveyed in the form of, or by the means of, a fluid stream from an application device to a receiving surface.

(b) **Spraying of Inorganic Fibrous Materials.** The spraying on any portion of a building or structure open to the outdoor atmosphere of any acoustical insulating, thermal insulating, or fireproofing product which does not contain asbestos but which contains inorganic fibrous material shall occur only under the following procedures:

(1) The entire floor area where the spraying is to occur shall be enclosed with plastic-coated tarpaulins or by other means in a manner which shall prevent the escape of sprayed material from the enclosure. All interior areas, such as elevator shafts and stairwells, shall be enclosed in a manner which shall prevent the escape of sprayed material from the working area.

(2) The entire area in which spraying has occurred, including all ledges, surfaces, equipment, and protective tarpaulins within the enclosure, shall be thoroughly cleaned by means of scraping, sweeping, vacuuming, or other acceptable methods upon completion of the spraying operation and before the enclosure is dismantled; provided, however, that all such cleaning procedures shall be followed by thorough vacuuming. The collected material shall be placed in a sealed container or bag strong enough to resist breaking and tearing under normal handling conditions and shall be transported directly to a disposal site approved by the Director.

(3) All areas for opening containers of the material to be sprayed and for loading the material to be sprayed into hoppers, or other containers shall be enclosed in a manner which shall prevent the escape of the material to be sprayed to the outdoor atmosphere.

[Filed March 18, 1974]

APC 19 Permits for Indirect Sources

(a) Definitions

(1) "Indirect Source": A facility, building, structure, or installation which attracts or may attract mobile source activity that results in emissions of a pollutant for which there is a state standard. Such indirect sources include, but are not limited to:

- (aa) Highways and roads.
- (bb) Parking facilities.
- (cc) Retail, commercial and industrial facilities.
- (dd) Recreation, amusement, sports and entertainment facilities.
- (ee) Airports.
- (ff) Office and government buildings.
- (gg) Apartment and condominium buildings.
- (hh) Education facilities.

(2) "Associated Parking Area": A parking facility or facilities owned or operated in conjunction with an indirect source.

(3) "To Commence Construction": To engage in a continuous program of construction including site clearance, grading, dredging, or land filling specifically designed for an indirect source in preparation for the fabrication, erection, or installation of the building components of the indirect source. For the purpose of this paragraph, interruptions resulting from acts of God, strikes, litigation, or other matters beyond the control of the owner shall be considered in determining whether a construction or modification program is continuous.

(4) "To Commence Modification": To engage in a continuous program of modification, including site clearance, grading, dredging, or land filling in preparation for a specific modification of the indirect source.

(5) "Highway Project": The development proposal of a highway of substantial length between logical termini (major crossroads, population centers, major traffic generators, or similar major highway control elements) as normally included in a single location study or multi-year highway improvement program.

(6) "Metropolitan Area": The city limits of Duluth and all contiguous incorporated areas in Minnesota; the city limits of Moorhead and all contiguous incorporated areas in Minnesota; the city limits of St. Cloud and all contiguous incorporated areas; Rochester and all area within the boundaries of Olmsted County; and the Twin Cities metropolitan area including Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington counties.

(b) Permit Required

No person shall cause or allow the construction of any of the following without first obtaining a permit to do so from the Agency:

Parking Facilities

(1) Any new parking facility, or other new indirect source with an associated parking area, which has a new parking capacity of 2,000 cars or more.

(2) Any modified parking facility, or any modification or an associated parking area, which increases parking capacity by 1,000 cars or more, or which increases total parking capacity to 2,000 cars or more.

Highways

(3) Any new highway project wholly within or partially within a metropolitan area with an anticipated average annual daily traffic volume of 20,000 or more vehicles per day within 10 years of the completion of construction.

(4) Any modified highway project which will increase average annual daily traffic volume by 10,000 or more vehicles per day within 10 years after completion of the modification.

Airports

(5) Any new or modified airport construction which will result in the generation of more than 1,000,000 passengers per year on regularly scheduled air carriers and commercial charter flights within 10 years after completion of construction.

(6) Where an indirect source is constructed or modified in increments which individually are not subject to review under this regulation, and which are not part of a program of construction or modification in planned incremental phases approved by the Agency, all such increments commenced after December 31, 1974, or after the latest approval hereunder, whichever date is most recent, shall be added together for determining the applicability of this regulation.

Other Sources

(7) Any indirect source which will generate mobile sources in a quantity that preparation of an assessment as set forth in Appendix A of this regulation and provided for in Section (d) indicates that a permit is required.

(c) Exemptions

The following indirect sources are exempt from the requirement to obtain a permit:

Existing Sources

(1) Indirect sources which are in operation on the effective date of this regulation.

Sources Under Construction

(2) Indirect sources for which construction has commenced prior to January 1, 1975.

Parking Facilities

(3) Any new parking facility, or other new indirect source with an associated parking area, which has a new parking capacity of fewer than 1,000 cars.

(4) Any modified parking facility, or any modification of an associated parking area, which increases parking capacity by fewer than 500 cars, provided that the conditions of Section (b) (2) are not exceeded.

Airports

(5) Any new or modified airport construction which will result in the generation of fewer than 500,000 passengers per year on regularly scheduled air carriers and commercial charter flights within 10 years after completion of construction.

Highways

(6) Highway projects which are wholly outside a metropolitan area.

Other Sources

(7) Indirect sources constructed as part of the Minnesota Implementation Plan to Achieve Carbon Monoxide Ambient Air Quality Standards, specifically the parking ramps constructed by the City of Minneapolis on the fringe of the Minneapolis Central Business District.

(d) Assessment

For all indirect sources not described in Section (b) or Section (c), the necessity for an indirect source permit shall be determined according to the assessment procedure set forth in Appendix A to this regulation. No person shall cause or allow the construction of an indirect source for which an assessment is required until the assessment has been completed to the satisfaction of the Director. The Director shall make a determination on whether a permit application is required within seven days of receipt of a satisfactory assessment. If the Director determines that a permit application is required, such applications shall be made in accordance with Section (c).

(e) Permit Application

Construction or modification of any indirect source subject to this regulation shall not commence until a permit is issued by the Agency or until a determination is made by the Director in accordance with Section (d) that a permit application need not be made. Application for a permit shall be made in accordance with provisions of this section. Every application shall be accompanied with a copy of any draft or final environmental impact statement which has been prepared pursuant to the National Environmental Policy Act (42 U.S.C. 4321), or a copy of any environmental assessment or environmental impact statement submitted to the Minnesota Environmental Quality Council.

(1) For all indirect sources subject to this regulation, other than highway projects:

(aa) The name and address of the applicant.

(bb) A map showing the location of the site of the indirect source and the topography of the area.

(cc) A description of the proposed use of the site, including the normal hours of operation of the facility, and the general types of activities to be operated therein.

(dd) A site plan showing the location of associated parking areas, points of motor vehicle ingress and egress to and from the site and its associated parking areas, and the location and height of buildings on the site.

(ee) An identification of the principal roads, highways, and intersections that will be used by motor vehicles moving to or from the indirect source.

(ff) An estimate, as of the first year after the date the indirect source will be substantially complete and operational, of the average daily traffic volumes, maximum traffic volumes for one-hour and eight-hour periods, and vehicle capacities of the principal roads, highways, and intersections identified pursuant to subsection (1)(ee) located within one-fourth mile of all boundaries of the site.

(gg) Availability of existing and projected mass transit to service the site.

(hh) Where approval is sought for indirect sources to be constructed in incremental phases, the information required by this section shall be submitted for each phase of the construction project.

(ii) Any additional information or documentation that the Director or Agency deem necessary to determine the air quality impact of the indirect source, including the submission of measured air quality data for carbon monoxide at the proposed site prior to construction or modification.

(2) For airports:

(aa) An estimate of the average number and maximum number of aircraft operations per day by type of aircraft during the first, fifth, and tenth years after the date of expected completion.

(bb) A description of the commercial, industrial, residential and other development that the applicant expects will occur within three miles of the perimeter of the airport within the first five and the first ten years after the date of expected completion.

(cc) Expected passenger loadings at the airport.

(dd) The information required under subsections (1)(aa) through (ii) of this section.

(3) For highway projects:

(aa) A description of the average and maximum traffic volumes for one, eight, and 24-hour time periods expected within 10 years of date of expected completion.

(bb) An estimate of vehicle speeds for average and maximum traffic volume conditions and the vehicle capacity of the highway project.

(cc) A map showing the location of the highway project, including the location of buildings along the right-of-way.

(dd) A description of the general features of the highway project and associated right-of-way, including the approximate height of buildings adjacent to the highway.

(ee) Any additional information or documentation that the Director deems necessary to determine the air quality impact of the indirect source, including the submission of measured air quality data for carbon monoxide at the proposed site prior to construction or modification.

(ff) The information required under subsections (1)(aa) through (ii) of this section.

(4) The air quality monitoring requirements of this section shall be limited to carbon monoxide, and shall be conducted for a period of not more than 14 days.

(f) Standards for Issuance

(1) For indirect sources other than highway projects, the Agency shall approve an application to construct or modify if it determines that the indirect source will not:

(aa) Violate any control strategy of the Minnesota Implementation Plan to Achieve National Ambient Air Quality Standards; or,

(bb) Violate state standards for carbon monoxide in any region or portion thereof.

(2) The Agency shall make the determination pursuant to this section by evaluating the anticipated concentration of carbon monoxide at reasonable receptor or exposure sites which will be affected by the mobile source activity expected to be attracted by the indirect source. Such determination may be made by using traffic flow characteristic guidelines published by the Environmental Protection Agency which relate traffic demand and capacity considerations to ambient carbon monoxide impact by use of appropriate atmospheric diffusion models, or by any other reliable analytic method. The applicant may submit with his application the results of an appropriate diffusion model or any other reliable analytic method, along with the technical data and information supporting such results. Any such results and supporting data submitted by the applicant shall be considered by the Agency in making a determination pursuant to this section.

(3) For all highway projects subject to this regulation, the Agency shall not grant a permit to construct or modify if it determines that the indirect source will:

(aa) Cause a violation of any control strategy of the Minnesota Implementation Plan to Achieve National Ambient Air Quality Standards; or,

(bb) Cause or exacerbate a violation of the state standards for carbon monoxide in any region or portion thereof. The determination pursuant to this section shall be made by evaluating the anticipated concentration of carbon monoxide at reasonable receptor or exposure sites which will be affected by the mobile source activity expected on the highway for the ten-year period following the expected date of completion according to the procedures specified in Section (f)(2) of this regulation.

(4) The determination of the air quality impact of a proposed indirect source "at reasonable receptor or exposure sites" shall mean such locations where people might reasonably be exposed for time periods consistent with the state ambient air quality standards for the pollutants specified for analysis pursuant to this section.

(g) Permit Procedure

(1) Within 20 days after receipt of an application or addition thereto, the Director shall advise the owner or operator of any deficiency in the information submitted in support of the application. In the event of such a deficiency, the date of receipt of the application for the purpose of subsection (2) of this section shall be the date on which all required information is received by the Agency.

(2) Within 30 days after receipt of a complete application, the Director shall:

(aa) Make a preliminary determination whether the application for an indirect source permit should be approved, approved with conditions in accordance with Section (h) of this regulation, or disapproved;

(bb) Make available to the public in at least one location in the affected Minnesota Development Region a copy of all materials submitted by the owner or operator, a copy of the Director's preliminary determination, and a copy or summary of other materials, if any, considered by the Director in making the preliminary determination; and,

(cc) Notify the public, by prominent advertisement in a newspaper of general circulation in each Minnesota Development Region in which the proposed indirect source would be constructed, of the opportunity for written public comment on the information submitted by the owner or operator and the Director's preliminary determination on the approvability of the indirect source.

(3) A copy of the notice required pursuant to this section shall be sent to the applicant and to officials and agencies having cognizance over the location where the indirect source will be situated, as follows: Local air pollution control agencies, the chief executive of the city and county, and the Regional Development Commission in the Minnesota Development Region in which the indirect source is located.

(4) Public comments submitted in writing within 30 days after the date such information is made available shall be considered by the Agency in making its final decision on the application. No later than 10 days after the close of the public comment period, the applicant may submit a written response to any comments submitted by the public. The Agency shall consider the applicant's response in making its final decision. All comments shall be made available for public inspection in at least one location in the Minnesota Development Region in which the indirect source would be located.

(5) The Agency shall take final action on an application within forty-five days after the close of the public comment period. The Agency shall notify the applicant in writing of its approval, conditional approval, or denial of the application, and shall set forth its reasons for conditional approval or denial. Such notification shall be made available for public inspection in at least one location in the region in which the indirect source would be located.

(6) The Agency may extend each of the time periods specified in this section for a period not to exceed 30 days or such other periods as agreed to by the applicant. Nothing herein, however, shall preclude the Agency from extending any of these time periods for an appropriate length of time if it decides to hold a public hearing or public meeting on any permit application, or if an environmental impact statement on the indirect source is prepared.

(h) Permit Conditions

(1) Whenever an indirect source as proposed by an owner or operator's application would not be permitted to be constructed for failure to meet the tests set forth pursuant to Section (f) of this regulation, the Agency may impose reasonable conditions on an approval related to the air quality aspects of the proposed indirect source so that such source, if constructed or modified in accordance with such conditions, could meet the tests set forth pursuant to Section (f) of this regulation. Such conditions may include, but not be limited to:

(aa) Binding commitments to roadway improvements or additional mass transit facilities to serve the indirect source secured by the owner or operator from governmental agencies having jurisdiction thereof;

(bb) Binding commitments by the owner or operator to specific programs for mass transit incentives for the employees and patrons of the source; and,

(cc) Binding commitments by the owner or operator to construct, modify, or operate the indirect source in such a manner as may be necessary to achieve the traffic flow characteristics published by the Environmental Protection Agency pursuant to Section (f)(2) of this regulation.

(2) The Agency may specify that any items of information provided in an application for approval related to the operation of an indirect source which may affect the source's air quality impact shall be considered permit conditions.

(3) Notwithstanding the provisions relating to modified indirect sources contained in Section (b) of this regulation, the Agency may condition any approval by reducing the extent to which the indirect source may be further modified without resubmission for approval under this section.

(4) No owner or operator shall construct an indirect source except in accordance with the permit as approved by the Agency, and no owner or operator shall construct and operate an indirect source except in accordance with conditions imposed by the Agency under this section. Subsequent modification to an approved indirect source may be made without applying for permission pursuant to this regulation only where such modification would not violate any condition imposed pursuant to this section and would not be subject to the modification criteria set forth in Section (b) of this regulation.

(5) Approval to construct or modify shall become invalid if construction or modification is not commenced within 24 months after receipt of such approval. The Agency may extend such time period upon a satisfactory showing that an extension is justified. The applicant may apply for such an extension at the time of initial application or at any time thereafter.

(6) Approval to construct or modify shall not relieve any owner or operator of the responsibility to comply with all local, state and federal regulations.

(7) The Permittee shall allow the Agency, or any authorized employee or agent of the Agency, when authorized by law and upon presentation of proper credentials, to enter upon the property of the Permittee for the purpose of obtaining information or examining records or conducting surveys or investigations pertaining to the installation or operation of the indirect source covered by the permit.

(8) The Permittee shall, when requested by the Agency, submit such information and reports which are relevant to the control of pollution regarding the operation of the indirect source covered by the permit.

(9) The Agency may prescribe other permit conditions related to the maintenance of carbon monoxide standards.

(i) Circumvention.

No person shall circumvent the requirements of this regulation by causing or allowing a pattern of ownership or development to occur over a geo-

(aa) Make a preliminary determination whether the application for an indirect source permit should be approved, approved with conditions in accordance with Section (h) of this regulation, or disapproved;

(bb) Make available to the public in at least one location in the affected Minnesota Development Region a copy of all materials submitted by the owner or operator, a copy of the Director's preliminary determination, and a copy or summary of other materials, if any, considered by the Director in making the preliminary determination; and,

(cc) Notify the public, by prominent advertisement in a newspaper of general circulation in each Minnesota Development Region in which the proposed indirect source would be constructed, of the opportunity for written public comment on the information submitted by the owner or operator and the Director's preliminary determination on the approvability of the indirect source.

(3) A copy of the notice required pursuant to this section shall be sent to the applicant and to officials and agencies having cognizance over the location where the indirect source will be situated, as follows: Local air pollution control agencies, the chief executive of the city and county, and the Regional Development Commission in the Minnesota Development Region in which the indirect source is located.

(4) Public comments submitted in writing within 30 days after the date such information is made available shall be considered by the Agency in making its final decision on the application. No later than 10 days after the close of the public comment period, the applicant may submit a written response to any comments submitted by the public. The Agency shall consider the applicant's response in making its final decision. All comments shall be made available for public inspection in at least one location in the Minnesota Development Region in which the indirect source would be located.

(5) The Agency shall take final action on an application within forty-five days after the close of the public comment period. The Agency shall notify the applicant in writing of its approval, conditional approval, or denial of the application, and shall set forth its reasons for conditional approval or denial. Such notification shall be made available for public inspection in at least one location in the region in which the indirect source would be located.

(6) The Agency may extend each of the time periods specified in this section for a period not to exceed 30 days or such other periods as agreed to by the applicant. Nothing herein, however, shall preclude the Agency from extending any of these time periods for an appropriate length of time if it decides to hold a public hearing or public meeting on any permit application, or if an environmental impact statement on the indirect source is prepared.

(h) Permit Conditions

(1) Whenever an indirect source as proposed by an owner or operator's application would not be permitted to be constructed for failure to meet the tests set forth pursuant to Section (f) of this regulation, the Agency may impose reasonable conditions on an approval related to the air quality aspects of the proposed indirect source so that such source, if constructed or modified in accordance with such conditions, could meet the tests set forth pursuant to Section (f) of this regulation. Such conditions may include, but not be limited to:

(aa) Binding commitments to roadway improvements or additional mass transit facilities to serve the indirect source secured by the owner or operator from governmental agencies having jurisdiction thereof;

(bb) Binding commitments by the owner or operator to specific programs for mass transit incentives for the employees and patrons of the source; and,

(cc) Binding commitments by the owner or operator to construct, modify, or operate the indirect source in such a manner as may be necessary to achieve the traffic flow characteristics published by the Environmental Protection Agency pursuant to Section (f)(2) of this regulation.

(2) The Agency may specify that any items of information provided in an application for approval related to the operation of an indirect source which may affect the source's air quality impact shall be considered permit conditions.

(3) Notwithstanding the provisions relating to modified indirect sources contained in Section (b) of this regulation, the Agency may condition any approval by reducing the extent to which the indirect source may be further modified without resubmission for approval under this section.

(4) No owner or operator shall construct an indirect source except in accordance with the permit as approved by the Agency, and no owner or operator shall construct and operate an indirect source except in accordance with conditions imposed by the Agency under this section. Subsequent modification to an approved indirect source may be made without applying for permission pursuant to this regulation only where such modification would not violate any condition imposed pursuant to this section and would not be subject to the modification criteria set forth in Section (b) of this regulation.

(5) Approval to construct or modify shall become invalid if construction or modification is not commenced within 24 months after receipt of such approval. The Agency may extend such time period upon a satisfactory showing that an extension is justified. The applicant may apply for such an extension at the time of initial application or at any time thereafter.

(6) Approval to construct or modify shall not relieve any owner or operator of the responsibility to comply with all local, state and federal regulations.

(7) The Permittee shall allow the Agency, or any authorized employee or agent of the Agency, when authorized by law and upon presentation of proper credentials, to enter upon the property of the Permittee for the purpose of obtaining information or examining records or conducting surveys or investigations pertaining to the installation or operation of the indirect source covered by the permit.

(8) The Permittee shall, when requested by the Agency, submit such information and reports which are relevant to the control of pollution regarding the operation of the indirect source covered by the permit.

(9) The Agency may prescribe other permit conditions related to the maintenance of carbon monoxide standards.

(i) Circumvention.

No person shall circumvent the requirements of this regulation by causing or allowing a pattern of ownership or development to occur over a geo-

graphic area which, except for the pattern of ownership or development, would otherwise require an indirect source permit.

(k) Ambient Standards.

Regardless of whether a permit is required for the indirect source, no owner or operator of an indirect source shall cause or allow a violation of any ambient air quality standard.

APPENDIX A

The air quality assessment required in paragraph (d) will require the following information and procedure:

(1) Information:

(a) The highest existing peak daily traffic count on any segment of any public road or highway located within one-fourth mile from any point on the property line of the indirect source. This public road or highway is the busiest roadway to be affected by the modification or construction and is hereinafter referred to as the "busiest roadway." [^e(24)]

(b) The highest projected peak daily traffic attracted to the proposed indirect source construction or modification occurring at any time during the one-year period immediately following the construction or modification. [^p(24)]

(c) The highest projected peak daily traffic on the busiest roadway during the one-year period immediately following the construction or modification, not including traffic attracted to the proposed indirect source. [^r(24)]

(d) Compute the maximum expected one-hour traffic volumes ^e(1), ^p(1), ^r(1), where:

$$\begin{aligned}\sup{e}(1) &= .12 \sup{e}(24) \\ \sup{p}(1) &= .12 \sup{p}(24) \\ \sup{r}(1) &= .12 \sup{r}(24)\end{aligned}$$

(e) Compute the maximum expected eight-hour traffic volumes ^e(8), ^p(8), ^r(8), where:

$$\begin{aligned}\sup{e}(8) &= .6 \sup{e}(24) \\ \sup{p}(8) &= .6 \sup{p}(24) \\ \sup{r}(8) &= .6 \sup{r}(24)\end{aligned}$$

(2) Procedure:

(a) **STEP 1:** Comparison of Existing Air Quality to the One-Hour Standard.

If ^e(1) is greater than or equal to 2,500 vehicles per hour, a permit application is required and completion of the remaining steps is not required; if it is less, go to STEP 2.

(b) **STEP 2:** Comparison of Existing Air Quality to the Eight-Hour Standard.

If ^e(8) is greater than or equal to 5,000 vehicles per eight hours, a permit application is required and completion of the remaining steps is not required; if it is less, go to STEP 3.

(c) **STEP 3:** Comparison of Projected Air Quality to the One-Hour Standard.

If ^r(1) + ^p(1) is greater than or equal to 5,000 vehicles per hour, a permit application is required and completion of the remaining step is not required; if it is less, then go to STEP 4.

(d) **STEP 4:** Comparison of Projected Air Quality to the Eight-Hour Standard.

If ^r(8) + ^p(8) is greater than or equal to 7,500 vehicles per eight-hours, a permit application is required. If it is less, then no permit application is required.

6 MCAR § 4.0021 Emission source monitoring, performance tests, reports, shutdowns and breakdowns.

A. Continuous monitoring.

1. **Monitoring requirement.** The owner or operator of any emission facility, whether or not continuous monitoring is required by another regulation, may be required to establish a continuous monitoring system, upon order of the director, when in his judgment other methods of measurement or calculation do not provide adequate information on the level or variation of emissions to assure compliance with applicable regulations.

2. **Monitoring system qualifications.** Any owner or operator of an emission facility who is required by applicable regulation or by order of the director to install a continuous monitoring system shall install a system which meets the following performance evaluations:

a. Continuous monitoring systems for measuring opacity of emissions shall comply with performance specification 1.

b. Continuous monitoring systems for measuring nitrogen oxides emissions shall comply with performance specification 2.

c. Continuous monitoring systems for measuring sulfur dioxide emissions shall comply with performance specification 2.

d. Continuous monitoring systems for measuring the oxygen content or carbon dioxide content of effluent gases shall comply with performance specification 3.

3. **Performance evaluation.** The agency or the director may order any owner or operator who has installed a continuous monitoring system to conduct performance evaluations of the system. The performance evaluations shall be conducted under such conditions as the agency or the director may impose.

134
4. **Old monitoring systems.** Any owner or operator of an emission facility who installed or entered into a building contract to purchase a specific continuous monitoring system prior to September 11, 1974, may be exempt from meeting the performance evaluations set forth in 6 MCAR S 4.0021 A.2. provided the following requirements are met:

a. Continuous monitoring systems for measuring opacity of emissions shall be capable of measuring emission levels within ± 20 percent of the correct value with a confidence level of 95 percent. The calibration error test and associated calculation procedures set forth in performance specification 1 shall be used for demonstrating compliance with this specification.

b. Continuous monitoring systems for measurement of nitrogen oxides or sulfur dioxide shall be capable of measuring emission levels within

± 20 percent of the correct value with a confidence level of 95 percent. The calibration error test, the field test for accuracy (relative), and associated operating and calculation procedures set forth in performance specification 2 shall be used for demonstrating compliance with this specification.

All continuous monitoring systems installed under this paragraph shall be upgraded or replaced with new continuous monitoring systems which comply with the performance evaluations set forth in 6 MCAR § 4.0021 A.2. by September 11, 1979.

5. Zero and span drift. Owners or operators who are required to install continuous monitoring systems shall check the zero and span drift at least once daily in accordance with the method prescribed by the manufacturer of such systems unless the manufacturer recommends adjustments at shorter intervals, in which case such recommendations shall be followed. The zero and span shall, as a minimum, be adjusted whenever the 24-hour zero drift or 24-hour calibration drift limits of the performance specifications in performance specification 1, 2 or 3, whichever is applicable, are exceeded. For continuous monitoring systems measuring opacity of emissions, the optical surfaces exposed to the effluent gases shall be cleaned prior to performing the zero or span drift adjustments except that for systems using automatic zero adjustments, the optical surfaces shall be cleaned when the cumulative automatic zero compensation exceeds four percent opacity. Unless otherwise approved by the agency, the following procedures, as applicable, shall be followed:

a. For extractive continuous monitoring systems measuring gases, minimum procedures shall include introducing applicable zero and span gas mixtures into the measurement system as near the probe as is practical. Span and zero gases certified by their manufacturer to be traceable to National Bureau of Standards reference gases shall be used whenever these reference gases are available. The span and zero gas mixtures shall be the same composition as specified in performance specification 1, 2, or 3, whichever is applicable. Every six months from date of manufacture, span and zero gases shall be reanalyzed by conducting triplicate analyses with reference method 6 for SO₂, reference method 7 for NO_x, and reference method 3 for O₂ and CO₂, respectively. The gases may be analyzed at less frequent intervals if longer shelf lives are guaranteed by the manufacturer.

b. For non-extractive continuous monitoring systems measuring gases, minimum procedures shall include upscale check(s) using a certified calibration gas cell or test cell which is functionally equivalent to a known gas concentration. The zero check may be performed by computing the zero value from upscale measurements or by mechanically producing a zero condition.

c. For continuous monitoring systems measuring opacity of emissions, minimum procedures shall include a method for producing a simulated zero opacity condition and an upscale (span) opacity condition using a certified neutral density filter or other related technique to produce a known

obscuration of the light beam. Such procedures shall provide a system check of the analyzer internal optical surfaces and all electronic circuitry including the lamp and photodetector assembly.

6. Operation requirements. Except for system breakdowns, repairs, calibration checks, and zero and span adjustments, all continuous monitoring systems shall be in continuous operation and shall meet minimum frequency of operation requirements as follows:

a. Opacity. All continuous monitoring systems for measuring opacity of emissions shall complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 10-second period.

b. Other pollutants.

(1) All continuous monitoring systems, except those old systems installed under 6 MCAR § 4.0021 A.4., for measuring oxides of nitrogen, sulfur dioxide, carbon dioxide, or oxygen shall complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period.

(2) All old continuous monitoring systems installed under 6 MCAR § 4.0021 A.4. for measuring oxides of nitrogen, sulfur dioxide, carbon dioxide, or oxygen shall complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive one-hour period.

7. Location of system. All continuous monitoring systems or monitoring devices shall be installed such that representative measurements of emissions or process parameters from the affected facility are obtained. Additional procedures for location of continuous monitoring systems contained in the applicable performance specifications shall be used.

8. Number of sources of emissions. When the effluents from a single affected facility or two or more affected facilities subject to the same emission standards are combined before being released to the atmosphere, the owner or operator may install applicable continuous monitoring systems on each effluent or on the combined effluent. When the affected facilities are not subject to the same emission standards, separate continuous monitoring systems shall be installed on each effluent. When the effluent from one affected facility is released to the atmosphere through more than one point, the owner or operator shall install applicable continuous monitoring systems on each separate effluent unless the installation of fewer systems is approved by the agency.

9. Monitoring data. Owners or operators of all continuous monitoring systems for measurement of opacity shall reduce all data to six (6) minute averages except that a one minute averaging period as described in 6 MCAR § 4.0021 B.7.c.(2) shall be used in the event an applicable standard of performance for opacity allows an excursion above the standard for a specified number of minutes in a one-hour period. Opacity averages shall be calculated

from all equally spaced consecutive fifteen second (or shorter) data points in the applicable averaging period. For systems other than opacity, the data shall be reduced to one hour averages, which shall be computed from four or more data points equally spaced over each one hour period.

Data recorded during periods of system breakdowns, repairs, calibration checks, and zero and span adjustments shall not be included in the data averages computed under this paragraph. An arithmetic or integrated average of all data may be used. The data output of all continuous monitoring systems may be recorded in reduced or non-reduced form (e.g. ppm pollutant and percent O₂ or lb of pollutant/million BTU). All excess emissions shall be converted into units of the standard using the conversion procedures specified in the applicable regulation. After conversion into units of the standard, the data may be rounded to the same number of significant digits used in the regulation to specify the applicable standard (e.g. rounded to the nearest one percent opacity).

10. Exceptions. Upon written application by an owner or operator, the director may approve alternatives to any monitoring procedures or requirements including, but not limited to, the following:

a. Alternative monitoring requirements when installation of a continuous monitoring system or monitoring device specified by this part would not provide accurate measurements due to liquid water or other interferences caused by substances with the effluent gases.

b. Alternative monitoring requirements when the affected facility is infrequently operated.

c. Alternative monitoring requirements to accommodate continuous monitoring systems that require additional measurements to correct for stack moisture conditions.

d. Alternative locations for installing continuous monitoring systems or monitoring devices when the owner or operator can demonstrate that installation at alternate locations will enable accurate and representative measurements.

e. Alternative methods of converting pollutant concentration measurements to units of the standards.

f. Alternative procedures for performing daily checks of zero and span drift that do not involve use of span gases or test cells.

g. Alternatives to the A.S.T.M. test methods or sampling procedures specified by any regulation.

h. Alternative continuous monitoring systems that do not meet the design or performance requirements in performance specification 1 but adequately demonstrate a definite and consistent relationship between its mea-

surements and the measurements of opacity by a system complying with the requirements in performance specification 1. The director may require that such demonstration be performed for each affected facility.

i. Alternative monitoring requirements when the effluent from a single affected facility or the combined effluent from two or more affected facilities are released to the atmosphere through more than one point.

B. Performance tests.

1. Testing requirements. The agency or the director may order the owner or operator of an emission facility to conduct or have conducted performance tests to determine the characteristics and amount of emissions of air contaminants from any affected facility.

2. Test method. Unless another method is specified in an applicable regulation, any owner or operator required to conduct performance tests shall utilize the following methods:

- a. Method 1 for sample and velocity traverses.
- b. Method 2 for stack gas velocity and volumetric flow rate.
- c. Method 3 for gas analysis for carbon dioxide, excess air, and dry molecular weight.
- d. Method 4 for moisture in stack gases.
- e. Method 5 for concentration of particulate matter and associated moisture content.
- f. Method 6 for concentration of sulfur dioxide.
- g. Method 7 for concentration of nitrogen oxides.
- h. Method 8 for concentration of sulfuric acid mist and sulfur dioxide.
- i. Method 9 for opacity.
- j. Method 10 for concentration of carbon monoxide.
- k. Method 11 for concentration of hydrogen sulfide.
- l. Method 101-reference method for determination of particulate and gaseous mercury emissions from stationary sources (air streams), Method 102-reference method for determination of particulate and gaseous mercury emissions from stationary sources (hydrogen streams), or Reference Method 105-method for determination of mercury in wastewater treatment sewage sludges, set forth in 40 C.F.R. Part 61, Appendix B, whichever is applicable, for mercury emissions.

m. Method 103-Beryllium screening method or method 104-reference method for determination of Beryllium emissions from stationary sources, set forth in 40 C.F.R. Part 61, Appendix B, whichever is applicable.

3. Alternative test methods. In lieu of the test method described in 6 MCAR § 4.0021 B.2., the director may:

a. Specify or approve minor changes in the reference method set forth in 6 MCAR § 4.0021 B.2. or the applicable regulation; or

b. Approve the use of an equivalent method; or

c. Approve the use of an alternative method the results of which he has determined to be adequate for indicating whether an affected facility is in compliance.

4. Testing conditions. Performance tests shall be conducted under such conditions as the director shall specify. The owner or operator shall make available to the director such records as may be necessary to determine the conditions of the performance tests. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions of performance tests unless otherwise specified in an applicable regulation.

5. Test runs. Each performance test shall consist of three separate runs using the applicable test method. However, the director reserves the right to require more than three runs under unusual circumstances. Each run shall be conducted for the time and under the conditions specified in the applicable standard. For the purpose of determining compliance with an applicable standard, the arithmetic mean of results of the three runs shall apply. In the event that a sample is accidentally lost or conditions occur in which one of the three runs must be discontinued because of forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, or other circumstances beyond the owner or operator's control, compliance may, upon the director's approval, be determined using the arithmetic mean of the results of the two other runs.

6. Notification. The owner or operator shall notify the director not less than 30 days prior to conducting any performance tests, unless a shorter time is accepted by the director.

7. Opacity.

a. Opacity readings of portions of plumes which contain condensed, uncombined water vapor shall not be used for purposes of determining compliance with opacity standards. The results of continuous monitoring by transmissometer which indicate that the opacity at the time visual observations were made was not in excess of the standard are probative but not conclusive evidence of the actual opacity of an emission, provided that the owner or operator shall meet the burden of proving that the instrument used meets (at the time of the alleged violation) performance specification 1, has been

properly maintained and (at the time of the alleged violation) calibrated, and that the resulting data have not been tampered with in any way.

b. The opacity standards set forth in a regulation shall apply at all times except during periods of startup, shutdown, malfunction, and as otherwise provided in the applicable standard.

c. Paragraph 2.5 of Method 9 (Data Reduction) is amended to read as follows, and this language shall be used whenever Method 9 is referenced in the rules:

(1) 2.5 Data reduction. Except as provided in 6 MCAR § 4.0021 B.7.c.(2), opacity shall be determined as an average of 24 consecutive observations recorded at 15 second intervals. Divide the observations recorded on the record sheet into sets of 24 consecutive observations. A set is composed of any 24 consecutive observations. Sets need not be consecutive in time and in no case shall sets overlap. For each set of 24 observations, calculate the average by summing the opacity of the 24 observations and dividing this sum by 24. Record the average opacities on a record sheet.

(2) In the event that an applicable standard of performance for opacity allows an excursion above the standard for a specified number of minutes in a one-hour period, determine the opacity as an average of 4 consecutive observations recorded at 15 second intervals. Determine the number of minutes in any one-hour period that the opacity exceeds a given opacity and record this information.

8. Agency tests. Upon order of the agency or the director, the owner or operator of an emission facility shall allow the agency, or any authorized employee or agent of the agency, to enter upon the premises of the owner or operator for purposes of conducting performance tests. The owner or operator shall provide performance testing facilities which will enable the agency or its agents or employees to conduct performance tests. Such performance testing facilities shall include:

- a. Sampling ports adequate for test methods applicable to such facility.
- b. Safe sampling platform(s).
- c. Safe access to sampling platform(s).
- d. Utilities for sampling and testing equipment.

9. Additional requirements. The owner or operator shall meet any other requirements imposed by the agency or the director in ordering the running of the performance tests.

C. Reports.

1. Excess emissions. Any owner or operator of an affected facility who

is required to install a continuous monitoring system shall submit a written report of excess emissions for every calendar quarter.

a. The report shall be submitted to the director of the division of Air Quality of the agency.

b. The report shall be submitted in accordance with the following requirements:

(1) The report shall be postmarked by the 30th day following the end of each calendar quarter; and

(2) The report shall contain the following information:

(a) The magnitude of excess emissions, any conversion factor(s) used, and the date and time of commencement and completion of each time period of excess emissions.

(b) Specific identification of each period of excess emissions that occurred during startups, shutdowns, and malfunctions of the affected facility, the nature and cause of any malfunction (if known), and the corrective action taken or preventative measures adopted.

(c) The date and time identifying each period during which the continuous monitoring system was inoperative except for zero and span checks and the nature of the system repairs or adjustments.

(d) When no excess emissions have occurred or the continuous monitoring system(s) have not been inoperative, repaired, or adjusted, such information shall be stated in the report.

2. Other data. The owner or operator of any affected facility shall maintain a file of all measurements, including continuous monitoring system, monitoring device, and performance testing measurements; all continuous monitoring system performance evaluations; all continuous monitoring system or monitoring device calibration checks; adjustments and maintenance performed on these systems or devices; and all other information required by any regulation and shall keep that file in a permanent form suitable for inspection. The file shall be retained for at least two years following the date of such measurements, maintenance, reports, and records.

3. Breakdowns. The owner or operator of an affected facility shall maintain records of the occurrence and duration of any startup, shutdown, breakdown, or malfunction in operation of the facility or any air pollution control equipment. The owner or operator shall maintain records of any periods of time in which a continuous monitoring system or monitoring device is inoperative. These records shall be retained for at least two years following the date of such shutdown, startup, breakdown, malfunction, or inoperation. These records shall be submitted to the agency at such times as the director may require.

4. Emission inventory. All owners or operators of emission facilities which emit more than 25 tons per year of particulate matter, sulfur oxides, nitrogen oxides, carbon monoxide, or hydrocarbons shall submit on or before April 1st of each year an emission inventory report covering the previous calendar year.

D. Shutdowns and breakdowns.

1. Shutdown. The owner or operator of an emission facility shall notify the director at least 24 hours in advance of shutdown of any control equipment and, if the shutdown would cause an increase in the emission of air contaminants, of a shutdown of any process equipment. At the time of notification, the owner or operator shall also notify the director of the cause of the shutdown and the estimated duration. The owner or operator shall notify the director when the shutdown is over.

2. Breakdown. The owner or operator of an emission facility shall notify the director immediately of a breakdown of more than one hour duration of any control equipment and, if the breakdown causes an increase in the emission of air contaminants, of a breakdown of any process equipment. At the time of notification or as soon thereafter as possible, the owner or operator shall also notify the director of the cause of the breakdown and the estimated duration. The owner or operator shall notify the director when the breakdown is over.

3. Operation changes. In any shutdown or breakdown covered by subparagraph (1) or (2) above, the owner or operator shall immediately take all practical steps to modify operations to reduce the emission of air contaminants. The director may require feasible and practical modifications in the operation to reduce emissions of air contaminants. No affected facility which has an unreasonable breakdown frequency of control equipment shall be permitted to operate. Nothing in this regulation shall permit the operation of an affected facility which may cause an immediate public health hazard.

4. Monitoring equipment. The owner or operator of a continuous monitoring system or monitoring device shall notify the director of any breakdown or malfunction of such system or device.

[May 7, 1976; amended November 24, 1976; amended January 8, 1980.]

CHAPTER TWENTY-TWO: APC 22**APC 22 Standards of Performance for Portland Cement Plants**

(a) **Portland Cement Plant.** As used in this regulation "portland cement plant" means any facility manufacturing portland cement by either the wet or dry process.

(b) **Standards of Performance for Existing Portland Cement Plants**

(1) No owner or operator of an existing portland cement plant shall cause or allow the discharge into the atmosphere any gases which:

(aa) Contain particulate matter in excess of the limits established by Minnesota Regulation APC 5, or

(bb) Exhibit greater than 20 percent opacity, except that a maximum of 40 percent opacity shall be permissible for not more than 4 minutes in any 30 minutes period and a maximum of 60 percent opacity shall be permissible for not more than 4 minutes in any 60 minute period.

(2) The requirements of this section are applicable to the kiln, the clinker cooler, the raw mill system, the raw mill dryer, raw material storage, the finish mill system, clinker storage, finished product storage, conveyor transfer points, and bagging and bulk loading and unloading systems.

(c) **Standards of Performance for New Portland Cement Plants**

(1) No owner or operator of a new portland cement plant shall cause or allow the discharge into the atmosphere from the kiln any gases which:

(aa) Contain particulate matter in excess of 0.15 kilogram per metric ton (0.30 pound per ton) of feed (dry basis) to the kiln; or

(bb) Exhibit greater than 20 percent opacity.

(2) No owner or operator of a new portland cement plant shall cause or allow the discharge into the atmosphere from the clinker cooler any gases which:

(aa) Contain particulate matter in excess of 0.050 kg per metric ton of feed (dry basis) to the kiln (0.10 lb per ton); or

(bb) Exhibit greater than 10 percent opacity.

(3) No owner or operator of a new portland cement plant shall cause or allow the discharge into the atmosphere from the raw mill system, the raw mill dryer, raw mill storage, the finish mill system, clinker storage, finished product storage, conveyor transfer points, or the bagging and bulk loading and unloading systems any gases which exhibit greater than 10 percent opacity.

(d) **Monitoring of Operations.** The owner or operator of any portland cement plant shall record the daily production rates and kiln feed rates.

(e) **Performance Test Methods.** Unless another method is approved by the Agency, any owner or operator required to submit performance tests for a portland cement plant shall utilize the following test methods:

(1) Method 5 for the concentration of particulate matter and the associated moisture content.

- (2) Method 1 for sample and velocity traverses.
- (3) Method 2 for velocity and volumetric flow rate.
- (4) Method 3 for gas analysis.
- (5) Method 9 for visual determination of opacity.

(f) Performance Test Procedures

(1) In testing for the concentration of particulate matter and the associated moisture content, the minimum sampling time and minimum sample volume for each run, except when other times and volumes are approved by the Agency, shall be as follows:

(aa) 60 minutes and 30 dscf (0.85 dscm) for the kiln.

(bb) 60 minutes and 40.6 dscf (1.15 dscm) for the clinker cooler.

(2) Total kiln feed rate (except fuels) expressed in tons per hour on a dry basis, shall be determined during each testing period by a method approved by the Agency, and shall be confirmed by a material balance over the production system.

(3) For each run, particulate matter emissions, expressed in pounds per ton of kiln feed, shall be determined by dividing the emission rate in pounds per hour by the kiln feed rate. The emission rate shall be determined by the equation, $\text{lb/hr} = Q_s \times c$, where Q_s = volumetric flow rate of the total effluent in dscf/hr as determined in accordance with subsection (e)(3), and c = particulate concentration in lb/dscf as determined in accordance with subsection (e)(1).

[March 12, 1976]

CHAPTER TWENTY-THREE: APC 23

APC 23 Standards of Performance for Asphalt Concrete Plants

(a) **Asphalt Concrete Plant.** "Asphalt concrete plant" means any facility used to manufacture asphalt concrete by heating and drying aggregate and mixing with asphalt cements. "Asphalt concrete plant" includes dryers, systems for screening, handling, storing, and weighing hot aggregate, systems for loading, transferring and storing mineral filler, systems for mixing asphalt concrete, and the loading, transfer, and storage systems associated with emission control systems.

(b) **Standards of Performance for Existing Asphalt Concrete Plants.** No owner or operator of an existing asphalt concrete plant shall cause to be discharged into the atmosphere from the asphalt concrete plant any gases which:

(1) Contain particulate matter in excess of the limits allowed by Minnesota Regulation APC 5, or

(2) Exhibit greater than 20 percent opacity, except that a maximum of 40 percent opacity shall be permissible for not more than 4 minutes in any 30 minute period and a maximum of 60 percent opacity shall be permissible for not more than 4 minutes in any 60 minute period.

(c) **Standards of Performance for New Asphalt Concrete Plants.** No owner or operator of a new asphalt concrete plant shall cause to be discharged into the atmosphere from the asphalt concrete plant any gases which:

(1) Contain particulate matter in excess of 90 mg/dscm (0.04 gr/dscf); or

(2) Exhibit 20 percent opacity or greater.

(d) **Test Methods.** Unless another method is approved by the Agency, any owner or operator required to submit performance tests for an asphalt concrete plant shall utilize the following test methods:

(1) Method 5 for the concentration of particulate matter and the associated moisture content.

(2) Method 1 for sample and velocity traverses.

(3) Method 2 for velocity and volumetric flow rate.

(4) Method 3 for gas analysis.

(e) **Performance Test Procedures.** For Method 5, the sampling time for each run shall be at least 60 minutes and the sampling rate shall be at least 0.9 dscm/hr (0.53 dscf/min) except that shorter sampling times, when necessitated by process variables or other factors, may be approved by the Agency.

[March 12, 1976]

CHAPTER TWENTY-FOUR: APC 24**APC 24 Standards of Performance for Petroleum Refineries**

(a) Definitions. As used in this regulation the following words shall have the meanings defined herein.

(1) "Petroleum refinery" means any facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oil, lubricants, or other products through distillation of petroleum or through redistillation, cracking or reforming of unfinished petroleum derivatives. "Petroleum refinery" includes fluid catalytic cracking unit catalyst regenerators, fluid catalytic cracking unit incinerator-waste heat boilers, fuel gas combustion devices, and all indirect heating equipment associated with the refinery.

(2) "Petroleum" means the crude oil removed from the earth and the oils derived from tar sands, shale, and coal.

(3) "Process gas" means any gas generated by a petroleum refinery process unit, except fuel gas and process upset gas as defined in this section.

(4) "Fuel gas" means any gas which is generated by a petroleum refinery process unit and which is combusted, including any gaseous mixture of a natural gas and fuel gas which is combusted.

(5) "Process upset gas" means any gas generated by a petroleum refinery process unit as a result of start-up, shut-down, upset or malfunction.

(6) "Refinery process unit" means any segment of the petroleum refinery in which a specific processing operation is conducted.

(7) "Fuel gas combustion device" means any equipment, such as process heaters, boilers and flares used to combust fuel gas, but does not include fluid coking units and fluid catalytic cracking unit incinerator-waste heat boilers and facilities in which gases are combusted to produce sulfur or sulfuric acid.

(8) "Coke burn-off" means the coke removed from the surface of the fluid catalytic cracking unit catalyst by combustion in the catalyst regenerator. The rate of coke burn-off is calculated by the formula specified in subsection (f)(5).

(9) "Indirect heating equipment" means a furnace, boiler or other unit of combustion equipment used in the process of burning fossil fuel for the purpose of producing steam, hot water, hot air, or other hot liquid, gas, or solid, where the products of combustion do not have direct contact with the heated medium. "Indirect heating equipment" includes all fuel gas combustion devices which burn a liquid or solid fossil fuel but does not include fluid catalytic cracking unit incinerator-waste heat boilers, fluid coking units, and facilities in which gases are combusted to produce sulfur or sulfuric acid.

(10) "Fossil fuel" means natural gas, petroleum, coal, wood, and any form of solid, liquid, or gaseous fuel derived from such materials.

(11) "Steam generating unit" means indirect heating equipment used to produce steam.

(12) "Heat input" means the number of BTU per hour (cal/hr) determined by multiplying the high heating value (BTU/lb) (cal/gm) of each

fossil fuel or fuel gas that is fired in the indirect heating equipment or fuel gas combustion device at the time of determining the heat input times the rate of each fuel burned (lb/hr) (gm/hr).

(13) "High heating value" means the number of (BTU/lb) (cal/gm) of a fossil fuel as determined by the A.S.T.M. test methods described in Minnesota Regulation APC 4(f).

(b) Standards of Performance for Existing Affected Facilities at Petroleum Refineries

(1) Fluid Catalytic Cracking Unit Catalyst Regenerator and Incinerator-Waste Heat Boiler. No owner or operator of an existing fluid catalytic cracking unit catalyst regenerator or its incinerator-waste heat boiler at a petroleum refinery shall cause to be discharged into the atmosphere from such regenerator or its incinerator-waste heat boiler any gases which:

(aa) Contain particulate matter in excess of 10.0 lb/1000 lb (10.0 kg/1000 kg) of coke burn-off in the catalyst regenerator, or

(bb) Exhibit greater than 30 percent opacity, except that 30 percent opacity may be exceeded for 3 minutes in any 60 minute period and except that this opacity standard shall not apply during periods of soot blowing.

(cc) If auxiliary liquid or solid fossil fuels are burned in the fluid catalytic cracking unit incinerator-waste heat boiler, particulate matter in excess of that permitted by subsection (aa) may be emitted provided that the incremental rate of particulate emissions shall not exceed 0.4 pounds per million BTU (0.72 grams per million cal) of heat input attributable to such liquid or solid fossil fuel.

(2) Fuel Gas Combustion Device and Indirect Heating Equipment. No owner or operator of existing fuel gas combustion devices and indirect heating equipment at a petroleum refinery shall cause to be discharged into the atmosphere from such devices and equipment any gases which contain sulfur dioxide in excess of 1.75 pounds per million BTU (3.15 grams per million cal) heat input. The total emissions of sulfur dioxide from all existing fuel gas combustion devices and all indirect heating equipment shall be divided by the total heat input of all such devices and equipment to determine compliance with this section; provided that no owner or operator shall cause to be discharged from any one fuel gas combustion device or any one unit of indirect heating equipment any gases which contain sulfur dioxide in excess of 3.0 pounds per million BTU (5.4 grams per million cal) heat input.

(3) Indirect Heating Equipment. No owner or operator of existing indirect heating equipment at a petroleum refinery shall cause to be discharged into the atmosphere from such equipment any gases which:

(aa) Contain particulate matter in excess of 0.4 pounds per million BTU (0.72 grams per million cal) heat input; or

(bb) Exhibit greater than 20% opacity, except that a maximum of 60% opacity shall be permissible for four minutes in any 60 minute period and that a maximum of 40% opacity shall be permissible for four additional minutes in any 60 minute period.

(c) Standards of Performance for New Affected Facilities at Petroleum Refineries

(1) Fluid Catalytic Cracking Unit Catalyst Regenerator and Incinerator-Waste Heat Boiler

(aa) No owner or operator of a new fluid catalytic cracking unit catalyst regenerator or its incinerator-waste heat boiler at a petroleum refinery shall cause to be discharged into the atmosphere from such regenerator or incinerator-waste heat boiler any gases which:

(i) Contain particulate matter in excess of 1.0 lb/1000 lb (1.0 kg/1000 kg) of coke burn-off in the catalyst regenerator, or

(ii) Exhibit greater than 30 percent opacity, except that 30 percent opacity may be exceeded for 3 minutes in any 60 minute period.

(iii) If auxiliary liquid or solid fossil fuels are burned in the fluid catalytic cracking unit incinerator-waste heat boiler, particulate matter in excess of that permitted by subsection (aa)(i) may be emitted provided that the incremental rate of particulate emissions shall not exceed 0.1 pound per million BTU of heat input attributable to such liquid or solid fossil fuel.

(bb) No owner or operator of a new fluid catalytic cracking unit catalyst regenerator at a petroleum refinery shall cause to be discharged into the atmosphere from such regenerator any gases which contain carbon monoxide in excess of 0.050 percent by volume.

(2) Fuel Gas Combustion Device. No owner or operator of a new fuel gas combustion device at a petroleum refinery shall burn in any such device any fuel gas which contains H₂S in excess of 0.10 gr/dscf, (230 mg/dscm) except as provided herein. The owner or operator may elect to treat the gases resulting from the combustion of fuel gas in a manner which limits the release of SO₂ to the atmosphere if it is shown to the satisfaction of the Director that this prevents SO₂ emissions as effectively as compliance with the H₂S restriction set forth above.

(3) Indirect Heating Equipment

(aa) No owner or operator of new indirect heating equipment at a petroleum refinery shall cause to be discharged into the atmosphere from such equipment any gases which contain sulfur dioxide in excess of 1.75 pounds per million BTU (3.15 grams per million cal) heat input. The total emissions of sulfur dioxide from all existing and new fuel gas combustion devices and indirect heating equipment shall be divided by the total heat input of all such devices and equipment to determine compliance with this section; provided that no owner or operator shall cause to be discharged from any one unit of new indirect heating equipment any gases which contain sulfur dioxide in excess of 3.0 pounds per million BTU (5.4 grams per million cal) heat input.

(bb) No owner or operator of new indirect heating equipment at a petroleum refinery shall cause to be discharged into the atmosphere from such equipment any gases which:

(i) Contain particulate matter in excess of 0.4 pounds per million BTU (0.72 grams per million cal) heat input; or

(ii) Exhibit greater than 20% opacity, except that a maximum of 60% opacity shall be permissible for four minutes in any 60 minute period

and that a maximum of 40% opacity shall be permissible for four additional minutes in any 60 minute period.

(cc) The owner or operator of a new steam generating unit of more than 250 million BTU per hour (63 million cal per hour) heat input at a petroleum refinery shall comply with the following requirements:

(i) No gases shall be discharged from the steam generating unit which contain particulate matter in excess of 0.1 pounds per million BTU (0.18 grams per million cal) heat input.

(ii) No gases shall be discharged which exhibit greater than 20% opacity, except that a maximum of 40% opacity shall be permissible for two minutes in any hour.

(iii) No gases shall be discharged which contain sulfur dioxide in excess of 0.80 pounds per million BTU (1.4 grams per million cal) heat input if a liquid fossil fuel is burned and 1.2 pounds per million BTU (2.2 grams per million cal) heat input if a solid fossil fuel is burned. When different fossil fuels are burned simultaneously in any combination, the applicable standard shall be determined by proration using the following formula:

$$x = \frac{y(0.8) + z(1.2)}{y + z} \quad (\text{English units})$$

where:

x is the maximum allowable emissions of sulfur dioxide gases in lbs. per million BTU, and

y is the percentage of total heat input derived from liquid fossil fuel, and

z is the percentage of total heat input derived from solid fossil fuel, and

compliance shall be based on the total heat input from all fossil fuel burned including gaseous fuels.

(d) Exemptions

(1) The combustion of process upset gas in a flare, or the combustion in a flare of process gas or fuel gas which is released to the flare as a result of relief valve leakage, is exempt from the standards of performance set forth in this regulation.

(2) The standards of performance promulgated in Minnesota Regulations APC 4 for indirect heating equipment shall not apply to indirect heating equipment at a petroleum refinery. Only those standards of performance for indirect heating equipment set forth in this regulation shall apply to such equipment.

(e) Emission Monitoring

(1) Fluid Catalytic Cracking Unit Catalyst Regenerators.

(aa) Opacity

(i) The owner or operator of any new fluid catalytic unit catalyst regenerator and the owner or operator of an existing fluid catalytic cracking

unit catalyst regenerator for fluid bed catalyst cracking units of greater than 20,000 barrels per day fresh feed capacity shall install, calibrate, maintain, and operate a continuous monitoring system for the measurement of opacity of emissions discharged into the atmosphere from the regenerator.

(ii) The continuous monitoring system shall be spanned at 60, 70, or 80 percent opacity.

(bb) Coke Burn-off. The average coke burn-off rate (thousands of pounds per hour or thousands of kilograms per hour) and hours of operation of any fluid catalytic cracking unit catalyst regenerator shall be recorded daily.

(2) Fuel Gas Combustion Devices.

(aa) Sulfur Dioxide

(i) The owner or operator of a new fuel gas combustion device at a petroleum refinery shall install, calibrate, maintain, and operate a continuous monitoring system for the measurement of sulfur dioxide in the gases discharged into the atmosphere.

(ii) The pollutant gas used to prepare calibration gas mixtures and for calibration checks shall be sulfur dioxide (SO₂).

(iii) The span shall be set at 100 ppm.

(iv) Reference Method 6 shall be used for conducting monitoring system performance specifications.

(v) For the purpose of reports under Minnesota Regulations APC 21(c)(1)(bb)(ii), periods of excess emissions that shall be reported are defined as any six-hour period during which the average emissions (arithmetic average of six continuous one-hour periods) of sulfur dioxide as measured by a continuous monitoring system exceed the applicable standards of performance in this regulation.

(bb) Hydrogen Sulfide. The owner or operator of a new fuel gas combustion device at a petroleum refinery may elect to install a continuous monitoring system for the measurement of hydrogen sulfide in the fuel gas instead of the sulfur dioxide monitor described in this subsection. The owner or operator shall notify the Director in writing of such election. The owner or operator who elects to install the hydrogen sulfide monitor shall not be required to do so until monitoring requirements for such a system are promulgated; provided, however, the Director may require the installation of a sulfur dioxide monitor under the provisions of Minnesota Regulations APC 21(a)(1).

(3) Incinerator Waste Heat Boilers. The owner or operator of any fluid catalytic cracking unit catalyst regenerator at a petroleum refinery which utilizes an incinerator-waste heat boiler to combust the exhaust gases from the catalyst regenerator shall record daily the rate of combustion of liquid or solid fossil fuels (gallons per hour or liters per hour, pounds per hour or kilograms per hour) and the hours of operation during which liquid or solid fossil fuels are combusted in the incinerator-waste heat boiler.

(e) Performance Test Methods. Unless another method is approved by the Director, any person required to submit performance tests for a petroleum refinery shall utilize the following test methods:

(1) For gases released to the atmosphere from the fluid catalytic cracking unit catalyst regenerator:

(aa) Method 5 for the concentration of particulate matter and moisture content,

(bb) Method 1 for sample and velocity traverses,

(cc) Method 2 for velocity and volumetric flow rate,

(dd) Method 9 for visual determination of the opacity of emissions from stationary sources,

(ee) Method 10 for carbon monoxide.

(2) For exhaust gases from the fluid catalytic cracking unit catalyst regenerator prior to the emission control system:

(aa) Method 3 for gas analysis,

(bb) Method 4 for moisture content,

(cc) Method 1 for sample and velocity traverses,

(dd) Method 2 for velocity and volumetric flow rate.

(3) For determining the concentration of H₂S in any fuel gas, Method 11 shall be used.

(4) For gases released to the atmosphere from the combustion of fuel gas, fossil fuel, and the combination of fuel gas and fossil fuel:

(aa) Method 1 for sample and velocity traverses,

(bb) Method 2 for velocity and volumetric flow rate,

(cc) Method 6 for concentration of SO₂,

(dd) Method 5 for the concentration of particulate matter and moisture content,

(ee) Method 9 for visual determination of the opacity of emissions from stationary sources.

(f) Performance Test Procedures

(1) For Method 5, the sampling time for each run shall be at least 60 minutes and the sampling rate shall be at least 0.015 dscm (0.53 dscf/min), except that shorter sampling times may be approved by the Agency when process variable or other factors preclude sampling for at least 60 minutes.

(2) For Method 10, the sample shall be extracted at a rate proportional to the gas velocity at a sampling point near the centroid of the duct. The sampling time shall not be less than 60 minutes.

(3) For Method 11, when refinery fuel gas lines are operating at pressures substantially above atmospheric, the gases sampled must be introduced into the sampling train at approximately atmospheric pressure. This may be accomplished with a flow control valve. If the line pressure is high enough to operate the sampling train without a vacuum pump, the pump may be eliminated from the sampling train. The sample shall be drawn from a point near the centroid of the fuel gas line. The minimum sampling

time shall be 10 minutes and the minimum sampling volume 0.01 dscm (0.35 dscf) for each sample. The arithmetic average of two samples shall constitute one run. Samples shall be taken at approximately 1-hour intervals. For most fuel gases, sample times exceeding 20 minutes may result in depletion of the collecting solution, although fuel gases containing low concentrations of hydrogen sulfide may necessitate sampling for longer periods of time.

(4) The sampling site for determining SO₂ concentration by Method 6 shall be the same as for determining volumetric flow rate by Method 2. The sampling point in the duct for determining SO₂ concentration by Method 6 shall be at the centroid of the cross section if the cross sectional area is less than 5 m² (54 ft²) or at a point no closer to the walls than 1 m (39 inches) if the cross sectional area is 5 m² or more and the centroid is more than one meter from the wall. The sample shall be extracted at a rate proportional to the gas velocity at the sampling point. The minimum sampling time shall be 10 minutes and the minimum sampling volume 0.01 dscm (0.35 dscf) for each sample. The arithmetic average of two samples shall constitute one run. Samples shall be taken at approximately 1-hour intervals.

(5) Coke burn-off rate shall be determined by the following formula:

$$R_c = 0.2982 Q_{re} (\%CO_2 + \%CO) + 2.088 Q_{ra} - 0.0994 Q_{re} \left(\frac{\%CO}{2} + \%CO_2 + \%O_2 \right) (\text{Metric Units})$$

$$R_c = 0.0186 Q_{re} (\%CO_2 + \%CO) + 0.1303 Q_{ra} - 0.0062 Q_{re} \left(\frac{\%CO}{2} + \%CO_2 + \%O_2 \right) (\text{English Units})$$

R_c = coke burn-off rate, kg/hr (English units lb/hr).

0.2982 = metric units material balance factor divided by 100, kg-min/hr-m³.

0.0186 = English units material balance factor divided by 100, lb-min/hr-ft³.

Q_{re} = fluid catalytic cracking unit catalyst regenerator exhaust gas flow rate before entering the emission control system, as determined by method 2, dscm/min (English units: dscf/min).

$\%CO_2$ = percent carbon dioxide by volume, dry basis, as determined by Method 3.

$\%CO$ = percent carbon monoxide by volume, dry basis, as determined by Method 3.

$\%O_2$ = percent oxygen by volume, dry basis, as determined by Method 3.

2.088 = metric units material balance factor divided by 100, kg-min/hr-m³.

0.1303 = English units material balance factor divided by 100, lb-min/hr-ft³.

Q_{ra} = air rate to fluid catalytic cracking unit catalyst regenerator, as determined from fluid catalytic cracking unit control room instrumentation, dscm/min (English units: dscf/min).

0.0994 = metric units material balance factor divided by 100, kg-min/hr-m³.

0.0062 = English units material balance factor divided by 100, lb-min/hr-ft³.

(6) Particulate emissions shall be determined by the following equation:
or

$$R_e = (60 \times 10^{-6}) Q_{rv} C_s \text{ (Metric Units)}$$

$$R_e = (8.57 \times 10^{-3}) Q_{rv} C_s \text{ (English Units)}$$

where:

R_e = particulate emission rate, kg/hr (English units: lb-hr)

60×10^{-6} = metric units conversion factor, min-kg/hr-mg.

8.57×10^{-3} = English units conversion factor, min-lb/hr.gr.

Q_{rv} = volumetric flow rate of gases discharged into the atmosphere from the fluid catalytic cracking unit catalyst regenerator following the emission control system, as determined by Method 2, dscm/min (English units: dscf/min).

C_s = particulate emission concentration discharged in the atmosphere, as determined by Method 5, mg/dscm (English units: gr/dscf).

(7) For each run, emissions expressed in kg/1000 kg (lb/1000 lb) of coke burn-off in the catalyst regenerator shall be determined by the following equation:

$$R_s = 1000 \frac{R_e}{R_c} \text{ (Metric or English Units)}$$

where:

R_s = particulate emission rate, kg/1000 kg (lb/1000 lb) of coke burn-off in the fluid catalytic cracking unit catalyst regenerator.

1000 = conversion factor, kg to 100 kg (lb to 1000 lb).

R_e = particulate emission rate, kg/hr (lb/hr).

R_c = coke burn-off rate, kg/hr (lb/hr).

(8) In those instances in which auxiliary liquid or solid fossil fuels are burned in an incinerator-waste heat boiler, the rate of particulate matter emissions permitted must be determined. Auxiliary fuel heat input, expressed in millions of cal/hr (English units: Millions of BTU/hr) shall be calculated for each run by fuel flow rate measurement and analysis of the liquid or solid auxiliary fossil fuels. For each run, the rate of particulate emissions permitted shall be calculated from the following equation:

New Affected Facilities

$$R_a = 1.0 + \frac{0.18 H}{R_c}$$

or

$$R_a = 1.0 + \frac{0.10 H}{R_c}$$

Existing Affected Facilities

$$R_a = 10.0 + \frac{0.72 H}{R_c} \quad \text{(Metric Units)}$$

$$R_a = 10.0 + \frac{0.4 H}{R_c} \quad \text{(English Units)}$$

where:

R_a = allowable particulate emission rate, kg/1000 kg (English units: lb/1000 lb) of coke burn-off in the fluid catalytic cracking unit catalyst regenerator.

1.0 = emission standard for new affected facilities, 1.0 kg/1000 kg (English units: 1.0 lb/1000 lb) of coke burn-off in the fluid catalytic cracking unit catalyst regenerator.

10.0 = emission standard for existing affected facilities.

0.18 = metric units maximum allowable incremental rate of particulate emissions for new affected facilities gm/million cal.

0.10 = English units maximum allowable incremental rate of particulate emissions for new affected facilities, lb/million BTU

0.72 = metric units maximum allowable incremental rate of particulate emissions for existing affected facilities gm/million cal.

0.4 = English units maximum allowable incremental rate of particulate emissions for existing affected facilities, lb/million BTU.

H = heat input from solid or liquid fossil fuel, million cal/hr (English units: million BTU/hr).

R_c = coke burn-off rate, kg/hr (English units: lb/hr).

[March 12, 1976]

CHAPTER TWENTY-FIVE: APC 25

APC 25 Standard of Performance for Secondary Lead Smelters

(a) **Definitions.** As used in this regulation the following words shall have the meanings defined herein:

(1) "Reverberatory furnace" includes the following types of reverberatory furnaces: stationary, rotating, rocking, and tilting.

(2) "Secondary lead smelter" means any facility producing lead from a lead-bearing scrap material by smelting to the metallic form.

(3) "Lead" means elemental lead or alloys in which the predominant component is lead.

(b) Standards of Performance for Secondary Lead Smelters

(1) No owner or operator of a secondary lead smelter shall cause to be discharged into the atmosphere from a blast (cupola) furnace or reverberatory furnace any gases which:

(aa) Contain particulate matter in excess of 50 mg/dscm (0.022 gr/dscf).

(bb) Exhibit 20 percent opacity or greater.

(2) No owner or operator of a secondary lead smelter shall cause to be discharged into the atmosphere from any pot furnace of more than 250 kg (550 lb) any gases which exhibit 10 percent opacity or greater.

(c) **Performance Test Methods.** Unless another method is approved by the Agency, any owner or operator required to submit performance tests for a secondary lead smelter shall utilize the following test methods:

(1) Method 5 for the concentration of particulate matter and the associated moisture content.

(2) Method 1 for sample and velocity traverses,

(3) Method 2 for velocity and volumetric flow rate, and

(4) Method 3 for gas analysis.

(d) **Performance Test Procedures.** In testing for the concentration of particulate matter and the associated moisture content, the minimum sampling time for each run shall be at least 60 minutes and the sampling rate shall be at least 0.9 dscm/hr (0.53 dscf/min) except that shorter sampling times, when necessitated by process variables or other factors, may be approved by the Agency. Particulate sampling shall be conducted during representative periods of furnace operation, including charging and tapping.

[May 7, 1976]

CHAPTER TWENTY-SIX: APC 26**APC 26 Standards of Performance for Secondary Brass and Bronze Ingot Production Plants**

(a) **Definitions.** As used in this regulation the following words shall have the meanings defined herein:

(1) "Brass or bronze ingot production plant" means any facility producing brass or bronze from a copper alloy-bearing scrap material by smelting to the metallic form.

(2) "Brass or bronze" means any metal alloy containing copper as its predominant constituent, and lesser amounts of zinc, tin, lead, or other metals.

(3) "Reverberatory furnace" includes the following types of reverberatory furnaces: Stationary, rotating, rocking, and tilting.

(4) "Electric furnace" means any furnace which uses electricity to produce over 50 percent of the heat required in the production of refined brass or bronze.

(5) "Blast furnace" means any furnace used to recover metal from slag.

(b) Standards of Performance for Secondary Brass and Bronze Ingot Production Plants

(1) No owner or operator of a secondary brass or bronze ingot production plant shall cause to be discharged into the atmosphere from a reverberatory furnace any gases which:

(aa) Contain particulate matter in excess of 50 mg/dscm (0.022 gr/dscf).

(bb) Exhibit 20 percent opacity or greater.

(2) No owner or operator of a secondary brass or bronze ingot production plant shall cause to be discharged into the atmosphere from any electric furnace of 1,000 kg (2,205 lbs) or greater production capacity any gases which exhibit 10 percent opacity or greater.

(3) No owner or operator of a secondary brass or bronze ingot production plant shall cause to be discharged into the atmosphere from any blast (cupola) furnace of 250 kg/hr (550 lb/hr) or greater production capacity any gases which exhibit 10 percent opacity or greater.

(4) No owner or operator of a secondary brass or bronze ingot production plant shall cause to be discharged into the atmosphere from any electric furnace of less than 1,000 kg (2,205 lbs) production capacity or any blast (cupola) furnace of less than 250 kg/hr (550 lb/hr) production capacity any gases which exceed the limits of APC-5 for particulate emissions, and exhibit 20 percent opacity or greater.

(c) **Performance Test Methods.** Unless another method is approved by the Agency, any owner or operator required to submit performance tests for a brass or bronze ingot production plant shall utilize the following test methods:

(1) Method 5 for the concentration of particulate matter and the associated moisture content.

(2) Method 1 for sample and velocity traverses.

(3) Method 2 for velocity and volumetric flow rate.

(4) Method 3 for gas analysis.

(d) **Performance Test Procedures.** In testing for the concentration of particulate matter and the associated moisture content, the minimum sampling time for each run shall be at least 120 minutes and the sampling rate shall be at least 0.9 dscm/hr (0.53 dscf/min) except that shorter sampling times, when necessitated by process variables or other factors, may be approved by the Agency. Particulate matter sampling shall be conducted during representative periods of charging and refining, but not during pouring of the heat.

[May 7, 1976]

CHAPTER TWENTY-SEVEN: APC 27**APC 27 Standards of Performance for Iron and Steel Plants**

(a) **Definitions.** As used in this regulation the following words shall have the meanings defined herein:

(1) "Basic oxygen process furnace" (BOPF) means any furnace producing steel by charging scrap metal, hot metal, and flux materials into a vessel and introducing a high volume of an oxygen-rich gas.

(2) "Steel production cycle" means the operations required to produce each batch of steel and includes the following major functions: Scrap charging, preheating (when used), hot metal charging, primary oxygen blowing, additional oxygen blowing (when used), and tapping.

(b) **Standards of Performance for Iron and Steel Plants.** No owner or operator of an iron and steel plant shall cause to be discharged into the atmosphere from any basic oxygen process furnace any gases which contain particulate matter in excess of 50 mg/dscm (0.022 gr/dscf).

(c) **Performance Test Methods.** Unless another method is approved by the Agency, any owner or operator required to submit performance tests for an iron and steel plant shall utilize the following test methods:

(1) Method 5 for concentration of particulate matter and associated moisture content.

(2) Method 1 for sample and velocity traverses.

(3) Method 2 for volumetric flow rate.

(4) Method 3 for gas analysis.

(d) **Performance Test Procedures.** In testing for the concentration of particulate matter and the associated moisture content, the sampling for each run shall continue for an integral number of steel production cycles with total duration of at least 60 minutes. The sampling rate shall be at least 0.9 dscm/hr (0.53 dscf/min) except that shorter sampling times, when necessitated by process variables or other factors, may be approved by the Agency. A cycle shall start at the beginning of either the scrap preheat or the oxygen blow and shall terminate immediately prior to tapping.

[May 7, 1976]

CHAPTER TWENTY-EIGHT: APC 28

APC 28 Standards of Performance for Sewage Sludge Incinerators

(a) Definitions. As used in this regulation the following words shall have the meanings defined herein:

(1) "Sewage sludge incinerator" means any furnace or other device used in the process of burning sludge produced by a sewage treatment facility.

(2) "Burning capacity" means the manufacturer's or designer's maximum rate or such other rate that is considered good engineering practice and accepted by the Director.

(b) Standards of Performance for Existing Sewage Sludge Incinerators

(1) No owner or operator of an existing sewage sludge incinerator shall cause to be discharged into the atmosphere from the sewage sludge incinerator any gases which:

(aa) Contain particulate matter in excess of 0.3 gr/dscf corrected to 12 percent CO₂ if the incinerator has a burning capacity of less than 200 pounds per hour.

(bb) Contain particulate matter in excess of 0.2 gr/dscf corrected to 12 percent CO₂ if the incinerator has a burning capacity of 200 to 2000 pounds per hour.

(cc) Contain particulate matter in excess of 0.1 gr/dsf corrected to 12 percent CO₂ if the incinerator has a burning capacity of greater than 2000 pounds per hour.

(2) No owner or operator of an existing sewage sludge incinerator shall cause to be discharged into the atmosphere from the incinerator any gases which exhibit greater than 20 percent opacity, except that a maximum of 40 percent opacity shall be permissible for four minutes in any 60 minute period.

(3) No owner or operator of an existing sewage sludge incinerator shall operate such incinerator unless such incinerator utilizes auxiliary fuel burners that maintain a minimum temperature of 1200°F for a minimum retention time of 0.3 second or other method of odor control as approved by the Director.

(c) Standards of Performance for New Sewage Sludge Incinerators

(1) No owner or operator of a new sewage sludge incinerator shall cause to be discharged into the atmosphere from the incinerator any gases which:

(aa) Contain particulate matter in excess of 0.65 g/kg dry sludge input (1.30 lb/ton dry sludge input), or

(bb) Exhibit 20 percent opacity or greater.

(2) No owner or operator of a new sewage sludge incinerator shall operate such incinerator unless such incinerator utilizes auxiliary fuel burners that maintain a minimum temperature of 1200°F for a minimum retention

time of 0.3 second or other method of odor control as approved by the Director.

(d) Monitoring of Operations. The owner or operator of any sewage sludge incinerator shall:

(1) Install, calibrate, maintain, and operate a flow measuring device which can be used to determine either the mass or volume of sludge charged to the incinerator. The flow measuring device shall have an accuracy of ± 5 percent over its operating range.

(2) Provide access to the sludge charged so that a well-mixed representative grab sample of the sludge can be obtained.

(e) Performance Test Methods. Unless another method is approved by the Agency, any owner or operator required to submit performance tests for a sewage sludge incinerator shall utilize the following methods:

(1) Method 5 for concentration of particulate matter and associated moisture content,

(2) Method 1 for sample and velocity traverses,

(3) Method 2 for volumetric flow rate, and

(4) Method 3 for gas analysis.

(f) Performance Test Procedures

(1) For Method 5, the sampling time for each run shall be at least 60 minutes and the sampling rate shall be at least 0.015 dscm/min (0.53 dscf/min), except that shorter sampling times, when necessitated by process variables or other factors, may be approved by the Agency.

(2) Dry sludge charging rate shall be determined as follows:

(aa) Determine the mass (S_m) or volume (S_v) of sludge charged to the incinerator during each run using a flow measuring device meeting the requirements of section (d)(1). If total input during a run is measured by a flow measuring device, such readings shall be used. Otherwise, record the flow measuring device readings at 5-minute intervals during a run. Determine the quantity charged during each interval by averaging the flow rates at the beginning and end of the interval and then multiplying the average for each interval by the time for each interval. Then add the quantity for each interval to determine the total quantity charged during the entire run, (S_m) or (S_v).

(bb) Collect samples of the sludge charged to the incinerator in non-porous collecting jars at the beginning of each run and at approximately 1-hour intervals thereafter until the test ends, and determine for each sample the dry sludge content (total solids residue) in accordance with "224 G. Method for Solid and Semisolid Samples," **Standard Methods for the Examination of Water and Wastewater**, Thirteenth Edition, American Public Health Association, Inc., New York, N.Y., 1971, pp. 539-41, except that:

(i) Evaporating dishes shall be ignited to at least 103°C rather than the 550°C specified in step 3(a)(1).

(ii) Determination of volatile residue, step 3(b) may be deleted.

(iii) The quantity of dry sludge per unit sludge charged shall be determined in terms of either R_{dv} (metric units: mg dry sludge/liter sludge charged or English units: lb/ft³) or R_{dm} (metric units: mg dry sludge/mg sludge charged or English units: lb/lb).

(cc) Determine the quantity of dry sludge per unit sludge charged in terms of either R_{dv} or R_{dm} .

(i) If the volume of sludge charged is used:

$$S_d = (60 \times 10^{-3}) \frac{R_{dv} S_v}{T} \text{ (Metric Units)}$$

or

$$S_d = (8.021) \frac{R_{dv} S_v}{T} \text{ (English Units)}$$

where:

S_d = average dry sludge charging rate during the run, kg/hr (English units: lb/hr).

R_{dv} = average quantity of dry sludge per unit volume of sludge charged to the incinerator, mg/l (English units: lb/ft³).

S_v = sludge charged to the incinerator during the run, m³ (English units: gal).

T = duration of run, min (English units: min).

60×10^{-3} = metric units conversion factor, 1-kg-min/m₃-mg-hr.

8.021 = English units conversion factor, ft³-min/gal-hr.

(ii) If the mass of sludge charged is used:

$$S_d = (60) \frac{R_{dm} S_m}{T} \text{ (Metric or English Units)}$$

where:

S_d = average dry sludge charging rate during the run, kg/hr (English units: lb/hr).

R_{dm} = average ratio of quantity of dry sludge to quantity of sludge charged to the incinerator, mg/mg (English units: lb/lb).

S_m = sludge charged during the run, kg (English units: lb).

T = duration of run, min (Metric or English units).

60 = conversion factor, min/hr (Metric or English units).

(3) Particulate emission rate shall be determined by:

$$C_{aw} = C_s Q_s \text{ (Metric or English Units)}$$

where:

C_{aw} = Particulate matter mass emissions, mg/hr (English units: lb/hr).

C_s = Particulate matter concentration, mg/m³ (English units: lb/dscf).

Q_s = Volumetric stack gas flow rate, dscm/hr (English Units: dscf/hr).
 Q_s and c_s shall be determined using Methods 2 and 5, respectively.

(4) Compliance with subsection (c) shall be determined as follows:

$$C_{ds} = (10^{-3}) \frac{C_{aw}}{S_d} \text{ (Metric Units)}$$

or

$$C_{ds} = (2000) \frac{C_{aw}}{S_d} \text{ (English Units)}$$

where:

C_{ds} = particulate emission discharge, g/kg dry sludge (English units: lb/ton dry sludge):

10^{-3} = Metric conversion factor, g/mg.

2000 = English conversion factor, lb/ton.

[March 12, 1976]

Repealed 8 SR 1675
1-16-84

CHAPTER TWENTY-NINE: APC 29

APC 29 Standards of Performance for Grain Handling Facilities

(a) **Definitions.** As used in this regulation the following words shall have the meanings defined herein:

(1) "Grain handling facility" means an emission facility used in the process of handling, storing, processing, or drying grain or seed.

(2) "Grain throughput" means the number of bushels of grain or seed processed by the grain handling facility in any one year and shall be determined by averaging previous or anticipated grain or seed receipts or shipments for three consecutive fiscal years including the fiscal year in progress at the time of the averaging.

(b) **Standards of Performance for All Grain Handling Facilities**

(1) The owner or operator of a grain handling facility, regardless of size and location and whether the facility is new or existing, shall follow and maintain good operating and housekeeping practices at all times.

(c) **Standards of Performance for Existing Grain Handling Facilities**

(1) The owner or operator of an existing grain handling facility located in the Minneapolis-St. Paul Air Quality Control Region or within a city with a population of 5000 or more shall apply induced draft to all sources of particulate emissions and shall convey these emissions through control equipment which has a particulate collection efficiency of not less than 99% by weight.

(2) The owner or operator of an existing grain handling facility located outside the Minneapolis-St. Paul Air Quality Control Region but within a city with a population of 2500 or more but less than 5000 shall apply induced draft to all sources of particulate emissions and shall convey these emissions through control equipment which has a particulate collection efficiency of not less than:

(aa) 99% by weight if the grain throughput of the facility is 4 million bushels or more; and

(bb) 85% by weight if the grain throughput of the facility is less than 4 million bushels.

(3) The owner or operator of an existing grain handling facility located in a location other than one described in (c)(1) or (c)(2) shall:

(aa) Apply induced draft to all sources of particulate emissions and convey these emissions through control equipment which has a particulate collection efficiency of not less than 85% by weight if the grain throughput of the facility is 4 million bushels or more; and

(bb) Not be required to apply induced draft if the grain throughput of the facility is less than 4 million bushels, but if induced draft is applied, these emissions shall be conveyed through control equipment which has a particulate collection efficiency of not less than 85% by weight.

(d) **Standards of Performance for New Grain Handling Facilities**

(1) The owner or operator of a new grain handling facility located in the Minneapolis-St. Paul Air Quality Control Region or within a city with a population of 2500 or more shall apply induced draft to all sources of particulate emissions and shall convey these emissions through control equipment which has a particulate collection efficiency of not less than 99% by weight.

(2) The owner or operator of a new grain handling facility located outside the Minneapolis-St. Paul Air Quality Control Region but within a city with a population of less than 2500 shall apply induced draft to all sources of particulate emissions and shall convey these emissions through control equipment which has a particulate collection efficiency of not less than:

(aa) 99% by weight if the grain throughput of the facility is 2 million bushels or more; and

(bb) 85% by weight if the grain throughput is less than 2 million bushels.

(3) The owner or operator of a new grain handling facility located in a location other than one described in (d)(1) or (d)(2) shall:

(aa) Apply induced draft to all sources of particulate emissions and convey these emissions through control equipment which has a particulate collection efficiency of not less than 85% by weight if the grain throughput of the facility is 2 million bushels or more; and

(bb) Not be required to apply induced draft if the grain throughput of the facility is less than 2 million bushels, but if induced draft is applied, these emissions shall be conveyed through control equipment which has a particulate collection efficiency of not less than 85% by weight.

(e) Equivalent Performance Standard. The owner or operator of a grain handling facility who is required to convey particulate emissions through control equipment shall be deemed to be in compliance with the requirements of this regulation if the owner or operator of the facility does not cause or allow the emission of particulate matter from any control equipment to exceed the limits set forth in Tables 1 & 2 in APC 5.

(f) Exceptions for Grain Dryers. The owner or operator of a grain dryer shall be deemed in compliance with the requirements of this regulation if:

(1) The grain dryer is located in a protected area away from residences and places frequented by the public and operation of the grain dryer does not create a public nuisance. If the Director determines that operation of the grain dryer does create a public nuisance, the owner or operator shall enclose the grain dryer in such a manner that the nuisance is eliminated.

(2) The perforations of a column dryer screen do not exceed 3/32 inches in diameter.

(3) The emissions from a rack dryer pass through a 50 mesh screen enclosure before discharge to the atmosphere.

(g) Nuisance. Notwithstanding any provisions in this regulation, no owner or operator of any grain handling facility shall operate or maintain the facility in such a manner as to create a public nuisance. If the Director determines that operation or maintenance of a grain handling facility does create a public nuisance, the Director may require the owner or operator to take such measures as are necessary to eliminate the nuisance.

[March 12, 1975]

CHAPTER THIRTY: APC 30

APC 30 Emission Standards for Beryllium

(a) Definitions. As used in this regulation the following words shall have the meanings defined herein:

(1) "Beryllium" means the element beryllium. Where weights or concentrations are specified, such weights or concentrations apply to beryllium only, excluding the weight or concentration of any associated elements.

(2) "Beryllium alloy" means any metal to which beryllium has been added in order to increase its beryllium content and which contains more than 0.1 percent beryllium by weight.

(3) "Beryllium-containing waste" means material contaminated with beryllium and/or beryllium compounds used or generated during any process or operation performed by a source subject to this regulation.

(4) "Beryllium facility" means an extraction plant, ceramic plant, foundry, incinerator, or propellant plant which processes beryllium ore, beryllium, beryllium oxide, beryllium alloys, or beryllium-containing wastes, or a machine shop which processes beryllium, beryllium oxides or any alloy when such alloy contains more than 5 percent beryllium by weight.

(5) "Beryllium ore" means any naturally occurring material mined or gathered for its beryllium content.

(6) "Beryllium propellant" means any propellant incorporating beryllium.

(7) "Ceramic plant" means a manufacturing plant producing ceramic items.

(8) "Extraction plant" means a facility chemically processing beryllium ore to beryllium metal, alloy, or oxide, or performing any of the intermediate steps in these processes.

(9) "Foundry" means a facility engaged in the melting or casting of beryllium metal or alloy.

(10) "Incinerator" means any furnace used in the process of burning waste for the primary purpose of reducing the volume of the waste by removing combustible matter.

(11) "Machine shop" means a facility performing cutting, grinding, turning, honing, milling, deburring, lapping, electro-chemical machining, etching, or other similar operations.

(12) "Propellant" means a fuel and oxidizer physically or chemically combined which undergoes combustion to provide rocket propulsion.

(13) "Propellant plant" means any facility engaged in the mixing, casting, or machining of propellant.

(14) "Rocket motor test site" means any building, structure, facility, or installation where the static test firing of a beryllium rocket motor and/or the disposal of beryllium propellant is conducted.

(b) Emission Standards for Beryllium

(1) Beryllium Facilities. No owner or operator of a beryllium facility

shall cause to be discharged into the atmosphere from such facility more than 10 grams of beryllium per 24-hour period.

(2) **Burning of Beryllium.** No person shall burn beryllium or beryllium-containing waste, except propellants, except in incinerators which comply with the emission standard in subsection (b)(1).

(3) **Rocket Motor Test Sites.** No owner or operator of a rocket motor test site shall cause to be discharged into the atmosphere from such site:

(aa) Emissions which cause time-weighted atmospheric concentrations of beryllium to exceed 75 microgram minutes per cubic meter of air within the limits of 10 to 60 minutes, accumulated during any 2 consecutive weeks, in any area in which an effect adverse to public health could occur.

(bb) More than 2 grams of beryllium per hour or more than 10 grams of beryllium per 24-hour period from a closed tank used to collect the combustion products from the firing of beryllium propellants, if such a tank is used.

(c) **Emission Monitoring**

(1) **Beryllium Facilities**

(aa) The owner or operator of a beryllium facility shall install a continuous monitoring system to determine the concentration of beryllium in the ambient air. The continuous monitoring system shall be installed at air sampling sites which have been approved by the Director and which are designed to detect the maximum concentrations of beryllium in the ambient air. The Director may require changes in, or expansion of, any sampling network.

(bb) The owner or operator of a beryllium facility shall report the concentrations measured at all sampling sites to the Director every 30 days by registered letter.

(2) **Rocket Motor Test Sites**

(aa) The owner or operator of a rocket motor test site shall measure the concentration of beryllium in the ambient air during and after firing of a rocket motor and during and after disposal of a beryllium propellant. Prior to the firing or disposal the owner or operator shall obtain the approval of the Director for the measuring technique which is proposed to be used. The technique shall be adequate to enable the Director to determine whether the emissions are in compliance with the standard.

(bb) If combustion products from the rocket motor firing or propellant disposal are collected in a closed tank, emissions from the tank shall be continuously sampled during release of combustion products from the tank, in such a manner to enable the Director to determine whether the emissions are in compliance with the standard.

(cc) All samples shall be analyzed and results shall be calculated within 30 days after samples are taken and before any subsequent rocket motor firing or propellant disposal at the given site. All results shall be reported to the Director by a registered letter dispatched before the close of the next business day following determination of such results.

(dd) The owner or operator of a rocket motor test site shall notify

the Director in writing at least 30 days prior to a rocket motor firing or propellant disposal.

(d) Performance Test Method. Unless another method is approved by the Agency, any person required to submit performance test results for a beryllium facility or rocket motor test site shall use Method 103. Beryllium Screening Method, set forth in Appendix B to 40 C.F.R. Part 61, or Method 104. Reference Method for Determination of Beryllium Emissions from Stationary Sources, set forth in Appendix B to 40 C.F.R. Part 61.

(e) Performance Test Procedures

(1) The Director shall be notified in writing at least 30 days prior to an emission test.

(2) Samples shall be taken over such a period or periods as are necessary to accurately determine the maximum emissions which will occur in any 24-hour period. Where emissions depend upon the relative frequency of operation of different types of processes, operating hours, operating capacities, or other factors, the calculation of maximum 24-hour-period emissions shall be based on that combination of factors which is likely to occur during the subject period and which results in the maximum emissions. No changes in the operation shall be made, which would potentially increase emissions above that determined by the most recent source test, until a new emission level has been estimated by calculation and the results reported to the Director.

(3) All samples shall be analyzed and beryllium emissions shall be determined within 30 days after the source test. All determinations shall be reported to the Director by a registered letter dispatched before the close of the next business day following such determination.

[December 18, 1976]

CHAPTER THIRTY-ONE: APC 31**APC 31 Emission Standards for Mercury**

(a) Definitions. As used in this regulation the following words shall have the meanings defined herein:

(1) "Cell room" means a structure(s) housing one or more mercury electrolytic chlor-alkali cells.

(2) "Condenser stack gases" means the gaseous effluent evolved from the stack of processes utilizing heat to extract mercury metal from mercury ore.

(3) "Denuder" means a horizontal or vertical container which is part of a mercury chlor-alkali cell and in which water and alkali metal amalgam are converted to alkali metal hydroxide, mercury, and hydrogen gas in a short-circuited, electrolytic reaction.

(4) "End box" means a container(s) located on one or both ends of a mercury chlor-alkali electrolyzer which serves as a connection between the electrolyzer and denuder for rich and stripped amalgam.

(5) "End box ventilation system" means a ventilation system which collects mercury emissions from the end boxes, the mercury pump sumps, and their water collection systems.

(6) "Hydrogen gas stream" means a hydrogen stream formed in the chlor-alkali cell denuder.

(7) "Mercury" means the element mercury, excluding any associated elements, and includes mercury in particulates, vapors, aerosols, and compounds.

(8) "Mercury chlor-alkali cell" means a device which is basically composed of an electrolyzer section and a denuder (decomposer) section and utilizes mercury to produce chlorine gas, hydrogen gas, and alkali metal hydroxide.

(9) "Mercury chlor-alkali electrolyzer" means an electrolytic device which is part of a mercury chlor-alkali cell and utilizes a flowing mercury cathode to produce chlorine gas and alkali metal amalgam.

(10) "Mercury chlor-alkali plant" means an emission facility which uses mercury chlor-alkali cells to produce chlorine gas and alkali metal hydroxide.

(11) "Mercury ore" means a mineral mined specifically for its mercury content.

(12) "Mercury ore processing facility" means a facility processing mercury ore to obtain mercury.

(13) "Sludge" means sludge produced by a treatment plant that processes municipal or industrial wastewaters.

(14) "Sludge dryer" means a device used to reduce the moisture content of sludge by heating to temperatures above 65°C (150°F) with combustion gases.

(15) "Sludge incineration and drying plant" means an emission facility which incinerates or dries wastewater treatment plant sludge.

(b) Emission Standards for Mercury

(1) Mercury ore processing facility. No owner or operator of a mercury ore processing facility shall cause to be discharged into the atmosphere from such facility more than 2,300 grams of mercury per 24-hour period.

(2) Mercury chlor-alkali plant. No owner or operator of a mercury chlor-alkali plant shall cause to be discharged into the atmosphere from such plant more than 2,300 grams of mercury per 24-hour period.

(3) Sludge incineration and drying plants. No owner or operator of a sludge incineration and drying plant shall cause to be discharged into the atmosphere from such plant more than 3,200 grams of mercury per 24-hour period.

(c) Performance Test Methods. Unless another method is approved by the Agency, any person required to submit performance test results for a mercury ore processing facility, a mercury chlor-alkali plant, or a sludge incineration and drying plant shall use Method 101. Reference Method for Determination of Particulate and Gaseous Mercury Emissions from Stationary Sources (Air Streams), set forth in Appendix B to 40 C.F.R. Part 61, or Method 102. Reference Method for Determination of Particulate and Gaseous Mercury Emissions from Stationary Sources (Hydrogen Streams), set forth in Appendix B to 40 C.F.R. Part 61, whichever is applicable.

(d) Performance Test Procedures

(1) The Director shall be notified in writing at least 30 days prior to an emission test.

(2) Samples shall be taken over such a period or periods as are necessary to accurately determine the maximum emissions which will occur in a 24-hour period. No changes in the operation shall be made, which would potentially increase emissions above that determined by the most recent source test, until the new emission level has been estimated by calculation and the results reported to the Director.

(3) All samples shall be analyzed, and mercury emissions shall be determined within 30 days after the source test. Each determination shall be reported to the Director by a registered letter dispatched before the close of the next business day following such determination.

(4) Cell room emissions at a mercury chlor-alkali plant shall be determined by passing all cell room air in forced gas streams through stacks suitable for testing.

(5) In lieu of performance tests for cell room emissions at a mercury chlor-alkali plant, the owner or operator may elect to carry out design, maintenance, and housekeeping practices approved by the Director and assume that emissions from the cell room ventilation system contain 1,300 grams of mercury per day.

(6) In lieu of performance tests for sludge incineration and drying plants, the owner or operator of such a plant may elect to carry out a sludge sampling program according to Method 105. Method for Determination of Mercury in Wastewater Treatment Plant Sewage Sludges, set forth in 40

Fed. Reg. 48310-48311 (1975), and according to the procedures set forth below:

(aa) The Director shall be notified in writing at least 30 days prior to the sludge sampling test.

(bb) The sludge shall be sampled after dewatering and before incineration or drying at a location that provides a representative sample of the sludge that is charged to the incinerator or dryer. Eight consecutive grab samples shall be obtained at intervals of between 45 and 60 minutes and thoroughly mixed into one sample. Each of the eight grab samples shall have a volume of at least 200 ml but shall not exceed 400 ml. A total of three composite samples shall be obtained within an operating period of 24 hours. When the 24-hour operating period is not continuous, the total sampling period shall not exceed 72 hours after the first grab sample is obtained. Samples shall not be exposed to any condition that may result in mercury contamination or loss.

(cc) The maximum 24-hour period sludge incineration or drying rate shall be determined by use of a flow rate measurement device that can measure the mass rate of sludge charged to the incinerator or dryer with an accuracy of ± 5 percent over its operating range. Other methods of measuring sludge mass charging rates, approved by the Director, may be used.

(dd) The handling, preparation, and analysis of sludge samples shall be accomplished according to Method 105.

(ee) The mercury emissions shall be determined by use of the following equation:

$$E_{\text{hx}} = 1 \times 10^{-3} c Q$$

where E_{hx} = mercury emissions, g/day

c = mercury concentration of sludge on a dry solids basis, ug/g (ppm)

Q = sludge charging rate, kg/day

(ff) No changes in the operation of a plant shall be made after a sludge test has been conducted which would potentially increase emissions above the level determined by the most recent sludge test, until the new emission level has been estimated by calculation and the results reported to the Director.

(gg) All sludge samples shall be analyzed for mercury content within 30 days after the sludge sample is collected. Each determination shall be reported to the Director by a registered letter dispatched before the close of the next business day following such determination.

(e) Emission Monitoring. The owner or operator of a sludge incineration and drying plant for which mercury emissions exceed 1600 g/day, demonstrated either by performance tests or sludge sampling shall monitor mercury emissions at intervals of at least once per year using Method 105 and the procedures under paragraph (d)(6) of this regulation.

[December 18, 1975]

APC 32 Standards of Performance for Fossil Fuel-Burning Direct Heating Equipment

A. Definitions. As used in this regulation, the following words shall have the meanings defined herein:

1. "Actual heat input" means the number of BTU per hour (cal/hr) determined by multiplying the gross heating value of the fuel by the rate of fuel burned.

2. "Direct heating equipment" means a furnace, kiln, dryer, or other combustion equipment used in the burning of a fossil fuel for the purpose of processing a material where the products of combustion have direct contact with the heated material.

3. "Fossil fuel" means natural gas, petroleum, coal, wood, peat, and any form of solid, liquid, or gaseous fuel derived from such materials for the purpose of creating useful heat.

4. "Gross heating value" means the gross calorific value (cal/g or BTU/lb) of the fuel combusted as determined by A.S.T.M. test methods D 2015-66(72) for solid fuels; D 1826-64(70) for gaseous fuels, and D 240-64(73) for liquid fuels.

5. "Indirect heating equipment" means a furnace, a boiler or other unit of combustion equipment used in the process of burning fossil fuel for the purpose of producing steam, hot water, hot air, or other hot liquid, gas, or solid, where the products of combustion do not have direct contact with the heated medium.

6. "Rated heat input" means the number of BTU per hour (cal/hr) which the manufacturer has determined to be the continuous rated capability of the direct heating equipment.

B. Determination of Applicable Standards of Performance.

1. This regulation shall apply to direct heating equipment for which a standard of performance has not been promulgated in a specific regulation.

2. The applicable standard of performance for sulfur dioxide shall be determined by using the total rated heat input of all indirect heating equipment and all direct heating equipment of one owner or operator at that particular location.

3. When different fossil fuels are burned simultaneously in any combination, the applicable sulfur dioxide (SO₂) standard shall be determined by proration using the following formula:

$$w = \frac{y(a) + z(b)}{x + y + z}$$

where:

w is the maximum allowable emissions of sulfur dioxide gases in lbs. per million BTU (g/million cal), and

x is the percentage of total heat input derived from gaseous fossil fuel, and

y is the percentage of total heat input derived from liquid fossil fuel, and

z is the percentage of total heat input derived from solid fossil fuel, and

a is the allowable SO₂ standard for liquid fossil fuels expressed in lbs per million BTU (g/million cal), and

b is the allowable SO₂ standard for solid fossil fuels expressed in lbs per million BTU (g/million cal).

C. Standards of Performance for Fossil Fuel-Burning Direct Heating Equipment.

1. Particulate limitations.

a. No owner or operator of any direct heating equipment shall cause to be discharged into the atmosphere from the direct heating equipment any gases which:

(1) Contain particulate matter in excess of the limits allowed by Minnesota Regulation APC 5, or

(2) Exhibit greater than 20% opacity, except that a maximum of 60% opacity shall be permissible for four minutes in any 60 minute period and that a maximum of 40% opacity shall be permissible for four additional minutes in any 60 minute period.

b. No owner or operator of an existing gray iron cupola with a melting capacity of less than one and one-half tons per hour shall allow emissions which exceed 0.3 grain per standard cubic foot, dry basis, and the owner or operator shall incinerate all gases, vapors, and gas entrained effluents from such cupolas at a temperature of not less than 1200 degrees Fahrenheit for a period of not less than 0.3 seconds. The owner or operator of any other gray iron cupola shall meet the requirements of subparagraph a.

2. Sulfur oxide limitations.

a. Within Minneapolis-St. Paul air quality control region. No owner or operator of direct heating equipment located within the Minneapolis-St. Paul Air Quality Control Region shall cause to be discharged into the atmosphere from such equipment any gases which contain sulfur dioxide:

(1) In excess of 3 pounds per million BTU heat input if a solid fossil fuel is burned or 1.6 pounds per million BTU heat input if a liquid fossil fuel is burned, if the total rated heat input of all indirect and direct heating equipment of the owner or operator at that particular location exceeds 250 million BTU per hour.

(2) In excess of 4 pounds per million BTU heat input if a solid fossil fuel is burned or 2 pounds per million BTU heat input if a liquid fossil fuel is burned, if the total rated heat input of all indirect and direct heating equipment of the owner or operator at that particular location is equal to or less than 250 million BTU per hour.

b. Outside Minneapolis-St. Paul air quality control region. No owner or operator of direct heating equipment located outside the Minneapolis-St. Paul Air Quality Control Region shall cause to be discharged into the atmosphere from such equipment any gases which contain sulfur dioxide in excess of 4 pounds per million BTU heat input if a solid fossil fuel is burned or 2 pounds per million BTU heat input if a liquid fossil fuel is

burned, if the total rated heat input of all indirect and direct heating equipment of the owner or operator at that particular location is greater than 250 million BTU per hour.

D. Performance Test Methods. Unless another method is approved by the Agency, any person required to submit performance tests for direct heating equipment shall utilize the following test methods:

1. Method 1 for selection of sampling site and sample traverses.
2. Method 3 for gas analysis.
3. Method 5 for concentration of particulate matter and the associated moisture content.
4. Method 6 for concentration of SO₂.
5. Method 9 for visual determination of opacity.

E. Performance Test Procedures.

1. The sampling site, as selected by Method 1, shall be the same for each pollutant during a performance test.

2. For Method 5, the sampling time for each run shall be at least 60 minutes and the minimum sampling volume shall be 0.85 dscm (30 dscf) except that smaller sampling times or volumes, when necessitated by process variables or other factors, may be approved by the Agency. The probe and filter holder heating systems in the sampling train shall be set to provide a gas temperature between 120°C and 160°C (250°F and 320°F).

3. For Method 6, the sampling point in the duct shall be at the center of the cross section or at a point no closer to the walls than 1 m (3.28 ft.). The sample shall be extracted at a rate proportional to the gas velocity at the sampling point.

4. For Method 6, the minimum sampling time shall be 20 minutes and the minimum sampling volume 0.02 dscm (0.71 dscf) for each sample. The arithmetic mean of two samples shall constitute one run. Samples shall be taken at approximately 30-minute intervals.

5. For each performance test for sulfur dioxide emissions, the emissions expressed in g/million cal (lb/million BTU) shall be determined by the following procedure if the actual heat input is used:

$$E = CF \left(\frac{20.90}{20.9 - \%O_2} \right)$$

where:

- a. E = pollutant emission, g/million cal (lb/million BTU).
- b. C = pollutant concentration, g/dscm (lb/dscf),
- c. %O₂ = oxygen content by volume (expressed as percent), dry basis. Percent oxygen shall be determined by using the integrated sampling procedures of Method 3 or with the Orsat analyzer. The sample shall be obtained at approximately the same point in the duct as used to obtain the samples for Method 6.

d. F = factor representing a ratio of the volume of dry flue gases generated to the calorific value of the fuel combusted. Values of F are given as follows:

(1) For anthracitic coal according to A.S.T.M. D388-66, $F = 0.01139 \text{ dscm}/10^4 \text{ cal}$ ($101.4 \text{ dscf}/10^4 \text{ BTU}$).

(2) For subbituminous and bituminous coal according to A.S.T.M. D388-66, $F = 0.01103 \text{ dscm}/10^4 \text{ cal}$ ($98.2 \text{ dscf}/10^4 \text{ BTU}$).

(3) For liquid fossil fuels including crude, residual, and distillate oils, $F = 0.01036 \text{ dscm}/10^4 \text{ cal}$ ($92.2 \text{ dscf}/10^4 \text{ BTU}$).

(4) For gaseous fossil fuels including natural gas, propane, and butane, $F = 0.00982 \text{ dscm}/10^4 \text{ cal}$ ($87.4 \text{ dscf}/10^4 \text{ BTU}$).

e. An owner or operator may use the following equation to determine an F factor ($\text{dscf}/10^4 \text{ BTU}$) in lieu of the F factors specified by paragraph 5.d. of this section:

$$F = \frac{10^6 3.64(\%H) + 1.53(\%C) + 0.57(\%S) + 0.14(\%N) - 0.46(\%O)}{GHV}$$

where:

(1) H, C, S, N, and O are content by weight of hydrogen, carbon, sulfur, nitrogen, and oxygen (expressed as percent), respectively, as determined by ultimate analysis of the fuel fired, dry basis, using A.S.T.M. methods D3178-74 or D3176 (solid fuels) or D240-64(73) (liquid fuels) or computed from results using A.S.T.M. method D1137-53(70), D1945-64(73) or D1946-67(72) (gaseous fuels) as applicable.

(2) GHV is the gross heating value.

f. When combinations of fuels are fired, the F factors determined by paragraph 5.d. or e. of this section shall be prorated in accordance with the following formula:

$$F = \frac{x F_1 + y F_2 + z F_3}{100}$$

where:

x = the percentage of total heat input derived from gaseous fossil fuel.

y = the percentage of total heat input derived from liquid fossil fuel.

z = the percentage of total heat input derived from solid fossil fuel.

F_1 = the value of F for gaseous fossil fuels according to subsection 5.d. or e. of this regulation.

F_2 = the value of F for liquid fossil fuels according to subsection 5.d. or e. of this regulation.

F_3 = the value of F for solid fossil fuels according to subsection 5.d or e. of this regulation.

g. When combinations of fossil fuels are fired, the actual heat input, expressed in cal/hr (BTU/hr), shall be determined during each testing period. The rate of fuels burned during each testing period shall be determined by suitable methods and shall be confirmed by a material balance over the direct heating system.

6 MCAR S 4.0033 Standards of performance for coal handling facilities within designated areas.

A. Definitions. As used in this rule the following words shall have the meanings defined herein:

1. "Coal" means any solid fossil fuel described as anthracite, bituminous, sub-bituminous, lignite, or coke (as derived from coal).

2. "Coal handling facility" means a facility where coal is handled such as coal transshipment terminals, electric generating plants, boiler plants, or steam plants.

3. "Coal handling" means operations including, but not limited to, operations such as dumping, loading, unloading, storing, reclaiming, transferring, and conveying.

4. "Coal throughput" means the number of tons of coal received plus the number of tons of coal shipped by an owner or operator of a coal transshipment facility in any one calendar year. In the case of facilities where coal is consumed at the same facility where received, such as electric generating plants, boiler plants, or steam plants, coal throughput means the number of tons of coal received at the facility.

5. "Dust suppression methods" mean dust control equipment or measures including, but not limited to, hoppers, hoods, screens, enclosures, wetting or chemical agents, foam agents, surfactants, pre-cleaning treatment, utilizing induced draft and air pollution control equipment, watering, and other equivalent methods approved by the director.

6. "Hauler" means any vehicle engaged in reclaiming, moving, or dumping coal within a coal handling facility.

7. "Pneumatic coal-cleaning equipment" means any equipment which classifies coal by size or separates coal from refuse by application of air stream(s).

8. "Thermal dryer" means any device in which the moisture content of coal is reduced by contact with a heated gas stream which is exhausted to the atmosphere.

9. "Reasonably available control technology (RACT)" is the lowest emission limit that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.

10. "Minimize" means, with respect to the control of fugitive emissions, to reduce such emissions to a level consistent with RACT.

B. Standards of performance for certain coal handling

facilities. The owner or operator of a new or existing coal handling facility which is located within the Minneapolis-St. Paul Air Quality Control Region or within the boundaries of the city of Duluth shall perform the following abatement measures unless otherwise exempt by portions of this rule:

1. Access areas, roads, parking facilities.

a. Install asphalt or concrete surfaces or chemical agents on all active truck haul roads of the coal handling facility when the coal throughput by truck is 200,000 tons or greater. All paved roads and areas shall be cleaned to minimize the discharge to the atmosphere of fugitive particulate emissions. Such cleaning shall be accomplished in a manner which minimizes resuspension of particulate matter. Access areas surrounding coal stockpiles and parking facilities which are located within a coal handling facility shall be treated with water, oils, or chemical agents.

b. No person shall cause or permit the use of access areas surrounding coal stockpiles and use of all active truck haul roads and parking facilities which are located within a coal handling facility whose coal throughput by truck is less than 200,000 tons unless such areas and roads are treated with water, oils, or chemical agents.

2. Coal loading stations. Control fugitive particulate emissions from the loading of trucks, haulers, and railcars by dust suppression methods so that emissions from such sources are minimized.

3. Truck and hauler unloading stations. Control fugitive particulate emissions from the unloading of trucks or haulers by dust suppression methods so that emissions from such sources are minimized.

4. Barge or vessel loading stations.

a. When the amount of coal loaded into barges or vessels at a given facility is 200,000 tons per year or greater, conveyor systems shall utilize loadout spouts with remote control capability for movement sideways, up and down, and telescoping so as to decrease as much as practical the vertical free fall of coal at all times during the loadout operation. Choke feeding devices, flood loading or other equivalent equipment or methods may be installed as alternates on conveyor systems to control fugitive emissions. Crane and shovels shall be operated so as to minimize the vertical free fall of coal.

b. When the amount of coal loaded into barges or vessels at a given facility is less than 200,000 tons per year, control fugitive particulate emissions by dust suppression methods so that emissions from such sources are minimized.

5. Barge or vessel unloading station. Cranes, shovels, and conveyors shall be operated in a manner which decreases as

much as practical the vertical free fall of coal. Control fugitive particulate emissions during unloading so that fugitive particulate emissions are minimized.

6. Stockpiles, stockpile construction and reclaiming.

a. Control fugitive particulate emissions by dust suppression methods on such operations so that fugitive particulate emissions are minimized.

b. In the alternative use an underground bottom feed (plow) of coal to an underground conveyor system provided the exhaust gases from the enclosed spaces do not contain particulate matter in excess of 0.020 grains per dry standard cubic foot (gr/dscf).

7. Enclosed coal handling facilities or emission sources not specifically covered by any other provision in this rule. If exhaust gases from any enclosed coal handling facility exceed 20 percent opacity, then the owner or operator of such facility shall select and implement one of the following further controls:

a. Install exhaust air system and control exhaust gases so that particulate emissions in such gases do not exceed 0.020 gr/dscf.

b. Control exhaust gases using dust suppression methods so that particulate emissions do not exhibit greater than 20 percent opacity.

8. Railcar unloading.

a. When the amount of coal unloaded by rail is 200,000 tons per year or greater, unload railcars only within a permanent building or structure. If exhaust gases from such building or structure exceed 20 percent opacity, then the owner or operator of such facility shall select and implement one of the following further controls:

1. Install an exhaust air system and control exhaust gases so that particulate emissions in such gases do not exceed 0.020 gr/dscf.

2. Control exhaust gases using dust suppression methods so that particulate emissions do not exhibit greater than 20 percent opacity.

b. When the amount of coal unloaded by rail is less than 200,000 tons per year control fugitive particulate emissions during unloading so that fugitive particulate emissions are minimized.

9. Operating practices.

-a. Clean up all coal spilled on roads or access areas as soon as practicable using methods that minimize the amount of

dust suspended.

b. Maintain air pollution control equipment in proper operating condition and utilize air pollution control systems as designed.

C. Standards of performance for existing outstate coal handling facilities. The owner or operator of an existing coal handling facility which is located outside the Minneapolis-St. Paul Air Quality Control Region and outside the boundaries of the city of Duluth shall comply with the requirements of existing rule APC 6 (6 MCAR S 4.0006) for the control of fugitive particulate emissions.

D. Standards of performance for pneumatic coal-cleaning equipment and thermal dryers at any coal handling facility.

1. Pneumatic coal-cleaning equipment. The owner or operator of a coal handling facility shall not cause to be discharged into the atmosphere from any pneumatic coal-cleaning equipment any gases which:

a. Contain particulate matter in excess of 0.040 g/dscm (0.018 gr/dscf); or

b. Exhibit 10 percent opacity or greater.

2. Thermal dryers. The owner or operator of a coal handling facility shall not cause to be discharged into the atmosphere from any thermal dryer any gases which:

a. Contain particulate matter in excess of 0.070 g/dscm (0.031 gr/dscf); or

b. Exhibit 20 percent opacity or greater.

3. The owner or operator shall install pneumatic coal-cleaning equipment and thermal dryers in a manner that performance tests for particulate matter can be run in accordance with applicable procedures and methods set forth in sections G. and H. of this rule.

4. Monitoring.

a. The owner or operator of any coal handling facility that contains a thermal dryer shall install, calibrate, maintain, and continuously operate monitoring devices as follows:

(1) A monitoring device for the measurement of the temperature of the gas stream at the exit of the thermal dryer on a continuous basis. The monitoring device shall be certified by the manufacturer to be accurate within ± 3 degrees Fahrenheit.

(2) In the event a venturi scrubber emission control equipment is utilized:

(a) A monitoring device for the continuous measurement of the pressure loss through the venturi constriction of the control equipment. The monitoring device shall be certified by the manufacturer to be accurate within .1 inch water gauge.

(b) A monitoring device for the continuous measurement of the water supply pressure to the control equipment. The monitoring device shall be certified by the manufacturer to be accurate within ± 5 percent of design water supply pressure. The pressure sensor or tap shall be located close to the water discharge point.

(3) The owner or operator of a coal handling facility who is required to maintain monitoring devices shall recalibrate each device annually in accordance with the manufacturer's written requirements for checking the operation and calibration of the device.

E. Exemption. During freezing temperatures, owners or operators shall not be required to apply water or dust suppressants.

F. Cessation of operations. The owner or operator of a coal handling facility shall not conduct any non-essential coal handling operations that are not shielded from the wind or enclosed in a building when steady wind speeds exceed 30 miles per hour as determined at the nearest official station of the U.S. Weather Bureau or by wind speed instruments on or adjacent to the site.

G. Performance test method. Unless another equivalent method is approved by the director, any person required to conduct performance tests for coal handling facilities shall utilize the following test methods, as referenced in 40 Code of Federal Regulations, part 60, Appendix A as in force on the effective date of this rule:

1. Method 1 for sample and velocity traverses.
2. Method 5 for the concentration of particulate material and moisture content.
3. Method 9 for the visual determination of the opacity of emission from stationary sources.

H. Performance test procedures. For Method 5, the sampling time for each run shall be at least 60 minutes and the minimum sampling volume shall be 0.85 dscm (30 dscf) except that smaller sampling times or volumes, when necessitated by process variables or other factors, shall be approved by the director. The probe and filter holder heating systems in the sampling train shall be set to provide a gas temperature between 100 degrees Centigrade and 120 degrees Centigrade (212 degrees Fahrenheit and 250 degrees Fahrenheit). Sampling shall not be started until at least 30 minutes after start up and shall be

terminated before shut down procedures commence. The owner or operator shall eliminate cyclonic flow during performance tests.

I. Dust suppressant agents. Nothing in this rule shall authorize the use of surface hardening agents, wetting or chemical agents, foam agents, and oils that may cause ground water or surface water contamination in violation of any applicable water pollution law.

004136
6 MCAR S 4.0039 Emergency Episodes.

A. Applicability. This rule applies to any owner or operator of any emission facility having allowable emissions of any air pollutant of 250 or more tons per year located within or having air pollutant emissions affecting any area within the state of Minnesota for which an air pollution alert, air pollution warning, air pollution emergency, or air pollution significant harm episode has been declared by the director.

B. Definitions. As used in this rule, the following words shall have the meaning defined herein:

1. "Air pollutant" means particulate matter, sulfur dioxide, nitrogen oxides, ozone, carbon monoxide or nonmethane hydrocarbons.
2. "Allowable emission" means the emission rate calculated using the maximum rated capacity of the emission facility, unless the emission facility is subject to enforceable permit conditions which limit the operating rate or hours of operation or both, and the applicable standard of performance set forth in agency rules or the standard set forth in the permit, whichever is more stringent.
3. "Alert level" means the concentration of pollutants, as specified in paragraph C., at which first stage control actions are to be taken.
4. "Declaration" means the formal public notification of an episode made by the director.
5. "Director" means the Executive Director of the Minnesota Pollution Control Agency or the director's designee.
6. "Emergency level" means that concentration of pollutants, as specified in paragraph C., at which third stage control actions are to be taken.
7. "Episode" means that period of time during which ambient air concentrations of air pollutants equal or exceed the alert level and meteorological conditions are such that the air pollutant concentrations can be expected to persist or to increase in the absence of control actions.
8. "Significant harm level" means that concentration of pollutants, as specified in paragraph C., at which fourth stage control actions are to be taken.
9. "Warning level" means that concentration of pollutants, as specified in paragraph C., at which second stage control actions are to be taken.

C. Episode levels. The level at which the director shall declare an air pollutant alert, warning, emergency or

significant harm episode shall be determined by Table 1.

D. Episode declaration.

1. An air pollution alert shall be declared by the director when the director finds that the concentration of any air pollutant has reached the alert level at any monitoring site and meteorological conditions are such that the air pollutant concentration can be expected to remain at, or exceed, the alert level for 12 or more hours or, in the case of ozone, to recur the following day at the same or higher levels unless control actions are taken.

2. An air pollution warning shall be declared by the director when the director finds that the concentration of any air pollutant has reached the warning level at any monitoring site and meteorological conditions are such that the air pollutant concentration can be expected to remain at, or exceed, the warning level for 12 or more hours or, in the case of ozone, to recur the following day at the same or higher levels unless control actions are taken. An air pollution warning shall also be declared by the director when the director finds that the alert level concentrations for any air pollutant have persisted in the area for 48 hours and are expected to continue for the subsequent 12 hours.

3. An air pollution emergency shall be declared by the director when the concentration of any air pollutant has reached the emergency level at any monitoring site and meteorological conditions are such that the air pollutant concentration can be expected to remain at, or exceed, the emergency level for 12 or more hours or, in the case of ozone, to recur the following day at the same or higher levels unless control actions are taken. An air pollution emergency shall also be declared by the director when the director finds that the warning level concentrations for any air pollutant have persisted in the area for 48 hours and are expected to continue for the subsequent 12 hours.

4. An air pollution significant harm episode shall be declared by the director when the concentration of any air pollutant has reached the significant harm level at any monitoring site and meteorological conditions are such that the air pollutant concentration can be expected to remain at, or exceed, the significant harm level for 12 or more hours or, in the case of ozone, to recur the following day at the same or higher levels unless control actions are taken.

5. The geographical area subject to episode levels of any air pollutant shall be delineated to the extent feasible and shall be identified in the director's declaration.

6. The director shall terminate the episode by declaration when:

- a. The measured air pollutant concentrations no longer

satisfy the criteria specified in paragraph C.; and

b. The meteorological conditions indicate that there will not be a recurrence of episode levels of air pollutants within 24 hours if control actions are reduced or eliminated.

E. Control actions.

1. Notwithstanding the provisions of other rules or of any installation permit, operating permit, stipulation agreement, variances, or order of the agency, all persons shall, upon notification by the director or the director's designee, comply with episode control directives issued by the director.

2. Control directives issued to any owner or operator of an emission facility shall be based on the emission reduction plan submitted to the director pursuant to paragraph E.3; provided, however, that in the event that no emission reduction plan has been approved for such facility, the episode control directives shall be based upon the emission reduction objectives set forth at paragraph E.4.

3. The owner or operator of each emission facility located within the state having allowable air pollutant emissions of at least 250 tons per year shall within 90 days of the effective date of this rule submit to the director an episode emission reduction plan to be implemented at the facility in the event of a declaration by the director of an air pollution episode. The plan shall be consistent with the emission reduction objectives set forth in paragraph E.4. and shall designate at least two individuals to be notified in the event of the declaration of an air pollution episode. The plan shall be subject to the approval of the director. If the director finds that the plan is inconsistent with such emission reduction objectives the plan shall be returned to the owner or operator along with a written statement of the reason(s) for disapproval. The owner or operator shall correct the deficiency within 30 days of notification of disapproval and shall resubmit the plan to the director.

4. For the purposes of this rule, emission reduction objectives shall be as indicated in Tables 2 through 6. In the event of episode levels of both particulate matter and sulfur dioxide the director shall direct coal fired electric power generating facilities which pollutant is to be reduced at each facility.

5. During the time that an air pollution episode declaration is in effect and has not been terminated, the owner or operator of any emission facility who has been directed to implement any portion of the facility's emission reduction plan shall allow the agency, or any authorized employee or agent of the agency, when authorized by law and upon the presentation of proper credentials to enter upon the property of the owner or operator for the purpose of obtaining information or examining records or conducting surveys or investigations pertaining to

the operation of the emission facilities and the control equipment. The owner or operator shall make available on the premises to such agency employee a copy of the episode emission reduction plan for the emission facility and shall, upon request of the agency employee, demonstrate that the control directives issued to the owner or operator are being implemented.

F. Emergency powers. Nothing in this rule shall be interpreted to preempt the agency's emergency powers as provided in Minnesota Statutes, section 116.11 (1978) or to preclude appropriate actions from being taken by the agency to protect the public health.

TABLE 1

	<u>SO₂</u> <u>24 Hr. Avg.</u>	<u>Part.</u> <u>24 Hr. Avg.</u>	<u>CO</u> <u>8 Hr. Avg.</u>	<u>NO₂</u> <u>24 Hr. Avg.</u>	<u>NO₂</u> <u>1 Hr. Avg.</u>	<u>Ozone</u> <u>1 Hr. Avg.</u>	<u>SO₂ x Part.</u> <u>ug/m³ x ug/m³</u> <u>24 Hr. x 24 Hr.</u>
ALERT	300 ppb 800 ug/m ³	375 ug/m ³	15 ppm 17 mg/m ³	150 ppb 282 ug/m ³	600 ppb 1130 ug/m ³	200 ppb 400 ug/m ³	65 x 10 ³
WARNING	600 ppb 1600 ug/m ³	625 ug/m ³	30 ppm 34 mg/m ³	300 ppb 565 ug/m ³	1200 ppb 2260 ug/m ³	400 ppb 800 ug/m ³	261 x 10 ³
EMERGENCY	800 ppb 2100 ug/m ³	875 ug/m ³	40 ppm 46 mg/m ³	400 ppb 750 ug/m ³	1600 ppb 3000 ug/m ³	500 ppb 1000 ug/m ³	393 x 10 ³
SIGN. HARM	1000 ppb 2620 ug/m ³	1000 ug/m ³	50 ppm 57.5 mg/m ³	500 ppb 938 ug/m ³	2000 ppb 3750 ug/m ³	600 ppb 1200 ug/m ³	490 x 10 ³

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TABLE 2
EMISSION REDUCTION OBJECTIVES FOR PARTICULATE MATTER

<u>EMISSION FACILITY</u>	<u>AIR POLLUTION ALERT</u>	<u>AIR POLLUTION WARNING</u>	<u>AIR POLLUTION EMERGENCY</u>
1. Coal or oil-fired electric power generating facilities.	a. Substantial reduction by utilization of fuels having lowest available ash content.	a. Maximum reduction by utilization of fuels having lowest available ash content.	a. Maximum reduction by utilization of fuels having lowest available ash content.
	b. Maximum utilization of mid-day (12:00 noon to 4:00 p.m.) atmospheric turbulence for boiler lancing and soot blowing.	b. Maximum utilization of mid-day (12:00 noon to 4:00 p.m.) atmospheric turbulence for boiler lancing and soot blowing.	b. Maximum utilization of mid-day (12:00 noon to 4:00 p.m.) atmospheric turbulence for boiler lancing and soot blowing.
	c. Substantial reduction by diverting electric power generation to facilities outside of Alert Area.	c. Maximum reduction by diverting electric power generation to facilities outside of Warning Area.	c. Maximum reduction by diverting electric power generation to facilities outside of Emergency Area.
2. Coal or oil-fired process steam generating facilities.	a. Substantial reduction by utilization of fuels having lowest available ash content.	a. Maximum reduction by utilization of fuels having lowest available ash content.	a. Maximum reduction by reducing heat and steam demands to absolute necessities consistent with preventing equipment damage.
	b. Maximum utilization of midday (12:00 noon to 4:00 p.m.) atmospheric turbulence for boiler lancing and soot blowing.	b. Maximum utilization of midday (12:00 noon to 4:00 p.m.) atmospheric turbulence for boiler lancing and soot blowing.	b. Maximum utilization of midday (12:00 noon to 4:00 p.m.) atmospheric turbulence for boiler lancing and soot blowing.
	c. Reduction of steam load demands consistent with continuing plant operation.	c. Reduction of steam load demands consistent with continuing plant operations.	c. Taking the action called for in the emergency plan.
		d. Making ready for use a plan of action to be taken if an emergency develops.	

TABLE 2 Continued

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|---|---|---|---|
| <p>3. A—Manufacturing, processing, and mining industries.
AND
B—Other persons required by this rule to prepare standby plans.</p> | <p>a. Substantial reduction of air contaminants from manufacturing operations by curtailing, postponing, or deferring production and allied operations.</p> | <p>a. Maximum reduction of air contaminants from manufacturing operations by, if necessary, assuming reasonable economic hardship by postponing production and allied operations.</p> | <p>a. Elimination of air contaminants from manufacturing operations by ceasing, curtailing, postponing or deferring production and allied operations to the extent possible without causing injury to persons or damage to equipment.</p> |
| | <p>b. Maximum reduction by deferring trade waste disposal operations which emit particles.</p> | <p>b. Maximum reduction by deferring trade waste disposal operations which emit particles.</p> | <p>b. Elimination of air contaminants from trade waste disposal processes which emits particles.</p> |
| | <p>c. Reduction of particulate producing heat load demands for processing consistent with continuing plant operations.</p> | <p>c. Reduction of particulate producing heat load demands for processing consistent with continuing plant operations.</p> | <p>c. Maximum reduction of particulate producing heat load demands for processing.</p> |
| <p>4. Refuse disposal operations.</p> | <p>a. Maximum reduction by prevention of open burning.</p> | <p>a. Maximum reduction by prevention of open burning.</p> | <p>a. Maximum reduction by prevention of open burning.</p> |
| | <p>b. Substantial reduction by limiting burning of refuse in incinerators to the hours between 12:00 noon and 4:00 p.m.</p> | <p>b. Complete elimination of the use of incinerators.</p> | <p>b. Complete elimination of the use of incinerators.</p> |

TABLE 3
EMISSION REDUCTION OBJECTIVES FOR SULFUR OXIDES

<u>EMISSION FACILITY</u>	<u>AIR POLLUTION ALERT</u>	<u>AIR POLLUTION WARNING</u>	<u>AIR POLLUTION EMERGENCY</u>
1. Coal or oil-fired electric power generating facilities.	<ul style="list-style-type: none"> a. Substantial reduction by utilization of fuels having lowest available sulfur content. b. Substantial reduction by diverting electric power generation to facilities outside of Alert Area. 	<ul style="list-style-type: none"> a. Maximum reduction by utilization of fuels having lowest available sulfur content. b. Maximum reduction by diverting electric power generation to facilities outside of Warning Area. 	<ul style="list-style-type: none"> a. Maximum reduction by utilization of fuels having lowest available sulfur content. b. Maximum reduction by diverting electric power generation to facilities outside of Emergency Area.
2. Coal or oil-fired process steam generating facilities.	<ul style="list-style-type: none"> a. Substantial reduction by utilization of fuels having lowest available sulfur content. b. Reduction of steam load demands consistent with continuing plant operations. 	<ul style="list-style-type: none"> a. Maximum reduction by utilization of fuels having the lowest available sulfur content. b. Reduction of steam load demands consistent with continuing plant operations. c. Making ready for use a plan of action to be taken if an emergency develops. 	<ul style="list-style-type: none"> a. Maximum reduction by reducing heat and steam demands to absolute necessities consistent with preventing equipment damage. b. Taking the action called for in the emergency plan.
3. A—Manufacturing and processing industries AND B—Other persons required by this rule to prepare standby plans.	<ul style="list-style-type: none"> a. Substantial reduction of air contaminants from manufacturing operations by curtailing, postponing, or deferring production and allied operations. 	<ul style="list-style-type: none"> a. Maximum reduction of air contaminants from manufacturing operations by, if necessary, assuming reasonable economic hardship by postponing production and allied operations. 	<ul style="list-style-type: none"> a. Elimination of air contaminants from manufacturing operations by ceasing, curtailing, postponing or deferring production and allied operations to the extent possible without causing injury to persons or damage to equipment.

TABLE 3 Continued

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| b. Maximum reduction by deferring trade waste disposal operations which emit sulfur dioxide. | b. Maximum reduction by deferring trade waste disposal operations which emit sulfur dioxide. | b. Elimination of air contaminants from trade waste disposal processes which emit sulfur dioxide. |
| c. Reduction of sulfur dioxide producing heat load demands for processing consistent with continuing plant operations. | c. Reduction of sulfur dioxide producing heat load demands for processing consistent with continuing plant operations. | c. Maximum reduction of sulfur dioxide producing load demands for processing. |

**TABLE 4
EMISSION REDUCTION OBJECTIVES FOR NITROGEN OXIDES**

<u>EMISSION FACILITY</u>	<u>AIR POLLUTION ALERT</u>	<u>AIR POLLUTION WARNING</u>	<u>AIR POLLUTION EMERGENCY</u>
1. Steam-electric power generating facilities.	<ul style="list-style-type: none"> a. Substantial reduction by utilization of fuel which results in the formation of less air contaminant. b. Substantial reduction by diverting electric power generation to facilities outside of Alert Area. 	<ul style="list-style-type: none"> a. Maximum reduction by utilization of fuel which results in the formation of less air contaminant. b. Maximum reduction by diverting electric power generation facilities outside of Warning Area. 	<ul style="list-style-type: none"> a. Maximum reduction by diverting electric power generation to facilities outside of Emergency Area.
2. Process steam generating facilities.	<ul style="list-style-type: none"> a. Substantial reduction by utilization of fuel which results in the formation of less air contaminant. b. Reduction of steam load demands consistent with continuing plant operations. 	<ul style="list-style-type: none"> a. Maximum reduction by utilization of fuel which results in the formation of less air contaminant. b. Reduction of steam load demands consistent with continuing plant operations. c. Making ready for use a plan of action to be taken if an emergency develops. 	<ul style="list-style-type: none"> a. Maximum reduction by reducing heat and steam demands to absolute necessities consistent with preventing equipment damage.
3. A—Manufacturing and processing industries. AND B—Other persons required by this rule to prepare standby plans.	<ul style="list-style-type: none"> a. Substantial reduction of air contaminants from manufacturing operations by curtailing, postponing, or deferring production and allied operations. 	<ul style="list-style-type: none"> a. Maximum reduction of air contaminants from manufacturing operations by, if necessary, assuming reasonable economic hardship by postponing production and allied operations. 	<ul style="list-style-type: none"> a. Elimination of air contaminants from manufacturing operations by ceasing, curtailing, postponing or deferring production and allied operations to the extent possible without causing injury to persons or damage to equipment.

TABLE 4 Continued

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| | b. Maximum reduction by deferring trade waste disposal operations which emit nitrogen oxides. | b. Maximum reduction by deferring trade waste disposal operations which emit nitrogen oxides. | b. Elimination of air contaminants from trade waste disposal processes which emit nitrogen oxides. |
| | c. Reduction of nitrogen oxide producing heat load demands for processing consistent with continuing plant operations. | c. Reduction of nitrogen oxide producing heat load demands for processing consistent with continuing plant operations. | c. Maximum reduction of nitrogen oxide producing heat load demands for processing. |
| 4. Stationary internal combustion engines. | a. Reduction of power demands consistent with continuing operations. | a. Reduction of power demands consistent with continuing operations. | a. Maximum reduction by reducing power demands to absolute necessities consistent with personnel safety and preventing equipment damage. |
| | | b. Maximum reduction by utilization of fuels or power source which results in the formation of less air contaminants. | b. Maximum reduction by utilization of fuels or power source which results in the formation of less air contaminants. |
| 5. Refuse disposal operations. | a. Maximum reduction by prevention of open burning. | a. Maximum reduction by prevention of open burning. | a. Maximum reduction by prevention of open burning. |
| | b. Substantial reduction by limiting burning of refuse in incinerators to the hours between 12:00 noon and 4:00 p.m. | b. Complete elimination of the use of incinerators. | b. Complete elimination of the use of incinerators. |

**TABLE 5
EMISSION REDUCTION OBJECTIVES FOR HYDROCARBONS**

<u>EMISSION FACILITY</u>	<u>AIR POLLUTION ALERT</u>	<u>AIR POLLUTION WARNING</u>	<u>AIR POLLUTION EMERGENCY</u>
1. Petroleum products storage and distribution.	a. Substantial reduction of air contaminants by curtailing, postponing, or deferring transfer operations.	a. Maximum reduction of air contaminants by assuming reasonable economic hardship by postponing transfer operations.	a. Elimination of air contaminants by curtailing, postponing, or deferring transfer operations to the extent possible without causing damage to equipment.
2. Surface coating and preparation.	a. Substantial reduction of air contaminants by curtailing, postponing, or deferring transfer operations.	a. Maximum reduction of air contaminants by assuming reasonable economic hardship by postponing transfer operations.	a. Elimination of air contaminants by curtailing, postponing, or deferring transfer operations to the extent possible without causing damage to equipment.
3. A—Manufacturing and processing industries. AND B—Other persons required by this rule to prepare standby plans.	a. Substantial reduction of air contaminants from manufacturing operations by curtailing, postponing, or deferring production and allied operations.	a. Maximum reduction of air contaminants from manufacturing operations by, if necessary, assuming reasonable economic hardship by postponing production and allied operations.	a. Elimination of air contaminants from manufacturing operations by ceasing, curtailing, postponing or deferring production and allied operations to the extent possible without causing injury to persons or damage to equipment.
4. Mobile sources.	a. Voluntary reduction in unnecessary vehicle use in response to Agency advisory.	a. Voluntary reduction in vehicle use through increased use of public transport, car pools, and van pools.	a. Maximum reduction by banning vehicle use except for emergencies.

TABLE 6
EMISSION REDUCTION OBJECTIVES FOR CARBON MONOXIDE

<u>EMISSION FACILITY</u>	<u>AIR POLLUTION ALERT</u>	<u>AIR POLLUTION WARNING</u>	<u>AIR POLLUTION EMERGENCY</u>
1. A—Manufacturing industries. AND B—Other persons required by this rule to prepare standby plans.	a. Substantial reduction of air contaminants from manufacturing operations by curtailing, postponing, or deferring production and allied operations.	a. Maximum reduction of air contaminants from manufacturing operations by, if necessary, assuming reasonable economic hardship by postponing production and allied operations.	a. Elimination of air contaminants from manufacturing operations by ceasing, curtailing, postponing or deferring production and allied operations to the extent possible without injury to persons or damage to equipment.
2. Refuse disposal operations.	a. Maximum reduction by prevention of open burning.	a. Maximum reduction by prevention of open burning.	a. Maximum reduction by prevention of open burning.
3. Mobile Sources.	a. Voluntary reduction in unnecessary vehicle use in response to Agency advisory.	a. Voluntary reduction in vehicle use through increased use of public transport, car pools, and van pools.	a. Maximum reduction by banning vehicle use except for emergencies.

[February 18, 1980]

4 6 MCAR S 4.0041 Offset rule.

A. Purpose. The purpose of this rule is to establish conditions to be included in permits which the agency issues, in accordance with the requirements of Minnesota Statutes, section 116.07, subdivision 4a, to persons who propose to construct or modify certain emission facilities in nonattainment areas. This rule may be known as the "offset rule."

B. Applicability.

1. Except as provided in 2., this rule applies to persons who propose to construct or modify a subject emission facility, as defined in C.17.

2. This rule does not apply in nonattainment areas of the state for which a plan has been developed and approved by the agency and the United States Environmental Protection Agency as providing sufficient emission reductions to both:

a. Bring the area into attainment with the national primary ambient air quality standards by December 31, 1982; and

b. Allow for an increase in emissions in the nonattainment area during that period of time the area is designated nonattainment.

C. Definitions. The definitions in rule APC 2 of the Minnesota Pollution Control Agency apply to the terms used in this rule unless the terms are defined herein. For the purposes of this rule, the following words have the meanings defined below.

1. "Air quality control region" means any of the seven geographic areas specified by the agency for administrative purposes based on jurisdictional boundaries, urban and industrial concentrations, climate, meteorology, topography, and other factors affecting the interchange and diffusion of pollutants in the atmosphere. These are identified in 40 Code of Federal Regulations, section 52.1221 (1980).

2. "Criteria pollutant" means any of the following: sulfur dioxide; particulate matter; nitrogen oxides; carbon monoxide; ozone; nonmethane hydrocarbons; and lead.

3. "Fugitive emissions" means those pollutant discharges which do not pass through a stack, chimney, vent, or other functionally equivalent opening and which discharges are quantifiable by methods in "Compilation of Air Pollutant Emission Factors" (OAQPS AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, N.C. 27711, 1980), or methods that the director determines are comparably reliable.

4. "Lowest achievable emission rate" means, for any

emission facility, the most stringent emission limitation or standard of performance that is achievable in practice by that class or category of emission facility. In no case shall the lowest achievable emission rate be construed to allow emissions in excess of any applicable standard. The emission limitation specified in any other state's plan shall be presumed to be achievable in practice unless a person demonstrates to the director that the emission limitation or standard of performance is not achievable for reasons other than economic costs.

5. "Modification" or "modified" means any physical change in, change in the method of operation of, or addition to an emission facility which would result in a net increase in emissions. As used in this rule, the term modification or modified does not include:

- a. Routine maintenance, repair or replacement;
- b. Changes in method or hours of operation unless the changes are disallowed by an agency rule, stipulation agreement, permit or order, or by a court order;
- c. Increases in production rates unless the increases exceed the operating design capacity of any emission facility;
- d. Use of a fuel generated from municipal solid waste in a steam generating unit;
- e. A change in ownership; or
- f. Use of a fuel or raw material in an emission facility that:

(1) Was designed to accommodate the use prior to December 21, 1976; or

(2) Is commencing or has commenced the fuel or raw material use pursuant to an order under sections 2(a) and (b) of the Energy Supply and Environmental Coordination Act of 1974, 15 United States Code, section 792 (1980), under a natural gas curtailment plan pursuant to the Federal Power Act, 16 United States Code, section 791a et seq. (1980), or under section 125 of the Clean Air Act of 1977, 42 United States Code, section 7425 (1980).

6. "National ambient air quality standards" means the primary (health related) and secondary (welfare related) pollutant concentrations established by the Administrator of the United States Environmental Protection Agency, pursuant to section 109 of the Clean Air Act of 1977, 42 United States Code, section 7409 (1980).

7. "Net air quality benefit" means that, in the area that would be affected by the subject emission facility, offsets proposed to be obtained by a person pursuant to D.1. are sufficient to result in a net reduction, on both a pounds per

hour and tons per year basis, in both the rate of emissions and the concentration of nonattainment criteria pollutants.

a. The area that would be affected by the subject emission facility is defined as follows:

(1) For subject emission facilities proposed to be located in carbon monoxide, nitrogen oxide, nonmethane hydrocarbon, or ozone nonattainment areas, the area that would be affected by the subject emission facility is the air quality control region in which the subject emission facility is proposed to be located; and

(2) For subject emission facilities proposed to be located in sulfur dioxide, particulate matter, or lead nonattainment areas, the area that would be affected by the subject emission facility is the area that the modeling analysis, performed in accordance with D.2., demonstrates to be affected by the subject emission facility.

b. The director shall find that there is a net reduction in both the rate of emissions and the concentration of nonattainment criteria pollutants if Y divided by X is equal to or greater than 1.1, where:

(1) X = the restricted emissions to which the subject emission facility will be limited and

(2) Y = the offsets to be provided by the person proposing the subject emission facility.

8. "Net increase in emissions" means the net number of new tons per year of a nonattainment criteria pollutant that could be legally discharged from a subject emission facility. In determining the net increase in emissions, the director

a. Shall include all nonattainment criteria pollutant discharges that the subject emission facility could emit but

b. Shall give a credit for

(1) All legally enforceable restrictions on or reductions of the nonattainment criteria pollutant discharges from the subject emission facility (such as a restriction on nonattainment criteria pollutant discharges that would result from installing required pollution control equipment); and

(2) Any other restrictions on or reductions of the nonattainment criteria pollutant discharges that the person proposing the subject emission facility both obtains within the same plant and agrees to include within the terms of any permit issued for the subject emission facility.

9. "Nonattainment area" means any geographic region that has been designated by the agency as violating a state or national ambient air quality standard or by the United States

Environmental Protection Agency as violating a national ambient air quality standard.

10. "Nonattainment criteria pollutants" means as follows:

a. For all nonattainment areas except ozone nonattainment areas, nonattainment criteria pollutant means the criteria pollutant for which an area is designated nonattainment; and

b. For ozone nonattainment areas, nonattainment criteria pollutant means nonmethane hydrocarbons.

11. "Offsets" means any documented reductions in restricted emissions of nonattainment criteria pollutants that:

a. Are legally enforceable and

b. Are achieved after August 7, 1977, or after the date of completion of the emission inventory used by the agency in developing the most recent revision to the plan, whichever is later.

12. "Plan" or "state implementation plan" means any state air quality control laws, rules, permits, stipulation agreements, and procedures, developed to insure compliance with state and national ambient air quality standards.

13. "Plant" means any assemblage of buildings, structures or emission facilities, on one or more adjacent or contiguous properties that are under common ownership or control and that are identified by the same two digit Standard Industrial Code as specified in the Standard Industrial Classification Manual, 1972, as prepared by the Executive Office of the President, Office of Management and Budget and as amended by the 1977 Supplement.

14. "Resource recovery facility" means any emission facility at which solid waste is processed for the purpose of extracting, converting to energy, or otherwise separating and preparing solid waste for reuse. An energy conversion facility must utilize solid waste to provide more than 50 percent of the heat input to be considered a resource recovery facility under this rule. In calculating whether solid waste is used to provide more than 50 percent of the heat input, a 30-day rolling average shall be used.

15. "Restricted emissions" means the maximum nonattainment criteria pollutant discharges, including fugitive emissions, which may be emitted from an emission facility based on the most stringent of the following:

a. Any emission standard or performance standard established in an applicable rule;

b. Any emission standard or performance standard

established in an applicable installation or operating permit or stipulation agreement;

c. Any emission rate resulting from operation at design efficiency of air pollution control equipment for an emission facility;

d. Any emission rate used as the basis for a revision to this state's plan unless such a rate is shown to be in error within 90 days of the effective date of this rule in which case the corrected rate shall be used; or

e. The emission rate to which the subject emission facility is physically limited.

16. "State ambient air quality standards" means the pollutant concentrations in rule APC 1 of the Minnesota Pollution Control Agency.

17. "Subject emission facility" means:

a. An emission facility that is proposed to be constructed or modified

(1) In any area designated a nonattainment area on the date the agency receives the completed permit application for the proposed construction or modification and

(2) The construction or modification of which will result in a net increase in emissions of at least 100 tons per year of a nonattainment criteria pollutant; or

b. An emission facility that is proposed to be modified

(1) In any area designated a nonattainment area on the date the agency receives the completed permit application for the proposed modification;

(2) Has existing restricted emissions of at least 100 tons per year of the nonattainment criteria pollutant; and

(3) The modification of which will result in a significant net increase in emissions of the nonattainment criteria pollutant. A net increase in emissions is significant if the rate of the increase is at least the rate specified below:

- (a) carbon monoxide: 100 tons per year;
- (b) sulfur dioxide: 40 tons per year;
- (c) nitrogen oxides: 40 tons per year;
- (d) nonmethane hydrocarbons: 40 tons per year;
- (e) particulate matter: 25 tons per year;
- (f) lead: 0.6 tons per year; or

c. A plant that is proposed to be modified

(1) In any area designated a nonattainment area on the date the agency receives the completed permit application for the proposed modification and

(2) Which proposed modification, when considered in aggregate with X, will result in a significant net increase in emissions of the nonattainment criteria pollutant, where:

(a) X = the net increase in nonattainment criteria pollutant discharges resulting from any construction or modification of the plant which was permitted by the agency during the following time period: any time both within the 18 months immediately prior to the date the agency receives the completed permit application for the proposed modification and during which the area within which the plant is located was designated a nonattainment area.

(b) A net increase in emissions is significant if the rate of the increase is at least the rate specified in b.(3).

18. "Thirty-day rolling average" means the arithmetic mean of daily values calculated with each new day as the last of a 30-day period; provided however, that the arithmetic mean of daily values obtained during times of breakdown shall be excluded from the calculation.

D. Conditions for permit. Except as provided in 5., the agency shall not issue permits for any subject emission facility unless the permit applicant has satisfied the conditions in 1.-3. All permits issued for subject emission facilities shall contain the conditions set forth in 4.

1. Requirement to get offsets. Prior to constructing or modifying a subject emission facility, except an emission facility that is intended to be located in a nonattainment area for less than two years, the owner or operator of that facility shall obtain offsets for all emissions of nonattainment criteria pollutants that will result from the construction or modification. An emission facility that was intended to be located in the nonattainment area for less than two years but that remains for two years or more shall be subject to all the applicable requirements of this rule.

2. Requirement to demonstrate a net air quality benefit. Prior to constructing or modifying a subject emission facility, the permit applicant shall demonstrate that the offsets to be provided are sufficient to result in a net air quality benefit, as defined in C.7.

a. For subject emission facilities located or proposed to be located in carbon monoxide, nitrogen oxide, nonmethane hydrocarbon or ozone nonattainment areas, a permit applicant shall not be required to perform a modeling analysis to demonstrate net air quality benefit but shall submit to the agency a detailed statement of all information that the director needs in order to be able to determine whether a net air quality

benefit will result from the construction or modification.

b. For subject emission facilities located or proposed to be located in sulfur dioxide or particulate matter or lead nonattainment areas, a permit applicant shall perform a modeling analysis to determine whether the offsets to be provided are sufficient to result in a net air quality benefit, shall analyze the data obtained and shall submit to the agency the modeling data, the modeling analyses, a detailed description of the system of continuous emission reduction planned, and emission estimates made, together with any other information that the director needs in order to be able to determine whether a net air quality benefit will result from the construction or modification. All modeling shall be performed in accordance with "Guidelines on Air Quality Models" (OAQPS No. 1.2-080, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, 1978) or methods that the director finds to be comparably reliable.

3. Requirement to certify compliance. Prior to constructing or modifying a subject emission facility, the permit applicant shall certify that all emission facilities in Minnesota which are either owned or operated in whole or in part by the same person for whom the application is made or which are operated under the common control of the same person for whom the application is made are in compliance or are on a compliance schedule.

4. Permit conditions. Any permit issued for a subject emission facility shall include a provision that

a. Limits emissions from the facility as follows:

(1) The owner or operator of a subject emission facility shall install technology that restricts emissions from the facility to the lowest achievable emission rate of the nonattainment criteria pollutants for which the facility is subject to this rule. The permit shall expressly describe the lowest achievable emission rate for the class or category of emission facility into which the subject emission facility falls.

(2) The director shall waive the requirement of (1) if the director determines that a performance standard based on design, equipment, work practice, operation or other alternative standard is more practicable than an emission rate.

b. States that the offsets that the subject emission facility has obtained in order to be issued a permit under this rule are legally enforceable by the agency and by the United States Environmental Protection Agency.

5. Exception from requirement to get offsets.

a. A permit applicant proposing to construct or modify a resource recovery facility burning municipal solid waste shall not be required to obtain sufficient offsets to demonstrate a

net air quality benefit if the director determines that the permit applicant

(1) Has made its best efforts to obtain sufficient offsets to comply with this rule and has demonstrated that such efforts were unsuccessful;

(2) Has obtained all available offsets; and

(3) Agrees to continue to seek the necessary offsets and apply them when they become available.

b. The director shall determine that the permit applicant has made its best efforts if the permit applicant demonstrates that the requirement to obtain sufficient offsets creates an undue economic hardship for the permit applicant or is technologically unachievable.

(1) If the permit applicant seeks to obtain an exception on the grounds of undue economic hardship, it shall submit to the director the information set out in rule MPCA 6(b)(5) of the Minnesota Pollution Control Agency.

(2) If the permit applicant seeks to obtain an exception on the grounds of technological unachievability, it shall submit to the director the information set out in rule MPCA 6(b)(6) of the Minnesota Pollution Control Agency.

E. Banking.

1. A person who has obtained a reduction in the amount of restricted emissions emitted from an emission facility shall be permitted to bank that reduction for future use as an offset (as allowed by this rule) under the following circumstances, limitations and conditions.

2. This rule authorizes a person to bank only those reductions in emissions that:

a. Were obtained after August 7, 1977, but prior to the effective date of this rule and that are reported to the agency within six months of the effective date of this rule; or

b. Are obtained after the effective date of this rule.

3. In order to be eligible for banking, the emission reductions shall be final and enforceable, either through the terms of a stipulation agreement, permit, or other legal instrument obtained by an owner of a facility or through a permanent, physical alteration of the facility.

4. In order to be able to bank reductions in emissions, the person obtaining those reductions shall report to the director the amount and location of the banked emissions and the time at which the banked emissions have become permanently and finally implemented. The report shall be made within six months

after the reductions have become final and enforceable or within six months after this rule has been adopted, whichever is later.

F. Limitation on use of offsets. To the extent that this rule creates a program for the use of offsets or allows persons to purchase or obtain offsets, this rule shall not be construed to create a property right that requires compensation from the state should offsets later become unuseable due to a change in an applicable emission limitation or standard of the agency.

NPC 1 Definitions, Severability and Variances for Noise Pollution Control Regulations

(a) **Definitions.** For the purpose of all noise pollution control regulations:

(1) **Agency.** Agency means the Minnesota Pollution Control Agency, its agent, or representative.

(2) **ANSI.** ANSI means the American National Standards Institute or its successor bodies.

(3) **Director.** Director means the Executive Director of the Minnesota Pollution Control Agency.

(4) **Daytime Hours.** Daytime hours are those from 7:00 a.m. to 10:00 p.m. (0700-2200).

(5) **Nighttime Hours.** Nighttime hours are those from 10:00 p.m. to 7:00 a.m. (2200-0700).

(6) **Person.** Person means any human being, any municipality or other governmental or political subdivision, or any other public agency, any public or private corporation, any partnership, firm, association or other organization, any receiver trustee, assignee, agent or other legal representative of any of the foregoing, or any other legal entity, but does not include the Minnesota Pollution Control Agency.

(7) **SLUCM.** SLUCM means the Standard Land Use Coding Manual (1969, United States Government Printing Office) which designates land activities by means of numerical codes.

(8) **Sound.** Sound is an oscillation in pressure, stress, particle displacement, particle velocity, etc., in an elastic or partially elastic medium, or the superposition of such propagated alterations.

(9) **Noise.** Noise means any sound not occurring in the natural environment, including, but not limited to, sounds emanating from aircraft and highways, and industrial, commercial and residential sources.

(10) **Impulsive Noise.** Either a single sound pressure peak (with either a rise time less than 200 milliseconds or total duration less than 200 milliseconds) or multiple sound pressure peaks (with either rise times less than 200 milliseconds or total duration less than 200 milliseconds) spaced at least by 200 millisecond pauses.

(11) **Non-Impulsive Noise.** All noise not included in the definition of Impulsive Noise.

(12) **Decibel.** Decibel is a unit of sound pressure level, abbreviated dB.

(13) **Sound Pressure Level (SPL).** Sound Pressure Level is 20 times the logarithm to the base 10 of the ratio of the pressure of a sound, p , to the reference pressure, p_r . For the purposes of these regulations, the reference pressure shall be 20 micronewtons per square meter ($20 \mu\text{N}/\text{m}^2$). In equation form, Sound Pressure Level in units of decibels is expressed as:

$$\text{SPL (dB)} = 20 \log_{10} p/p_r$$

(14) **dBA.** dBA is a unit of sound level. dBA is the weighted sound pressure level by the use of the A metering characteristic and weighting as specified in ANSI Specification for Sound Level Meters, S1.4 - 1971, which is hereby incorporated by reference. For the purpose of these regulations, dBA is used as a measure of human response to sound.

(15) **L₁₀.** L₁₀ is the sound level, expressed in dBA, which is exceeded ten percent of the time for a one hour survey, as measured by test procedures approved by the Director.

(16) **L₅₀.** L₅₀ is the sound level, expressed in dBA, which is exceeded fifty percent of the time for a one hour survey, as measured by test procedures approved by the Director.

(b) **Severability.** If any provision of any regulation or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provision or application, and to this end the provisions of all regulations and the various applications thereof are declared to be severable.

(c) **Variance.** Whereupon written application of the responsible person or persons, the Agency finds that by reason of exceptional circumstances strict conformity with any provisions of any noise regulation would cause undue hardship, would be unreasonable, impractical or not feasible under the circumstances, the Agency may permit a variance upon such conditions and within such time limitations as it may prescribe for the prevention, control or abatement of noise pollution in harmony with the intent of the State and any applicable Federal laws.

NPC 2 Noise Standards

(a) These standards describe the limiting levels of sound established on the basis of present knowledge for the preservation of public health and welfare. These standards are consistent with speech, sleep, annoyance and hearing conservation requirements for receivers within areas grouped according to land activities by the Noise Area Classification (NAC) system herein described. However, these standards do not, by themselves, identify the limiting levels of impulsive noise needed for the preservation of public health and welfare.

(b) Noise Standards

NAC	Day (0700-2200)		Night (2200-0700)	
	L_{50}	L_{10}	L_{50}	L_{10}
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

(c) **Noise Area Classification System According to Land Activity at Receiver.** Acceptable sound levels for the receiver are a function of the intended activity in that land area. The following noise area classifications are grouped and defined by the SLUCM numerical codes and descriptions.

(d) Noise Area Classification-1 (NAC-1) includes the following land activities:

NAC-1

- 11 Household units (includes farm houses)
- 12 Group quarters
- 13 Residential hotels
- 14 Mobile home parks or courts
- 15 Transient lodgings
- 19 Other residential, NEC*
- 397 Motion picture production
- 651 Medical and other health services
- 674 Correctional institutions
- 68 Educational services
- 691 Religious activities
- 71 Cultural activities and nature exhibitions
- 721 Entertainment assembly
- 7491 Camping and picnicking areas (designated)
- 75 Resorts and group camps
- 79 Other cultural, entertainment, and recreational activities, NEC

(e) Noise Area Classification-2 (NAC-2) includes the following land activities:

NAC-2

- 4113 Railroad terminals (passenger)
- 4115 Railroad terminals (passenger and freight)
- 4122 Rapid rail transit and street railway passenger terminals
- 4211 Bus passenger terminals (intercity)
- 4212 Bus passenger terminals (local)

*NEC — Not elsewhere coded.

- 4213 Bus passenger terminals (intercity and local)
- 429 Other motor vehicle transportation, NEC
- 4312 Airport and flying field terminals (passenger)
- 4314 Airport and flying field terminals (passenger and freight)
- 4411 Marine terminals (passenger)
- 4413 Marine terminals (passenger and freight)
- 46 Automobile parking
- 4721 Telegraph message centers
- 492 Transportation services and arrangements
- 51 Wholesale trade
- 52 Retail trade — building materials, hardware, and farm equipment
- 53 Retail trade — general merchandise
- 54 Retail trade — food
- 55 Retail trade — automotive, marine craft, aircraft, and accessories
- 56 Retail trade — apparel and accessories
- 57 Retail trade — furniture, home furnishings, and equipment
- 58 Retail trade — eating and drinking
- 59 Other retail trade, NEC
- 61 Finance, insurance and real estate services
- 62 Personal services
- 63 Business services
- 64 Repair services
- 652 Legal services
- 659 Other professional services, NEC
- 66 Contract construction services
- 67 Governmental services (except 674)
- 69 Miscellaneous services (except 691)
- 72 Public assembly (except 721, 7223)
- 73 Amusements (except 731)
- 74 Recreational activities (except 7491)
- 76 Parks

(f) Noise Area Classification-3 (NAC-3) includes the following land activities:

NAC-3

- 21 Food and kindred products — manufacturing
- 22 Textile mill products — manufacturing
- 23 Apparel and other finished products made from fabrics, leather, and similar materials — manufacturing
- 24 Lumber and wood products (except furniture) — manufacturing
- 25 Furniture and fixtures — manufacturing
- 26 Paper and allied products — manufacturing
- 27 Printing, publishing and allied industries
- 28 Chemicals and allied products — manufacturing
- 29 Petroleum refining and related industries
- 31 Rubber and miscellaneous plastic products — manufacturing
- 32 Stone, clay, and glass products — manufacturing
- 33 Primary metal industries

- 34 Fabricated metal products — manufacturing
- 35 Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks — manufacturing
- 39 Miscellaneous manufacturing, NEC (except 397)
- 41 Railroad, rapid rail transit, and street railway transportation (except 4113, 4115, 4122)
- 42 Motor vehicle transportation (except 4211, 4212, 4213, 429)
- 43 Aircraft transportation (except 4312, 4314)
- 44 Marine craft transportation (except 4411, 4413)
- 45 Highway and street right-of-way
- 47 Communication (except 4721)
- 48 Utilities
- 49 Other transportation, communication and utilities, NEC (except 492)
- 7223 Race tracks
- 731 Fairgrounds and amusement parks
- 81 Agriculture
- 82 Agricultural and related activities
- 83 Forestry activities and related services (including commercial forest land, timber production and other related activities)
- 84 Fishing activities and related services
- 85 Mining activities and related services
- 89 Other resource production and extraction, NEC
- All other activities

(g) Noise Area Classification-4 (NAC-4) includes the following land activities:

NAC-4

- 91 Undeveloped and unused land area (excluding non-commercial forest development)
- 92 Non-commercial forest development
- 93 Water areas
- 94 Vacant floor area
- 95 Under construction
- 99 Other undeveloped land and water areas, NEC

(h) **Measurement Procedure.** A measurement procedure approved by the Director shall be used to determine the acceptability of sound levels in a given area. Such measurements shall be made at the point of human activity in the receiving area which is nearest the noise source and which is typical for the Noise Area Classification category of the receiving area, except where existing barriers, obstructions or reflecting surfaces prevent an accurate measurement. All measurements shall be made outdoors.

(i) **Exceptions**

(1) The Standards of NAC-2 may apply to buildings within the following NAC-1 categories: 11, 12, 13, 14, 15, 19, 397, 651, 68, 691, 71, 721, if all of the following conditions are met:

(i) The building is constructed and insulated in such a way as to assure that the exterior-interior sound level attenuation, measured under a measurement procedure approved by the Director, is at least 30 dBA; and

(ii) The building possesses year-around indoor climate control; and

(iii) The building has no facilities intended for outdoor activities, including but not limited to yards, swimming pools, patios, balconies, tennis courts, golf course, gardens and picnic areas.

(2) The NAC-1 Day Standards may apply to land uses in NAC-1 categories during nighttime hours in lieu of NAC-1 Night Standards if such land uses are not intended for overnight sleeping.

§ 4.2004 Motor vehicle noise limits.**A. Definition.**

Motor vehicle. Motor vehicle means any self-propelled vehicle not operated exclusively upon railroad tracks and any vehicle propelled or drawn by a self-propelled vehicle and includes vehicles known as trackless trolleys which are propelled by electric power obtained from overhead trolley wires but not operated upon rails, except snowmobiles.

B. No person shall operate either a motor vehicle or combination of vehicles of a type subject to registration pursuant to Minn. Stat. ch 168 (1971) at any time or under any condition of grade, load, acceleration or deceleration in such a manner as to exceed the noise limits contained herein for the category of motor vehicle and speed limits specified, when tested with a measurement procedure approved by the Director.

C. No person shall sell or offer for sale a new motor vehicle or combination of vehicles of a type subject to registration pursuant to Minn. Stat. ch. 168 (1971) which when maintained according to the manufacturer's specifications would exceed the noise limits contained herein for the category of motor vehicle and speed limits specified, when tested with a measurement procedure approved by the Director.

D. No person shall modify a motor vehicle or combination of vehicles of a type subject to registration pursuant to Minn. Stat. ch. 168 (1971) in a manner which will amplify or increase the noise emitted by the vehicle, above the noise limits contained herein for the category of motor vehicle and speed limits specified, when tested with a measurement procedure approved by the Director. No person shall operate a motor vehicle so modified.

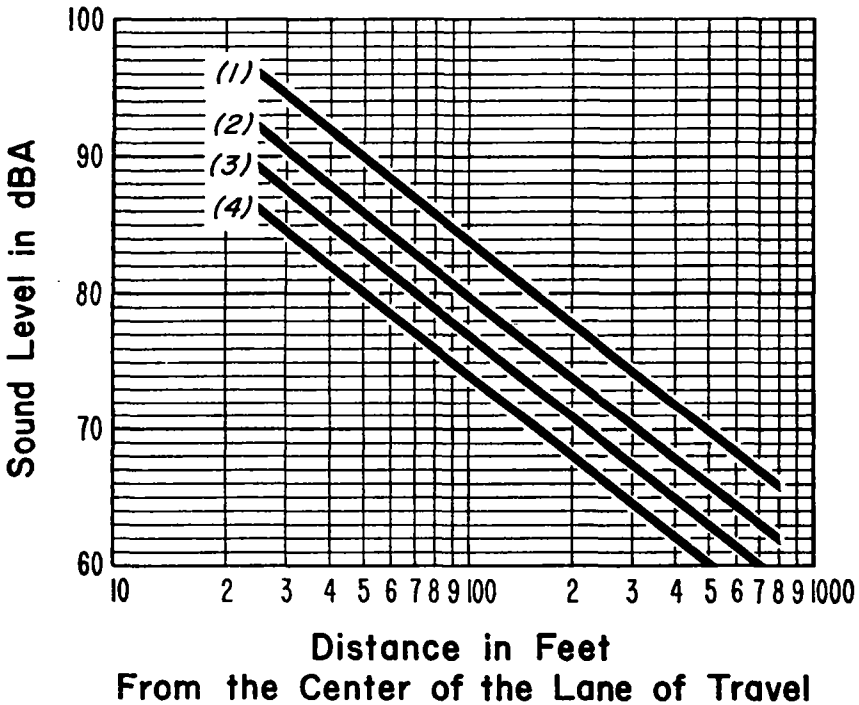
E. No person shall sell or offer for sale replacement or additional parts for a motor vehicle or combination of vehicles of a type subject to registration pursuant to Minn. Stat. ch. 168 (1971) which when installed in the vehicle will amplify or increase the noise emitted by the vehicle, above the noise limits contained herein for the category of motor vehicle and speed limits specified, when tested with a measurement procedure approved by the Director. No person shall operate a motor vehicle incorporating such parts.

F. This regulation applies to the total noise from a vehicle or combination of vehicles of a type subject to registration pursuant to Minn. Stat. ch. 168 (1971) and shall not be construed as limiting or precluding the enforcement of any other provision of law relating to motor vehicle exhaust noise.

G. Exceptions.

Vehicles under subdivisions I. and J. are allowed to exceed the noise limits contained herein when performing acceleration maneuvers for safety purposes.

H. Motor vehicle noise limits for vehicles with a manufacturer's gross vehicle weight rating of more than 10,000 pounds and any combination of vehicles towed by such motor vehicle.



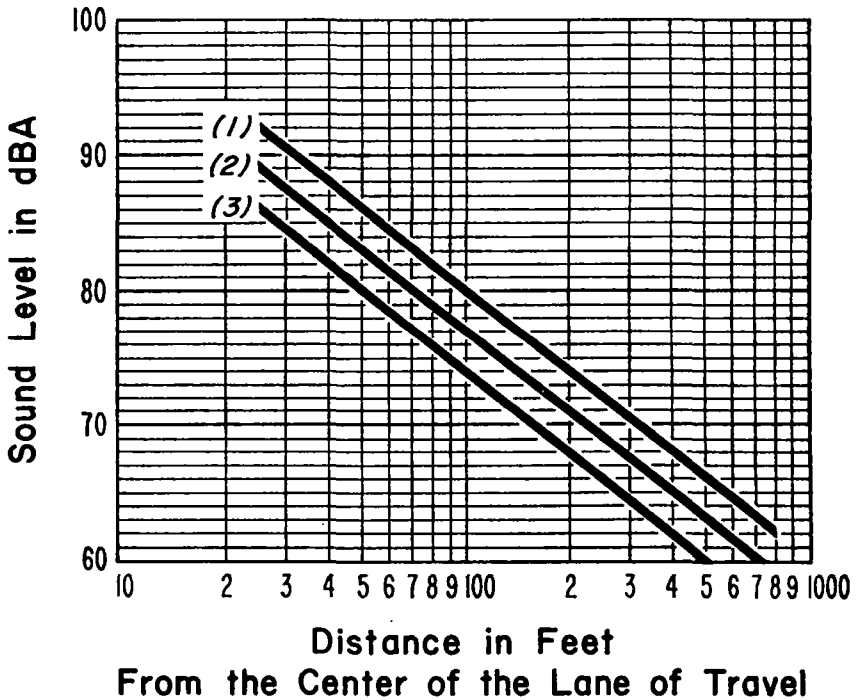
1. Speed limits greater than 35 mph.

2. Speed limits equal to or less than 35 mph and stationary run-up tests (for vehicles with governed engines). For stationary run-up tests on all-paved surfaces, add 2 dBA.

3. Speed limits equal to or less than 35 mph and stationary run-up tests (for vehicles with governed engines), for vehicles manufactured on or after January 1, 1978. For stationary run-up tests on all-paved surfaces, add 2 dBA.

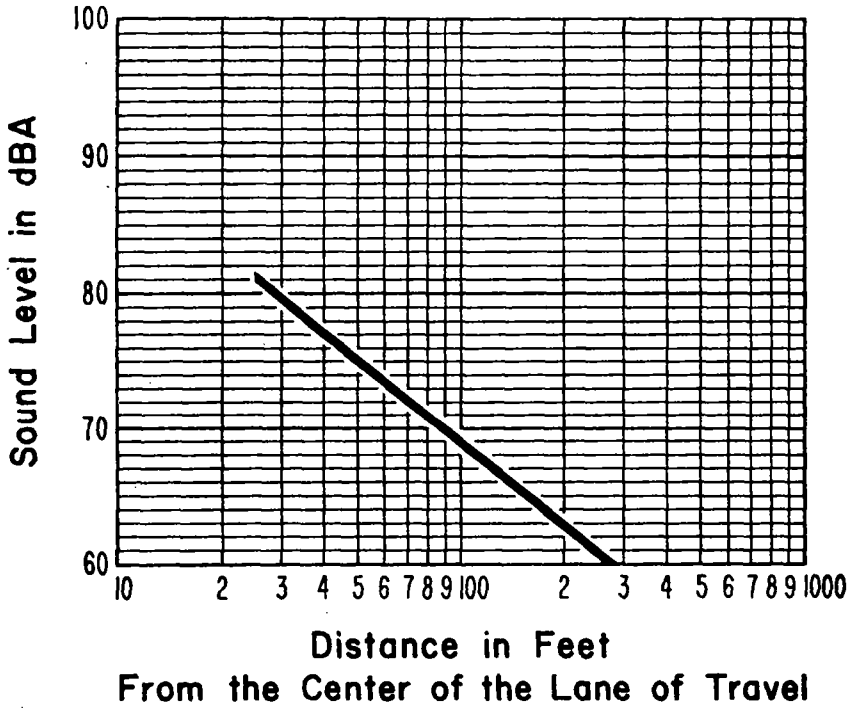
4. Speed limits equal to or less than 35 mph and stationary run-up tests (for vehicles with governed engines), for vehicles manufactured on or after January 1, 1982. For stationary run-up tests on all-paved surfaces, add 2 dBA.

I. Motor vehicle noise limits for motorcycles.



1. For vehicles manufactured before January 1, 1975.
2. Speed limits greater than 35 mph for vehicles manufactured on or after January 1, 1975.
3. Speed limits equal to or less than 35 mph for vehicles manufactured on or after January 1, 1975.

J. Motor vehicle noise limits for any other motor vehicle not included under subdivision H. or I. and any combination of vehicles towed by such motor vehicle.



CHAPTER ONE: MPCA 1

~~**MPCA 1 DUTY OF CANDOR.** In all formal or informal negotiations, communications, proceedings, and other dealings between any person and any member, employee or agent of the Agency, it shall be the duty of each person and each member, employee or agent of the Agency to act in good faith and with complete truthfulness, accuracy, disclosure, and candor. Any violation of the aforesaid duty shall be cause for imposition of sanctions as provided in MPCA 11.~~

*insert new to MPCA 5.4.3003,
after 4.3002 (see below), AR 02545T*

CHAPTER TWO: MPCA 2

~~**MPCA 2 DEFINITIONS.** As used in these Rules of Procedure the following words shall have the meanings given them herein.~~

~~(a) **AGENCY.** "Agency" means the Minnesota Pollution Control Agency, as constituted pursuant to Minn. Stat. § 116.02 subd. 1.~~

~~(b) **DAYS.** "Days" means calendar days.~~

~~(c) **DIRECTOR.** "Director" means the Executive Director and Chief Executive Officer of the Agency.~~

~~(d) **EMERGENCY.** "Emergency" means imminent and substantial danger to the health and welfare of the people of the state, or any part thereof, as a result of the pollution of air, land, or water.~~

~~(e) **HEARING OFFICER.** "Hearing officer" means the person or persons appointed by the Agency, pursuant to MPCA 9, to call and conduct a hearing.~~

~~(f) **ORDER.** "Order" means any written command or direction made by the Agency or the Director, as provided by law, or made by a hearing officer appointed by the Agency pursuant to MPCA 9.~~

~~(g) **PARTY.** "Party" means any person whose legal rights, duties, or privileges may be determined in a hearing under the provisions of these Rules and any person who has properly intervened in a hearing. The term "party" shall include the Agency when the Agency initiates the hearing pursuant to MPCA 11.~~

~~(h) **PERMIT.** "Permit" means every discharge, emission, and disposal authorization, every construction, installation or operation authorization, and every other Agency authorization designated "permit" in Minn. Stat. Chapters 115 and 116, as now in force or hereafter amended, including Minn. Stat. §§ 115.03 subd. 1, 115.07, 116.07 subd. 4(a), 116.081, and 116.091, except that "permit" does not include an "order" or a "variance" or "stipulation agreement" as defined in this Rule.~~

(i) **PERSON.** "Person" means any human being, any municipality or other governmental or political subdivision or other public department or agency, any public or private corporation, any partnership, firm, association, or other organization, any receiver, trustee, assignee, agency, legal entity, other than a court of law, or any legal representative of any of the foregoing, but does not include the Minnesota Pollution Control Agency.

(j) **PRONOUNS.** Any reference to the male in these regulations shall be construed to include the female.

(k) **PUBLIC INFORMATIONAL MEETING.** "Public informational meeting" means a meeting called by the Agency to solicit public comment and statements on a matter before the Agency.

(l) **SCHEDULE OF COMPLIANCE.** "Schedule of compliance" means a schedule of remedial measures including an enforceable sequence of actions or operations leading to compliance with an effluent limitation, other limitation, prohibition or standard.

(m) **SERVICE: SERVE.** "Service" or "serve" means service by United States mail, postage prepaid, addressed to a person or party at his last known address, unless some other manner of service is specifically required by law.

(n) **STIPULATION AGREEMENT.** "Stipulation agreement" means any agreement entered into between the Agency and any person or persons establishing a schedule for compliance with applicable statutes, rules, regulations or standards by designated dates.

(o) **VARIANCE.** "Variance" means an authorization from the Agency which grants an exemption from the requirements of any rule, regulation, or standard of the Agency and which does not require compliance with said rule, regulation, or standard for the duration of the authorization. Variance does not include permits, stipulation agreements, schedules of compliance, or any modifications thereto, or any order of the Agency which allows interim operation during completion of a compliance program, nor does variance include a time extension of an existing variance.

*insert new to MCA R 5
4.3001, ARO2545T*

*insert new to MCA R 5
4.3002, ARO2545T*

*insert new to MCA R 5
4.3003, (see above) ARO2545T*

CHAPTER THREE: MPCA 3

MPCA 3 AGENCY MEETINGS AND OFFICERS

(a) AGENCY OFFICERS

(1) **Titles.** The officers of the Agency shall consist of Chairman, Vice Chairman, and Director.

(2) Elections

(i) **Chairman.** The Chairman shall be elected by a majority of all Agency members at each annual meeting for a term of one (1) year. No member elected to the office of Chairman may serve in that capacity more than two (2) full terms consecutively.

(ii) **Vice Chairman.** The Vice Chairman shall be elected by a majority of all Agency members at each annual meeting for a term of one (1) year. No member elected to the office of Vice Chairman may serve in that capacity more than two (2) full terms consecutively.

(3) Duties

(i) **Chairman.** The Chairman shall have such duties as are prescribed by rule or regulation of the Agency.

(ii) **Vice Chairman.** The Vice Chairman shall discharge all duties of the Chairman during the absence or disability of the Chairman.

(iii) **Director.** The Director shall have such duties as are prescribed by statute or by rule or regulation of the Agency.

(4) **Vacancies.** Upon a vacancy (i.e., death, resignation, or removal) in the office of Chairman of the Agency, the Vice Chairman shall become the Chairman until such time as new officers are elected at the next annual meeting. Upon a vacancy in the office of Vice Chairman, a special election shall be held at the next regular meeting, for a term ending at the next annual meeting.

(5) **Removal.** The Chairman or Vice Chairman may be removed from office by the affirmative vote of two-thirds of all members of the Agency, said vote to be taken at the next regular meeting following the motion for removal.

(b) AGENCY MEETINGS

(1) Types

(i) **Regular Meetings.** Twelve (12) regular monthly meetings of the Agency shall be held each calendar year. A date for each regular meeting shall be set by the Agency. The annual meeting, also conducted as a regular meeting, shall be held on the third Tuesday of the month of July of each year, or such other date as the Agency may designate at least sixty (60) days in advance thereof. The time and place of each regular meeting, including the annual meeting, shall be designated by the Chairman. The Chairman may direct that any regular meeting, except the annual meeting, be postponed or advanced.

(ii) **Special Meetings.** The Chairman, or in his absence the Vice Chairman, or in their absence the Director of the Agency, may call a special meeting of the Agency when, in his opinion, a meeting is necessary or desirable. The Chairman shall call a special meeting upon receipt of a request from three (3) members of the Agency.

(2) Agency Notice of Meetings

(i) **Regular Meetings.** The Director shall give written notice of the time and place of each regular meeting to all Agency members at least ten (10) days prior to any regular meeting. The Director shall give written notice

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of the time and place to all Agency members at least seven (7) days prior to the date of the regular meeting if advanced and at least seven (7) days prior to the regular date if postponed.

(ii) **Special Meetings.** The Chairman or the Director shall give as much notice as possible to all Agency members prior to any special meeting, which notice shall state the time, place, and subject matter of the meeting. Except as provided in MPCA 4, such notice shall be given at least two (2) days prior to any special meeting.

(3) **Public Notice of Meetings.** The Director shall give the public the same notice of the time and place of regular and special meetings as is given to the Agency members. The public shall be given notice by mailing a copy of the notice to each person who shall be directly affected by a decision of the Agency on any matter to be considered at the meeting and to those persons whom the Director deems appropriate in the circumstances and by posting a copy of the notice in a conspicuous place at the Agency offices.

(4) **Agenda**

(i) **Preparation.** A proposed agenda of business to be conducted shall be prepared by the Director for all regular meetings of the Agency. Except when the exigencies of time and circumstances warrant, an agenda shall be prepared for all special meetings as far in advance of the special meeting as possible. The agenda shall include a list of all matters to be considered at the meeting. Agency members may place items on the agenda by notifying the Director of such item at least fourteen (14) days prior to a regular meeting. Citizens may request in writing that items be placed on the agenda by notifying the Director at least fourteen (14) days prior to a regular meeting. The Director may in his discretion determine whether or not to place a citizen item on the agenda but he shall advise the Agency of all items he decides not to place on the agenda. Items may be placed on the agenda for a special meeting in the same manner as for regular meetings provided the Director is notified of the item in time to place the item on the agenda.

(ii) **Notice of Agenda.** The Director shall mail a copy of the agenda for each regular meeting to every member of the Agency and to each person who shall be directly affected by a decision of the Agency on any matter on the agenda and to those persons whom the Director deems appropriate in the circumstances, at least ten (10) days prior to the regular meeting for which the agenda has been prepared. The agenda for a regular meeting shall be available for public inspection in the Agency offices at least ten (10) days prior to the regular meeting for which the agenda has been prepared.

The agenda for a special meeting shall be available for public inspection in the Agency offices as far in advance of the special meeting as is reasonably possible, provided that except as provided in MPCA 4, the agenda shall be available at least two (2) days prior to the special meeting.

(5) **Conduct of Meetings**

(i) **Quorum.** A majority of the members of the entire Agency shall constitute a quorum, and a quorum must be present for the transaction of business.

(ii) **Presiding Officer.** The Chairman shall preside at all Agency meetings. The Vice Chairman shall preside in the Chairman's absence. The remaining members shall elect a presiding officer from among the members present whenever the Chairman and Vice Chairman are both absent. The presiding officer shall serve only for that meeting or until the Chairman or Vice Chairman shall arrive.

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(iii) **Agenda.** The first order of business at the meeting shall be adoption of the agenda, which may be amended or modified by the Agency at this time.

(iv) **Agenda Items.** No matter shall be considered at a regular Agency meeting unless it has been placed on the agenda and all relevant public information has been made available for public inspection at least ten (10) days prior to such regular meeting, except where the Agency in its discretion determines otherwise. Public information regarding matters to be considered at a special meeting shall have been made available for public inspection as far in advance of the special meeting as reasonably possible but except as provided in MPCA 4, at least two (2) days prior to the special meeting.

(v) **Voting.** The affirmative vote of a majority of all the members shall be necessary to make any decision, including the adoption, amendment, or repeal of rules, orders, and regulations as provided by law. All members present, including the Chairman, shall vote or abstain on every matter presented for decision. Any Agency matter which does not receive a majority vote shall be placed on the agenda of the next regular monthly meeting or considered at a special meeting.

(vi) **Decisions at Open Meetings.** All regular and special meetings of the Agency shall be open to the public, and all decisions of the Agency shall be made at such meetings; provided, however, that if the Chairman, or in his absence, the Vice Chairman, determines that the exigencies of time and circumstances warrant, then an Agency decision may be made by telephone poll, or other appropriate means. The unavailability of any Agency member shall not postpone the making of the decision. If, pursuant to the poll, a majority of all members of the Agency cast an identical vote, the decision of the majority shall be an Agency decision. In the event that an Agency decision is made by telephone poll, or other appropriate means, such decision shall be subject to confirmation at the next Agency meeting.

(vii) **Record of Meetings.** The Agency shall keep full and accurate minutes of all meetings, including a record of all votes of individual members.

(viii) **Parliamentary Procedure.** Except as specifically provided in these Rules of Procedure, **Robert's Rules of Order** shall govern any question of parliamentary procedure which may arise at any meeting of the Agency.

(c) **COMMITTEES.** The Agency may from time to time establish committees of Agency members as it may deem necessary and desirable to facilitate its work. All committee recommendations shall be duly submitted to the Agency for appropriate action.

(d) **EXECUTION OF DOCUMENTS.** Contracts, stipulation agreements, and other documents approved by the Agency pursuant to law shall be executed on the Agency's behalf by the Chairman and the Director.

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CHAPTER FOUR: MPCA 4

MPCA 4 DECLARATION OF EMERGENCY

(a) **DELEGATION TO DIRECTOR.** The Agency herewith delegates to the Director the authority to exercise, in accordance with the limitations and procedures hereinafter enumerated, emergency powers granted to the Agency by Minn. Stat. § 116.11.

(b) **NOTIFICATION TO AGENCY.** If the Director anticipates that emergency conditions may be approaching, he shall keep the Agency informed of such conditions by such means as may be practicable. Upon declaration of an emergency by the Director, he shall immediately notify all Agency members that such emergency has been declared and poll the members on the action taken by the Director. Notification may be by telegram, telephone or any other means practicable. The unavailability of any Agency member shall not postpone the implementation of any emergency or any rules, regulations or orders pursuant thereto. If, pursuant to the poll, a majority of all members of the Agency disapprove of the declaration of emergency, the declaration and the action taken shall be discontinued immediately. If, pursuant to the poll, a majority of all members of the Agency disapprove of the action taken by the Director, but agree that an emergency exists, the action of the Director shall remain in effect until the Agency shall order different action to be taken.

(c) **DURATION.** Any action taken by the Director pursuant to his declaration of emergency shall remain effective according to the following provisions:

- (1) For not to exceed three (3) days, unless approved by a majority of the members of the Agency pursuant to the poll required in section (b); or
 - (2) If extended beyond three (3) days as provided in subsection (c)(1) hereof, then the period until the date of the next Agency meeting, unless extended by the Agency at such meeting; or
 - (3) Subsection (c)(1) and (c)(2) notwithstanding, until notice, hearing and determination are effected pursuant to law; or
- (4) Said emergency action may be discontinued at any time by the declaration of the Director or by majority vote of the Agency.

(d) **REPORT.** Any action taken by the Director pursuant to a declaration of emergency shall be included on the agenda of the next meeting of the Agency, at which time the Director shall report to the Agency on the status of the emergency.

(e) **AGENCY ACTION.** The Agency may by majority vote exercise its emergency powers. The action of the Agency taken in an emergency situation shall remain effective until discontinued by majority vote of the Agency or until notice, hearing and determination are effected pursuant to law.

(f) **NOTICE.** The notice requirements of MPCA 3 shall not apply when the Agency or the Director are considering the exercise of their emergency powers, but the Agency and the Director shall give such notice to the public as is possible under the circumstances.

(g) **EMERGENCY POWERS.** Nothing contained in these Rules of Procedure shall be construed to pre-empt, repeal or conflict with MPCA 4 or any other rule, regulation or statute which provides for acts to be taken or procedure to be followed by the Agency or the Director in an emergency.

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CHAPTER FIVE: MPCA 5

MPCA 5 PERMITS

(a) **SCOPE.** This Rule shall govern the procedure for issuance of all permits by the Agency, except to the extent otherwise specifically provided by statute or regulation.

(b) **WRITTEN APPLICATION.** In no case shall the Agency grant a permit unless a written application therefor has been made, under oath, to the Agency. The application shall be served upon the Director. The written application shall contain:

(1) The name and address of the applicant and the person who prepared the application;

(2) The signature of the applicant or the authorized representative thereof;

(3) A description of the business, plant, system, or facility for which a permit is sought, including the location thereof;

(4) Such other data or information which is required by any applicable Agency regulation or standard;

(5) Such other relevant data or information which the Agency or the Director deems essential to a determination on the application, including but not limited to the following:

(i) A general description of the materials handled or processed by the applicant which are pertinent to the subject application, and a statement of the nature and quantity of the materials being discharged, emitted or disposed of, and which can reasonably be expected to be discharged, emitted or disposed of during the period of the required permit, and proposed methods for control of such materials;

(ii) Identification of the applicable regulations or standards under which the applicant seeks the permit and evidence that these regulations and standards will be complied with;

(iii) The nature of the permit sought, including the period of time for which it is sought and a detailed statement of the facts, claims, and reasons relied upon by the applicant in requesting the permit;

(iv) A concise statement of the effect upon the air, water, and land resources of the State and upon the public and other persons affected, including those residing in the area where the permit will take effect, which may result from Agency approval of the requested permit; and

(v) A concise statement of the effect on the establishment, maintenance, operation and expansion of business, commerce, trade, industry, traffic, and other economic factors which may result from approval and from denial of the requested permit.

(c) **LISTING AND INSPECTION.** Upon receipt by the Agency of a permit application, the receipt shall be noted on a list which shall be made available for public inspection. The permit application shall also be made available for public inspection.

(d) **PUBLIC HEARINGS.** Any applicant or any other person may file a request with the Agency pursuant to MPCA 9(b) asking that a public hearing be held on a permit application. All public hearings held on permit applications, whether ordered by the Agency in its discretion or required to be held pursuant to statute or regulation, shall be conducted in accordance with MPCA 9.

(e) **AGENCY DECISION.** The Agency shall make all final decisions on permit applications and shall approve or deny each permit application, except where otherwise provided by statute or regulation. The Agency may approve a permit subject to such conditions as the Agency may prescribe. In addition, the Director may grant an interim permit when the exigencies of time and circumstance warrant, but such interim permit shall be subject to validation by the Agency.

The Agency shall act on each permit application as expeditiously as possible after submission of the application, or after receipt of the hearing officer's recommendation if a hearing is held. Any person may submit an oral or written statement or recommendation to the Agency regarding a permit application in accordance with MPCA 9(m)(4) or MPCA 13(a).

(f) **NOTIFICATION.** Every decision of the Agency or Director on a permit application shall be served on the applicant and upon all persons who entered an appearance at any public hearing held on the application.

(g) **AGENCY REMEDIES PRESERVED.** During the pendency of a permit application under these guidelines, the Agency may, in its discretion, avail itself of any legal, equitable or administrative remedy provided by law.

(h) **AMENDMENT OR MODIFICATION.** In the event a permit has been granted by the Agency, the person holding the permit may file with the Agency at any time a written application for modification or amendment of the permit. The application for modification or amendment, and the Agency's consideration of the application, shall comply with the requirements of these Rules.

(i) **ASSIGNMENT.** No permit may be assigned or transferred by the holder without the approval of the Agency. The Agency may, in its discretion, hold a hearing on any request to assign or transfer a permit.

CHAPTER SIX: MPCA 6**MPCA 6 VARIANCES**

(a) **SCOPE.** This Rule shall govern the procedure for issuance of all variances by the Agency, except to the extent otherwise specifically provided by statute or regulation.

(b) **WRITTEN APPLICATION.** In no case shall the Agency grant a variance unless a written application therefor has been made, under oath, to the Agency. The application shall be served upon the Director. The written application shall contain:

(1) The name and address of the applicant and the person who prepared the application;

(2) The signature of the applicant or the authorized representative thereof;

(3) A description of the business, plant, system, or facility for which a variance is sought, including the location thereof;

(4) The nature of the variance sought, including an identification of the applicable regulations or standards from which a variance is sought, the period of time for which it is sought, and the reasons relied upon by the applicant in requesting the variance;

(5) If the applicant seeks a variance primarily on grounds of economic burden, the application shall be accompanied by financial statements prepared or approved by a certified public accountant, or other person acceptable to the Agency, which shall fairly set forth the status of the business, plant, system or facility for each of the three financial years immediately preceding the year of the application, and an analysis of the effect of such financial status if the variance is not granted. If the business, plant, system or facility has not been in operation for such period, then the financial statements and said analysis shall be based on the most complete data available;

(6) If the applicant seeks a variance on grounds that compliance is not technologically feasible, the application shall be accompanied by a report from a registered professional engineer, or other person acceptable to the Agency, stating fully the reasons why compliance is not technologically feasible;

(7) Such other or additional data or information which is required by any applicable Agency regulation or standard;

(8) Such other relevant data or information which the Agency or the Director deems essential to a determination on the application, including but not limited to the following:

(i) A general description of the materials handled or processed by the applicant which are pertinent to the subject application, and a statement of the nature and quantity of the materials being discharged, emitted, or disposed of, and which can reasonably be expected to be discharged, emitted or disposed of during the period of the proposed variance, and proposed methods for the control of such materials;

(ii) A comprehensive proposed plan indicating the steps to be taken by the applicant during the period of the variance, even if the applicant is seeking a permanent variance, to reduce emission levels or discharges to the lowest limits practical;

(iii) A concise statement of the effect upon the air, water, and land resources of the State and upon the public and other persons affected, including those residing in the area where the variance will take effect, which will result from Agency approval of the requested variance;

(iv) A statement of the alternatives to the proposed operation under the variance which have been considered by the applicant;

(v) A concise statement of the effect on the establishment, maintenance, operation and expansion of business, commerce, trade, traffic, and other economic factors which may result from approval and from denial of the requested variance.

(c) **LISTING AND INSPECTION.** Upon receipt by the Agency of a variance application, the receipt thereof shall be noted on a list which shall be made available for public inspection. The variance application shall also be available for public inspection.

(d) **PUBLIC HEARINGS.** A public hearing shall be held on all variance applications except variances from feedlot regulations and standards relating to family farm and family farm corporation buildings used for the raising of livestock, poultry and other animals in which the animals and waste are confined. In any application for a feedlot variance which is exempt from the public hearing requirement, any person may file a request with the Agency pursuant to MPCA 9(b) asking that a public hearing be held on the application. All public hearings held on variance applications shall be conducted in accordance with MPCA 9.

(e) **AGENCY DECISION.** The Agency shall make all final decisions on variance applications. The Agency shall approve or deny each application. The Agency may grant a variance upon such conditions as the Agency may prescribe.

The Agency shall act on each variance application as expeditiously as possible after receipt of the hearing officer's recommendation or after submission of the application if no hearing is held. Any person may submit to the Agency an oral or written statement or recommendation regarding a variance application in accordance with MPCA 9(m)(4) or MPCA 13(a).

(f) **NOTIFICATION.** Every decision of the Agency on a variance application shall be served on the applicant and upon all persons who entered an appearance at any public hearing held on the application.

(g) **AGENCY REMEDIES PRESERVED.** During the pendency of a variance application, the Agency may, in its discretion, avail itself of any legal, equitable, or administrative remedy provided by law.

(h) **AMENDMENT OR MODIFICATION.** In the event a variance has been granted by the Agency, the person holding the variance may file with the Agency at any time a written application for modification or amendment of the variance. The application for modification or amendment, and the Agency's consideration of the application, shall comply with the requirements of these Rules. This provision shall not apply to a time extension of an existing variance.

(i) **ASSIGNMENT.** No variance may be assigned or transferred by the holder without the approval of the Agency. The Agency may, in its discretion, hold a hearing on any request to assign or transfer a variance.

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CHAPTER SEVEN: MPCA 7**MPCA 7 STIPULATION AGREEMENTS**

(a) **DATA OR INFORMATION.** Whenever any person or the Agency proposes that a stipulation agreement be entered into, the person who is proposed as a signer of the stipulation agreement shall furnish such information or data as is deemed essential by the Agency or the Director in making a determination regarding the proposed stipulation agreement.

(b) **INTERIM OPERATION.** The Agency may in its discretion provide under the terms of a stipulation agreement for the operation of existing systems pending completion of compliance under the schedule therefor, and under such further conditions as it may prescribe in the stipulation agreement. Completion of performance under the stipulation agreement shall not relieve any party thereto of any requirement of law or Agency rules or regulations to apply for all necessary permits or variances.

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CHAPTER EIGHT: MPCA 8

MPCA 8 INFORMAL COMPLAINTS. Any person may file with the Director an informal complaint concerning a pollution source. The informal complaint may be either written or oral and shall state the name and address of the person filing the informal complaint, the name and address of the alleged pollution source, and a description of the matter giving rise to the complaint. A person making an oral complaint may be asked to submit his complaint in writing. Upon receipt of such informal complaint, the Director shall make such investigation as is deemed necessary and appropriate. Within twenty (20) days after the complaint is filed, the Director shall notify the person responsible for the alleged pollution source that an informal complaint has been filed. At any time after a complaint is filed, the Agency may take whatever action it deems necessary and appropriate. The person who filed the complaint shall be notified of the disposition of his complaint.

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CHAPTER NINE: MPCA 9

MPCA 9 HEARINGS

(a) **OBJECTIVES.** All hearings required by statute or regulation and all hearings ordered by the Agency in its discretion, other than rule-making hearings conducted pursuant to Minn. Stat. Chapter 15 and other than public informational meetings, shall be conducted in accordance with the procedures set forth in this Rule. No person before this Agency shall have his rights, privileges or duties determined without regard for fundamental fairness. To that end, this Rule is intended to assure that all parties are provided a just and speedy public hearing.

(b) **DECISION TO HOLD A HEARING**

(1) **Public Requests.** Any person may request the Agency to hold a public hearing on any matter. The person may submit such request at an Agency meeting if the matter is on the agenda for consideration by the Agency. If the matter is not on an agenda, the person shall request the Director to place such matter on the agenda for the next Agency meeting. Such request shall be made pursuant to MPCA 3(b)(4)(i). The Agency shall not consider a request for a public hearing on a matter unless the matter is properly on the agenda for the Agency meeting. The person requesting that a public hearing be held may accompany his request with a complaint stating his reasons for requesting the hearing, how he has been aggrieved and the relief requested.

(2) **Agency Decision.** The Agency shall, in its discretion, grant or deny the hearing request. The Agency, upon its own motion, may order that a public hearing be held on a matter. The Agency may, in its discretion, decline to order a public hearing but order that a public informational meeting be held.

(c) **HEARING OFFICERS**

(1) **Appointment.** All hearing officers shall be appointed by the Agency. Following a decision that a hearing shall be held, the Agency shall appoint a hearing officer. This appointment shall be recorded in the Agency minutes.

(2) **Qualifications**

(i) All appointments hereunder shall be consistent with the purpose of obtaining objectivity and impartiality in making decisions.

(ii) The hearing officer may be an employee or a member of the Agency. The Agency may appoint as hearing officer a person who is not an employee or member of the Agency. In such event, the hearing officer shall be an attorney at law licensed to practice in the State of Minnesota, unless some other person is agreed upon by all parties; provided that such hearing officer shall be considered an employee of the Agency for the sole purpose of compensation, if any, and authorization to conduct the hearing and recommend findings of fact and a decision to the Agency. In all other respects he shall be independent of the Agency.

(iii) In all cases, the Agency retains discretion to:

a. Conduct the hearing itself, in which case the Agency shall be the hearing officer;

b. Appoint a hearing panel consisting of two or more persons. Such panel shall not include members of the Agency. The panel shall include at least one attorney at law licensed to practice in the State of Minnesota. The Agency shall appoint a chairman of the hearing panel, who shall be an attorney at law licensed to practice in the State of Minnesota.

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(3) **Authority.** The appointment of the hearing officer shall, to the extent permitted by law, authorize and direct the hearing officer to call and conduct the hearing and recommend a decision to the Agency.

(4) **Functions**

(i) The functions of the hearing officer shall be to hear and rule on preliminary motions, conduct the hearing, examine witnesses, make such preliminary discovery, interlocutory, or other orders as he deems appropriate, recommend a decision to the Agency, and do things necessary or proper to the performance of the foregoing.

(ii) In the event that a hearing panel is appointed by the Agency, all decisions of the panel shall be made by majority vote. Any member or members of the panel may submit a dissenting recommendation to the Agency.

(5) **Disqualification**

(i) Any party may file a petition with the Agency to dismiss a hearing officer. The Agency shall determine the petition and enter its decision on the record.

(ii) The Agency may, for good cause, revoke the appointment of any hearing officer upon the filing of a petition of a party or upon the Agency's own motion.

(iii) A hearing officer shall withdraw from participation in a hearing at any time prior to the final determination if he deems himself disqualified for any reason.

(iv) Whenever a hearing officer is disqualified or removed, the Agency shall appoint another in his place, without the need for hearing evidence already presented.

(d) **NOTICE OF DECISION TO HOLD A HEARING.** Upon appointment of a hearing officer the Director shall serve upon all known parties a copy of such order and a notice stating:

- (1) The matter under consideration for which a hearing will be held;
- (2) The name and address of the hearing officer;
- (3) The rights of the parties to legal counsel;
- (4) That failure to attend any stage of the hearing may prejudice the party's rights, and that a party shall be regarded as present at all stages of the hearing for which notice is given; and
- (5) The availability of a copy of these Rules.

~~(e) **PARTIES.** Any person whose legal rights, duties, or privileges may be determined in the matter for which the hearing is to be held shall be a party. When a hearing is held pursuant to a request for a hearing, the person or persons requesting the hearing shall be parties to the matter. In any hearing on an application for a permit or variance, the applicant shall be a party. The Agency shall be a party in any hearing to revoke or suspend a permit or variance pursuant to MPCA 11. Any person who has properly intervened in the matter shall be a party.~~

(f) **ANSWER.** Within twenty (20) days after receipt of notice that a hearing will be held on a matter for which a complaint has been filed by the Agency or by the person requesting the hearing, an adverse party shall interpose an answer to the complaint. A copy of such answer shall be served

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on all parties to the matter. The original, together with an attached affidavit of service, shall be filed with the hearing officer within five (5) days after service is completed. A copy of the answer shall also be served upon the Agency.

(g) **RIGHT TO COUNSEL.** Any party may be represented by legal counsel throughout the hearing.

(h) **INFORMAL DISPOSITION.** Informal disposition may be made of any matter for which a hearing is scheduled or any issue therein by stipulation, agreed settlement, or consent order at any point therein, subject to the approval of such informal disposition, or any terms thereof, by the Agency.

(i) **CONSOLIDATION.** The Agency may consolidate two or more matters for which hearings are scheduled and hold a joint hearing. The requirements of these Rules of Procedure shall be followed when consolidation is ordered. Any party may object to consolidation by filing a petition for severance with the Agency at least twenty (20) days before the hearing. The Agency may sever the matter to which the petitioner is a party from the joint hearing.

(j) **PREHEARING CONFERENCE.** A prehearing conference may be held at any time at the discretion of the hearing officer prior to each hearing. The prehearing conference shall be an informal proceeding conducted fairly and expeditiously by the hearing officer, for purposes of identifying and simplifying the issues to be determined, identifying and limiting the number of witnesses, and reaching an agreement on any or all issues of law or fact without the necessity for further hearing thereon. Agreements entered into as the result of a prehearing conference shall be put in the form of stipulations and entered on the record. Such agreements are subject to review by and final approval of the Agency. Any final settlement shall be set forth in a settlement agreement or consent order and made a part of the record, subject to final approval by the Agency.

(k) **DISCOVERY**

(1) **Agency Discovery**

(i) **Information.** Upon request of the Agency or the hearing officer, any party to the matter who operates or installs a disposal system or point source or an emission system or facility specified in Minn. Stat. § 116.081 subd. 1 shall furnish to the Agency or the hearing officer any information which the party may have which is relevant to the matter under consideration.

(ii) **Examination of Records.** Upon request of the Agency or the hearing officer, any party to the matter who operates or installs a disposal system or point source or an emission system or facility specified in Minn. Stat. § 116.081 subd. 1 shall allow the Agency or any member, employee, or agent of the Agency, when authorized by it and upon presentation of proper credentials, or the hearing officer, to examine and copy any books, papers, records or memoranda pertaining to the matter under consideration.

(iii) **Inspection of Premises.** Upon request of the Agency or the hearing officer, any party shall allow the Agency, or any member, employee, or agent of the Agency when authorized by it and upon presentation of credentials, or the hearing officer, to enter upon any of the party's property for the purpose of obtaining information or examining records or conducting surveys or investigations.

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(iv) **Other Discovery.** The Agency and the hearing officer may exercise their authority under Minn. Stat. §§ 115.04 and 116.091 to obtain relevant information from persons who are not parties to the matter.

(2) **Discovery by Parties.** Parties other than the Agency shall obtain discovery by examination of those public records which are in possession of the hearing officer or the Agency. Any party to a matter may request the Agency or the hearing officer to exercise its powers in subparagraph (1) or in the statutes to obtain public information or to issue a subpoena as provided in subparagraph (3). The Agency or the hearing officer may grant or deny such requests. A party may request voluntary disclosure of information by another party.

(3) **Subpoenas**

(i) **Issuance.** The Agency, or the hearing officer in the name of the Agency, may issue a subpoena for attendance at the hearing. The subpoena may include a command to produce books, papers, documents, or tangible objects designated therein and reasonably necessary to resolution of the matter under consideration. Every subpoena shall state the title of the matter and shall command each person to whom it is directed to attend and give testimony at the time and place therein specified.

(ii) **Quash.** The Agency, or the hearing officer if he issued the subpoena, upon motion made promptly and in any event at or before the time specified in the subpoena for compliance therewith, may quash or modify the subpoena if it is unreasonable and oppressive.

(l) **NOTICE OF HEARING.** Except as otherwise provided by the Agency for good cause, when permitted by law, the hearing officer shall give notice of the time and place of hearing at least thirty (30) days prior to the hearing by serving a Notice of Hearing upon those persons or groups or associations who are required to be notified by law. The hearing officer shall also serve a Notice of Hearing upon all parties and upon any person he knows to have a direct and substantial interest in the matter. The Notice of Hearing shall also be suitably posted at the office of the Agency.

Such Notice of Hearing shall identify the parties, include a short and plain statement of the proceeding, and state the statute, regulation, rules, and standards affected. The Notice of Hearing shall also state the name and address of the hearing officer or hearing panel who has been appointed in accordance with these Rules.

(m) **THE HEARING**

(1) **Conduct of Hearing.** The hearing shall be public. The parties may cross-examine witnesses, and present evidence, rebuttal testimony, oral argument and written briefs with respect to the issues.

(2) **Witnesses.** Any party may be a witness or may present witnesses on his behalf. All testimony at a hearing shall be under oath or affirmation. Every party shall have the right of cross-examination of adverse witnesses.

(3) **Authority of Board Members and Counsel.** Any Agency member, the Director or any staff member designated by him, or counsel to the Agency, may advise the hearing officer and may examine witnesses, but shall not have the authority to rule on objections or motions or overrule the hearing officer on any matter which has been determined by the hearing officer.

Appealed 7 SR 969 12-20-82

(4) **Statements by Any Person.** Any person may submit a written statement, under oath, relevant to the subject matter of the hearing prior to or at the hearing. In the absence of special circumstances, any person submitting such a statement shall be subject to cross-examination by any party. If such person is not available for cross-examination upon timely request, the written statement may be stricken from the record, in whole or in part, or may be given such weight as the hearing officer deems appropriate. The hearing officer may in his discretion permit any person to offer oral testimony, whether or not such person is a party to the matter. Any such person offering oral testimony shall be subject to cross-examination by any party.

(5) **Rules of Evidence**

(i) **Admission.** The hearing officer may admit and rely on evidence which possesses probative value commonly accepted by reasonable men. The hearing officer shall give effect to the rules of privilege recognized by law. Information certified confidential shall be treated in accordance with MPCA 10(b). Proposed evidence which is incompetent, irrelevant, immaterial, repetitive, or otherwise objectionable may be excluded.

(ii) **Judicial Notice.** The hearing officer may take notice of judicially cognizable facts and, in addition, may take notice of technical or scientific facts within his specialized knowledge. Where final determination rests on official notice of material facts not appearing in the evidence in the record, the hearing officer shall serve and file a statement of Notice of Facts upon the parties. A party is entitled, upon timely request, to an opportunity to rebut such facts.

(iii) **Burden of Proof.** The burden of proving any issue of fact in a proceeding shall be by a preponderance of the evidence.

(6) **Transcript**

(i) **Record.** A verbatim record of the hearing shall be taken by court reporter or by recording equipment. A court reporter shall be used if demanded by any party. Unless the Agency agrees to bear the expense of the court reporter, such expense shall be paid by the party demanding the reporter.

(ii) **Cost.** If a transcript is requested, the Agency may require the requesting party to pay the reasonable cost of preparing the transcript.

(7) **Disruption of Hearing**

(i) **Cameras.** Television, newsreel, motion picture, still, or other cameras, and lights or other devices used in connection with such cameras, shall be permitted in the hearing room while the hearing is in progress, subject to such conditions and restrictions as the hearing officer may impose in order to avoid disruption of the hearing. Mechanical recording devices, in addition to those provided by the Agency or at its discretion, shall also be permitted in the hearing room during the course of the hearing, subject to such conditions and restrictions as the hearing officer may impose in order to avoid disruption of the hearing.

(ii) **Interference.** Pursuant to and in accordance with provisions of Minn. Stat. § 624.72, no person shall interfere with the free, proper, and lawful access to or egress from the hearing room. No person shall interfere with the conduct of the hearing.

(n) **DEFAULT.** Whenever any party with adequate notice fails to appear at the hearing, the hearing officer may decide all issues in the matter

Repealed 7 SR 959 12-20-82

adversely to the defaulting party, may terminate the hearing, may proceed with the hearing, or may take other appropriate action, without further notice to the party. The hearing officer shall consider the rights of other parties to the matter when a party defaults.

(o) **HEARING OFFICER RECOMMENDATION.** Except as otherwise provided by the Agency for good cause, the hearing officer shall submit his recommendation to the Agency within thirty (30) days after the close of the hearing. Each party to the matter and each person who submitted a statement into the record shall be immediately served a copy of the hearing officer's recommendation.

(p) **APEAL.** Any party aggrieved by a decision of the hearing officer during the course of the hearing may appeal such decision to the Agency by submitting notice of such appeal on the Agency anytime after receipt of the hearing officer's recommendation and prior to a final decision on the matter by the Agency. The notice shall be in writing and shall state with particularity the decision being appealed and the prejudice caused the aggrieved party by such decision. The notice shall be served on all other parties to the matter, who may submit a statement in support or opposition to the appeal.

(q) **FINAL DECISIONS AND ORDERS**

(1) **Agency Decision.** The Agency shall make all final decisions and orders in those matters for which a hearing has been held. When required by law, the Agency's decision or order shall be based solely on the record from the hearing. The decision or order shall be accompanied by a concise statement of the findings and conclusions upon each contested issue of fact necessary to the decision.

(2) **Time.** The Agency shall reach a final decision or order on the matter as expeditiously as possible after receipt of the hearing officer's recommendation.

(3) **Manner.** The Agency shall place the matter on the agenda for an Agency meeting when it is prepared to reach a decision. The decision or order shall be announced at the Agency meeting and in all cases the decision or order shall be entered in the minutes of the Agency meeting. If the Agency has reached a Proposed Decision prior to the Agency meeting, it shall make such Proposed Decision available to all parties at least ten (10) days prior to the Agency meeting at which it intends to announce its decision or order.

(4) **Alternatives.** The Agency may accept, modify, or reject the recommendation of the hearing officer, in whole or in part. The Agency may remand the matter to the hearing officer for further proceedings. The Agency shall act on each appeal of a decision of the hearing officer which has been served on the Agency.

(5) **Notice.** Every final decision or order in a matter for which a hearing has been held shall be served on all parties to the matter and on all persons who submitted a statement into the record.

(r) **REHEARING**

(1) **Agency Right to Reconsider.** The Agency may, upon request and good cause shown, or on its own motion, reconsider a final decision. This right may be exercised until it is lost by appeal or the granting of a writ of certiorari or until the time allowed by statute for appeal, or six months, whichever is less, has expired.

Revised 11 3R 259 12-20-82

(2) Obtaining a Rehearing

(i) Petition for Rehearing. At any time prior to the Agency's loss of the right to reconsider a final decision, any party to the matter may request a rehearing by filing a Petition for Rehearing. Such petition shall contain:

1. The name and address of the petitioner;
2. The Agency designation for the matter; and
3. The reasons for the petition.

(ii) Agency Action. The Agency shall grant or deny a Petition for Rehearing as part of the record. Such Petition shall be granted upon a showing that there are irregularities in the hearing, errors of law, or newly discovered material evidence of such importance as likely to have altered the outcome of the hearing. A rehearing Petition may be granted upon a showing of good cause for failure to answer or appear at the hearing. Evidence and argument may be presented at the discretion of the Agency in written or oral form, or both, by any party to the matter with respect to the granting or denial of the Petition.

(3) Notice of Rehearing. Notice of rehearing shall be provided in the same manner prescribed for notice of hearing.

(4) Rehearing Procedure. A rehearing in a matter shall be conducted in the same manner prescribed for a hearing.

(5) Decision After Rehearing. The decision after rehearing shall be made in the same manner prescribed for the decision after a hearing.

(s) SEVERABILITY. The provisions of this Rule are severable, and if any section, subsection, clause, sentence or other provision of this Rule is held invalid for any reason, such invalidity shall not affect the validity of these rules as a whole or the validity of any other section, subsection, clause, sentence, or other provision, which can be given effect without the invalid provision.

*Repealed
7 SE 959
12-28-82*

*insert new 6 MCAR 5
4.3010, ARO254ST*

*insert new 6 MCAR 5
4.3011, ARO254ST*

CHAPTER TEN: MPCA 10

MPCA 10 INSPECTION AND CONFIDENTIAL INFORMATION

(a) **INSPECTION OF PUBLIC RECORDS.** All public records of the Agency, or copies thereof, shall be available for inspection and copying by any person, Monday through Friday, excluding legal holidays, between the hours of 9:00 a.m. and 4:00 p.m. at the Agency offices. No public records shall be removed from said offices. Any inspection or copying of said records shall be made in the presence of an officer, employee, or agent of the Agency. The Agency may charge and collect a reasonable fee for the reproduction of any public records.

(b) CONFIDENTIAL INFORMATION

(1) **Certification.** In order to certify records, information, or objects for the confidential use of the Agency, an owner or operator, or other person qualified by law, shall submit to the Director a written statement setting forth those statutory grounds which require the Agency to keep such records, information, or objects confidential. Any certification of records or information which applies to water pollution sources must be approved by the Director. Such records or information shall not be released unless the Director denies the certification request. Whenever the Director shall deny a certification request, he shall notify the certifier of such denial at least three (3) days prior to making the records or information available to the public. The certifier may withdraw such records or information if such an option is available to him.

(2) **Filing.** All certified records, information, or objects shall be appropriately identified and segregated at the offices of the Agency.

(3) Use

(i) **Agency Use.** Certified records, information, and objects, when approved by the Director if required, shall be only for the confidential use of the Agency. However, confidential information may be used by the Agency in compiling or publishing analyses or summaries relating to the general condition of the state's water, air and land resources so long as such analyses or summaries do not identify any owner or operator who has so certified.

(4) Release

(i) **Approval.** Confidential information may be released when the Agency is specifically authorized to do so by the person who certified the records, information, or objects.

(ii) **Denial of Request.** Certified records or information which apply to water pollution sources may be released if the Director denies the certification request. The provisions of subparagraph (b)(1) above shall apply to such release.

(iii) **Federal Law.** Regardless of whether records or information are certified confidential, the Agency may disclose any information which it is obligated to disclose in order to comply with federal law and regulation, to the extent and for the purposes of such federally required disclosure. Whenever the Agency is required to release certified information pursuant to federal law, he shall notify the certifier of such requirement at least three (3) days prior to making the records or information available to the public. The certifier may withdraw such information if such an option is available to him.

~~(iv) Public Hearings. Confidential information which is relevant to a matter for which a public hearing is being held may be considered by the Agency in reaching a decision on the matter but shall not be released to the public unless the Agency is required by statute to release it. When the Agency is required by statute to release the information at the public hearing, the person who certified the information may withdraw the information, but the information shall not be considered by the Agency or the hearing officer in reaching a decision or recommendation on the matter. Whenever confidential information is considered by the Agency or a hearing officer in reaching a decision or recommendation on a matter, that fact shall be so stated on the record.~~

*insert new; 6 MCARS 4.3012, 4.3013
AR02545T
CHAPTER ELEVEN: MPCA 11*

MPCA 11 SANCTIONS

(a) SANCTIONS

(1) Violation of Duty of Candor. Anyone who knowingly makes any material misstatement, act, or omission which results in a breach of the duty of candor in MPCA 1 shall be subject to imposition of such sanctions as the Agency deems appropriate in the circumstances, and as may be permitted by law, including, but not limited to, the denial or revocation of any affected permit or variance, or application therefor.

(2) Violation by Permit Holder or Variance Holder. Any permit holder or variance holder who violates a provision of a permit or variance, or any applicable statute, rule, regulation, standard, or order, may be subject to action by the Agency for revocation or suspension of such permit or variance.

(3) Violation of Order. Any person who violates any lawful order shall be subject to imposition of such sanctions as the Agency deems appropriate in the circumstances, and as may be permitted by law.

(b) IMPOSITION OF SANCTIONS. In the case of any alleged violation as described in MPCA 11(a) above, the Agency may, in its discretion, seek to impose an appropriate sanction. No revocation, suspension, or other sanction may be imposed except upon hearing in accordance with MPCA 9.

(c) JUDICIAL RELIEF. Notwithstanding whether the Agency has pursued an administrative sanction under these Rules, nothing contained herein shall preclude the Agency from seeking any judicial relief available to the Agency by law for any violation described herein.

CHAPTER TWELVE: MPCA 12

MPCA 12 CONFLICT OF INTEREST. Any member of the Agency who has a direct and substantial financial or employment interest relating to any matter before the Agency, which interest is reasonably likely to affect his impartiality or judgment in the matter, shall make known such interest and shall refrain from participating in, or voting upon, such matter.

No employee or agent of the Agency, including the Director, shall engage in any outside employment or other conduct which is likely to affect adversely the effectiveness or efficiency of any functions or duties he performs for the Agency.

*insert new 6 MCARS 4.3014
AR02545T*

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CHAPTER THIRTEEN: MPCA 13

MPCA 13 PUBLIC PARTICIPATION IN AGENCY MATTERS

(a) PARTICIPATION

(1) **Agency Matters.** Any person shall be permitted to participate in any matter in which the Agency is involved in carrying out its statutory duties and obligations. Participation shall include the right to submit statements, the right to attend meetings and conferences and to share in discussions, and the right to receive such notice of progress in the matter as is adequate to exercise such rights. Any person who wishes to receive notice of progress in an Agency matter shall advise the Director of such desire. Thereafter, the Director shall give such person adequate notice of pending events in the matter.

Whenever any person submits a written statement or recommendation to the Agency on any matter, the Agency shall notify each person adversely affected by such statement or recommendation. The Agency shall allow each person adversely affected such opportunity to respond as is appropriate in the circumstances.

(2) **Agency Meetings**

(i) **Agenda Items for which No Public Hearing Was Held.** Upon request made prior to an Agency meeting, any person who desires to present a statement on a matter which is on the agenda for such meeting and for which no public hearing was held, shall be afforded an opportunity to present oral or written statements to the Agency at the meeting, within such limits of time and manner as the Agency may establish under the circumstances. Such request shall be submitted to the Director at least three (3) days prior to the meeting. Upon request made during an Agency meeting, any person who desires to present a statement on such an agenda matter may be afforded an opportunity to do so, within such limits of time and manner as the Agency may establish under the circumstances. The Agency may allow any person adversely affected by any oral or written statement submitted herewith additional time in which to respond to such statement.

(ii) **Agenda Items for which a Public Hearing Has Been Held.** When a public hearing has been held on an agenda matter, any person shall be permitted to submit written statements or arguments to the Agency at any time up to three (3) days before the meeting. When the Agency's decision is limited to the record created at the hearing, written statements or arguments shall be limited to comments or arguments regarding evidence in the record. Adverse parties shall be notified of statements and arguments which are submitted and may be granted additional time in which to respond.

(b) **INTERVENTION.** Any person shall be permitted to intervene as a party in any matter for which a public hearing will be held by the Agency. Prior to intervention, the intervenor shall file with the Agency or the hearing officer a verified pleading asserting that the matter involves conduct that has caused or is likely to cause pollution, impairment, or destruction of the air, water, land or other natural resources located within the state or asserting that the matter involves conduct that is in conformance with the pollution laws and policies of the State. Any party who has properly intervened shall have all the rights of any other party to the hearing.

Repealed 7 SR 959 12-20-82

insert new to MCA 34.3015
ARC 254 ST

SR-1 Applicability and Definition**(a) Scope**

These regulations and criteria govern the review of new or revised packages/containers sold at retail within the State of Minnesota after May 25, 1973, in accordance with Minn. Stat. Chapter 116F (Supp. 1973).

The purpose of these regulations is to:

- (1) Identify the types of new or revised packages/containers which may be subject to Agency review;
- (2) Set forth the criteria which the Agency will use in evaluating the new or revised packages/containers;
- (3) Establish the types of samples and information that shall be requested or required by the Agency for evaluation of new or revised packages/containers;
- (4) Establish a procedure for the manner in which samples and information shall be submitted and reviewed;
- (5) Establish exemptions for some new or revised packages/containers.

(b) Definitions

(1) **Agency.** "Agency" means the Minnesota Pollution Control Agency, its agent or representative;

(2) **Closure.** "Closure" means any article, device, or contrivance made in whole or in part of paper, paperboard, fiber, wood, ceramic, glass, metal, plastic or any combination of such materials, including, but not limited to caps, clips, covers, lids, tabs or seals for the purpose of closing or fastening a package/container, but not including staples, metal tacks, nails, glues and adhesives;

(3) **New or Revised.** "New or Revised" means either a new packaging concept not previously sold at retail in Minnesota or any change in a package/container sold at retail before May 25, 1973, or approved for sale at retail under these regulations. Such changes include: change from one product to another product (different five-digit product codes of the **Numerical List of Manufactured Products** (New (1972) SIC Basis)) contained in the package/container; change in the chemical formulation of any constituent material; substitution of one or more constituent materials; substitution of closure; substitution of label; changes in design; and all other changes, except any changes in size, color, printing, or shape. Changes from one product to another within the same five-digit product code of the **Numerical List of Manufactured Products** (New (1972) SIC Basis) shall not be considered a change of product for purposes of this definition.

(4) **Package/Container.** "Package/Container" means any article, receptacle, device or contrivance made in whole or in part of paper, fiber, wood, ceramic, glass, metal, plastic or any combination of such materials, including but not limited to bags, baskets, bottles, boxes, cans, cartons, carrying cases, cups, cylinders, envelopes, glasses, jars, jugs, pails, tubs, sacks, trays, tubes, tumblers, and vessels intended for use in conveying any product for sale at retail. Such term does not include any shipping carton not intended to be sold at retail;

(5) **Person.** "Person" means any human being, any municipality or other governmental or political subdivision, or any other public agency, any public or private corporation, any partnership, firm, association or other organization, any receiver, trustee, assignee, agent or other legal representa-

tive of any of the foregoing, or any other legal entity, but does not include the Minnesota Pollution Control Agency;

(6) **Review Period.** "Review Period" means the one hundred and twenty (120) day time period in which the Agency may review submitted samples and the accompanying information. The Agency may, for good cause shown, order the one hundred and twenty (120) day period to be extended for an additional period not to exceed thirty (30) days;

(7) **Sold at Retail.** "Sold at Retail" means sale or other transfer to the household of the ultimate consumer;

(8) **User.** "User" means an industry which combines packages/containers and products to create a unit intended for sale at retail.

(c) Severability

If any provision of any packaging regulation or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions or application of any other part of such regulation or any other regulation which can be given effect without the invalid provision or application; and to this end all provisions of all packaging regulations and the various applications thereof are declared to be severable.

SR-2 Criteria

(a) In determining whether a package/container is consistent with state environmental policy, the Agency shall place emphasis upon state responsibilities and policies established by the Environmental Policy Act, Minn. Stat. §116D.02 subd. 2 (Supp. 1973), and by Minn. Stat. §§116F.01 and 116.05 (Supp. 1973).

(b) The Agency staff will compare a new or revised package/container with packaging alternatives. The object of this comparison will be to encourage those alternatives which maximize material and energy conservation while minimizing adverse environmental impact and increased economic costs to the people of the state. The staff will assess the relative merits of alternatives and encourage those alternatives which:

(1) Minimize the potential for environmental contamination, including but not limited to the release of metals or substances with the potential for biological harm;

(2) Minimize the total system energy costs;

(3) Minimize the use of scarce or non-renewable resources;

(4) Minimize the use of virgin materials;

(5) Are most recyclable where recyclability is consistent with (1) and (2) above;

(6) Minimize adverse economic effects on the consumer, the labor force, and industry, consistent with (1) and (2) above.

(c) In reviewing a new or revised package/container the Agency shall compare it to the existing package/container and/or all feasible alternatives submitted pursuant to SR-5. The decision to approve a new or revised package/container shall be based on a finding that the total positive impacts of the new or revised package/container outweigh the total negative impacts in comparison to the existing package/container and/or all feasible alternatives submitted pursuant to SR-5. The agency shall assess whether the new or revised package/container:

(1) Contains greater or lesser quantities of metals, hydrocarbons, organic

or inorganic chemicals, or other substances which upon release into the environment through incineration, leaching, or littering have or may have potential for biological harm when compared with the existing package/container and/or feasible alternatives submitted pursuant to SR-5;

(2) Has a potential for creating an environmental problem as litter, which is higher or lower than the existing package/container and/or feasible alternatives submitted pursuant to SR-5;

(3) Requires more or less Btu/kg of product than the existing package/container and/or feasible alternatives submitted pursuant to SR-5 for the same package/container size;

(4) Requires more or less scarce or non-renewable resources than the existing package/container and/or feasible alternatives submitted pursuant to SR-5, for the same package/container size;

(5) Has a higher or lower virgin materials content than the existing package/container and/or feasible alternatives submitted pursuant to SR-5;

(6) Has more or less current potential for recycling than the existing package/container and/or feasible alternatives submitted pursuant to SR-5;

(7) Results in an increase or decrease in the volume of solid waste in comparison to the existing package/container and/or feasible alternatives submitted pursuant to SR-5;

(8) Has a beneficial or adverse economic effect on the consumer, in comparison to the existing package/container and/or feasible alternatives submitted pursuant to SR-5;

(9) Has a beneficial or adverse economic effect on the labor force, in comparison to the existing package/container and/or feasible alternatives submitted pursuant to SR-5; and

(10) Has a beneficial or adverse economic effect on industry in comparison to the existing package/container and/or feasible alternatives submitted pursuant to SR-5.

SR-3 Review Procedure

(a) Package/container review by the Agency may be initiated in any of the following ways:

(1) A package/container user may submit the information and samples described in SR-5. While such submission for review is not mandatory, any package/container user wishing to initiate the review process must submit all the information requested in SR-5;

(2) The Agency itself may identify a package/container which it believes is subject to its review and shall proceed according to SR-3(c);

(3) Any other person may submit to the Agency a package/container for review, and if the Agency determines that such package/container is subject to its review, the Agency shall proceed according to SR-3(c).

(b) Once the review process is initiated, the Agency shall review the new or revised package/container during the review period. If the Agency determines that the package/container constitutes a solid waste disposal problem or is inconsistent with state environmental policies, as manifested in the criteria of SR-2, the Agency may by order made after notice and hearing as provided in Minn. Stat. Chapter 15 (1971), and following an additional period not to exceed thirty (30) days during which the Minnesota Environmental Quality Council may review the proposed action, prohibit the sale of the package/container within the state. Any such prohibition shall continue

in effect until revoked by the Agency or until the last legislative day of the next following legislative session, whichever occurs first, unless extended by action of the legislature. If the Agency fails to issue an order prohibiting a package/container by the end of the review period or to provide written notice of its acceptability, the Agency may not thereafter prohibit it, pursuant to Minn. Stat. Chapter 116F (Supp. 1973). If it is determined that the package/container is acceptable, the Agency will so notify the submitting user. Any package/container approved by the Agency may subsequently be used to enclose or convey other products within the same five-digit product group of the **Numerical List of Manufactured Products** (New (1972) SIC Basis), as the product in the approved package/container without further review by the Agency, but use of a package/container to enclose or convey products within other product groups may subject package/container to review initiated pursuant to SR-3(a).

(c) Where the Agency or any other person initiates the review process by identification or submission of a package/container, a Notice of Intention to Review shall be sent to the user of the package/container within ten (10) days of identification or receipt of the package/container. Upon receipt of such Notice, the package/container user shall have thirty (30) days to submit the information required by SR-5. The review period shall begin upon the date of identification or submission of a package/container.

SR-4 Exemptions

(a) A new or revised package/container, will not be reviewed by the Agency if:

(1) It is marketed with a deposit of five (5) cents or more to encourage its return to the distribution system for reuse;

(2) It has a capacity of over two (2) gallons by volume or twenty-five (25) pounds by weight;

(3) It is required by federal laws and regulations relating to health or safety. Any modification of a package ostensibly intended to achieve compliance with federal law, which involves changes of a kind different than those required for compliance with the law or regulation shall negate the exempt status of the package;

(4) It conveys products which are subject to the regulation of the U.S. Department of Agriculture pursuant to the Federal Meat Inspection Act, 21 U.S.C. §§601-691;

(5) It conveys products other than those which come within Industry Numbers 20111 - 20999 inclusive, 28412 - 28424 inclusive, 28441 - 28445 inclusive of the **Numerical List of Manufactured Products** (New (1972) SIC Basis).

(b) A new or revised package/container, will not be reviewed by the Agency:

(1) When a package/container is made substantially of glass, and the change is of the following nature:

(aa) Any change in the chemical formulation of the glass or its coloring agents; or

(bb) Any change in enamels or coatings which are for color or identification; or

(cc) Any change in coatings or surface treatments used to facilitate lubricity in manufacture or handling as long as such coating is not a structural portion of the package/container.

(2) When a package/container is made substantially of aluminum or steel, and the change is of the following nature:

(aa) Any change in the alloy chemistry or temper thereof within the same metal type; or

(bb) Any gauge change; or

(cc) Any change in seam construction or solders or adhesives; or

(dd) Any change in the inside coatings of metal packages/containers as long as such materials were in use for any steel or aluminum package/container coatings prior to May 25, 1973, or are approved by the United States Food and Drug Administration for contact with food surfaces and provided that such coatings do not exceed .0025 inch in gauge.

(3) When a package/container is made substantially of paper or paper products and the change is of the following nature:

(aa) Any change in board or paper coatings of clay, waxes, lacquers, or polyolefin compounds as long as such substitute materials were in use as board or paper coatings prior to May 25, 1973, or are approved for contact with food surfaces by the United States Food and Drug Administration; or

(bb) Any change of foil laminates which do not exceed .0005 inch in gauge in those cases where scientific or engineering data substantiate the need for a functional barrier; or

(cc) Any change in caliper or basis weight; or

(dd) Any change in board or paper furnish where such change does not represent a specification change by the user with the effect of reducing recycled content.

(4) When a package/container is made substantially of plastic-type materials and the change is of the following nature:

(aa) For rigid wall containers:

(1) Any change in density; or

(2) Any substitution of standard formulations within the same monomer group.

(bb) For pouches, liners, chubs, and other film packaging including laminates with a wall thickness not exceeding .010 inch:

(1) Any substitution within or between the following groups:

a. Nylons

b. Polyester

c. PVDC

d. Polyethelene

e. Polypropylene

f. Ionomers

g. Polyethelene terephthalate; or

(2) Any change in density or caliper of any material constituents so long as the total gauge does not exceed .010 inches; or

(3) Any substitution individually or in combination of substrate materials of paper, glass, nylon or cotton fabric.

(cc) A new or revised package/container otherwise exempt from review pursuant to SR-4 (b) (4) may be reviewed by the Agency if the revision involves the use of any foamed resins.

(c) Notwithstanding any other provision of these regulations, no package/container shall be reviewed if:

(1) It is identical in all ways to a package/container sold at retail in Minnesota before May 25, 1973, or if any changes do not bring it within the definition of "new or revised" contained in SR-1, and

(2) The product to be packaged in the package/container is within the same product group as a product sold at retail before May 25, 1973, in such identical container. For products within the **Numerical List of Manufactured Products (New (1972) SIC Basis)** subject to review the five-digit product code shall be used to determine whether the products are within the same product group.

(d) If the user certifies that the package/container has been introduced into the Minnesota retail market for test marketing, seasonal, or promotional purposes, and further certifies the period of time necessary to complete such test marketing, seasonal or promotional purpose, the Agency may, upon request of the user, defer review for that period of time equal to the test marketing, seasonal and promotional time period so certified by the user; provided, however, that in no event shall such deferral extend for longer than one hundred and eighty (180) days. In addition, the Agency may defer review for a fixed period of time (not to exceed one hundred and eighty (180) days) where the user certifies that an emergency situation has arisen; the term "emergency situation" includes specifically, but is not limited to, any change made in a package which is temporary and caused by an inability to obtain supplies.

(e) Notwithstanding any other provisions of SR-4, the user or manufacturer of any package/container who believes the package/container to be exempt under SR-4 (a), (b) or (c) may, but is not required to:

(1) Submit to the Agency a request for Certification of Exemption which identifies the subdivision of SR-4 that the user, or manufacturer believes is applicable and which contains appropriate documentation. The Agency may request the submission of additional information necessary to determine whether such Certification of Exemption is appropriate.

(2) Initiate the review process, pursuant to SR-3 (a) (1), by submitting the information and samples described in SR-5.

SR-5 Information Required for Review

(a) Where the package/container review process has been initiated pursuant to SR-3, the package/container user may, but is not required to, submit a sample of the new or revised package/container. The sample may, but need not, contain the product retailed in it. Such samples and products will not be returned to the submitting party.

(b) The package/container user who initiates the review process pursuant to SR-3 (a) (1) or who receives a Notice of Intention to Review issued pursuant to SR-3 (c) shall submit to the Agency the following information on the new or revised package/container:

(1) A brief description of the package/container and closure including its appearance, weight (in grams of each sub-assembly), volume of package/container and weight of product to be contained therein;

(2) In the event a sample is not submitted, an engineering drawing of the package/container with closure must accompany the application for review;

(3) A brief description of the product to be retailed in the new or revised package/container and the five-digit product group of the Numerical

List of Manufactured Products (New (1972) SIC Basis) thereof;

(4) The trade name and/or common names of all components present in quantities greater than 1% by weight in the package/container and closure;

(5) The chemical name (following the nomenclature of Chemical Abstracts) of all components present in quantities greater than 1% by weight in the package/container and closure including but not limited to resins, catalysts, plasticizers, stabilizers, coatings, coloring agents, metals and preservatives. The total mass of each such constituent shall be listed in grams. However other chemical constituents or contaminants constituting less than 1% by weight should be reported if known;

(6) The percent of recycled content from post-consumer waste of each component if known;

(7) A brief statement as to whether the user's specifications for the package/container specifically discriminate against the use of recycled materials from post-consumer waste in cases where the United States Food and Drug Administration does not prohibit such reuse;

(8) The best estimate of energy requirements for fabrication or conversion of the package/container and closure;

(9) Any specifications for the package/container and closure which limit total heavy metals and which specifically limit any undesirable impurities such as unreacted monomer, catalysts or reaction-by-products to lowest levels consistent with good manufacturing practices;

(10) An estimate by the package/container user of effects on the labor force of acceptance or prohibition of the package/container. This estimate shall include both positive and negative effects;

(11) An estimate by the package/container user of effects on industry of acceptance or prohibition of the package/container. This estimate shall include both positive and negative effects;

(12) An estimate by the package/container user of unit price per ounce of product sold at retail for the same package/container size;

(13) The approximate date the package/container will be introduced into the Minnesota retail market;

(14) A listing of assumptions and methods of computation used to determine the calculated data required by SR-5 (b) (6), (8), (10), (11) and (12).

(15) The name and address of the user of the package/container, including the name of a person within the company who may be contacted for additional information.

(c) The package/container user who initiates the review process, pursuant to SR-3(a) (1) or who receives a Notice of Intention to Review issued pursuant to SR-3(c) shall submit to the Agency for purposes of comparison the following information on any original package/container:

(1) A brief description of the original package/container and closure including its appearance, weight (in grams of each sub-assembly), volume of package/container and volume of product to be contained therein;

(2) In the event a sample is not submitted, an engineering drawing of the package/container with closure shall accompany the other information;

(3) A brief description of the product retailed in the original package/

container and the five-digit product group of the **Numerical List of Manufactured Products** (New (1972) SIC Basis) thereof;

(4) The trade name and/or common names of all components in the package/container and closure;

(5) The chemical name (following the nomenclature of Chemical Abstracts) of all components present in quantities greater than 1% by weight in the package/container and closure including but not limited to resins, catalysts, plasticizers, stabilizers, coatings, coloring agents, metals and preservatives. The total mass of each constituent shall be listed in grams. However other chemical constituents or contaminants constituting less than 1% by weight should be reported if known;

(6) The percent of recycled content from post-consumer waste of each component if known;

(7) The best estimate of energy requirements for fabrication or conversion of the package/container and closure;

(8) Any specifications for the package/container and closure which limit total heavy metals and which specifically limit any undesirable impurities such as unreacted monomer, catalysts or reaction-by-products to lowest levels consistent with good manufacturing practice;

(9) An estimate by the package/container user on unit price per ounce of product at retail for the same package/container size.

(d) In the case of a new or revised package/container the user shall evaluate the merits of feasible alternative packages/containers. The user shall submit to the Agency all information required pursuant to SR-5 (b) on all feasible alternatives so considered.

SR-6 Confidentiality

(a) If the manufacturer and/or user of a new or revised package/container certifies at the time of submission of any sample and required information that disclosure of any of the information will affect the company's competitive position, the Agency shall keep such sample and information confidential except as may be necessary for public hearings as requested by the user required under SR-3.

MINNESOTA POLLUTION CONTROL AGENCY SOLID WASTE DISPOSAL REGULATIONS

PREAMBLE

The high level of production required to meet the varied needs of an expanding population and high standard of living has resulted in a sharp rise in the amount of waste materials discarded annually. Inefficient and improper methods of waste disposal have caused ever-increasing pollution of our vital air, land and water resources threatening the utility of our resources and the quality of the environment in which we live. Improper waste storage, collection, transportation and disposal endanger the public health, safety and welfare, create public nuisances, result in scenic blight and adversely affect land values. The close interrelationship of air, land and water pollution requires concerted action to preserve and improve the quality of our environment. A problem concerning solid waste will not be solved satisfactorily by creating air pollution, nor will a problem in air pollution be solved satisfactorily by intensifying the problems of water pollution. Immediate remedial action is needed to protect our valuable resources, and can only be accomplished through dedicated joint efforts.

The following solid waste disposal standards and regulations apply to any solid waste management system located partially or wholly within the State of Minnesota. Regulations are of general application throughout the state unless specifically indicated otherwise by their context. The official policy and purpose of the State of Minnesota in regard to solid waste control is set forth in Laws 1969, Chapter 1046 (Codified as Minnesota Statutes 1967, Section 116.07):

Subd. 2. The pollution control agency shall also adopt standards for the control of the collection, transportation and disposal of solid waste for the prevention and abatement of water, air and land pollution, recognizing that due to variable factors, no single standard of solid waste control is applicable to all areas of the state. In adopting standards, the pollution control agency shall give due recognition to the fact that elements of control which may be reasonable and proper in densely populated areas of the state may be unreasonable and improper in sparsely populated or remote areas of the state, and it shall take into consideration in this connection such factors, including others which it may deem proper, as existing physical conditions, topography, soils and geology, climate, transportation and land use. Such standards of solid waste control shall be premised on technical criteria and commonly accepted practices.

Subd. 4. Pursuant and subject to the provisions of chapter 15, and the provisions hereof, the pollution control agency may adopt, amend and rescind regulations and standards having the force of law relating to any purpose within the provisions of this act for the collection, transportation, and disposal of solid waste and the prevention, abatement, or control of water, air, and land pollution which may be related thereto, and the deposit in or on land of any other material that may tend to cause pollution. Any such regulation or standard may be of general application throughout the state or may be limited as to times, places, circumstances, or conditions in order to make due allowance for variations therein. Without limitation, regulations or standards may relate to collection, transportation, disposal, equipment, location, procedures, methods, systems or techniques

or to any other matter relevant to the prevention, abatement or control of water, air, and land pollution which may be advised through the control of collection, transportation and disposal of solid waste, and the deposit in or on land of any other material that may tend to cause pollution.

Consistent with these objectives, it shall be the policy of the Pollution Control Agency to encourage the development and expansion of solid waste control programs in cities, counties and other political subdivisions of the state and to provide planning, technical and enforcement assistance.

Filed January 12, 1970

SW1 Applicability, Definitions and General Conditions for Solid Waste Collection, Transportation and Disposal. Severability and Variances.

APPLICABILITY

These are regulations and standards the provisions of which govern the storage, collection, transportation, treatment, utilization, processing, transfer, intermediate disposal and final disposal of solid waste by any person and the issuing of permits for the construction and operation of solid waste disposal sites and facilities for the protection of the environment in keeping with Chapters 115, 116, 400 and 473D of the Minnesota Statutes 1971.

DEFINITIONS

For the purpose of these regulations

- (1) Agency. The Minnesota Pollution Control Agency, its agent or representative.
- (2) Cell. Compacted solid wastes that are enclosed by cover material in a land disposal site.
- (3) Composting. The controlled biological decomposition of selected solid waste in a manner resulting in an innocuous final product.
- (4) Cover Material. Material that is used to cover compacted solid waste in a land disposal site. Important general characteristics of good cover material are low permeability, uniform texture, cohesiveness and compactibility. Suitable cover material includes sandy loam, loam, silt loam, sandy clay loam, silty clay loam, clay loam, sandy clay and loamy sand.
- (5) Daily Cover. Cover material that is spread and compacted on the top and side slopes of compacted solid waste at least at the end of each operating day in order to control vectors, fire, infiltration and erosion and to assure an aesthetic appearance.
- (6) Decomposition Gases. Gases produced by chemical or microbial activity during the decomposition of solid waste.
- (7) Director. Director of the Minnesota Pollution Control Agency.
- (8) Final Solid Waste Disposal. The site, facility, operating procedures, and maintenance thereof for the complete and ultimate disposal of solid waste by the sanitary landfill method.
- (9) Flood Plain. As defined in Minn. Stat. 1971, ch. 104.
- (10) Free Moisture. Liquid that will drain freely by gravity from solid materials.
- (11) Garbage. Discarded material resulting from the handling, processing, storage, preparation, serving and consumption of food.
- (12) Special Infectious Waste. Waste originating from the diagnosis, care or treatment of a person or animal that has been or may have been exposed to a contagious or infectious disease. Special infectious waste includes, but is not limited to,
 - (a) All wastes originating from persons placed in isolation for control and treatment of an infectious disease.

(b) Bandages, dressings, casts, catheters, tubing, and the like, which have been in contact with wounds, burns, or surgical incisions and which are suspect or have been medically identified as hazardous.

(c) All anatomical waste, including human and animal parts or tissues removed surgically or at autopsy.

(d) Laboratory and pathology waste of an infectious nature which has not been autoclaved.

(e) Any other waste, as defined by the State Board of Health, which, because of its infectious nature, requires handling and disposal in a manner prescribed for (a) through (d).

Paragraph (13) is repealed.

(14) Incineration. The process of burning wastes for the purpose of volume and weight reduction in facilities designed for such use.

(15) Intermediate Solid Waste Disposal. The site, facility, operating procedures and maintenance thereof, for the preliminary or incomplete disposal of solid waste including, but not limited to, transfer station, open burning, incomplete land disposal, incineration, composting, reduction, shredding and compression.

(16) Land Disposal Site. Any tract or parcel of land, including any constructed facility, at which solid waste is disposed of in or on the land.

(17) Land Pollution. The presence in or on the land of any solid waste in such quantity, of such nature and duration, and under such condition as would affect injuriously any waters of the state, create air contaminants or cause air pollution.

(18) Leachate. Liquid that has percolated through solid waste and has extracted, dissolved or suspended materials from it.

(19) Municipality. A city, village, borough, county, town, sanitary district or other governmental subdivision or public corporation, or agency created by the legislature.

(20) Open Burning. Burning any matter whereby the resultant combustion products are emitted directly to the open atmosphere without passing through an adequate stack, duct or chimney.

(21) Open Dump. A land disposal site at which solid waste is disposed of in a manner that does not protect the environment, is susceptible to open burning and is exposed to the elements, flies, rodents and scavengers.

(22) Person. Any human being, any municipality or other governmental or political subdivision or other public agency, any public or private corpora-

tion, any partnership, firm, association, or other organization, any receiver, trustee, assignee, agent, or other legal representative of any of the foregoing, or any other legal entity, but does not include the pollution control agency.

(23) **Refuse.** Putrescible and nopotrescible solid wastes, including garbage, rubbish, ashes, incinerator ash, incinerator residue, street cleanings, and market and industrial solid wastes, and including municipal treatment wastes which do not contain free moisture.

(24) **Refuse Collection Service.** A public or private operation engaged in solid waste collection and solid waste transportation.

(25) **Regional Flood.** As defined in Minnesota Statutes 1971, Chapter 104.

(26) **Rubbish.** Nonputrescible solid wastes, including ashes, consisting of both combustible and noncombustible wastes, such as paper, cardboard, tin cans, yard clippings, wood, glass, bedding, crockery, or litter of any kind.

(27) **Runoff.** The portion of precipitation that drains from an area as surface flow.

(28) **Sanitary Landfill.** A land disposal site employing an engineered method of disposing of solid waste on land in a manner that minimizes environmental hazards by spreading the solid waste in thin layers, compacting the solid waste to the smallest practical volume, and applying cover material at the end of each operating day, or at intervals as may be required by the Agency.

(29) **Scavenging.** Uncontrolled removal of solid waste materials.

(30) **Solid Waste.** Garbage, refuse and other discarded solid materials, except animal waste used as fertilizer, including solid waste materials resulting from industrial, commercial and agricultural operations, and from community activities. Solid waste does not include earthen fill, boulders, rock and other materials normally handled in construction operations, solids or dissolved material in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial waste water effluents, dissolved materials in irrigation return flows, or other common water pollutants.

(31) **Solid Waste Collection.** The gathering of solid waste from public or private places.

(32) **Solid Waste Management System.** A total system for the storage, collection, transportation, intermediate and final disposal of solid waste.

(33) **Solid Waste Storage.** The holding of solid waste near the point of generation.

(34) **Solid Waste Transportation.** The conveying of solid waste from one place to another, by means of vehicle, rail car, water vessel, conveyor or other means.

(35) **Transfer Station.** A facility in which solid waste from collection vehicles is concentrated for subsequent transport. A transfer station may be fixed or mobile.

(36) **Underground Water.** The water contained below the surface of the earth in the saturated zone including, without limitation, all waters whether

under confined, unconfined or perched conditions in near surface unconsolidated sediment or regolith, or in rock formations deeper underground. The term ground water shall be synonymous with underground water. Refer to Minnesota Pollution Control Agency Regulation WPC 22.

(37) Water Monitoring System. A system of wells, lysimeters, or other mechanisms used to obtain representative samples of both underground water and surface water where required in the vicinity of a land disposal site.

(38) Water Table. The surface of the ground water at which the pressure is atmospheric. Generally this is the top of the saturated zone. Refer to Minnesota Pollution Control Agency Regulation WPC 22.

(39) Wetland. A natural marsh where water stands near, at or above the soil surface during a significant portion of most years, and which is eligible for classification as an inland fresh water wetland type 3, 4 or 5 under U. S. Department of Interior classifications.

(40) Working Face. That portion of the land disposal site where waste is discharged and is spread and compacted prior to the placement of cover material.

GENERAL CONDITIONS

All solid waste shall be stored, collected, transferred, transported, utilized, processed and disposed of, or reclaimed in a manner consistent with requirements of these regulations. The Agency is responsible for enforcement of these regulations and encourages cooperation of municipalities which may adopt these regulations for use in local laws, ordinances or regulations.

SEVERABILITY

If any provision of any regulation or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions or application of any other part of such regulation or any other regulation which can be given effect without the invalid provision of application, and to this end the provisions of all regulations and the various applications thereof are declared to be severable.

VARIANCES

Where upon written application of the responsible person or persons the Agency finds that by reason of exceptional circumstances strict conformity with any provisions of the regulations contained herein would cause undue hardship, would be unreasonable, impractical, or not feasible under the circumstances, the Agency may permit a variance from these regulations upon such conditions and within such time limitations as it may prescribe for prevention, control or abatement of air, land or water pollution in harmony with the intent of the State and any applicable Federal laws.

Filed with Secretary of State and Commissioner of Administration September 26, 1973.

SW 2 Solid Waste Storage

(1) The owner and occupant of any premises, business establishment, or industry shall be responsible for the satisfactory storage of all solid waste accumulated at that premise, business establishment or industry.

(2) Garbage and similar putrescible waste shall be stored in:

(a) Durable, rust resistant, nonabsorbent, watertight, rodent proof, and easily cleanable containers, with close fitting, fly-tight covers and having adequate handles or bails to facilitate handling, or;

(b) Other types of containers acceptable to the municipality and conforming to the intent of this regulation.

(c) The size and allowable weight of the containers may be determined by the refuse collection service subject to requirements of the municipality.

(3) Refuse shall be stored in durable containers or as otherwise provided in this regulation. Where garbage and similar putrescible wastes are stored in combination with nonputrescible refuse, containers for the storage of the mixture shall meet the requirements for garbage containers.

Paragraph (4) is repealed.

(5) All containers for the storage of solid waste shall be maintained in such a manner as to prevent the creation of a nuisance or menace to public health. Containers that are broken or otherwise fail to meet requirements of this regulation shall be replaced with acceptable containers.

(6) Solid waste objects or materials too large or otherwise unsuitable for storage containers shall be stored in a pollution and nuisance free manner and in compliance with the regulations of federal, state and local governments, and their regulatory agencies.

Filed January 12, 1970.

SW 3 Collection and Transportation of Solid Waste

(1) The owner and occupant of any premises, business establishment or industry and/or the refuse collection service shall be responsible for the satisfactory collection and transportation of all solid waste accumulated at a premise, business establishment or industry to a solid waste disposal site or facility, for which a permit has been issued by the Agency unless otherwise provided in these regulations.

(2) Vehicles or containers used for the collection and transportation of garbage and similar putrescible wastes, or refuse containing such materials, shall be covered, leakproof, durable and of easily cleanable construction. These shall be cleaned to prevent nuisances, pollution or insect breeding, and shall be maintained in good repair.

(3) Vehicles or containers used for the collection and transportation of any solid waste shall be loaded and moved in such a manner that the contents will not fall, leak or spill therefrom, and shall be covered when necessary to prevent blowing of material. Where spillage does occur, the material shall be picked up immediately by the collector or transporter and returned to the vehicle or container and the area properly cleaned.

Paragraph (4) is repealed.

Filed January 12, 1970.

SW 4 Intermediate and Final Disposal of Solid Waste.

Open burning is prohibited at all intermediate and final solid waste disposal sites, except as shall be allowed by any regulations of the Agency now or hereafter adopted.

Solid waste shall not be deposited at any intermediate or final solid waste disposal site in such a manner that material or leachings therefrom may cause pollution of ground or surface waters.

A person shall make an intermediate or final disposal of any solid waste, only at a site or facility for which a permit has been issued by the Agency unless otherwise provided by these regulations. Permits shall not be required for sites used for the disposal of solid waste from only a single family or household, a member of which is the owner, occupant or lessee of the property, under these regulations, but these shall be operated and maintained in a nuisance-free, pollution-free and aesthetic manner consistent with the intent of these regulations.

SW 5 Plan Approval and Permit Issuance, Denial and Revocation

It shall be unlawful for any person to establish, maintain, conduct or operate an intermediate or final solid waste disposal site or facility except as provided in these regulations without first obtaining a permit from the Agency.

(1) Although a permit shall be granted the same shall become effective only if the location of the site or facility shall conform to all applicable federal, state and local laws, ordinances and regulations.

(2) Each permit application shall be accompanied by plans as described in these regulations and a plan of operation indicating procedures which will be followed to fulfill requirements of these regulations.

(3) Plans and specifications shall be approved and a permit issued when the Director of the Agency believes that they are in accordance with the requirements as set forth in these regulations.

(4) Denial of Permit. When a permit is denied, applicant shall be notified in writing of the reasons therefor. A denial shall be without prejudice to the applicant's right to an appearance before the Agency or for filing a further application after revisions are made to meet objections specified as reasons for the denial.

(5) Revocation of Permit. Permits may be revoked for violation of these regulations.

Filed January 12, 1970

SW 6 Sanitary Landfill

The sanitary landfill method shall be used for all final disposal of solid waste.

(1) The fill and trench areas of sanitary landfill sites are prohibited within the following areas, as existing at the time of receipt of the permit application by the Agency:

(a) 1,000 feet from the normal high water mark of a lake, pond or flowage.

(b) 300 feet from a stream.

(c) A regional flood plain (100 year flood).

(d) Wetlands.

(e) Within 1,000 feet of the nearest edge of the right-of-way of any state, federal or interstate highway or of the boundary of a public park or of an occupied dwelling. Permission may be granted under this subsection, without these distance requirements, at the discretion of the Director, taking into consideration such factors as noise, dust, litter and other aesthetic and environmental considerations.

(f) Locations considered hazardous because of the proximity of airports.

(g) An area which is unsuitable because of reasons of topography, geology, hydrology or soils.

(2) Any person who maintains or operates a sanitary landfill site or permits the use of property for such, shall maintain and operate the site in conformance with the following practices unless otherwise allowed by the Agency in issuing the required permit:

(a) Open burning shall be prohibited.

(b) Solid waste shall not be deposited in such a manner that material or leachings therefrom may cause pollution of underground or surface water.

Proposed separation between the lowest portion of the landfill and the high water table elevation shall be a minimum of five feet. This requirement shall not be construed to render inoperative any other requirements specified herein and additional ground water protection shall be provided if needed.

(c) Dumping of solid waste shall be confined to as small an area as practicable and with appropriate facilities to confine possible wind-blown material within the area. At the conclusion of each day of operation, all wind-blown material resulting from the operation shall be collected and returned to the area by the owner or operator.

(d)(i) Solid waste shall be compacted as densely as practicable and covered after each day of operation, or as specified by the Director, with a compacted layer of at least six inches of suitable cover material. All previously filled areas shall be maintained with at least six inches of suitable cover material.

(ii) If refuse cells will be exposed to the elements for a period of 120 days or longer, an intermediate cover totalling at least twelve inches of compacted, suitable cover material shall be provided and maintained.

(iii) There shall be an available supply of suitable cover material, which, if necessary, shall be stockpiled and protected for winter operation.

(iv) The sanitary landfill shall be constructed and cover material graded so as to promote surface water runoff without excessive erosion.

(e) Surface water drainage shall be diverted around and away from the landfill operating area.

(f) A minimum separating distance of 20 feet, or greater as specified by the Director, shall be maintained between the disposal operation and the adjacent property line.

(g) Effective means shall be taken if necessary to control flies, rodents and other insects or vermin.

(h) The approach road to the disposal site and the access road on the site shall be of all-weather construction and maintained in good condition so that they will be passable at all times for any vehicle using the site.

(i) Adequate dust control on the site shall be provided.

(j) Equipment shall be available for adequate operation of the site. The equipment shall be provided with adequate safety devices and adequate noise control devices.

(k) Equipment shall be provided and kept at the site during the hours of operation to control accidental fires and arrangements made with the local fire protection agency to immediately acquire their services when needed.

(l) Adequate communication facilities shall be provided for emergency purposes.

(m) Sanitary facilities and shelter shall be available for site personnel.

(n) Scavenging shall be prohibited to avoid injury and prevent interference with operations.

(o) The site shall be adequately screened by existing or provided means.

(p) There shall be qualified personnel for general direction and operation of the site on duty at all times while it is open for public use.

(q) Access to the site shall be controlled. A gate shall be provided at the entrance to the site and kept locked when an attendant is not on duty.

(r) A permanent sign, identifying the operation and showing the permit number of the site, and indicating the hours and days the site is open for public use, rates, the penalty for nonconforming dumping, and other pertinent information, shall be posted at the site entrance.

(s) A water monitoring program shall be constructed and operated to

determine whether or not solid waste or leachate therefrom is causing pollution of underground or surface water. The drilling and construction of all site wells, including those used for monitoring purposes, shall be done in compliance with Minnesota Statutes 1973, Chapter 747.

The conditions of monitoring, including the frequency and the analysis of water monitoring samples, shall be determined by the Director and may be changed at his discretion.

(t) Approved leachate collection and treatment systems shall be used where required to protect underground and surface water.

(u) Decomposition gases shall not be allowed to migrate laterally from the sanitary landfill. They shall be vented into the atmosphere directly through the cover material, or into cut-off trenches, or into the atmosphere by forced ventilation, or by other means approved by the Director so that explosive concentrations are prevented.

(v) The following shall not be acceptable for deposit in sanitary landfills except in amounts normal in household waste:

(i) Liquids

(ii) Any of the following: digested sewage sludges, lime sludges, grit chamber cleanings, bar screenings and other sludges, unless approved by the Director. Approval will be based on consideration of such factors as chemical composition, free moisture content and workability.

(iii) In no case will special infectious waste, raw sewage sludge, raw animal manure or septic tank pumpings be acceptable.

(iv) Other substances that may be deemed unacceptable by the Agency.

Paragraph (2)(w) is repealed.

(x) Dead animals shall be transported and disposed of in accordance with Minnesota Statutes 1971, Chapter 35. When received at a sanitary landfill, household pet animal carcasses should be buried along with other refuse. Larger animal carcasses may be buried in the fill and trench area under other refuse, but the carcass itself must first be completely covered separately with at least twelve inches of earth material. Animal carcasses may be buried in a separate area of the landfill site at a depth of at least three feet.

(y) When disposed of at a sanitary landfill, certain demolition and construction type wastes may be disposed of in a separate area, as specified by the Director.

(z) The permittee shall properly complete the Agency operational report form and submit it monthly to the Agency, whether or not the permitted landfill is yet constructed or whether or not it is in operation.

(aa)(i) Within one month after final termination of a site, or a major part thereof, the area shall be covered with at least two feet of compacted earth material, graded to a minimum 2 percent slope to promote surface water runoff without excessive erosion.

(ii) The finished surface of the filled area shall be covered and maintained with adequate top soil and seeded to provide suitable vegetation immediately upon completion, or immediately in the spring on areas terminated

during winter conditions. If necessary, seeded slopes shall be covered with straw or similar material to prevent erosion.

(iii) Prior to completion of a sanitary landfill site, the Agency shall be notified in order that a site investigation may be conducted by the Agency staff before earth moving equipment is removed from the property.

(iv) After completion of a sanitary landfill site, a detailed description, including a plat, shall be recorded with the county register of deeds. The description shall include general types and location of wastes, depth of fill, and other information of interest to future land owners.

(v) If the completed site is to be cultivated, the integrity of the finished surface shall not be disturbed by agricultural cultivation activities. If cultivated, a sufficient depth of cover material to allow cultivation and to support vegetation shall be maintained.

(3) Plans, including a permit application, report and drawings shall be prepared by a registered engineer of Minnesota. Three complete sets of the plans shall be submitted to the Agency. The submitted plans shall include the following:

(a) A completed permit application form.

(b) An engineering report including:

(i) General information.

(ii) Site analysis including consideration of each item in SW 6 (1) along with data and supplementary reports, including soil boring data and a hydrogeologic study. Attention to this requirement must include consideration of surface features, underground formations, soil boring data from soil borings of which at least one is to a minimum depth of 50 feet below proposed excavation and lowest elevation of the site, water table profile, direction of underground water flow, initial quality of water resources in the potential zone of influence of the landfill, use of water resources in the potential zone of influence of the landfill, need and availability of cover material, and existing refuse deposits. Also considered shall be climate, average rates of precipitation based on average monthly rates from records of rain gauge stations, evapotranspiration, runoff and infiltration.

(iii) Proposed operating procedures including consideration of each item in SW 6 (2).

(iv) Equipment to be used for operation of the site.

(c) Drawings, folded to 8½ by 11 inch size, including:

(i) An Existing Conditions Plan of the area showing land use and zoning within ¼ mile of the proposed solid waste disposal site. The plan shall show all buildings, lakes, ponds, watercourses, wetlands, sinkholes, rock outcroppings, roads, public parks and other applicable details and shall indicate the general topography with contours and drainage patterns. An on-site bench mark shall be indicated and a north arrow drawn. A location insert map and a U.S.G.S. topographic map of the area shall be included. The scale of the existing conditions plan shall not be greater than 300 feet per inch.

(ii) A Development Plan of the site and immediately adjacent area showing dimensions, contours, at contour intervals of two feet or less, soil boring locations with surface elevations and present and planned pertinent features, including but not limited to roads, screening, buffer zone, fencing, gate, shelter and equipment buildings, surface water diversion and drainage, and water monitoring system. The development plan shall show progressive development of trench and/or area fills and any phase construction. The scale of the development plan shall not be greater than 200 feet per inch.

The development plan shall include consideration of the ultimate land use, for example, pre-planned building islands, not to be used for landfilling or refuse.

(iii) Cross Sections Plan including a minimum of two cross sections of each phase, perpendicular to one another, showing existing grade, excavation grade, final grade, any additional ground water protection, high water table profile and profile of a separation line five feet above, profile and identity of soils and profile and identity of bedrock.

(iv) An Ultimate Land Use Plan showing the land use after the site is completed, final contours, at contour intervals of two feet or less, and surface water drainage. Consideration shall be given in the design of an ultimate land use plan to gas control, erosion and differential settlements. The scale of the ultimate land use plan shall not be greater than 200 feet per inch.

(4) A sanitary landfill shall not be opened or placed into operation until:

(a) An Agency permit has been issued.

(b) A construction certification has been approved by the Director. The certification, signed by the project engineer, shall certify, with any exceptions listed, that the construction has been completed in accordance with the plans and Agency permit. It shall be certified that an Agency-approved water monitoring system is functional and includes an analysis of initial water monitoring samples.

If any construction has been scheduled in the plans for phase development subsequent to the initial operation, then a similar certification shall be approved for each phase before it shall be operated.

(c) The site is consistent with the county solid waste management system plan.

(5) These regulations shall be effective as to the construction of permitted sanitary landfills when the permit applications and final plans are received after the date these regulations are filed with the Commissioner of Administration; provided, however, the Agency reserves the right to require compliance with any provision of these regulations in order to abate pollution.

Filed with Secretary of State and Commissioner of Administration September 26, 1973

SW 7 Incineration

This regulation applies only to existing and new incinerators having a capacity greater than 6,000 pounds per hour: All incinerators shall be designed and operated in a manner to conform to emission limitations of Regulation APC 7 and other Air Pollution Control Regulations of the Agency now or hereafter adopted. All incinerators shall have adequate disposal of liquid wastes. Any discharge to surface or ground waters of the state must meet the Agency's regulations of water quality or effluent standards now or hereafter adopted. Residue from all incinerators must be disposed of in conformance with these regulations.

(1) It is unlawful for any person to install a new incinerator or install or alter any incinerator appurtenances, except for routine maintenance, without first having been issued a permit by the Agency.

(2) When a permit is desired, the following details shall be submitted to the Agency for review:

(a) A minimum of three sets of plans and specifications, folded to 8½ inch by 11 inch size, prepared by a registered engineer of Minnesota, clearly indicating the construction which will be undertaken. These details shall include a plot plan showing land use, zoning, and the location, type and height of all buildings within 500 feet of the proposed installation.

(b) An engineering report including furnace design criteria and expected performance data, the present, and future population and area to be served by the incinerator, and the characteristics, quantities and sources of solid waste to be incinerated.

(c) Plans for the disposal of incinerator residue, and emergency disposal of solid waste in the event of major incinerator plant breakdown.

(d) Information relating to Regulation SW 5.

(e) Owner of the site and/or plant.

(f) Persons responsible for actual operation and maintenance of the plant and intended operating procedures.

(g) Such additional data and information as may be requested by the Agency.

(3) The incinerator operation for each proposed installation shall be considered for approval on its own merits, shall be in compliance with the following criteria, and in accordance with accepted engineering practices.

(a) The incinerator plant shall be so situated, equipped, operated, and maintained as to minimize interference with other activities in the area.

(b) Shelter and sanitary facilities shall be available for plant personnel.

(c) A permanent sign shall be posted at the site entrance identifying the operation and showing the permit number of the plant, and indicating the hours and days when the plant is open for public use. Access to the plant shall be limited to those times when authorized personnel are on duty.

(d) All incoming solid waste to be incinerated at the plant shall be confined to the unloading area. Adequate holding bin capacity shall be provided.

(e) Facilities shall be designed to provide for dust control in the unloading and charging areas.

(f) The incinerator plant shall have weighing facilities available. The agency may require that permanent records be maintained for inspection as to the total weight of material incinerated, the total quantity of resulting residue and total hours of plant operation.

(g) Fire-fighting equipment, meeting the standards of Underwriters Laboratory, Inc., or other approved nationally recognized safety standards, shall be available in the storage and charging areas and elsewhere as needed.

(h) Arrangements shall be made with the local fire protection agency to provide fire-fighting forces in an emergency.

(i) Adequate communication facilities shall be provided for emergency purposes.

(j) Equipment shall be provided in the storage and charging areas and elsewhere as needed to allow cleaning after each day of operation or as may be required in order to maintain the plant in a sanitary condition.

(k) The charging openings as well as all equipment throughout the plant shall be provided with safety equipment.

(l) During normal operation, the temperature in the combustion chambers shall conform to Regulation APC 7 and other Air Pollution Control Regulations of the Agency now or hereafter adopted, to produce a satisfactory residue and to result in an odor-free operation.

(m) A continuously recording pyrometer shall be provided in order to maintain continuous records of temperature in the combustion chambers. A copy of such records shall be available for the Agency upon request.

(n) All residue removed from the incinerator plant shall be promptly disposed of at an approved site, and in a manner that will prevent nuisances, pollution and public health hazards. Residue containing combustible material shall be disposed of in a sanitary landfill in conformance with Regulation SW 6.

(o) Upon completion of the plant and prior to initial operation, the Agency shall be notified to allow personnel of the Agency to inspect the plant both prior to and during the performance tests.

(p) Performance tests of the plant may be required by the Agency. A report covering the results of the performance tests in such case shall be prepared by the design engineer of the project and submitted to the agency with the copy of all supporting data.

(4) Existing incinerators which do not meet the above criteria shall be reconstructed in order to meet the foregoing standards as specified in Regulation SW 10.

(5) Reports describing the total weight of material incinerated, the total quantity of resulting residue and residue disposition, and the total hours of plant operation shall be submitted to the Agency every month, together with other information on the operation of the incinerator.

Filed January 12, 1970

SW 8 Composting

(1) It is unlawful for any person to install or alter any composting operation without first having been issued a permit by the Agency. (See also SW 4)

(2) When a permit is desired, the following details shall be submitted to the Agency for review, prepared by a registered engineer of Minnesota.

(a) A minimum of three sets of plans and specifications, folded to 8½ inch by 11 inch size, clearly indicating the layout and construction which will be undertaken.

(b) A minimum of three sets of maps or aerial photographs indicating land use and zoning within ¼ mile of the facility. The map or aerial photograph shall be of adequate scale to show all homes, buildings, lakes, ponds, watercourses, wetlands, dry runs, rock outcroppings, roads and other applicable details and shall indicate the general topography with contours and drainage patterns. Wells and soil boring locations should be identified on the map or aerial photograph.

(c) Details relating to geological formations of the property whereon the proposed installation is to be located. Such details shall be determined by soil borings or other appropriate means to a depth of at least ten feet. The high water table should be included.

(d) An engineering report outlining the proposed method of operation, the quantity and source of material to be processed, the proposed use and distribution of the processed material, and related details.

(e) Information relating to Regulation SW 5.

(f) Owner of the site and/or p. ant.

(g) Persons responsible for actual operation and maintenance of the plant.

(h) Additional data or information may be required by the Agency.

(3) The operation shall be conducted in a manner which minimizes pollution, public health hazards and nuisances.

(4) Materials resulting from composting or similar processes and offered for sale shall contain no pathogenic organisms, shall not reheat upon standing, shall be innocuous, and shall contain no sharp particles which would cause injury to persons handling the compost.

(5) By-products removed during processing shall be handled in a pollution and nuisance free manner and shall be disposed of as provided in these regulations.

(6) Reports describing the types and amounts of waste composted, the amount of compost produced, and the amounts of by-products removed and the disposition of the by-products shall be submitted to the Agency every month together with other information on the operation of the compost plant.

Filed January 12, 1970

SW 9 Other Methods of Solid Waste Handling, Processing and Disposal

Before a site or facility for any method of solid waste handling, processing and disposal, including transfer stations, not otherwise provided for in these regulations is practiced or placed into operation, three sets of complete plans, specifications, design data, ultimate land use plan and proposed operating procedures shall be submitted to the Agency for review and permit issuance. All such information shall be prepared and submitted by a registered professional engineer of Minnesota.

Filed January 12, 1970

SW 10 Nonconforming Sites and Facilities

Modification of existing sites and facilities, and of operating procedures to conform to the requirements of these regulations shall be accomplished. When the degree of necessary improvement is of such extent that immediate compliance cannot be accomplished, special consideration may be given by the Agency. In such event, the owner of the nonconforming site or facility shall, not later than six months after the effective date of these regulations, submit to the Agency a report setting forth a program and plan for compliance with these regulations. Included with this report shall be a time schedule for submission of plans and specifications and a time schedule requiring commencement and completion of construction of necessary operations or improvements. In any event such construction shall be completed by not later than July 1, 1972.

Filed January 12, 1970

6 MCAR § 4.6011 Exemptions for solid waste disposal facilities located in sparsely populated areas and county solid waste management plans.

A. The agency shall issue permits for the operation of land disposal sites located in sparsely populated areas. These permits shall be entitled "Modified Landfill Permits" and shall be issued to proposed land disposal sites provided:

1. The proposed land disposal site will be utilized by a year-round, permanent residential population of less than 2,500.

2. No prudent and feasible alternative to the proposed modified landfill exists as demonstrated by an economic and environmental analysis of at least the following alternatives:

- a. Canister systems;
- b. Transfer stations;
- c. Use of an existing permitted solid waste facility.

3. No material adverse economic and environmental impact on existing solid waste disposal systems currently operating under agency permits will be caused by the operation of the proposed modified landfill.

4. The proposed modified landfill will not cause pollution, impairment or destruction of the environment as defined in Minn. Stat. ch. 116B (1978).

5. The proposed modified landfill will not accept any hazardous waste as defined in 6 MCAR § 4.9002.

In order to show the existence of the above criteria, the applicant may provide the agency with information relating to: seasonal fluctuations in population; large areas of publicly-owned lands; circuitous transportation routes; topography, soils or geologic conditions; adverse climatic conditions; economics; waste types; waste quantities; and, energy considerations.

B. Locational and operational requirements for modified sanitary landfills shall comply with Minn. Rules SW 6 (1) and (2) (6 MCAR § 4.6006 A. and B.) with the following exceptions:

1. Minn. Rule SW 6 (2) (a) (6 MCAR § 4.6006 B. 1.) shall not apply, rather, open burning of certain materials shall be allowed in accordance with Minn. Rule APC 8 provided the burning is done in a separate, controlled access area at least 200 feet from any fill area and permits are obtained.

2. Minn. Rule SW 6 (2) (C) (6 MCAR § 4.6006 B. 3.) shall not apply, rather, dumping of solid waste shall be confined to as small an area as practicable and with appropriate facilities to confine windblown material within the area. All windblown material resulting from the operation shall be collected and returned to the site by the owner or operator as necessary to prevent nuisance conditions.

3. Minn. Rule SW 6 (2) (d) (i) (6 MCAR § 4.6006 B. 4. a.) as it relates to the time of covering and compaction shall not apply, rather, covering and compaction of waste material shall take place on a weekly basis from May 1 to November 30 of each year and on a monthly basis from December 1 to April 30 of each year or in accordance with a less stringent cover and compaction plan approved by the agency. Agency approval shall be given for a less stringent cover and compaction plan upon a showing that such a plan will not cause pollution, impairment or destruction of a protectable natural resource or that there exists no prudent and feasible alternative in accordance with Minn. Stat. 116B (1978).

4. Minn. Rule SW 6 (2) (k) (6 MCAR § 4.6006 B. 11.) shall not apply, rather, equipment shall be available for adequate operation and fire protection of the site but does not have to be maintained at the site.

5. Minn. Rule SW 6 (2) (m), (t), (u), and (w) (6 MCAR § 4.6006 B. 13., 20., 21., and 23.) shall not apply to the operation of modified sanitary landfills permitted in accordance with this rule.

6. Minn. Rule SW 6 (2) (z) (6 MCAR § 4.6006 B. 26.) shall not apply, rather, the permittee shall properly complete the agency's operational report forms and submit them quarterly.

C. Permit applications for the operation of modified landfills shall comply with Minn. Rule SW 6 (3) (6 MCAR § 4.6006 C.) with the following exceptions:

1. The permit application requirements in Minn. Rule SW 6 (3) (b) (ii) (6 MCAR § 4.6006 C. 2. b.) shall not be required, however, a site analysis shall be submitted with the permit application and shall include surface features, underground formations, soil boring data, water table profile, direction of underground water flow, need and availability of cover material, and existing refuse deposits.

2. The permit application requirements in Minn. Rule SW 6 (3) (c) (ii) (6 MCAR § 4.6006 C. 3. b.) shall apply in total except those requirements relating to contour intervals of two feet or less and hazardous waste storage areas which shall not be required, rather, contour intervals sufficient to show drainage shall be provided by the applicant.

3. The permit application requirements in Minn. Rule SW 6 (3) (c) (iv) (6 MCAR § 4.6006 C. 3. d.) relating to an ultimate land-use plan shall not be required.

D. A modified landfill shall not be placed in operation until compliance with the provisions of Minn. Rule SW 6 (4) (6 MCAR § 4.6006 D.).

E. On or before July 1, 1971, each county shall submit to the agency a workable preliminary plan for a solid waste management system within such county. On or before July 1, 1972, each county shall submit for the approval

of the agency a workable final plan for a solid waste management system within such county. The plan shall be amended from time to time as changing conditions occur, by filing revisions for the approval of the agency. Such plans and revisions shall be adopted by the Board of Commissioners of the county prior to filing with the agency.

Each county shall provide for a solid waste management system plan to serve all persons within the county. Two or more counties may elect to submit a joint plan.

F. Public hearings. Any person may request a public hearing on any matter relating to the administration of this rule in accordance with 6 MCAR § 4.3009. If the agency denies a county plan or a revision to a county plan submitted in accordance with Minn. Rule SW 11 E (6 MCAR § 4.6011 E.), the agency shall grant a public hearing when requested to do so by a resolution duly and properly passed by a majority of the county board whose plan or revision was denied.

G. Severability. If any provision of this rule or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions of this rule or application of any other part of this rule which can be given effect without application of the invalid provision. To this end the provisions of all sections, subsections and subdivisions thereof are declared to be severable.

H. Variance from rules. Any person may apply for a variance from any requirements of this rule. Such variances shall be applied for and acted upon by the agency in accordance with Minn. Stat. § 116.07 subd. 5 (1978) and other applicable statutes and rules.

Sw 12 Solid Waste Land Disposal Site Abandonment

This regulation applies to all land disposal sites, including abandoned dumps.

The person or persons (as defined in SW 1) having the responsibility for the operation of the site must accomplish the closure of the site.

The closure of the site shall include the following procedures:

(1) Designate a substitute site or facility which has been approved by the Agency and notify the media and the general public of the closing and of the substitute site.

(2) Close access to the site and prohibit refuse disposal.

(3) Stop any burning.

(4) Eradicate rodents.

(5) Provide measures to protect underground and surface water.

(6) Divert surface water drainage around and away from the disposal area.

(7) Compact refuse and cover with a minimum of two feet of compacted earth material.

(8) Establish and maintain final grade to promote surface water runoff without excessive erosion. Seed to provide suitable vegetation.

(9) Record a detailed description, including a plat, with the county register of deeds. The description shall include general types and location of wastes, depth of fill, and other information of interest to potential land owners.

(10) An authorized official shall properly complete the disposal site closure record and submit it to the Agency.

*Filed with Secretary of State and Commissioner of Administration
September 26, 1973*

**MINNESOTA POLLUTION CONTROL AGENCY
DIVISION OF SOLID WASTE**

**Regulations for the Disposal and Reuse of Abandoned
Motor Vehicles and Other Scrap Metal
March 3, 1972**

SW 75 Applicability and General Conditions, Definitions, and Severability.

(a) **Applicability and General Conditions.** These regulations pertain to the disposal and reuse of abandoned motor vehicles and other scrap metal for the protection of the environment, pursuant to Minnesota Statutes, Chapters 115, 116, 168B and 400, as amended. All abandoned motor vehicles and other scrap metal shall be collected, reduced, transported and processed in a manner consistent with these regulations and all other applicable state and federal laws and regulations not inconsistent with these regulations.

(b) **Definitions.**

(1) **Abandoned Motor Vehicle.** Abandoned motor vehicle means a motor vehicle, as defined in Minnesota Statutes, 169.01, that; (i) has remained for a period of more than 48 hours on public property illegally; (ii) has remained for a period of more than 48 hours on public property and is lacking vital component parts such that it is in an inoperable condition; (iii) has remained for a period of more than 48 hours on private property without the consent of the person in control of such property; (iv) has remained for a period of more than 48 hours on private property, with or without the consent of the person in control of such property, which is in an inoperable condition such that it has no substantial potential further use consistent with its usual functions, unless it is kept in an enclosed garage or storage building; (v) has been voluntarily surrendered by its owner to a unit of government or a person duly licensed pursuant to Minnesota Statutes, 168B.10 and these regulations. A classic car or pioneer car, as defined in Minnesota Statutes, 168.10 shall not be considered an abandoned motor vehicle within the meaning of these regulations.

(2) **Agency.** Agency means the Minnesota Pollution Control Agency, its agents or representatives.

(3) **Collection.** Collection means the gathering or consolidating of abandoned motor vehicles and other scrap metal at regional collection sites.

(4) **Collector.** Collectors means a person holding a valid license from the Agency to engage in the collection of abandoned motor vehicles and other scrap metal.

(5) **Disposal Contract.** Disposal contract means a contract entered into between a unit of government or the agency acting on its behalf and a site operator, disposer, or other qualified person for the purpose of storage, collection, transportation, reduction, scrap processing or other services necessary to prepare abandoned motor vehicles and other scrap metal for recycling or other methods of disposal.

(6) **Disposer.** Disposer means a person licensed by the Agency as a collector, transporter, reducer or scrap processor.

(7) **Other Scrap Metal.** Other scrap metal means scrap metal, other than abandoned motor vehicles, including, but not limited to, discarded metal in the form of machinery, appliances and motor vehicle parts.

(8) **Reducer.** Reducer means a person holding a valid license from the Agency to engage in the reduction of abandoned motor vehicles and other scrap metal.

(9) **Reduction.** Reduction means the decrease or diminishment in bulk or mass of abandoned motor vehicles or other scrap metal by methods approved by the Agency, including, but not limited to, incineration, crushing, shearing, or baling.

(10) **Regional Collection Site.** Regional collection site means a location designated by a unit of government with Agency approval where abandoned motor vehicles and other scrap metal can be consolidated and stored.

(11) **Scrap Processing.** Scrap processing means converting of abandoned motor vehicles and other scrap metal to a form usable in the manufacture of new metal products.

(12) **Scrap Processor.** Scrap processor means a person holding a valid license from the Agency to engage in processing scrap from abandoned vehicles and other scrap metal.

(13) **Site Operator.** Site operator means the operator of a regional collection site, whether the operation be a unit of government or a person under contract with a unit of government to operate the site.

(14) **Storage.** Storage means the holding of abandoned motor vehicles and other scrap metal in regional collection sites.

(15) **Storage Costs.** Storage costs means costs of acquisition, rental, construction maintenance and operation of regional collection sites and facilities.

(16) **Transporter.** Transporter means a person holding a license from the Agency to engage in transporting abandoned vehicles and other scrap metal.

(17) **Unit of Government.** Unit of government means a state department or agency, special purpose district, county, city, village, borough, town or other municipality.

(18) **Vital Component Parts.** Vital component parts means those parts of a motor vehicle that are essential to the mechanical functioning of the vehicle, including, but not limited to, the motor, drive train, and wheels.

(c) **Severability.** If any provision of any regulation or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions or application of any other part of such regulations which can be given effect without application of the invalid provision. To this end the provisions of all regulations and the various applications thereof are declared to be severable.

SW 76 Regional Collection Sites.

(a) All units of government may maintain or contract for the maintenance of one or more regional collection sites. Such regional collection sites shall satisfy the requirements specified herein.

(b) Regional collection sites shall be those sites designated as such by one or more counties, separately or in cooperation with another county or counties, and approved by the Agency. Where feasible, they should be located at or near locations where accumulations or motor vehicle hulks are already present and where haul distances needed to accumulate an adequate number of hulks are minimized.

(c) Regional collection sites must be of size and location which will permit access by large heavy transport vehicles by means of all weather roads.

(d) Regional collection sites shall be open to any person desiring to dispose of an abandoned motor vehicle or vehicles or other scrap metal therein, and such person may voluntarily surrender the vehicle, vehicles or other scrap metal by depositing the same at a regional collection site and either transferring any applicable certificate of title to the site operator, or executing a release of any interest in the vehicle or scrap metal to the site operator upon a form approved by the Agency. Each site operator shall publicize, within the area served by the site, the existence and location of the site, its hours of operation, and its availability for disposition of abandoned motor vehicles and other scrap metal.

(e) There shall be a site operator for every regional collection site. The site operator shall have responsibility for the operation, maintenance and administration of the site.

SW 77 Collection and Sale.

(a) All abandoned motor vehicles taken into custody shall be deposited at the nearest regional collection site. If the vehicle is not reclaimed by the owner or lienholder, it shall be sold to the highest bidder at public auction or sale, following at least 15 days notice by the site operator. Such notice shall be published, shall be given in writing to any person whom the operator knows or has reason to believe may be the owner or lienholder, and shall be given in writing to the those persons holding valid licenses from the Agency as reducers or transporters.

(b) All abandoned motor vehicles and other scrap metal to be sold at an auction shall be sold subject to a package bid.

(c) The site operator shall require as a condition of the sale that the purchaser shall: (i) remove all abandoned motor vehicles and other scrap metal from the regional collection site; (ii) dispose of the abandoned motor vehicles and other scrap metal in a manner approved by the Agency; (iii) police the grounds; and (iv) dispose of all solid waste, such as tires, seats, and similar materials, in a solid waste disposal facility approved by the Agency.

SW 78 Reimbursable Contracts.

(a) The Agency will reimburse any unit of government for a percentage of costs incurred under a disposal contract approved by the Agency. The

percentage of reimbursement shall be established annually by the Agency. Agency approval, subject to annual review, will be granted to disposal contracts entered into with site operators, licensed disposers, and other qualified persons, and which:

(1) appear likely to result in substantially greater amounts of abandoned motor vehicles and other scrap metal being processed in the region covered by the disposal contract in question, than have been processed without such a contract;

(2) are made after public solicitation of bids, pursuant to the laws applicable to such unit of government, as modified by Chapter 168B;

(3) are made on a form provided by the Agency; and

(4) are reasonable in price.

(b) Where the Agency has made reimbursement and the abandoned motor vehicles and other scrap metal thus collected are ultimately sold by the site operator to a disposer or other person, the proceeds thus obtained shall be deposited in the State Treasury.

(c) Every site operator shall keep books of account and records available for review by authorized representatives of the Agency, including therein such information as the Agency may reasonably request.

SW 79 Licensing and Revocation.

(a) **Collectors.** Any person may apply to be licensed as a collector by submitting an application to the Agency upon a form provided by the Agency. In the application, an applicant must demonstrate that he owns or has access to at least one tow truck and equipment having the capacity to haul two or more abandoned motor vehicles at one time. Upon issuance of a license, every collector shall conduct his operation in such a manner as to satisfy the foregoing conditions. The licensee shall also keep a record in a form prescribed by the Agency of all abandoned motor vehicles and other scrap metal collected, which record shall be subject to review by the site operator and the Agency.

(b) **Transporters and Reducers.** Any person may apply to be licensed as a transporter or reducer by submitting an application to the Agency upon a form provided by the Agency. In the application, the applicant must demonstrate: (i) that he has ready access to a market for any and all abandoned motor vehicles and other scrap metal which he may reduce; (ii) that he owns or has adequate transportation or reduction equipment; and (iii) that he will provide adequate fire-fighting equipment at each regional collection site. Upon being issued a license, every transporter or reducer shall conduct his operations in such manner as to satisfy the foregoing conditions. The licensee shall also keep a record in a form prescribed by the Agency, identifying all abandoned motor vehicles and other scrap metal transported or reduced, which record shall be subject to review by the site operator and the Agency. Unless specifically authorized in writing by the Agency, reduction of abandoned motor vehicles and other scrap metal is prohibited by open burning or incineration by means of equipment which is not subject to an Agency permit. Unless specifically authorized in writing by the Agency, no person shall possess, transport, employ or used abandoned motor vehicles

which have been reduced by means of open burning or incineration, unless the incinerator used in the reduction is subject to an Agency permit. In the event of reduction by means of incineration pursuant to an Agency permit said person shall have in his possession an affidavit from the permittee holding a permit from the Agency for such incinerator, verifying that the abandoned motor vehicles or other scrap metal in his possession were reduced in an incinerator subject to an Agency permit.

(c) **Scrap Processors.** Any person may apply to be licensed as a scrap processor by submitting an application to the Agency upon a form provided by the Agency. If the application, the applicant must demonstrate that he owns or has access to a hydraulic baler, shears, shredder or other equipment capable of converting a large volume of scrap metal to a form usable in the manufacture of new metal products. Upon issuance of a license, every scrap processor shall conduct his operation in such a manner as to satisfy the foregoing conditions. The licensee shall also keep records in a form prescribed by the Agency. Such records shall be subject to review by the site operator and the Agency. No person shall possess, process, employ or use abandoned motor vehicles which have been reduced by open burning or incineration unless the incinerator used in the reduction is subject to an Agency permit. In the event of reduction by means of incineration pursuant to an Agency permit, said person shall have in his possession an affidavit from the permittee holding a permit from the Agency for such incinerator, verifying that the abandoned motor vehicles or other scrap metal in his possession were reduced in an incinerator subject to an Agency permit.

(d) **Revocation.** Any license is subject to revocation upon five days notice by the Agency for violation of its rules or regulations, breach of contract by the licensee, conviction of a felony or gross misdemeanor, misrepresentation, or other just cause.

Filed with the Secretary of State and Commissioner of Administration March 3, 1972.

SW 80 Applicability and General Conditions, Definitions and Severability**(1) Applicability and General Conditions**

These regulations pertain to the application procedure for grants-in-aid, state requirements, approval of applications, and payments for programs or projects which will encourage both the reduction of the amount of material entering the solid waste stream and the re-use and recycling of solid waste, pursuant to Minnesota Statutes 1973 Supplement, Chapter 116F. All programs and projects shall be reviewed, approved, maintained and operated in a manner consistent with these regulations and all other applicable state and federal laws and regulations not inconsistent with these regulations.

(2) Definitions

- (a) "Agency" means the Minnesota Pollution Control Agency.
- (b) "Institution" means an incorporated private organization.
- (c) "Metropolitan Area" means the counties of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington.
- (d) "Metropolitan Council" means that body as constituted by Minnesota Statutes Ch. 473B (1971).
- (e) "Municipality" means any city, village, borough, or any designated agency thereof.
- (f) "Region" means any county, group of counties, group of municipalities, any special district, or any designated agency thereof.
- (g) "Resource Conservation Programs" means programs which encourage solid materials conservation and the reduction of environmental impact from solid waste, including, but not limited to, public education and encouragement of market demand for reusable or recyclable materials. Generally such programs are not directly linked to the ultimate construction of a particular resource recovery facility but may include the initial feasibility study.
- (h) "Resource recovery facility" means structures, machinery, or devices which, singly or in combination, are designed, constructed and operated so as to separate, process, connect, treat or prepare collected solid waste in such a manner that component materials, substances or recoverable resources may be used as a raw material or for other productive purposes.
- (i) "Resource recovery system" means any system used for the recovery of material or energy from solid waste, or for the collection, transportation, separation, sorting, processing or storage of solid materials which aids in the recovery of materials or energy from solid waste.
- (j) "Resource Recovery Projects" means projects which result in the design, installation, implementation, or operation of resource recovery systems or resource recovery facilities.

(3) Severability

If any provision of any regulation or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions or application of any other part of such regulation or any other regulation which can be given effect without the invalid provision of application, and to this end the provisions of all regulations and the various applications thereof are declared to be severable.

(4) Variances

Whereupon written application of the responsible person or persons the Agency finds that by reason of exceptional circumstances strict conformity with any provisions of the regulations contained herein would cause undue hardship, would be unreasonable, impractical or not feasible under the circumstances, the Agency may permit a variance from these regulations upon such conditions and within such time limitations as it may prescribe.

SW 81 Application Procedure for Grants-in-Aid

(1) A region, municipality, or institution shall make application for a state grant-in-aid on forms provided by the Agency.

(2) Each application shall include the following information, where applicable:

(a) Each application for a grant-in-aid by a region or municipality shall be accompanied by a resolution adopted by the region or municipality authorizing the filing of the grant-in-aid application.

(b) All applications shall be signed by the person who has been authorized to submit the application.

(c) In the event that more than one region, municipality, or institution desires to make application for a joint resource recovery project or resource conservation program, a single application for state aid shall be executed by all participating parties. Such application shall be accompanied by a joint resolution setting forth responsibilities of each of the parties.

(d) A description of the operation and maintenance of the resource recovery project after construction is completed or the system is implemented.

(e) A market analysis defining markets for saleable products, particularly those for which no purchase commitments are included in the proposal, shall be submitted with any proposal for a detailed engineering study or construction of a resource recovery facility or system.

(f) If a proposal for a detailed engineering study for a resource recovery facility or system is submitted, the application shall include proof of intentions to purchase the saleable materials.

(g) If a proposal for construction of a resource recovery system or facility is submitted, the application shall include proof of commitments to purchase the saleable materials.

(h) A description of the resource conservation program or the resource recovery project, including the following:

(i) Benefits

(ii) Major objectives

(iii) Method of obtaining major objectives

(iv) Ultimate goal

(v) Operational and management personnel's background, education and experience.

(i) If the private sector is involved in the project or program, an explanation of the commitments in terms of capital, operation and maintenance, and manpower of each private person or other entity which will have a major role in the operation of the project or program is needed.

(j) An explanation of the existence and extent of local public support for the project or program. Local support includes, but is not limited to, that from universities, citizen groups, and environmental groups.

(k) If the proposed project or program is to serve more than one institution, municipality, or region, the following information shall be included in the application:

(i) A written commitment by each participating party to dispose of a stated amount of its solid waste through the proposed system or facility.

(ii) A specific definition of the contribution to capital and operating and maintenance costs of each.

(iii) A specific definition of the operating and management roles of each.

(l) Total cost of the project or program, which includes an itemization of the following costs:

(i) Investment costs

(ii) Annual operating costs

(iii) Fixed costs

(iv) Other costs

(m) Revenue to be generated by the project or program.

(n) Such other additional information, documents, transcripts or other data which the Agency deems necessary to determine eligibility of the region, municipality, or institution.

SW 82 Criteria for Eligibility

(1) To be eligible for state assistance, a program or project shall be consistent with all Agency approved solid waste management plans of all affected counties. All projects or programs in the metropolitan area shall be consistent with the Metropolitan Council's plan for solid waste management.

(2) A high priority shall be given to applications for projects or programs designed to service more than one county or designed to service areas of the state where natural geologic conditions make sanitary landfill undesirable.

(3) The Agency shall seek those alternatives which maximize the conservation of energy and materials while minimizing the environmental impact and the cost to the people of the state.

(4) In addition to such other requirements as may be provided for by law, any project for which an application is submitted, shall comply in all respects with any local, state and federal regulations, guidelines, instructions, criteria, standards or other documents promulgated or issued by the local, state and federal governments relative to such program or project.

(5) All contract documents prepared by any region, municipality or institution relative to a program or project pursuant to these regulations shall conform to all state and local laws, ordinances, rules and regulations, and in the event of more than one party seeking state aid for such project or program, all contracts shall be executed by each of the parties involved.

(6) Funding shall not be made available to any resource recovery system or facility which accepts solid waste material which is transported to the facility primarily in motor vehicles with a load capacity of less than ten cubic yards.

(7) In addition to other considerations provided for in these regulations and other applicable laws for resource recovery projects and resource conservation programs, in reviewing grant applications the Agency shall consider the following:

- (a) The size of the service area if it is a resource recovery project.
- (b) The degree of county, multi-county or regional participation in the program or project.
- (c) The priority of the program or project in relationship to the Agency's immediate and long range goals for resource recovery in the state.
- (d) The availability of other sources of financing.
- (e) The state's share of the cost of the program or project.
- (f) The time schedule for completion.
- (g) Conformance with county and regional solid waste management plans and other applicable laws.
- (h) The statewide applicability of the program or project.
- (i) The demand placed on other public service or commercial facilities.
- (j) Benefits, objectives, methods of obtaining the objectives, and the ultimate goal.
- (k) The total cost of the project or program, and the proportion of the cost attributable to each phase of the project or program.
- (l) The revenue to be generated upon completion of the project or program.
- (m) The amount of materials or energy or both recovered from the solid waste entering the system.
- (n) The degree to which the program or project promotes solid materials conservation and reduces the environmental impact of solid waste generation.
- (o) The steps taken to assure proper, efficient and economical operation and maintenance of the resource recovery project after construction is completed or the resource recovery system is implemented.
- (p) The percentage of saleable materials for which the applicant has obtained purchase commitments if the application is for a resource recovery project. If the application is for an engineering study for a resource recovery project, the commitments shall be an intention to purchase recoverable materials of a specified quality. If the application is for construction of a

resource recovery project, the commitments shall be legally binding agreements specifying product quality and price acceptable to the purchaser. The Agency shall not approve an application unless the application has commitments to purchase at least 50% by weight or of energy, by appropriate output measure, of the saleable materials, unless the applicant can justify the failure to have such commitments.

SW 83 Administration of Grants-in-Aid

(1) The Agency shall give final approval of any resource recovery project or resource conservation program funded under provisions of these regulations.

(2) All applications for projects or programs in the metropolitan area shall be submitted to the Metropolitan Council for its review.

(3) The region, municipality, or institution which obtains a state grant under these regulations shall be paid in installments when twenty-five (25) percent, fifty (50) percent, and seventy-five (75) percent of the cost of the program or project has been completed. Additional installment payments may be authorized upon a showing of good cause by the grantee. Final payment shall be released only after final inspection by the Agency of construction, performance, or operation of the program or project or upon review of the final report as required by the grant contract.

(4) Grants-in-aid payments made by the Agency shall not exceed 50% of the total cost of the program or project funded.

(5) The Agency may assist in the planning and development of resource recovery projects and resource conservation programs funded under these regulations.

(6) The grant contract shall provide for the periodic submission of status and evaluation reports on technical, product, market, and economic aspects of the project or program. A final report shall be submitted to the Agency upon completion of the project or program.

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221
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6 MCAR S 4.6085 Rule for the administration of the Minnesota solid waste management planning assistance program.

A. Purpose. This rule implements the solid waste management planning assistance program, created and described in the Waste Management Act of 1980, Minnesota Statutes, sections 115A.42 to 155A.46, by establishing the substantive criteria and procedural conditions according to which the agency shall award solid waste management planning assistance grants.

B. Overview of procedures for applying for and receiving a grant.

1. Application for a grant. To be eligible for a grant under this rule, an applicant shall apply for a grant.

a. The procedures the applicant shall follow in applying for a grant are set out in E.

b. The information and documentation the applicant shall provide in the grant application are set out in F.

2. Award of a grant. The agency shall award the applicant a grant in accordance with the procedures and limitations set out in G., if the agency determines:

a. That the applicant, cost, and project specified in the grant application are grant eligible;

b. That the application deadlines are met; and

c. That sufficient funds are available.

The criteria the agency shall use in determining the grant eligibility of the applicant are set out in D.1.; the criteria the agency shall use in determining the grant eligibility of the costs are set out in D.2.; the criteria the agency shall use in determining the grant eligibility of the project are set out in D.3.; and the criteria the agency shall use in determining compliance with deadlines are set out in E.1., 4., 5., and G.2.

C. Definitions.

1. "Acceptable plan" means a written report prepared by a grantee to provide the planning information set out in Minnesota Statutes, section 115A.46. To be considered an acceptable plan under this rule, the written report shall:

a. Contain descriptions, estimates, or assessments of existing and proposed waste practices, including the following:

(1) A description of the existing collection, storage, transportation, processing, and disposal systems used within the political subdivision being studied by the named grantee, including schedules of rates and charges, financing

methods, environmental acceptability, and opportunities for improvements in the systems;

(2) An estimate, calculated on the basis of current and projected waste generation practices, of the land disposal capacity in acre-feet which will be needed to serve the political subdivisions being studied by the named grantee through the year 2000;

(3) An assessment of specific opportunities to reduce the need for land disposal through the use of waste reduction and resource recovery, as defined in Minnesota Statutes, section 115A.03, subdivision 27, including an assessment of:

(a) The alternative degrees of reduction achievable;

(b) The comparative costs of the alternatives, including capital and operating costs; and

(c) The effects of the alternatives on the cost to generators of the waste.

(4) A description of existing and proposed county and municipal ordinances and license and permit requirements relating to solid waste management, including a description of the existing and proposed regulations and enforcement procedures relevant to those requirements;

b. Establish a detailed siting procedure and development program to assure the orderly location, development, and financing of new or expanded solid waste facilities and services sufficient for a prospective ten year period, which procedure and program shall be consistent with all applicable rules of the agency and shall include:

(1) Estimated costs and implementation schedules;

(2) Proposed procedures for operation and maintenance;

(3) Estimated annual costs and gross revenues; and

(4) Feasible proposals for the use of facilities after they are no longer needed or useable;

c. Include an evaluation and recommendation of specific options, consistent with all applicable rules of the agency, for the resolution of conflicting, duplicative, or overlapping local management efforts, including the possible establishment of joint powers management programs or waste management districts; and

d. Establish a schedule of actions which need to be undertaken to put the procedures, programs, and resolutions

described in the plan into effect, including a statement of the appropriate entity to take each action.

2. "Agency" means the Minnesota Pollution Control Agency, as constituted pursuant to Minnesota Statutes, section 116.02, subdivision 1.

3. "Director" means the executive director and chief executive officer of the agency or a person expressly designated by the director to discharge a duty or responsibility of the director.

4. "Grant eligible" or "grant eligibility" means meeting the criteria to receive funding assistance under this rule. The fact that an item or person is "grant eligible" under this rule does not automatically assure that a grant will be awarded. A grant shall only be awarded if the grant eligibility criteria are met.

5. "Landfill" means a sanitary landfill or a modified landfill which has a valid permit issued by the agency.

6. "Metropolitan area" has the meaning given it in Minnesota Statutes, section 115A.03, subdivision 18.

7. "Population growth rate" means the rate at which population in a proposed study area either increased or decreased during the decade between 1970 and 1980. The director shall determine the population growth rate of a proposed study area by determining the difference in population in the proposed study area, as reported in the 1970 and 1980 United States Census Bureau data, dividing this difference by the 1970 population of the proposed study area and multiplying this result by 100. The growth rate will thus be expressed as a percentage.

8. "Project manager" means an employee of the grantee who is given the responsibility and the authority to direct and coordinate all aspects of the project as defined in the contractual agreement between the grantee and the agency. The project manager shall assume the responsibility for performing all contract and project management functions.

9. "Political subdivision" has the meaning given it in Minnesota Statutes, section 115A.03, subdivision 24.

10. "Regional development commission" has the meaning given it in Minnesota Statutes, section 115A.03, subdivision 26.

D. Grant eligibility criteria.

1. Eligible applicants. Except for political subdivisions located within the seven county metropolitan area, any political subdivision within the state of Minnesota is grant eligible.

2. Eligible costs.

a. The following costs are grant eligible:

(1) Salaries of staff persons, consultants, and other persons employed to develop and publish an acceptable plan;

(2) Costs associated with the drafting and execution of necessary contracts between the grantee and other units of government or qualified consultants employed to develop or publish an acceptable plan, including reasonable attorney's fees;

(3) Costs associated with holding meetings to inform the public of the development of the plan and to provide an opportunity for the public to participate in and comment on the development of the plan, including costs associated with providing notices of and recording the meeting;

(4) Costs associated with the printing and distribution of plans and draft plan materials;

(5) Costs of any travel in the state, the primary purpose of which is to attend meetings or gather information needed for the development and publication of an acceptable plan, including reimbursement for mileage consistent with state allowances;

(6) Costs of any necessary supplies required for the development and publication of an acceptable plan. The costs of any commodities, materials, capital expenditures, and equipment which could be used after the plan is completed shall not be considered supplies and are, therefore, not grant eligible under this rule; and

(7) Overhead costs.

b. The amount of the grants available under this rule is limited as follows:

(1) For planning by a regional development commission, joint planning by two or more contiguous counties, or joint planning by political subdivisions located in two or more contiguous counties:

(a) Except as provided in (5), the agency shall award grants to cover 90 percent of the eligible costs specified in the grant application or the percentage of eligible costs requested in the grant application, whichever is less; and

(b) The grantee shall assume the responsibility for the remaining costs of completing the planning efforts.

(2) For all planning efforts other than that described in (1):

(a) Except as provided in (5), the agency shall

award grants to cover 50 percent of the eligible costs specified in the grant application or the percentage of eligible costs requested in the grant application, whichever is less; and

(b) The grantee shall assume the responsibility for the remaining costs of completing the planning efforts.

(3) For (1) grants and (2) grants, the maximum amount that a grantee shall be awarded to complete the plan is 90 percent and 50 percent, respectively, of the total project cost detailed by the grantee in its application. Within these maximums, adjustments between funds awarded to cover the costs specified in 2. shall be made if the agency and the grantee determine that the adjustments will result in the development of an acceptable plan in a more efficient manner.

(4) If, while working to complete the grant, a grantee finds that more funds are needed, the grantee shall not be awarded additional funds unless the grantee makes application for an additional grant in accordance with the grant application procedures set out in E. The agency shall treat an application for an additional grant in the same manner as it treats applications for original grants, as provided in G.

(5) If available funds are not adequate to meet the funding requests of all applicants assigned to group number one under G.3.b., the agency shall reduce the state share of the eligible costs sufficiently to enable all applicants assigned to group number one to receive funding, but the size of the grant awards in (1)(a) and (2)(a) shall not be less than 60 percent and 33 percent, respectively. If available funds are not adequate under this reduced funding level to meet the funding requests of all applicants assigned to group number one under G.3.b., grants shall be awarded at the reduced amount in the order established under G.3.c.

c. Grants shall be awarded to cover the eligible costs of only those tasks which are undertaken and completed during the grant period established in the grant agreement. Grants shall not be awarded to cover any cost associated with tasks performed prior to the award of a grant or after the expiration of the grant agreement.

d. The availability of funds is a precondition to the award of any grant by the agency.

3. Eligible projects.

a. The agency shall consider grant eligible all projects which are reasonably designed to result in the development and publication of an acceptable plan, as defined in C.1. A project shall not be considered eligible if it is proposed to include a study area for which an acceptable plan has previously been approved by the agency under this grant program.

b. The director shall determine that a project is reasonably designed to result in an acceptable plan if the director finds that the grant application required to be submitted under E. is complete. The director shall determine that a grant application is complete if the application contains all the information and meets all the requirements set out in F.

E. Grant application procedures.

1. A grant applicant shall submit a grant application to the agency no later than 4:30 p.m. on the first Monday of August of each year. The application must be received by the agency by this deadline or must have a postmark dated no later than the Friday immediately preceding the deadline in order to qualify as meeting that deadline.

2. The grant application submitted to the agency shall include all the information and documentation set out in F.

3. Upon receiving a grant application, the director shall promptly review the application and make a determination as to the eligibility of the applicant, costs, and project specified in the application.

4. Within two weeks after receiving the application, the director shall notify each applicant of the following:

a. If the director determines that the applicant, the costs, and the project specified in the application are grant eligible, the application shall be considered final as of the date it was received and the applicant shall be so notified. The application shall then be treated in accordance with the agency review provisions established in G.;

b. If the director determines that the applicant is not grant eligible, the application shall not be further considered and the applicant shall be so notified;

c. If the director determines that any of the costs described in the application are not grant eligible or that the application is otherwise incomplete:

(1) The director shall note the inadequacies in the application and shall so notify the applicant;

(2) The applicant shall have an opportunity to cure the inadequacies noted by the director. However, no information received by the agency after the 42nd day beyond the appropriate deadline in 1., except as provided in 5., shall be considered by the agency in determining the grant eligibility of the applicant, costs, or project.

(a) An application which is considered inadequate under this rule shall not be considered final until the agency receives the information or documentation which cures the inadequacies described by the director.

(b) An application which is considered inadequate under this rule shall be considered final on the date all necessary supplemental information is received by the agency.

(c) Once the application is considered final, it shall be treated in accordance with the agency review provisions established in G.

5. If the agency exceeds the two-week review period in 4. for an application, the 42-day periods specified in 4.c.(2) and G.2. shall be extended for only that application by the number of days equal to the number of review days in excess of two weeks.

F. Grant application content. Applications for grants shall include the following information:

1. The name of each political subdivision making the grant application;

2. Resolutions from each political subdivision named on the application which:

a. Demonstrate the political subdivision's desire to make the grant application and interest in the planning efforts described in the grant application; and

b. Demonstrate the political subdivision's commitment to provide the required financial input to complete the planning efforts described in the grant application;

3. In the case of a regional development commission, resolutions from each of the counties represented by the regional development commission, which demonstrate the counties' interest in and support for the planning efforts described in the grant application;

4. The name, address, and qualifications of the project manager;

5. The total project cost;

6. The amount of grant funding requested;

7. The amount and sources of all other funding contributions, including the amount of funds to be contributed by the applicant;

8. The regional boundaries of, and the population in, the area to be considered in the planning study;

9. A list of all the landfills which receive solid waste from each of the counties in the proposed study area and the percent of each county's refuse which is currently being disposed at each of the landfills; and

10. A work plan which provides the following information and details:

a. A brief description of the problem which the grantee hopes to address through the planning efforts, including a statement of any known waste management problems to be addressed by the grantee and any present support or opposition to current or proposed solid waste disposal alternatives;

b. A breakdown of the specific work tasks to be completed under the terms of the grant, including each of the tasks required to be completed by Minnesota Statutes, section 115A.46;

c. A breakdown of the number of work hours needed to complete each of the tasks specified in b.;

d. A breakdown of all the costs associated with completing each of the tasks specified in b., including an explanation of how each cost was calculated;

e. A breakdown of the staff, consultants, and units of government associated with completing each of the tasks specified in b.;

f. A breakdown of the amount of time needed to complete each of the tasks specified in b.;

g. An overall time schedule for the project showing estimated dates of completion of the tasks specified in b.; and

h. A description of the program to be completed by the applicant to ensure public participation in the planning efforts.

G. Agency review of grant applications and award of grants.

1. The agency shall review all applications received prior to the appropriate deadline specified in E.1., and shall exclude from consideration all applications received after that deadline.

2. Only grant applications considered final pursuant to E.4.a. and E.4.c.(2) as of 4:30 p.m. on the 42nd day following the application deadlines specified in E.1., except as provided in E.5., shall be eligible for a grant award.

3. The agency shall assign a priority ranking to each of the applications which are eligible for a grant award under 2. This priority ranking shall be made pursuant to a.-c.

a. The agency shall make the lists and determinations specified in (1)-(5).

(1) The agency shall make a list of the counties proposed to be studied under the grant eligible applications identified under 2.

(2) The agency shall make a list of the landfills available to and being used by each county identified in (1).

(3) The agency shall determine whether the remaining permitted landfill capacity available to and being used for a majority of the refuse from each of the counties identified in (1) is greater than or equal to five years or is less than five years. An applicant may provide recent, reliable data to the agency to assist it in making these determinations.

(4) The agency shall determine whether the location of each of the landfills identified in (2) is environmentally undesirable. The agency shall determine that a landfill's location is environmentally undesirable if the landfill meets one or more of the following criteria:

- (a) The landfill is located less than 1,000 feet from the normal high water level of a lake, pond, or flowage;
- (b) The landfill is located less than 300 feet from a stream;
- (c) The landfill is located within a 100 year flood plain;
- (d) The landfill is located within a wetland; and
- (e) The landfill is located on Karst bedrock.

An applicant may provide recent, reliable data to the agency to assist it in making these determinations.

(5) After making the determinations specified in (4), the agency shall determine which counties contribute a majority of their solid wastes to landfills that are considered to be in environmentally undesirable locations. An applicant may provide recent, reliable data to the agency to assist it in making these determinations.

b. The agency shall divide the grant applications into two groups. All applications whose study areas contain one or more counties that contribute a majority of their solid wastes to landfills having less than five years of permitted landfill capacity remaining, as determined under a.(3), or that contribute a majority of their solid wastes to landfills that are determined to be in environmentally undesirable locations, as determined under a.(5), shall be placed in group number one. All other applications shall be placed in group number two.

c. The agency shall determine the population growth rate within each application's proposed study area using 1970 and 1980 United States Census Bureau data. The agency shall assign a priority ranking to applications in groups one and two as provided in (1) and (2).

- (1) First, the agency shall divide the applications

in group one and in group two into subgroups. Subgroup 1 shall contain the applications for planning by a regional development commission, for joint planning by two or more contiguous counties, and for joint planning by political subdivisions located in two or more contiguous counties. Subgroup 2 shall contain all other applications.

(2) Funds shall be awarded, on a priority basis, in the following order. Priority shall be determined by growth rate, with the highest priority within each subgroup being given to the applicant with the highest growth rate:

- (a) Group 1, subgroup 1;
- (b) Group 1, subgroup 2;
- (c) Group 2, subgroup 1; and
- (d) Group 2, subgroup 2.

4. The agency shall award grants to applicants in the order of the priority ranking in 3.c. No awards shall be made to any applicant in group two until all applicants in group one have been awarded grants.

5. Once the agency has determined which applicants will receive grants, the agency shall proceed as follows:

a. The agency shall provide a complete listing of grant awards and of applicant rankings to each applicant; and

b. Within three weeks of the notification required by a., the agency shall draft a grant agreement for each applicant which is to receive a grant in accordance with the requirements and conditions set out in H.

H. Grant agreement.

1. The grant agreement shall incorporate by reference the final grant application submitted to the agency in accordance with F.

2. The grant agreement shall establish the term of the grant. All grants awarded under this rule shall have a maximum term of one year, unless the agency determines for a specific grantee that a longer term is necessary due to circumstances beyond the control of the grantee in order to produce an acceptable plan. The agency shall then set the term of the grant.

3. Funds for projects not performed or completed in accordance with the terms and conditions of the grant agreement, including time schedules, shall be forfeited unless the agency determines that the variances from the grant requirements are due to factors outside the control of the grantee.

4. The grant agreement shall include a payment schedule. This payment schedule shall provide for reimbursement of stated travel costs in a manner described in the grant agreement and shall require that the last 25 percent of the total grant award, except reimbursable travel costs, be retained by the agency until the director determines that the report submitted under the grant is an acceptable plan. If the director determines that a report is deficient, the director shall notify the grantee of the deficiency. The agency shall pay the withheld 25 percent of the grant as soon as the deficiency is corrected and the director determines that the report is an acceptable plan.

5. The grant agreement shall provide that the grantee is authorized to enter into contracts to complete the work specified in the grant. The grant agreement shall also require that all such contracts name the agency as a third-party beneficiary to that contract.

I. Severability. If any provision of this rule or the application of it to any person or circumstance is held to be invalid, the invalidity shall not affect any other provision or the application of any other part of this rule or any other rule which can be given effect without the invalid provision or application. To this end, the provisions of this rule and the various applications of it are severable.

6/21/82 6SR 2334

4/80A

6 MCAR S 4.6086 Rule for the administration of the Minnesota solid waste management demonstration program.

A. Purpose. This rule implements the solid waste management demonstration assistance program, created and described in Article VI of the Waste Management Act of 1980, Minnesota Statutes, sections 115A.49 to 115A.54 (1980), by establishing the substantive criteria and procedural conditions according to which the agency shall award grants to demonstrate the conceptual and technical feasibility of waste reduction and source separation projects.

B. Overview of procedures for applying for and receiving a grant.

1. Application for a grant. To be eligible for a grant under these rules, an applicant shall make an application for a grant.

a. The procedures the applicant shall follow in applying for a grant are set out in part E.

b. The information and documentation the applicant shall provide in the grant application are set out in part F.

2. Award of a grant. The agency shall award the applicant a grant, in accordance with the procedures and limitations set out in part G. of this rule, if the agency determines:

a. that the applicant specified in the grant application is grant eligible (see D.1.);

b. that the costs specified in the grant application are grant eligible (see D.2.); and

c. that the project specified in the grant application is grant eligible (see D.3.).

C. Definitions.

1. "Acceptable project" means:

a. for pre-implementation projects, a project which results in an acceptable written report on the conceptual and technical feasibility of implementing a particular source separation or waste reduction program, as defined in C.16. and C.18, respectively. To be considered an acceptable written report under this rule, the report shall:

(1) describe a particular waste reduction or source separation program proposed to be implemented in a specified area;

(2) establish the solid waste management objectives

to be accomplished through the implementation of the proposed program;

(3) evaluate the feasibility and anticipated success of accomplishing those objectives through the implementation of the proposed program;

(4) estimate the operating revenues, if any, to be obtained from the proposed program, considering the availability and security of sources of solid waste and of markets for recovered resources, together with any proposed federal, state or local financial assistance; and,

(5) describe the potential statewide significance or the transferability of knowledge or experience gained from the project to other communities in the state.

b. for implementation projects, a project which:

(1) is undertaken to demonstrate the conceptual and technical feasibility of implementing a particular source separation or waste reduction program, as defined in C.16. and C.18, respectively, and

(2) results in a report which includes an analysis of:

(a) the conceptual and technical feasibility of implementing the project; and

(b) the potential statewide significance of the project or the transferability of the knowledge or experience gained from the project to other communities in the state.

The agency shall determine that a project is reasonably designed to demonstrate the conceptual and technical feasibility or implementing a particular waste reduction or source separation program if the grant application required to be submitted under part E. is complete.

2. "Agency" means the Minnesota Pollution Control Agency, as constituted pursuant to Minnesota Statutes, section 116.02, subdivision 1 (1980).

3. "Application submittal date" means the date by which an application is required to be submitted to the agency in order for the applicant to be eligible to receive a grant under this rule.

4. "City" has the meaning given to it in Minnesota Statutes, section 115A.03, subdivision 4.

5. "Collection" has the meaning given to it in Minnesota Statutes, section 115A.03, subdivision 5.

6. "County" means a subdivision of the state organized

pursuant to Minnesota Statutes, chapter 373.

7. "Curbside collection" means the source separation method whereby generators of household refuse segregate and set out recyclable materials for collection and transportation to a resource recovery facility or to a transfer station.

8. "Director" means the executive director and chief executive officer of the agency or a person expressly designated by the director to discharge a duty or responsibility of the director.

9. "Drop off center" means a location where persons can bring or drop off recycled materials derived primarily from households for consolidation and transportation to a resource recovery facility.

10. "Grant eligible" or "grant eligibility" means meets the criteria to receive funding assistance under this rule.

11. "Implementation project" means a project undertaken to demonstrate the feasibility and practicability of a particular source separation or waste reduction method(s).

12. "Person" has the meaning given to it in Minnesota Statutes, section 115A.03, subdivision 23.

13. "Pre-implementation project" means a project undertaken to accomplish preliminary planning and development of, to study the feasibility and practicability of, or to do the conceptual design of a particular source separation or waste reduction method(s).

14. "Resource recovery facility" has the meaning given to it in Minnesota Statutes, section 115A.03, subdivision 28.

15. "Solid waste management district" has the meaning given to it in Minnesota Statutes, section 115A.03, subdivision 32.

16. "Source separation or source separation program" means the process of segregation and accumulation of recyclable materials at the source of generation of those materials and also means the process of collection and transportation of those materials for resource recovery.

17. "Transfer station" has the meaning given to it in Minnesota Statutes, section 115A.03, subdivision 33.

18. "Waste reduction or waste reduction program" means measures taken by persons to change product or packaging design or consumption habits and thereby reduce the quantity of waste generated.

D. Grant eligibility criteria.

1. Eligible applicants. Any city, county, or solid waste management district within the state of Minnesota is grant eligible. Eligible applicants may apply for grants on behalf of any person that is not an eligible applicant, but the named grantee shall be the city, county, or solid waste management district.

2. Eligible costs.

a. For pre-implementation projects:

(1) the following costs are grant eligible:

(a) Consultant fees and salaries of staff persons employed to develop an acceptable project;

(b) Costs associated with the drafting and execution of necessary contracts between the grantee and other units of government or qualified consultants employed to carry out project tasks, including, but not limited to, reasonable attorneys' fees;

(c) Costs associated with holding meetings to inform the public of the development of the project and to provide an opportunity for the public to participate in and comment on the development of the project;

(d) Costs associated with printing and distributing project materials and the project report;

(e) Costs of any in-state travel, the primary purpose of which is to attend meetings or gather information needed for the development of the project report, including, but not limited to, reimbursement for mileage consistent with state allowances;

(f) Costs of any necessary supplies required for the development and publication of the report. The costs of leasing equipment needed for the development and publication of the report are eligible for funding. The costs of any commodities, materials, capital expenditures and equipment which could be used after the project is completed shall not be considered supplies and are, therefore, not grant eligible under this rule; and

(g) Overhead costs.

(2) the agency shall award grants to cover 90 percent of the eligible costs specified in the grant application and the grantee shall either fund or obtain from another source funding for the remaining costs of completing the project, provided, however, that to the extent the grantee has obtained a non-agency grant(s) to fund any portion of the project, the agency shall fund only 90 percent of the remaining (i.e., non-agency funded) eligible costs; and

(3) the maximum amount of a pre-implementation grant for each category listed in G.2.b.(1) and (2) shall be \$3,500. If a grantee submits an application for a grant relating to more than one category, the maximum amount of the grant to be awarded by the agency shall be \$3,500 for each category funded.

b. For implementation projects:

(1) the following costs are grant eligible:

(a) Consultant fees and salaries of staff persons employed to develop an acceptable project;

(b) Costs associated with the drafting and execution of necessary contracts between the grantee and other units of government or qualified consultants employed to carry out project tasks, including, but not limited to, reasonable attorneys' fees;

(c) Costs associated with holding meetings to inform the public of the development of the project and to provide an opportunity for the public to participate in and comment on the development of the project.

(d) Costs associated with printing and distributing project materials,

(e) Costs of any in-state travel, the primary purpose of which is to attend meetings or gather information needed for the development of the project report, including, but not limited to, reimbursement for mileage consistent with state allowances,

(f) Costs of any necessary supplies required for the development of the project and the publication of the report. The costs of leasing equipment needed for the development of the project and the publication of the report are eligible for funding. The costs of any commodities, materials, capital expenditures and equipment which could be used after the project is completed shall not be considered supplies and are, therefore, not grant eligible under this rule; and

(g) Overhead costs.

(2) the agency shall award grants to cover 90 percent of the eligible costs specified in the grant application and the grantee shall either fund or obtain from another source funding for the remaining costs of completing the project, provided, however, that to the extent the grantee has obtained a non-agency grant(s) to fund any portion of the project, the agency shall fund only 90 percent of the remaining (i.e., non-agency funded) eligible costs; and

(3) the maximum amount of an implementation grant for each category listed in G.2.b.(1) and (2) shall be \$15,000. If a grantee submits an application for a grant relating to more

than one category, the maximum amount of the grant to be awarded by the agency shall be \$15,000 for each category funded.

c. Once a grant has been awarded, adjustments between funds awarded to cover the costs specified in D.2.a.(1) and D.2.b.(1) shall be made if the agency and the grantee agree that such adjustments shall result in the development of the project in a more efficient manner.

d. If, while working to complete the project, a grantee finds that more funds are needed, the grantee shall proceed as follows:

(1) if the grantee finds that the amount of additional funding that is needed is more than 20 percent of the original grant, the grantee shall submit a new application which shall be treated in accordance with the procedures set out in G.1.-G.4.

(2) if the grantee finds that the amount of additional funding that is needed is less than 20 percent of the original grant, and that the original grant was for an amount less than the maximum grants allowed under D.2.(a)(3) and D.2.(b)(3), the grantee shall submit an amended grant application which shall be treated in accordance with the procedures set out in G.5.

e. Grants shall be awarded to cover the eligible costs of only those tasks which are undertaken and completed during the grant period established in the grant agreement. Grants shall not be awarded to cover any cost associated with tasks performed prior to the award of a grant or after the expiration of the grant agreement.

f. The availability of funds is a precondition to the award of any grant or grant amendment by the agency.

g. The fact that an item or person is "grant eligible" under this rule does not automatically assure that a grant shall be awarded. A grant shall only be awarded if the grant eligibility criteria are met and if sufficient funds are available to cover the grant.

3. Eligible projects.

a. The agency shall consider grant eligible all projects that are reasonably designed to result in an acceptable project, as defined in C.1.

b. The agency shall determine that a project is reasonably designed to result in an acceptable project if the agency finds that the grant application required to be submitted under part E. is complete. The agency shall determine that a grant application is complete if the application contains all the information and meets all the requirements set out in part F.

c. The agency shall prioritize and limit the award of grants to eligible projects in accordance with the procedures and limitations set out in part G.

E. Grant application procedures.

1. For grants to be awarded during the fiscal year ending June 30, 1981.

a. As soon as possible and no later than April 15, 1981, a grant applicant shall submit a grant application to the agency.

b. The grant application to be submitted to the agency shall include all the information and documentation set out in part F. of this rule.

c. Upon receiving a grant application, the director shall promptly review the application and shall make a determination as to:

(1) the eligibility of the applicant specified in the application;

(2) the eligibility of the costs specified in the application; and

(3) the eligibility of the project specified in the application.

d. Within two weeks after receiving the application, the director shall notify each applicant as to the director's determinations:

(1) If the director determines that the applicant, the costs and the project specified in the application are grant eligible, the application shall be considered final as of the date it was received and the applicant shall be so notified. The application shall then be treated in accordance with the agency review provisions established in part G. of this rule.

(2) If the director determines that the applicant is not grant eligible, the application shall not be further considered and the applicant shall be so notified.

(3) If the director determines that any of the costs described in the application are not grant eligible or that the application is otherwise incomplete.

(a) The director shall note the inadequacies in the application and shall so notify the applicant;

(b) The applicant shall have two weeks after the date of the director's notification to cure the inadequacies noted by the director or shall have two weeks after the application submittal date, whichever gives the applicant more

time to cure the inadequacies noted.

(i) An application which is considered inadequate under this section shall not be considered final until the agency receives the information or documentation which cures the inadequacies described by the director.

(ii) An application which is considered inadequate under this section shall be considered final on the date all necessary supplemental information is received by the agency.

(iii) Once the application is considered final, it shall be treated in accordance with the agency review provisions established in part G. of this rule.

2. For grants to be awarded during all fiscal years other than that described in E.1.:

a. There shall be two application submittal dates: June 30 and December 31 of each year.

b. As soon as possible and no later than the application submittal dates, a grant applicant shall submit a grant application to the agency.

c. The grant application to be submitted to the agency shall include all the information and documentation set out in part F. of this rule.

d. Upon receiving a grant application, the director shall promptly review the application and shall make a determination as to:

(1) the eligibility of the applicant specified in the application;

(2) the eligibility of the costs specified in the application; and

(3) the eligibility of the project specified in the application.

e. Within two weeks after receiving the application, the director shall notify each applicant as to the director's determinations:

(1) If the director determines that the applicant, the costs and the project specified in the application are grant eligible, the application shall be considered final as of the date it was received and the applicant shall be so notified. The application shall then be treated in accordance with the agency review provisions established in part G. of this rule.

(2) If the director determines that the applicant is not grant eligible, the application shall not be further

considered and the applicant shall be so notified.

(3) If the director determines that any of the costs described in the application are not grant eligible or that the application is otherwise incomplete:

(a) The director shall note the inadequacies in the application and shall so notify the applicant,

(b) The applicant shall have two weeks after the date of the director's notification to cure the inadequacies noted by the director or shall have two weeks after the application submittal date, whichever gives the applicant more time to cure the inadequacies noted.

(i) An application which is considered inadequate under this section shall not be considered final until the agency receives the information or documentation which cures the inadequacies described by the director.

(ii) An application which is considered inadequate under this section shall be considered final on the date all necessary supplemental information is received by the agency.

(iii) Once the application is considered final, it shall be treated in accordance with the agency review provisions established in part G. of this rule.

3. If, while working to complete a project which has been funded under this rule, a grantee finds that more funds are needed to complete the project and that the amount of additional funding needed is more than 20 percent of the original grant, the grantee shall submit a new grant application which shall be treated in accordance with the procedures set out in G.1.-G.4. The total amount awarded for any one project (including all additional funding) shall in no event exceed the maximums established in D.2.(a)(3) and D.2.(b)(3).

4. If, while working to complete a project which has been funded under this rule, a grantee finds that more funds are needed to complete the project, that the amount of additional funding is less than 20 percent of the original grant, and that the original grant was for an amount less than the maximum grants allowed under D.2.(a)(3) and D.2.(b)(3):

a. The grantee shall submit an amended grant application to the agency.

b. The amended grant application shall include all the information and documentation set out in part F.3. of this rule.

c. Upon receiving the amended grant application, the director shall promptly review the amended grant application and shall make a determination as to:

(1) the eligibility of the costs specified in the amended grant application; and

(2) the difference between the maximum amount of funding the project is eligible to receive and the amount of funding the project has received to date.

d. Within two weeks after receiving the amended grant application, the director shall notify the applicant as to the eligibility of the costs specified in the amended grant application.

(1) If the director determines that the costs are not eligible, the amended grant application shall not be further considered and the applicant shall be so notified.

(2) If the director determines that the costs are eligible, the application shall be considered final as of the date it was received and the applicant shall be so notified. The application shall then be treated in accordance with the agency review provisions established in G.5.

(3) If the director determines that the amended grant application is incomplete:

(a) The director shall note the inadequacies in the application and shall so notify the applicant,

(b) The applicant shall have two weeks from the date of the director's notification to cure the inadequacies noted by the director,

(i) An application which is considered inadequate under this section shall not be considered final until the agency receives the information or documentation which cures the inadequacies described by the director.

(ii) An application which is considered inadequate under this section shall be considered final on the date all necessary supplemental information is received by the agency.

(iii) Once the application is considered final, it shall be treated in accordance with the agency review provisions established in G.

F. Grant application content.

1. Applications for grants for pre-implementation projects shall include the following information:

a. The name(s) of each applicant making the grant application;

b. The name(s) of each person on whose behalf the grant application is submitted;

c. The name(s) of each political subdivision(s) affected by the project, located in the area studied in the project, or located in the area in which the project is intended to be implemented;

d. Resolutions from each political subdivision named in the application which demonstrate that the political subdivision is committed to implement the project; is committed to provide necessary local financing; and, is committed to accept and exercise the government powers necessary to the project;

e. The name(s) and address(es) of the project manager(s);

f. Total project cost;

g. Amount of grant funding requested;

h. Amount and sources of all other funding contributions; including the amount of funds to be contributed by the applicant;

i. Boundaries of and population of any areas which would be served by the program if the project were implemented;

j. A work plan which provides the following information and details how the grantee will make the evaluations necessary to complete an acceptable project within the meaning of C.1.a:

(1) A brief description of the waste reduction and/or source separation program the grantee proposes to evaluate;

(2) A breakdown of the specific work tasks to be completed under the terms of the grant; including, but not limited to,

(a) an evaluation of the conceptual and technical feasibility of implementing the project;

(b) an evaluation of the solid waste management objectives to be accomplished through the implementation of the project;

(c) an estimate of the operating revenues, if any, to be obtained from the proposed program, considering the availability and security of sources of solid waste and of markets for recovered resources, together with any proposed federal, state or local financial assistance; and

(d) the drafting of a final report describing the work done and conclusions made by the grantee.

(3) A breakdown of the number of work hours needed

to complete each of the work tasks specified in j.(2);

(4) A breakdown of all the costs associated with completing each of the tasks specified in j.(2), including an explanation of how each cost was calculated;

(5) A breakdown of the staff, consultants, and units of government associated with completing each of the tasks specified in j.(2);

(6) A breakdown of the amount of time needed to complete each of the tasks specified in j.(2);

(7) A discussion of the reports, documents and other written materials to be developed;

(8) A discussion of the applicability of the project results to other areas of the state; and

(9) A discussion of the existing solid waste management system, the impact the project may have on that system, and a statement of the landfill(s) currently serving the area which would be served by the project if it were implemented.

2. Applications for grants for implementation projects shall include the following information:

a. The name(s) of the each applicant making the grant application;

b. The name(s) of each person on whose behalf the grant application is submitted;

c. The name(s) of each political subdivision(s) affected by the project, located in the area studied in the project, or located in the area in which the project is intended to be implemented;

d. Resolutions from each political subdivision named in the application which demonstrate that the political subdivision is committed to implement the project; is committed to provide necessary local financing; and, is committed to accept and exercise the government powers necessary to the project;

e. The name(s) and address(es) of the project manager(s);

f. Total project cost;

g. Amount of grant funding requested;

h. Amount and sources of all other funding contributions, including the amount of funds to be contributed by the applicant;

i. Boundaries of and population of any areas which would be served by the program if the project were implemented;

j. Statements, together with supporting information, that demonstrate:

(1) that the project is conceptually and technically feasible;

(2) that operating revenues from the project, considering the availability and security of sources of solid waste and of markets for recovered resources, together with any proposed federal, state, or local financing assistance, will be sufficient to pay all costs over the projected life of the project; and

(3) that the applicant has evaluated the feasible and prudent alternatives to disposal and has compared and evaluated the costs of the alternatives, including capital and operating costs, and the effects of the alternatives on the cost to generators.

k. A work plan which provides the following information and details how the grantee will take the action necessary to complete an acceptable project within the meaning of C.1.b.

(1) A brief description of the waste reduction and/or source separation program the grantee proposes to undertake;

(2) A breakdown of the specific work tasks to be completed under the terms of the grant;

(3) A breakdown of the number of work hours needed to complete each of the work tasks specified in k.(2);

(4) A breakdown of all the costs associated with completing each of the tasks specified in k.(2), including an explanation of how each cost was calculated;

(5) A breakdown of the staff, consultants, and units of government associated with completing each of the tasks specified in k.(2);

(6) A breakdown of the amount of time needed to complete each of the tasks specified in k.(2);

(7) A discussion of the reports, documents and other written materials to be developed;

(8) A discussion of the applicability of the project results to other areas of the state; and

(9) A discussion of the existing solid waste management system, the impact the project may have on that

system, and a statement of the landfill(s) currently serving the area which would be served by the project if it were implemented.

3. Amended grant applications shall include the following information:

- a. The name(s) of each applicant making the amended grant application;
- b. The additional funds requested by the applicant;
- c. Justification for the request for additional funds;
- d. A statement of the amount of funds already obtained from the agency to complete the project;
- e. A statement of the total amount of funds expended and anticipated to be expended to complete the project;
- f. A statement of the amount and sources of all funds not provided by the agency; and
- g. A discussion of the work proceeding to date under the grant and a statement as to whether the work is being completed on schedule and, if not, a discussion as to why it is not proceeding on schedule.

G. Agency review of grant applications and amendments and award of grants and grant amendments.

1. Grants shall be awarded to eligible grantees, to the extent funding is available, in accordance with the procedures and limitations set out in this part.

2. Within 45 days after each application submittal date, the agency shall categorize each eligible project:

- a. by determining whether the project is a waste reduction or a source separation project; and
- b. by identifying the category within which each eligible project falls. The categories of eligible projects are the following:

(1) Waste reduction

Pre-implementation projects that study or design the following methods of waste reduction

Implementation projects that demonstrate the following methods of waste reduction

- (a) Change in procurement policies
- (b) Public awareness programs
- (c) Marketing programs

- (a) Change in procurement policies
- (b) Public awareness programs
- (c) Marketing programs

- (d) Office waste reduction
- (e) Reduction of solid materials generated by an industry or commercial establishment
- (f) Curriculum development
- (d) Office waste reduction
- (e) Reduction of solid materials generated by an industry or commercial establishment
- (f) Curriculum use

(2) Source separation

Pre-implementation projects that study or design the following methods or source

Implementation projects that demonstrate the following methods of source separation

- | | |
|--|--|
| <ul style="list-style-type: none"> (a) Public awareness programs (b) Marketing program (c) Office waste recycling (d) Source separation of solid materials generated by an industry or commercial establishment (e) Separation of yard waste (f) Curriculum development (g) Drop off center (h) Mandatory curbside collection (i) Voluntary curbside collection (j) Separation at a transfer station | <ul style="list-style-type: none"> (a) Public awareness programs (b) Marketing program (c) Office waste recycling (d) Source separation of solid materials generated by an industry or commercial establishment (e) Separation of yard waste (f) Curriculum use (g) Drop off center (h) Mandatory curbside collection (i) Voluntary curbside collection (j) Separation at a transfer station |
|--|--|

3. Also within 45 days after each application submittal date, the agency shall rank the projects within each category by assigning that project one point for each of the following statements that correctly describes that project:

a. The project relates specifically to an area where natural geologic and soil conditions are unsuitable for land disposal of solid waste.

b. The project relates specifically to an area where the available capacity of existing solid waste disposal facilities is determined by the agency to be less than five years.

c. The project relates specifically to an area outside the metropolitan area and would serve more than one local government unit.

d. The project is being carried out pursuant to the findings or recommendations of a solid waste management plan which meets the requirements of Minnesota Statutes, section 115A.46 and 6 MCAR S 4.6085.

4. The agency shall award grants as follows:

a. The agency shall award a grant to the project with the highest point ranking within each category. If there are insufficient moneys to fund the highest ranking project within each category, the agency shall first award a grant to the project with the highest ranking; shall second award a grant to the project with the second highest ranking; shall third award a grant to the project with the third highest ranking and so on until all grant moneys are obligated. For projects with equal rankings, the agency shall first award a grant to the grantee whose final application was submitted earliest, shall second award a grant to the grantee whose final application was submitted second earliest, shall third award a grant to the grantee whose final application was submitted third earliest and so on until grant moneys are obligated. If grant applications with equal rankings were submitted on the same date, the agency shall determine the priority of the projects by lottery.

b. After the agency has awarded a grant to the projects that rank the highest within each category, the agency shall award a grant to the projects that rank the second highest within each category. In awarding grants for these projects, the agency shall follow the procedure described in G.4.a.

c. After the agency has awarded a grant to the projects that rank the second highest within each category, the agency shall award a grant to the project that ranks the third highest within each category. The agency shall continue in this fashion until all grant moneys have been obligated.

5. The agency shall award grants on a first come, first serve basis to applicants for a supplemental grant that meet the description set out at E.4. These awards shall be made within one month after a completed eligible application for a grant amendment has been received by the agency. Grant amendments shall not be subject to the ranking procedures set out in G.4.

H. Grant agreement.

1. The grant agreement shall incorporate by reference the final grant application submitted to the agency in accordance with F.

2. The grant agreement shall establish the term of the grant. All grants awarded under this rule shall have a maximum term of two years.

3. Grants not completed in accordance with the terms and conditions of the grant agreement, including time schedules, shall be forfeited unless the agency determines that the variances from the grant requirements are due to factors outside the control of the grantee.

4. The grant agreement shall include a payment schedule. This payment schedule shall provide for reimbursement of stated

travel costs in a manner described in the grant agreement and shall require that ten percent of each payment made under the grant agreement (except reimbursable travel costs) be retained by the agency until the director determines that the report submitted under the grant is an acceptable project. If the director determines that the report is deficient, the director shall notify the grantee of the deficiency. The agency shall pay the withheld ten percent of the grant as soon as the director determines that the report is an acceptable project.

5. The grant agreement shall provide that the grantee shall be authorized to enter into contracts to complete the work specified in the grant. The grant agreement shall further provide that if any person other than the grantee is to receive any grant moneys for completing work under the grant, the grantee must enter into a written agreement with that person for the work to be done by that person. The grant agreement shall further require that all written agreements for work to be done under this grant shall name the agency as a third-party beneficiary to those agreements.

6. The grant agreement shall provide that, upon the agreement of the grantee and the director, the grant agreement shall be amended.

7. The grant agreement shall provide that the director shall extend the expiration date of the grant upon request and justification of the change by the grantee. The grantee shall justify a request for extension by demonstrating that the factors which resulted in the delay of the project were beyond the control of the grantee.

I. Apportionment.

1. The agency shall apportion funds allocated to it by the legislature for the grant programs set out in Articles V and VI of the Waste Management Act, Minnesota Statutes, sections 115A.42 to 115A.54 (1980) as follows:

a. Article V grants (grants awarded under other rules): 40 percent of the amount appropriated to the agency; and

b. Article VI grants (grants awarded under this rule): 60 percent of the amount appropriated to the agency.

c. If the agency receives more eligible requests for grant assistance under Article VI than the agency has funds available and the agency receives less eligible requests for grant assistance under Article V than it has funds available, the agency shall adjust the apportionment described in this part. Similarly, if the agency receives less eligible requests for grant assistance under Article VI than the agency has funds available to it and more eligible request for grant assistance under Article V than it has funds available, the agency shall adjust the apportionment described in this part. No such

adjustment shall be made until the last date that grant applications are permitted to be submitted to the agency under this rule and the rule developed to implement Article V of the Waste Management Act.

2. For pre-implementation and implementation grants, the agency shall apportion funds allocated to it by the legislature as follows:

a. Pre-implementation grants: 20 percent of the amount appropriated to the agency; and

b. Implementation grants: 80 percent of the amount appropriated to the agency.

J. Severability. If any provision of this rule or the application thereof to any person or circumstance is held to be invalid, such invalidity shall not affect any other provision or application of any other part of this rule or any other rule which can be given effect without the invalid provision or application, and to this end the provisions of this rule and the various applications thereof are declared to be severable.

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6 MCAR S 4.6088 Certification of operators and inspectors of waste disposal facilities. Rules 6 MCAR SS 4.6088-4.6100 implement the requirement of Minnesota Statutes, section 116.41, subdivision 2, that the Minnesota Pollution Control Agency shall require operators and inspectors of waste disposal facilities to obtain a certificate of competency from the agency.

6 MCAR S 4.6089 Definitions.

A. Scope. For the purposes of 6 MCAR SS 4.6088-4.6100, the following terms and abbreviations shall have the meanings specified. Terms which are not specifically defined shall be construed to be in conformance with Minnesota Statutes, chapters 115, 115A and 116, their context, and professional usage.

B. Agency. "Agency" means the Minnesota Pollution Control Agency.

C. Agency director. "Agency director" means the Executive Director of the Minnesota Pollution Control Agency or its designated staff.

D. Certification. "Certification" means a process by which individuals must show competency in their chosen occupation through a combination of work experience, education, training, and successful completion of an examination as set forth in 6 MCAR SS 4.6090-4.6100.

E. Contact hour. "Contact hour" means a pertinent instructional or training session of 50 minutes.

F. Disposal facility. "Disposal facility" means a waste facility that is designed or operated for the purpose of disposing of waste on or in the land and has a permit, stipulation agreement, or other written approval from the agency.

G. Equipment operator. "Equipment operator" means an individual on the site who performs the necessary actions of properly disposing of the waste.

H. Inspector. "Inspector" means any individual who has governmental authority to routinely review waste disposal facilities to determine compliance with applicable statutes, rules, permits, ordinances, or standards. "Inspector" does not include county board members, agency board members, or other individuals employed, appointed, or elected who are not directly involved in routine review of a waste disposal facility. "Inspector" may include individuals who are employed as environmental health specialists or sanitarians, technicians, zoning administrators, county solid waste officers, pollution control specialists, engineers, soil scientists, and hydrologists.

I. Operator. "Operator" means any individual responsible

for conducting work at a waste disposal facility. "Operator" does not include office personnel, laborers, transporters, corporate directors, elected officials, or other individuals in managerial roles unless such individuals are directly involved in on-site supervision or operation of a waste disposal facility. "Operator" does not include private individuals who store or landspread sewage sludge on property owned or farmed by that individual. "Operator" includes facility managers, supervisors, and equipment operators.

J. Waste. "Waste" means solid waste, sewage sludge, hazardous waste and construction debris, as those terms are defined in Minnesota Statutes, section 115A.03.

6 MCAR S 4.6090 Classification of disposal facilities. The agency adopts the following classifications of disposal facilities for training and certification purposes.

A. Type I. A Type I facility is any disposal facility that accepts hazardous waste.

B. Type II. A Type II facility is any disposal facility that accepts solid waste; or a facility permitted to dispose sewage sludge with solid waste; or a facility that uses the landfill method for sewage sludge disposal. This facility type includes sanitary landfills, modified sanitary landfills, and sewage sludge landfills.

C. Type III. A Type III facility is any disposal facility that accepts only nonhazardous source-specific waste from industrial processes or construction debris. This facility type includes demolition landfills and industrial waste landfills.

D. Type IV. A Type IV facility is any disposal facility that applies on the land any sewage sludge or semisolids from commercial or industrial operations.

E. Type V. A Type V facility is any disposal facility that applies on the land any nonhazardous liquid waste from commercial, industrial, or agricultural operations.

6 MCAR S 4.6091 Certification committee.

A. Establishment. The agency shall establish a certification committee consisting of 11 voting members and two nonvoting members. The voting members shall be appointed by the agency for three-year terms and shall serve without compensation. The initial appointments shall be four three-year terms, four two-year terms and three one-year terms. The initial term lengths will be determined by lot once the appointments are made. There shall be equal representation of operators and inspectors on the committee. There shall be one citizen representative. Not more than one voting member shall be a member of the agency staff. Voting members, except the citizen

representative, must be certified. There shall be two nonvoting members who are agency staff members responsible for training and certification. Robert's Rules of Order shall govern committee meetings.

B. Duties of the committee. The committee shall maintain accurate records of all meetings. The committee shall also review and make recommendations in the following areas to the agency director or, when appropriate, to the agency:

1. Applicants to be certified based on information provided in their applications and examination results;
2. Changes to 6 MCAR SS 4.6088-4.6100;
3. Changes in examinations and training to meet needs;
4. Action on operator and inspector complaints relating to certification and training; and
5. The number of initial or renewal contact hours to be given for nonagency training courses.

C. Transitional committee. The advisory committee that was established by the agency director to develop 6 MCAR SS 4.6088-4.6100 shall function as the certification committee until 24 months after the effective date of 6 MCAR SS 4.6088-4.6100.

6 MCAR S 4.6092 Individuals required to be certified.

A. Operators. Operators of waste disposal facilities shall be certified to operate the appropriate type of facility. The number of certified operators at a waste disposal facility which has three or fewer operators shall be at least one. The number of certified operators at a waste disposal facility which has four to seven operators shall be at least two. The number of certified operators at a waste disposal facility that has eight or more operators shall be at least three.

B. Inspectors. Inspectors of waste disposal facilities shall be certified to inspect the appropriate type of facility.

C. Waiver. Operators of Type V facilities that are certified under 6 MCAR SS 5.001-5.003 are not required to be certified under 6 MCAR SS 4.6088-4.6100 unless they also operate a land application facility for solids or semisolids. Operators of Type V facilities shall have the option to be certified under 6 MCAR SS 5.001-5.003 or 6 MCAR SS 4.6088-4.6100.

6 MCAR S 4.6093 Certification of facility operators.

A. In general. To be certified an operator must demonstrate the skill, knowledge, and experience necessary to operate the

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appropriate type of facility by qualifying for and passing the appropriate examination required by 6 MCAR S 4.6096.

B. Type I requirements. Before taking an examination, an applicant for certification as an operator of a Type I facility shall:

1. Have a bachelor's degree in an appropriate branch of biological, physical, or chemical science or engineering or equivalent experience;

2. Complete at least 15 contact hours of training offered through the agency or other training courses approved by the agency director which are designed to ensure competency at a Type I facility within three years prior to the date of application; and

3. Have at least six months work experience as a Type I facility operator.

C. Type II requirements. Before taking an examination, an applicant for certification as an operator of a Type II facility shall:

1. Have a high school diploma or equivalent or equivalent experience;

2. Complete at least 15 contact hours of training offered through the agency or other training courses approved by the agency director which are designed to ensure competency at a Type II facility within three years prior to the date of application; and

3. Have at least six months work experience as a Type II facility operator.

D. Type III requirements. Before taking an examination, an applicant for certification as an operator of a Type III facility shall complete at least four contact hours of training offered through the agency or other training courses approved by the agency director which are designed to ensure competency at a Type III facility within three years prior to the date of application.

E. Type IV requirements. Before taking an examination, an applicant for certification as an operator of a Type IV facility shall:

1. Have a high school diploma or equivalent or equivalent experience;

2. Complete at least nine contact hours of training offered through the agency or other training courses approved by the agency director which are designed to ensure competency at a Type IV facility within three years prior to the date of application; and

3. Have at least six months work experience as a Type IV facility operator.

F. Type V requirements. Before taking an examination, an applicant for certification as an operator of a Type V facility shall:

1. Within the three years before the date of application, complete at least nine contact hours of training courses offered through the agency or other training courses approved by the agency director which are designed to ensure competency at a Type V facility; and

2. Have at least one spray season's work experience as a Type V facility operator.

6 MCAR S 4.6094 Certification of facility inspectors.

A. In general. To be certified, an inspector shall demonstrate the knowledge, skill, education, and experience necessary to inspect the appropriate type of waste disposal facility by qualifying for and passing a written examination required by 6 MCAR S 4.6096.

B. Facility inspector requirements. An individual who seeks certification as an inspector of a waste disposal facility shall meet the same educational requirements and contact hours of training outlined for operators of the corresponding facility types as specified in 6 MCAR S 4.6093 before taking an examination. Each applicant shall also have conducted at least ten inspections of the appropriate type of waste disposal facility in the presence of a certified inspector. This inspection requirement does not apply to inspectors of Type I facilities until 24 months after a Type I facility is given a permit to operate in this state.

C. Waiver. The agency director shall waive the requirement of B. for supervised inspections for individuals applying for an inspector certificate within 24 months after the effective date of 6 MCAR SS 4.6088-4.6100 if the applicant produces evidence of employment as an inspector for that type of facility for at least one year immediately preceding application and has conducted at least ten inspections of the appropriate facility type during that year.

6 MCAR S 4.6095 Application for examination.

A. Form. Application for examination shall be made in writing on a form provided by the agency director and shall be submitted at least 15 days prior to the examination date.

B. Fee. The examination fee shall accompany the application.

C. Review of application. The agency director shall review

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the application for certification and determine the accuracy of the information included in the application. If the agency director determines that additional information or documentation is necessary to assess the eligibility of the applicant to take the examination, the director shall notify the applicant. The applicant shall provide the information prior to examination.

D. Notification. The agency director shall notify an applicant of eligibility for examination at least five days before the examination date.

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6 MCAR S 4.6096 Examinations.

A. Content. The agency director shall prepare separate operator and inspector examinations for the different types of waste disposal facilities. The examinations shall test the applicant's knowledge in any one or more of the following areas: basic math, science, public health, rules and laws, facility operation, and facility maintenance.

B. Conditions of testing. The examination shall be closed book.

C. Passing grade. A minimum grade of 70 percent shall be required to pass.

D. Results; review. The agency director shall notify the applicant in writing of the examination results. Examinations shall not be returned to the applicant. Upon request, within 60 days after notification of the results, the applicant shall be allowed to review the examination.

E. Reexamination. An applicant who fails to pass the examination shall not retake the same examination for a period of three months.

ARCO TEST

6 MCAR S 4.6097 Certificates.

A. Use of certificate.

1. Operators shall not be allowed to inspect facilities unless they have a valid inspector certificate.

2. Operators having a Type II facility operator certificate shall be allowed to operate a Type III facility.

3. Inspectors shall not be allowed to operate facilities unless they have a valid operators certificate.

4. Inspectors having a Type II facility inspector certificate shall be allowed to inspect a Type III facility.

B. Issuance. Certificates shall be issued by the agency director when all necessary conditions prescribed in 6 MCAR SS

4.6088-4.6099 have been met. Certificates shall be valid for three years.

C. Renewal. A certified individual shall apply for certificate renewal within 30 days of certificate expiration. Renewal certificates shall be issued by the agency director when the agency director receives the application, renewal fee, and evidence that the person has, during the preceding three years, obtained credit for attending training courses offered through the agency or other waste disposal facility training courses approved by the agency director for the number of contact hours specified in Exhibit 6 MCAR S 4.6097 C.-1. for the appropriate type of facility. Individuals who are certified under both 6 MCAR SS 4.6088-4.6100 and 6 MCAR SS 5.001-5.003 shall be allowed to renew their Type IV certificate by submitting the renewal application, fee and information required by 6 MCAR S 5.003 and evidence of completion of the training hours specified in Exhibit 6 MCAR S 4.6097 C.-1. After confirming that the individual meets the requirements for certificate renewal, the agency director shall issue one certificate which evidences renewal of both the certificate issued under 6 MCAR SS 4.6088-4.6100 and the certificate issued under 6 MCAR SS 5.001-5.003.

Exhibit 6 MCAR S 4.6097 C.-1.

Required Training for Certificate Renewal

Facility	Training
Type I	18 Contact hours
Type II	18 Contact hours
Type III	6 Contact hours
Type IV	9 Contact hours
Type V	6 Contact hours

D. List of courses. The agency director shall annually prepare and make available to the operators and inspectors a list of accredited training courses and approved educational activities for which credit may be obtained.

E. Reinstatement. An individual whose certificate has expired may apply to the agency director for reinstatement of the certificate in the same classification. Before a certificate will be reissued the individual must submit the following:

1. An application for reinstatement;
 2. A nonrefundable fee for a reinstatement certificate;
- and
3. Evidence of completion of the minimum number of contact hours described in C. since the certificate was last issued or renewed.

F. Denial of reinstatement. An individual who is denied

reinstatement shall follow the procedure imposed for a new applicant. In such cases the reinstatement fee shall be credited towards the fee for examination and new certificate.

G. Reciprocity. Operators or inspectors who are certified in states other than Minnesota shall be entitled to certification to operate or inspect the appropriate type of facility in Minnesota if they can provide evidence of meeting requirements equivalent to those of 6 MCAR SS 4.6088-4.6100.

6 MCAR S 4.6098 Fees.

A. Schedule of fees. Fees for certification shall be as follows:

1. Application examination - \$15.00;
2. Issuance of certificate - \$15.00;
3. Reexamination from failure to pass an examination - \$15.00;
4. Renewal of certificate - \$15.00;
5. Replacement certificate - \$5.00; and
6. Reinstatement or reciprocity certificate - \$30.00.

B. Refund of fees. The agency director shall return fees received only from individuals who are rejected for examination.

6 MCAR S 4.6099 Sanctions.

A. Criteria. The agency director shall refuse to issue, renew, or reinstate a certificate, suspend or revoke a certificate, or use any lesser remedy against an individual for any of the following reasons:

1. Submission of false or misleading information or credentials in order to obtain or renew a certificate;
2. Failure to meet the requirements for renewal certification; or
3. Incompetency, negligence, or inappropriate conduct in the performance of operator or inspector duties.

B. Investigation. Upon receiving a signed written complaint which alleges the existence of grounds for sanctions against a certified individual, the agency director shall initiate an investigation. No revocation, suspension, or other sanction shall be imposed before notice is given to the certified individual and an opportunity for a contested case hearing is provided.

C. Procedures. Procedures for contested case hearings shall comply with the provisions of the Administrative Procedures Act, Minnesota Statutes, chapter 15.

D. Return of certificate. Upon revocation or suspension, certified individuals shall return to the agency their certificate and current renewal certificates.

E. Recertification. An individual whose certificate has been revoked shall not be entitled to apply for recertification until at least one year following the effective date of revocation or for any longer period of time specified in the revocation order.

F. Reinstatement after suspension. The agency director shall reinstate a suspended certificate if the individual whose certificate has been suspended fulfills the terms of the suspension order and meets all applicable requirements of the rules for obtaining a certificate.

ACCOUST
6 MCAR S 4.6100 Certification deadlines. Individuals requiring certification who are employed on the effective date of 6 MCAR SS 4.6088-4.6100 as operators or inspectors of a disposal facility shall obtain certification within 24 months after the effective date of 6 MCAR SS 4.6088-4.6100. Except as provided in 6 MCAR S 4.6093 F.2., individuals newly employed after the effective date of 6 MCAR SS 4.6088-4.6100 must become certified within ten months after obtaining employment. During this ten-month time period, they shall be allowed to operate or inspect the appropriate type of waste disposal facility if they meet the educational requirements necessary for certification and, within 30 days after obtaining employment, submit their application for certification and a signed statement of intention to complete all other requirements for certification within the ten-month time period.

Chapter Five: General Provisions

6 MCAR S 4.6101 Purpose and scope. The purpose of 6 MCAR SS 4.6101-4.6136 is to provide for the protection of the public health and the environment in the utilization or disposal of sewage sludge. In accordance with the authority granted in Minnesota Statutes, section 116.07, subdivision 4, these rules establish standards for the design, location, and operation of sewage sludge landspreading sites and facilities.

6 MCAR S 4.6102 Permit and letter of approval requirements.

A. Landspreading.

1. The following persons shall comply with the requirements of 6 MCAR SS 4.6101-4.6136:

- a. political subdivisions that landspread sewage sludge;
- b. persons who own, lease, or rent landspreading facilities; and
- c. persons who are under contract to a. or b. to landspread sewage sludge or to operate a landspreading facility.

2. The persons identified in 1. shall apply for, and be copermittees of, a state disposal system permit for landspreading facilities.

3. Political subdivisions shall apply for a letter of approval for landspreading sites.

4. Each existing and proposed landspreading site shall have a letter of approval at the time given in Exhibit 6 MCAR S 4.6102 A.4.-1, unless it possesses a current letter of approval. Each existing landspreading facility shall have a state disposal system permit at the time given in Exhibit 6 MCAR S 4.6102 A.4.-1, unless it possesses a current permit. Each proposed landspreading facility shall have a state disposal system permit prior to development and use.

Exhibit 6 MCAR S 4.6102 A.4.-1

Schedule for Obtaining Letter of Approval or Permit

Wastewater Treatment System Design Flow in Million Gallons/Day		Months After Rule Effective Date
More than 20	Sites	0
	Facilities	3
1 - 20	Sites	6
	Facilities	12
Fewer than 1	Sites	12
	Facilities	12

B. Incineration. Incineration of sewage sludge is governed by rule APC 28 of the Minnesota Pollution Control Agency.

C. Other facilities. Any facility for the processing, storage, or disposal of sewage sludge into or on any land by means other than regulated by 6 MCAR SS 4.6101-4.6136 is prohibited without an agency permit.

6 MCAR S 4.6103 Definitions. For the purpose of 6 MCAR SS 4.6101-4.6136, the following terms have the meanings given them.

A. Agency. "Agency" means the Minnesota Pollution Control Agency.

B. Animal feed. "Animal feed" means any crop grown for consumption by animals, such as pasture crops, forage, and grain.

C. Aquifer. "Aquifer" means a water-bearing soil horizon or bedrock formation that transmits water in sufficient quantities to supply a well.

D. Available nitrogen. "Available nitrogen" means nitrogen which is present in inorganic forms that are useable by plants, and which may be determined by procedures set out in 6 MCAR S 4.6135.

E. Available water-holding capacity. "Available water-holding capacity" means the capacity of soil to hold water against the force of gravity and available for use by most plants. It is usually expressed in inches of water per inch of soil. It may be found in Soil Conservation Service soil surveys or Soil Conservation Service soil interpretation sheets, or it may be obtained in the laboratory using the method provided in 6 MCAR S 4.6132 B.3.

F. Bedrock outcrop. "Bedrock outcrop" means any bedrock

that appears at the surface of the land.

G. Cation exchange capacity. "Cation exchange capacity" means a measure of the potential quantity of readily exchangeable positive ions that the soil can attract and retain, expressed in milliequivalents per 100 grams of soil. Rule 6 MCAR S 4.6132 B.2. provides acceptable methods of determining cation exchange capacity.

H. Cave. "Cave" means any naturally formed, subterranean open area or chamber, or series of chambers.

I. Crops for direct human consumption. "Crops for direct human consumption" means crops that are consumed by humans without processing to minimize pathogens prior to distribution to the consumer.

J. Dewatered sewage sludge. "Dewatered sewage sludge" means any sewage sludge with a total solids content of 20 percent or greater or which can be transported and handled as a solid material.

K. Director. "Director" means the executive director or other designated representative of the Minnesota Pollution Control Agency.

L. Fallow land. "Fallow land" means land that is uncropped and kept cultivated throughout a growing season. Vegetative cover is less than 25 percent. Any land that is uncropped and cultivated during the months of September through May where a crop will be grown the following growing season is not considered fallow land.

M. Food-chain crops. "Food-chain crops" means tobacco, crops grown for human consumption, and feed for animals whose products are consumed by humans.

N. Hundred-year floodplain. "Hundred-year floodplain," as defined in 6 MCAR S 4.8051 for floodplain, means any area adjoining a watercourse which has been or hereafter may be covered by a large flood known to have occurred generally in Minnesota and reasonably characteristic of what can be expected to occur on an average frequency in the magnitude of the 100-year recurrence interval.

O. Immediate incorporation. "Immediate incorporation" means the mixing of sewage sludge with topsoil, concurrent with application or within 48 hours thereafter, by means such as injection, discing, mold-board plowing, chisel plowing or rototilling to a minimum depth of six inches.

P. Intermittent stream. "Intermittent stream" means any stream which flows at certain times during the year, such as after a rainstorm or during wet weather. Intermittent streams receive water from surface runoff, springs, or melting snow and have definable banks. Any intermittent stream mapped on Soil

Conservation Service soil surveys or United States Geological Survey quadrangle maps may be included within this definition. All Class 7 limited resource value waters listed in Supplement 1 of 6 MCAR SS 4.8024 and 4.8025 are included within this definition.

Q. Lakes and ponds. "Lakes and ponds" means any water basins defined as water basins and public waters in Minnesota Statutes, section 105.37, subdivisions 9 and 14 respectively.

R. Landspreading. "Landspreading" means placement of sewage sludge on or incorporated into the soil surface.

S. Landspreading facility. "Landspreading facility" means any land that is used for sewage sludge landspreading and is owned, leased, or rented by the political subdivision generating the sewage sludge.

T. Landspreading site. "Landspreading site" means any land used for sewage sludge landspreading that is not owned, leased, or rented by the political subdivision generating the sewage sludge.

U. Long-term storage. "Long-term storage" means the storage of dewatered sewage sludge for a period of greater than one month but not exceeding seven months at a landspreading site not located at the place of sewage sludge generation.

V. Mine. "Mine" means any excavation for minerals.

W. Organic priority pollutant. "Organic priority pollutant" means the organic compounds that appear in 40 Code of Federal Regulations, section 401.15 (1981).

X. Pasture crops. "Pasture crops" means crops such as legumes, grasses, grain stubble, and stover which are consumed by animals while grazing.

Y. Pathogens. "Pathogens" means organisms that are capable of producing an infection or disease in a susceptible host.

Z. Person. "Person," as defined in Minnesota Statutes, section 116.06, subdivision 8, means any human being, any municipality or other governmental or political subdivision or other public agency, any public or private corporation, any partnership, firm, association, or other organization, any receiver, trustee, assignee, agent, or other legal representative of any of the foregoing, or any other legal entity, but does not include the Minnesota Pollution Control Agency.

AA. Place of habitation. "Place of habitation" means any house, apartment, mobile home, dwelling, residence, or other structure, occupied or intended to be occupied on a day to day basis by an individual, group of individuals, family unit, or group of family units.

BB. Political subdivision. "Political subdivision" as defined in Minnesota Statutes, section 115A.03, subdivision 24, means any municipal corporation, governmental subdivision of the state, local government unit, special district, or local or regional board, commission, or authority authorized by law to plan or provide for waste management.

CC. Process to further reduce pathogens. "Process to further reduce pathogens" means high temperature composting, heat drying, heat treatment, thermophilic aerobic digestion, or other methods which will achieve similar levels of pathogen reduction. These methods are described in 6 MCAR S 4.6136.

DD. Process to significantly reduce pathogens. "Process to significantly reduce pathogens" means aerobic digestion, air drying, anaerobic digestion, low temperature composting, lime stabilization, or other methods which achieve similar levels of pathogen reduction. These methods are described in 6 MCAR S 4.6136.

EE. Putrescible sewage sludge. "Putrescible sewage sludge" means any sewage sludge that has a volatile solids content of 70 percent or more of the total solids content.

FF. Quarry. "Quarry" means any surficial mine used for the purpose of obtaining building stone, limestone, gravel, or sand.

GG. Recreational area. "Recreational area" means any public park, trail, campground, playground, athletic field, picnic ground, botanical or zoological garden, swimming beach or pool, fairground, or wayside and any commercial campground, resort, tourist court, amusement park, riding stable, or golf course.

HH. Residential development. "Residential development" means ten or more places of habitation concentrated within ten acres of land. The term also includes schools, churches, hospitals, nursing homes, businesses, offices, and apartment buildings or complexes having ten or more living units.

II. Rivers and streams. "Rivers and streams" means any watercourses defined as natural watercourses or altered natural watercourses and public waters in Minnesota Statutes, section 105.37, subdivisions 10, 11, and 14 respectively.

JJ. Road right-of-way. "Road right-of-way" means any interstate, United States, state, county, municipal, or township highway or road including any shoulder and drainage ditch alongside the road.

KK. Root crops. "Root crops" means plants whose edible parts are grown below the soil surface.

LL. Seasonal high water table. "Seasonal high water table" means the highest level the water table reaches during a given year. Methods of determining the seasonal high water table are given in 6 MCAR S 4.6132 B.5.

MM. Sewage sludge. "Sewage sludge," as defined in Minnesota Statutes, section 115A.03, subdivision 29, means the solids and associated liquids in municipal wastewater which are encountered and concentrated by a municipal wastewater treatment plant. Sewage sludge does not include incinerator residues and grit, scum, or screenings removed from other solids during treatment.

NN. Sewage sludge solids. "Sewage sludge solids" means the total solids remaining in sewage sludge after oven drying at 105 degrees Centigrade.

OO. Short-term storage. "Short-term storage" means the storage of dewatered sewage sludge for a period of less than one month at a landspreading site not located at the place of sewage sludge generation.

PP. Sinkhole. "Sinkhole" means a closed depression in an area of Karst topography that is formed either by solution of surficial limestone or by collapse of underlying caves.

QQ. Soil Conservation Service. "Soil Conservation Service" means the Soil Conservation Service of the United States Department of Agriculture.

RR. Soil horizon. "Soil horizon" means a layer of soil that is approximately parallel to the soil surface and has some set of properties that have been produced by soil-forming processes, and has some properties that are not like those of the layers above and beneath it. These properties include color, structure, texture, consistence, and bulk density.

SS. Soil pH. "Soil pH" means the soil's hydrogen-ion activity or the negative logarithm of the hydrogen-ion concentration. It is a measure of the acidity of soil. A soil pH value of 7.0 is neutral. The value is obtained by methods provided in 6 MCAR S 4.6132 B.1.

TT. Soil texture. "Soil texture" means the relative portion of the soil separates sand, silt, and clay. It can be measured using methods addressed in 6 MCAR S 4.6132 B.1. Coarse texture is United States Department of Agriculture textural classifications sand and loamy sand. Medium texture is United States Department of Agriculture classifications sandy loam, loam, silt, silt loam, and sandy clay loam. Fine texture is United States Department of Agriculture classifications clay loam, silty clay loam, sandy clay, silty clay, and clay.

UU. Soil type. "Soil type" means a soil body having the same profile characteristics and morphology. It is the lowest unit in the natural system of soil classification.

VV. Spray application. "Spray application" means liquid sewage sludge application by sprinkling devices such as center pivots and stationary or movable spray irrigation mechanisms.

WW. Spring. "Spring" means any natural surface discharge of

ground water large enough to flow in a small rivulet.

XX. Surface application. "Surface application" means sewage sludge spread on the surface of the land and not incorporated into the soil within 48 hours of application.

YY. Surface water. "Surface water" means any lake or pond, and any river or stream as defined in Q. and II., respectively.

ZZ. Ten-year floodplain. "Ten-year floodplain" means the lowland and relatively flat areas adjoining surface waters which are inundated by a flood which can be expected to occur, on an average, of once in ten years; or the land area to which flood waters have a ten percent chance of inundating in any given year.

AAA. Water table. "Water table" means the surface of the ground water at which the pressure is atmospheric. Generally this is the top of the saturated zone.

BBB. Wetland. "Wetland" means a natural marsh where water stands near, at, or above the soil surface during a significant portion of most years, which is eligible for classification as inland fresh water wetland type 3, 4 or 5 under United States Department of Interior classification, defined in United States Fish and Wildlife Circular No. 39 (1971 edition), not included within the definition of public waters as defined in Minnesota Statutes, section 105.37, subdivision 14, and which is ten or more acres in size in unincorporated areas or 2.5 acres or more in incorporated areas.

6 MCAR S 4.6104 Variance. Any person may apply for a variance from any requirement of 6 MCAR SS 4.6101-4.6136. Variances shall be applied for and acted upon by the agency in accordance with Minnesota Statutes, section 116.07, subdivision 5 and other applicable statutes and rules.

6 MCAR S 4.6105 Application requirements for landspreading sites. Applications for letters of approval for sewage sludge landspreading sites shall include the specific information given in A.-E. Submittal of this information shall be made using a form obtained from the director.

A. Sewage sludge characterization. Applications shall contain sewage sludge characterization.

1. This shall include a description of the process to significantly reduce pathogens or process to further reduce pathogens used to treat the sewage sludge, including temperatures, retention times, volatile solids reduction, and chemical doses, if applicable.

2. Sewage sludge chemical characteristics shall be determined from either a single composite sample taken within six months of application submittal or the average of analyses

from any number of samples taken within one year of application submittal. Sewage sludge shall be analyzed for parameters listed in 6 MCAR S 4.6111 A.5. The dates of sampling and analysis shall be included with the analysis.

B. Site characterization. Applications shall contain site characterization.

1. This shall include a copy of Soil Conservation Service soil survey maps or comparable soil maps prepared by a soil scientist with mapping experience, delineating the boundaries of the specific sewage sludge landspreading and short-term or long-term storage areas. Information included with the soil survey maps or obtained from actual on-site investigations shall include the following items for each soil type present at the landspreading site:

- a. texture and thickness of each soil horizon to 60 inches of depth;
- b. permeability of each soil horizon to 60 inches of depth;
- c. available water-holding capacity of each soil horizon to 60 inches in depth;
- d. soil depth required to obtain six inches of available water-holding capacity;
- e. depth to seasonal high water table;
- f. depth to bedrock; and
- g. slope of land surface.

2. It shall include a copy of a United States Geological Service quadrangle map or aerial photo which shows the location of and distance to each of the following features, if within one-quarter mile of the landspreading site:

- a. lakes and ponds;
- b. rivers and streams;
- c. wetlands;
- d. intermittent streams;
- e. ten-year flood plains;
- f. sinkholes, caves, bedrock outcrops, mines, or quarries;
- g. potable water supply wells;
- h. places of habitation;

- i. recreational areas;
- j. residential developments;
- k. road right-of-ways; and
- l. airports.

3. It shall include a legal description of the landspreading site, including township, range, section, quarter section, township or city name, and county.

4. It shall include the approximate quantity of sewage sludge solids previously applied to the landspreading site.

5. Required sampling and analytical procedures of soil characteristics listed in a. to g. are provided in 6 MCAR S 4.6132. Applications shall contain the following soil characteristics which shall be determined from samples obtained within six months of application submittal:

a. United States Department of Agriculture textural classification;

b. percentage of organic matter;

c. extractable phosphorus in pounds per acre;

d. exchangeable potassium in pounds per acre;

e. pH;

f. soluble salts expressed in millimhos per centimeter; and

g. cation exchange capacity expressed in milliequivalents per 100 grams.

6. Site characterization shall include the acreage of the landspreading site.

7. It shall include the name and address of landowner.

8. It shall also include the name and address of any renter, lessee, or occupier of the landspreading site.

C. Site management. Applications shall include site management. This includes the following:

1. a description of the proposed method or methods of sewage sludge application;

2. the name and address of the person who will apply sewage sludge to the proposed landspreading site;

3. the maximum annual application rate, in tons of sewage

sludge solids per acre per year, based on nitrogen or cadmium additions, whichever is limiting;

4. the estimated maximum sewage sludge loading rate over the life of the site, in tons of sewage sludge solids per acre, based on cumulative heavy metal limits, current sewage sludge analysis, and past heavy metal applications;

5. a description of the crop to be grown or dominant vegetation at the site and intended use of the crop;

6. a description of how public access to the site is proposed to be controlled; and

7. months and approximate dates when sewage sludge will be landspread.

D. Provisions for long-term sewage sludge storage at the site. Applications shall include the following provisions for long-term sewage sludge storage at the site:

1. A description of the necessity for storage at the landspreading site.

2. The location of the storage area delineated on maps submitted pursuant to B.1. and B.2.

3. A description of how sewage sludge is to be stored.

4. The acreage of the sewage sludge storage area.

5. The quantity of sewage sludge to be stored.

6. Boring logs from at least two soil borings to a depth of ten feet taken at the perimeter of the proposed storage area. The boring logs shall include:

a. texture and thickness of each soil horizon encountered;

b. color and presence or absence of mottling for each soil horizon encountered;

c. depth to water table, if encountered; and

d. depth to bedrock, if encountered.

7. The soil depth required to obtain eight inches of available water-holding capacity.

8. The expected duration and dates of storage before landspreading.

9. The description of precaution or practices to minimize or prevent leachate, runoff, or nuisance conditions from the storage area. If the long-term storage site is to be at the

same location for each year the landspreading site is used, an evaluation of the necessity for an impervious pad shall be included.

E. Public notification. Applications shall include evidence that the applicable county and local officials have been notified that application is being made to the agency for approval of the proposed landspreading site and operation.

6 MCAR S 4.6106 Application requirements for landspreading facilities. Applications for state disposal system permits for sewage sludge landspreading facilities shall include the information required by A.-D.

A. Information required for letters of approval. The application shall contain all information required in 6 MCAR S 4.6105 A., B., and C. for letters of approval for landspreading sites.

B. Ground water quality. Applications shall contain present ground water quality for the following parameters:

1. pH;
2. electrical conductivity expressed in millimhos per centimeter;
3. total hardness expressed in milligrams per liter as CaCO_3 ;
4. alkalinity expressed in milligrams per liter as CaCO_3 ;
5. chlorides expressed in milligrams per liter;
6. sulfates expressed in milligrams per liter;
7. total organic carbon expressed in milligrams per liter;
8. nitrate-nitrogen expressed in milligrams per liter;
9. total phosphorus expressed in milligrams per liter;
10. methylene blue active substances expressed in milligrams per liter;
11. total dissolved solids expressed in milligrams per liter; and
12. total coliform bacteria expressed in organisms per 100 milliliters.

The ground water to be sampled and analyzed shall be from the first aquifer below the proposed landspreading facility that is being used or may be used for drinking water purposes. Analytical methods for these parameters may be found in 6 MCAR S

4.6134.

C. Ground water monitoring wells and soil water sampling devices. Applications shall contain a description of all ground water monitoring wells and soil water sampling devices installed at the facility, including:

1. location on required soil map;
2. elevation of ground water surface, depth of boring and well, well seals, and screened interval; and
3. description of well construction materials such as casing, well seal, grouting and packing.

D. Sewage sludge storage facility and operation. Applications shall contain a description of the sewage sludge storage facility and operation, including:

1. facility type and capacity;
2. frequency of sewage sludge addition to and removal from the storage facility; and
3. description and permeability of storage pond liner or storage pad base, whichever is applicable.

E. Additional information. The information in 1.-3. shall be submitted in addition to that required in A.-D. if the applicant or permittee proposes to apply available nitrogen in excess of that stipulated in 6 MCAR S 4.6121 A.2.e., cadmium in excess of two pounds per acre per year, or metals in excess of levels stipulated in Exhibits 6 MCAR S 4.6121 D.2.f.-1 or D.2.g.-2. The information in 4., 5., 6., or 7., whichever is applicable, shall be submitted in addition to that required in A.-D. if the applicant or permittee proposes not to comply with one or more of the minimum design requirements in 6 MCAR S 4.6121.

1. An application shall contain a characterization of hydrogeological conditions at and within one mile from the landspreading facility, including:

- a. type of and depth to bedrock;
- b. bedrock condition, such as fractures, faults, and channels;
- c. texture of unconsolidated material above bedrock;
- d. depth to hydrostatic ground water table;
- e. direction of ground water flow and rate of movement;
- f. ground water recharge and discharge areas;

- g. available well boring logs for any public or private, potable or non-potable water supply wells;
- h. present ground water quality and use; and
- i. suitability of ground water for future use.

This information may be obtained from available well boring data, United States Geological Survey hydrogeologic atlases, other hydrogeological studies in the area, or by actual on-site investigations.

2. The application shall contain a description of soil characteristics to a minimum depth of 25 feet. The minimum number of borings required can be determined using the following formula:

$$\text{Number of borings} = (\text{landspreading acreage} \times 0.1) + 3.$$

The information given for each boring shall include:

- a. location and depth of boring;
- b. soil classification using the Unified system for each soil horizon encountered;
- c. color and presence or absence of mottling for each soil horizon encountered; and
- d. water level measurement.

3. Utilizing the information in 1. and 2., the application shall contain an evaluation of the potential for impacting aquifer quality based on proposed facility management practices.

4. It shall contain a description and evaluation of the provisions, practices, and site features that will be utilized to comply with 6 MCAR S 4.6121 A.1. if one or more of the minimum design requirements in 6 MCAR S 4.6121 A.2. cannot be accomplished.

5. It shall contain a description and evaluation of the provisions, practices, and site features that will be utilized to comply with 6 MCAR S 4.6121 B.1. if one or more of the minimum design requirements in 6 MCAR S 4.6121 B.2. cannot be accomplished.

6. It shall contain a description and evaluation of the provisions, practices, and site features that will be utilized to comply with 6 MCAR S 4.6121 C.1. if one or more of the minimum design requirements in 6 MCAR S 4.6121 C.2. cannot be accomplished.

7. It shall also contain a description and evaluation of the provisions, practices and site features that will be

utilized to comply with 6 MCAR S 4.6121 D.1. if one or more of the minimum design requirements in 6 MCAR S 4.6121 D.2. cannot be accomplished.

6 MCAR S 4.6107 Administration of letters of approval.

A. Review. All applications shall be reviewed for completeness by the director. If the application is incomplete, the director shall promptly advise the applicant of the incompleteness. Further processing of the application may be suspended until the applicant has supplied the necessary information.

B. Preparation of preliminary determinations. The director shall make a preliminary determination regarding a completed application. This preliminary determination shall include a proposed determination to issue or to deny the approval sought in the application.

1. If the preliminary determination is to deny an approval, the director shall notify the applicant in writing and include the specific reasons for denial. The applicant may request an appearance before the agency to appeal the denial pursuant to agency rules of procedure, rule MPCA 3 of the Minnesota Pollution Control Agency.

2. If the preliminary determination is to issue an approval, the procedures set out in C. and D. shall apply.

C. Public participation.

1. The director shall provide notice of the application and a copy of the draft letter of approval to the following persons: the applicant; the owner and occupier of land proposed to be used for sewage sludge landspreading; the city or township and county officials of the area where a sewage sludge landspreading site is located; and other persons known by the director to have an interest in the proposed approval.

2. Any interested person, including the applicant, may, within 14 days following the date of issuance of the notice, submit written comments on the application and the proposed approval to the director.

3. All written comments submitted during the comment period shall be retained and considered in the formulation of final determinations concerning the application.

D. Final determination.

1. The director shall attempt to resolve all comments prior to a final determination concerning the application. If such comments have been resolved, the director shall issue or deny the approval.

AR013837

2. If all comments cannot be resolved, the application shall be presented to the agency, which shall issue or deny the approval. A public hearing may be requested in accordance with rule WPC 36(k) of the Minnesota Pollution Control Agency.

3. All persons submitting comments on the application and the proposed approval shall be notified of the final determination concerning the application.

E. Denial of approval.

1. Approval shall be denied if the proposed site does not comply with this rule and other applicable state or federal laws or rules; or approval is likely to cause pollution, impairment or destruction of the air, water, land or other natural resources of the state and there is a feasible and prudent alternative.

2. Notice of denial and reasons for the denial shall be issued to the persons listed in C.1.

F. Modification, suspension, and revocation of letters of approval. A letter of approval may be modified, suspended, or revoked in accordance with the requirements of rule WPC 36(s) of the Minnesota Pollution Control Agency.

G. Duration of approvals. The letter of approval shall have a duration of one to five years. The term of approval shall be based upon the request of the applicant and a determination of the suitability of the landspreading site and operation for compliance with 6 MCAR SS 4.6101-4.6136 for the duration of the requested approval period.

H. Enforcement. A letter of approval issued to a political subdivision pursuant to this rule shall become part of the political subdivision's national pollutant discharge elimination system or state disposal system permit and shall be enforceable to the same extent as the permit.

6 MCAR S 4.6108 Administration of state disposal system permits. The administration of state disposal system permits for landspreading facilities shall be governed by rule WPC 36 of the Minnesota Pollution Control Agency.

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Chapter Six: Landspreading Sites

6 MCAR S 4.6111 Requirements and limitations. The following requirements and limitations apply to the management of landspreading sites.

A. Sewage sludge sampling and analysis.

1. Sewage sludge samples shall be representative of the sewage sludge to be landspread.

2. In the case of digesters and liquid storage tanks, a representative sample shall be composed of at least four grab samples composited over a 24-hour period prior to landspreading.

3. In the case of lagoons, stockpiles, drying beds, and compost piles, a representative sample shall be composed of at least ten grab samples composited from the sewage sludge prior to landspreading.

4. Other recommended sampling and handling procedures are provided in 6 MCAR S 4.6131.

5. Sewage sludge shall be analyzed according to methods set forth in 6 MCAR S 4.6131 for the following parameters:

- a. percentage of total solids;
- b. volatile solids as percentage of total solids;
- c. pH;

d. nitrogen, including the percentages of kjeldahl, ammonia and, in the case of aerobically digested and composted sewage sludges only, nitrate;

e. total weight of heavy metals, including milligrams per kilogram of zinc, copper, lead, nickel, cadmium, chromium and mercury; and

f. polychlorinated biphenyls expressed as milligrams per kilogram.

All analytical values, except pH and total solids, shall be recorded on a dry weight basis.

6. The minimum frequency of sewage sludge sampling and analysis is given in Exhibit 6 MCAR S 4.6111 A.6.-1.

Exhibit 6 MCAR S 4.6111 A.6.-1

Minimum Frequency of Sewage Sludge Sampling and Analysis

Wastewater Treatment System Design Flow in Million Gallons/Day	Minimum Frequency
Less than 1.0	annually
1.0 - 20	semi-annually
More than 20	quarterly

7. Each parameter exceeding concentrations listed in Exhibit 6 MCAR S 4.6111 A.7.-2 shall be analyzed for at two or three times the minimum frequency given in Exhibit 6 MCAR S 4.6111 A.6.-1.

Exhibit 6 MCAR S 4.6111 A.7.-2

Greater Frequency of Sewage Sludge Sampling and Analysis

Parameter	Concentration Expressed in Milligrams/ Kilogram of Dry Weight	
	2x Frequency	3x Frequency
Zinc	1800	3600
Copper	900	1800
Lead	500	1000
Nickel	100	200
Cadmium	20	40
Chromium	1000	2000
Mercury	5	10
Polychlorinated biphenyls	5	10

8. Frequency of sewage sludge sampling and analysis may be reduced by the director depending on the annual frequency of landspreading and the variability of sewage sludge quality.

B. Pathogen control.

1. Sewage sludge, at a minimum, shall be treated by a process to significantly reduce pathogens prior to landspreading.

2. Sewage sludge shall be treated by a process to further reduce pathogens if crops for direct human consumption are to be grown within 18 months of sewage sludge application, unless there is no contact between the sewage sludge and the edible portion of the crop.

3. Sewage sludge shall only be applied to pasture or forage crops when foliage is minimal unless the sewage sludge is injected. Surface application during the growing season shall only be permitted within seven days following a cutting.

4. If sewage sludge is to be applied to land used for pasturing livestock or for growing forage crops, the pasturing

or harvesting of the crop shall not be permitted for at least one month following the last sewage sludge application unless the sewage sludge was treated by a process to further reduce pathogens.

5. Public access to a landspreading site shall be controlled during and for a period of 12 months following sewage sludge application unless the sewage sludge was treated by a process to further reduce pathogens. Fencing or posting of appropriate signs is required if the site is likely to be frequented by the general public. If the site is remote, or used for agricultural purposes, fencing or posting is not required unless inadvertant public contact is likely.

C. Soil pH and cadmium application.

1. For landspreading sites where food-chain crops will be grown, the pH of the soil and sewage sludge mixture shall be 6.5 or greater during the growing season following sewage sludge application.

2. Annual cadmium application shall not be more than one-half pound per acre on the land used for the production of tobacco, leafy vegetables, or root crops grown for human consumption. For other food-chain crops, the annual cadmium application shall not exceed two pounds per acre.

3. Cumulative cadmium application to any landspreading site shall not exceed the levels provided in Exhibit 6 MCAR S 4.6111 C.3.-3.

Exhibit 6 MCAR S 4.6111 C.3.-3.

Maximum Cumulative Cadmium Application

Soil Cation Exchange Capacity (milliequivalents/100 grams)	Maximum Cumulative Cadmium Application (pounds/acre)
Less than 5	5
5 - 15	10
More than 15	20

D. Cumulative heavy metal additions. Sewage sludge application shall be terminated when the sum addition of any one heavy metal equals the level in Exhibit 6 MCAR S 4.6111 D.-4 for that particular heavy metal and soil.

Exhibit 6 MCAR S 4.6111 D.-4

Maximum Cumulative Heavy Metal Addition

Soil Cation Exchange Capacity (milliequivalents/100 grams)	Maximum Cumulative Heavy Metal Addition (pounds/acre)			
	Lead	Zinc	Copper	Nickel
Less than 5	500	250	125	50
5 - 15	1000	500	250	100
More than 15	2000	1000	500	200

E. Sewage sludge application rates.

1. Sewage sludge application rates, combined with other known nitrogen sources, shall supply no more nitrogen than the amount required by the vegetation to be grown at the site. The rate of sewage sludge application shall be determined using the method outlined in 6 MCAR S 4.6135.

2. Sewage sludge application to a site shall be suspended whenever the soil extractable phosphorus content exceeds 400 pounds per acre.

3. Sewage sludge application to a site shall be suspended whenever the electrical conductivity of the saturation extract of soil exceeds four millimhos per centimeter as determined by the soluble salt test.

4. Sewage sludge shall not be applied to fallow land unless the following provisions are met: the soil surface has a medium or fine texture; the average annual precipitation is no greater than 24 inches; the addition of available nitrogen does not exceed 50 pounds per acre on medium-textured soil and 75 pounds per acre on fine-textured soil; and a crop is grown the year following sewage sludge application. The amount of available nitrogen applied to that crop is reduced by the amount of available nitrogen applied the previous year.

F. Organic priority pollutant limitations.

1. Sewage sludge containing concentrations of PCBs equal to or greater than 10 milligrams per kilogram of sewage sludge solids shall be incorporated into the soil when applied to land used for producing food-chain crops.

2. Sewage sludge containing concentrations of PCBs equal to or greater than 50 milligrams per kilogram of sewage sludge solids shall not be landspread.

3. If there is a known source in the sewer system service area which discharges a significant quantity of an organic priority pollutant, the sewage sludge shall be analyzed for that chemical. Concentrations will be considered on a case-by-case basis and recommendations will be made regarding the utilization

of that sewage sludge on land.

G. Suitable soil conditions.

1. A soil profile shall be of sufficient depth to provide an available water-holding capacity of at least six inches above bedrock or the seasonal high water table. In no case shall this depth be less than three feet. Where sewage sludge is injected into the soil, the six inches of water-holding capacity or the three foot separation distance, whichever is applicable, shall exist between the bottom of the injection zone and the seasonal high water table or bedrock.

2. For the purpose of 1., a perched water condition, in which a zone of saturated soil exists between zones of unsaturated soil in the upper five feet of the soil profile, shall not be considered a seasonal high water table.

3. For the purpose of 1., the depth to subsurface drainage tiles shall be considered the depth to the seasonal high water table for tile drainage systems that are designed according to or equivalent to Soil Conservation Service engineering standards and criteria.

4. If, according to available information such as Soil Conservation Service soil surveys and soil interpretation sheets, the required six inches of available water-holding capacity is not provided in the upper five feet of soil for any given soil type, a boring shall be made to the depth in which six inches of available water-holding capacity would be provided. If indication of a seasonal high water table or bedrock is found before this depth is accomplished, that soil type shall not be used for landspreading.

5. The soil texture, United States Department of Agriculture classification, at the zone of sewage sludge application shall be one of the following: fine sand; loamy sand; sandy loam; loam; silt loam; silt; sandy clay loam; sandy clay; clay loam; silty clay loam; silty clay; or clay.

6. Liquid sewage sludge shall not be spread on soils with surface permeabilities of less than 0.2 inch per hour unless the sewage sludge is immediately incorporated.

7. Sewage sludge shall not be spread on soils that have permeabilities of greater than six inches per hour throughout the top five feet.

8. Sewage sludge shall not be spread in areas where bedrock containing solution cavities or fractures or cracks exists within six feet of the soil surface.

9. Sewage sludge shall not be spread on areas ponded with water or sewage sludge.

10. Surface application of sewage sludge shall not be

allowed on land with a slope greater than six percent. Subsurface application or an immediately incorporated application of sewage sludge shall not be allowed on land with a slope greater than 12 percent.

11. Soil samples shall be collected and analyzed prior to each cropping season that a landspreading site is used. The following parameters shall be determined using collection and analysis procedures provided in 6 MCAR S 4.6132:

- a. United States Department of Agriculture textural classification;
- b. percentage of organic matter content;
- c. extractable phosphorus in pounds per acre;
- d. exchangeable potassium in pounds per acre;
- e. pH; and
- f. soluble salts expressed in millimhos per centimeter.

H. Separation distances.

1. A distance of at least 200 feet from any place of habitation and a distance of at least 600 feet from any residential development or recreational area shall be maintained, unless written permission is obtained from all persons responsible for residential developments and places of recreation and all persons inhabiting within the otherwise protected distance.

2. A distance of at least 200 feet from any private water supply well and a distance of at least 1,000 feet from any public water supply well shall be maintained. Monitoring and test wells are exempt from this limitation.

3. Separation distances prescribed in 1. may be reduced by one-half if sewage sludge is injected into the soil.

4. Land application of sewage sludge shall be conducted so that sewage sludge is not applied to adjoining property or to road right-of-ways.

5. A distance of at least 200 feet for coarse-textured soils and at least 300 feet for medium and fine-textured soils shall be maintained from any downgradient surface water where sewage sludge is surface applied during the months of May through October. These separation distances shall be doubled where sewage sludge is surface applied during the months of November through April.

6. The minimum distances in Exhibit 6 MCAR S 4.6111 H.6.-5 from any downgradient surface water shall be maintained where sewage sludge is immediately incorporated into the soil.

Exhibit 6 MCAR S 4.6111 H.6.-5

Minimum Distances From Downgradient Surface Water

Land Slope	Separation (feet)
Less than 2 percent	25
2 - 6 percent	50
6 - 12 percent	100

7. A 100 foot separation distance from intermittent streams shall be maintained when applying sewage sludge unless one or more of the following conditions exist, in which case the separation distance shall be at least 25 feet:

- a. the sewage sludge is immediately incorporated;
- b. the sewage sludge is surface applied and the intermittent stream does not discharge to any surface water; or
- c. the sewage sludge is surface applied and the intermittent stream discharges to a surface water that is more than one mile downstream.

I. Short-term dewatered sewage sludge storage.

1. Sewage sludge in short-term storage shall be spread as soon as conditions permit. In no case shall the short-term storage of sewage sludge be in excess of 30 days. It is advisable that the short-term storage site be relocated each year the landspreading site is used.

2. Separation distances for short-term sewage sludge storage areas shall be those provided in H. for landspreading sites except that short-term storage of sewage sludge shall not be within 100 feet of any adjoining property without the written permission of the owner or within 100 feet of any road right-of-way.

3. Short-term storage of sewage sludge shall not take place on land with a slope greater than two percent unless measures are taken to control water runoff or the sewage sludge is being spread concurrent with the unloading of sewage sludge delivery trucks.

4. The suitable soil conditions for short-term storage of sewage sludge shall be the same as those for landspreading sites in G.

J. Long-term dewatered sewage sludge storage.

1. Long-term storage of sewage sludge shall only be allowed at landspreading sites where the stored sewage sludge is to be applied. Long-term storage at one landspreading site of sewage sludge that is intended for application at several landspreading sites is allowed provided that all sites are owned by the same person and all sites are within a one-half mile radius.

2. Long-term storage of sewage sludge for landspreading areas of 40 acres or less shall not take place within 400 feet from any place of habitation. This separation distance shall increase 100 feet for every additional ten acres of landspreading area, or portion thereof, up to a maximum of 1,000 feet. Separation distances may be reduced if written permission is obtained from all persons inhabiting within the otherwise protected distance.

3. Long-term storage of sewage sludge shall not take place within 1,000 feet of any residential development or recreational area.

4. Long-term storage of sewage sludge shall not take place within 1,000 feet of any downgradient surface waters or ten-year floodplain, unless measures are taken to control runoff in which case the separation distance may be reduced to 200 feet.

5. Long-term storage of sewage sludge shall not be allowed on land with greater than two percent slope unless measures are taken to control runoff, in which case the maximum land slope may be increased to six percent.

6. Long-term sewage sludge storage areas shall not be located in areas where the soil profile has less than eight inches of available water-holding capacity between the soil surface and the seasonal high water table and bedrock.

7. Long-term sewage sludge storage shall not take place in areas where the soil permeability is greater than six inches per hour throughout the top five feet of soil.

8. Long-term sewage sludge storage shall not take place in the same area for two or more consecutive years.

9. Conditions set forth in 6., 7., and 8. are not required if measures are taken to control leachate generation from the area of long-term sewage sludge storage.

K. Prohibited sites and other limitations.

1. Sewage sludge shall not be disposed of on or into any cave, sinkhole, or wetland. Except as part of a reclamation project, sewage sludge shall not be disposed of in or on any mine or quarry.

2. Sewage sludge shall not be applied on any land without the permission of the owner.

3. Organic soils or peat shall not be utilized for sewage sludge application unless subsurface drainage is provided by a system designed according to or equivalent to Soil Conservation Service engineering criteria.

4. Daily surface applications of liquid sewage sludge shall not exceed the following: for coarse-textured soil, 25,000 gallons per acre; for medium-textured soil, 15,000 gallons per acre; or for fine-textured soil, 10,000 gallons per acre.

5. Sewage sludge shall be applied to land in such a manner as to provide uniform spreading or application over the entire site.

6. The boundary of a landspreading site shall be identified prior to and during application with the use of conspicuous flags placed every 100 feet along the border unless apparent boundaries, such as fence rows, roads, tree lines, or steep slopes, exist.

7. Putrescible sewage sludge, regardless of pathogen reduction process, shall be immediately incorporated into the soil.

6 MCAR S 4.6112 Record keeping and annual reporting.

A. Record keeping. A record keeping system shall be initiated and maintained by the political subdivision generating the sewage sludge that is applied at landspreading sites to verify compliance with 6 MCAR S 4.6111. The information recorded in the system shall include the following:

1. required sewage sludge composition data pursuant to 6 MCAR S 4.6111 A.5.;

2. soil test data for landspreading sites used during the year, pursuant to 6 MCAR S 4.6111 G.11.;

3. the location of the landspreading and stockpile sites on a United States Geological Survey quadrangle or soil survey map and the number of acres to which sewage sludge was applied, if different from the submitted application;

4. the amount of sewage sludge applied that year and cumulatively expressed in terms of tons of sewage sludge solids per acre;

5. the known amount of available nitrogen applied that year expressed in terms of pounds per acre;

6. the amount of cadmium, zinc, lead, nickel, and copper applied that year and cumulatively expressed in terms of pounds per acre; and

AR013851

7. vegetation grown on the site during the year.

B. Reports. The information in A. shall be recorded on an agency form by the political subdivision and submitted annually to the agency no later than the March 1 next following the end of the reporting year. The form for annual reporting may be obtained from the director.

Chapter Seven: Landspreading Facilities

6 MCAR S 4.6121 Requirements and limitations. The following requirements and limitations apply to the management of landspreading facilities.

A. Ground water protection.

1. A sewage sludge landspreading facility shall be designed, constructed, monitored, and maintained so that it will comply with the standards of rule WPC 22 of the Minnesota Pollution Control Agency at the facility boundary.

2. The facility shall comply with the following minimum design requirements unless the permittee can demonstrate that compliance with 1. will be accomplished.

a. A minimum of six ground water monitoring wells shall be installed at the facility. Four wells shall be placed within the facility boundaries, two upgradient and two downgradient of ground water flow. The remaining two wells shall be placed within the area of landspreading. All wells shall be placed in the uppermost portion of the first aquifer below the landspreading facility that is currently being used or may be used in the future for drinking water purposes. All wells shall sample the same portion of the aquifer. At a minimum, the frequency of sampling shall be semi-annually. The parameters to be tested for and a sampling frequency exceeding the minimum shall be determined by the director and will be based upon soil permeabilities, depth to water table, direction of ground water flow in relation to the location of potable water supply wells, distance to potable water supply wells, sewage sludge application rates, sewage sludge quality, and suitability of the ground water as a source of potable drinking water.

b. A landspreading facility shall not be located on soils that have permeabilities of greater than six inches per hour throughout the profile above the water table.

c. Landspreading facilities shall not be located in areas where the soil profile has less than six inches of available water-holding capacity between the soil surface and the water table or bedrock.

d. Landspreading facilities shall be located at least 1,000 feet from potable water supply wells that are finished to

a depth of less than 50 feet and are downgradient with respect to ground water flow direction.

e. Sewage sludge application rates shall supply no more nitrogen than the amount required by the vegetation to be grown at the facility. The rate of sewage sludge application shall be determined using the method outlined in 6 MCAR S 4.6135.

f. Any basin, tank, pit, or lagoon used to store liquid sewage sludge shall not seep at a rate greater than 500 gallons per acre per day. Any area at a landspreading facility used to store dewatered sewage sludge for a period in excess of one month per year shall be paved with asphalt or concrete to a depth sufficient to bear the weight of unloading and loading trucks and equipment without cracking. The pad shall be sloped and curbed to collect all runoff water. Runoff water shall be routed to a wastewater treatment facility or land applied in a manner approved by the director.

B. Surface waters protection.

1. A sewage sludge landspreading facility shall be designed, constructed, operated, and maintained so that it will not impact the use or the quality of surface waters.

2. The facility shall comply with the following minimum design requirements unless the permittee can demonstrate that compliance with 1. will be accomplished.

a. A sewage sludge landspreading facility shall not be located within 1,000 feet of the normal high water level of any lake or pond.

b. A sewage sludge landspreading facility shall not be located within 300 feet of any river or stream.

c. A sewage sludge landspreading facility shall not be located within a wetland.

d. A sewage sludge landspreading facility shall not be located within a hundred year floodplain.

e. Surface sewage sludge application at a landspreading facility shall not take place within 100 feet of an intermittent stream unless it is immediately incorporated, in which case the separation distance may be reduced to 25 feet.

f. The director may determine that discharge from a landspreading facility of subsurface water via underground drainage systems or of channelized runoff to surface waters should be monitored. Any required monitoring, parameters to be monitored for, and sampling frequency shall be determined by the director based upon the following: discharge quantity; time of year discharge is expected; classification of receiving water; sewage sludge quality; sewage sludge application rate; source of channelized runoff; depth of tile drainage system; and purpose

of tile drainage system.

C. Public health and safety.

1. A sewage sludge landspreading facility shall be designed, constructed, operated, and maintained so that it will not adversely impact the health and safety of the public living near or passing by the facility. The facility shall comply with applicable provisions of rule APC 9 of the Minnesota Pollution Control Agency at the facility boundary.

2. The facility shall comply with the following minimum design requirements unless the permittee can demonstrate that compliance with 1. will be accomplished.

a. At a minimum, sewage sludge applied to a landspreading facility shall be treated by a process to significantly reduce pathogens.

b. Daily surface applications of liquid sewage sludge shall be limited to quantities that will infiltrate into the soil within 24 hours.

c. Unauthorized public access to a landspreading facility shall be controlled by fencing or posting of appropriate signs.

d. Any landspreading facility located within 10,000 feet of any airport runway used by turbojet aircraft or within 5,000 feet of any airport runway used by only piston-type aircraft shall have the approval of the Federal Aviation Administration.

D. Food-chain protection.

1. A sewage sludge landspreading facility shall be designed, constructed, operated, and maintained so that the quality of food-chain crops grown at the facility complies with applicable regulations of the Food and Drug Administration, United States Department of Agriculture, and rules of the Minnesota Department of Agriculture.

2. The facility shall comply with the following minimum design requirements unless the permittee can demonstrate that compliance with 1. will be accomplished.

a. If crops for direct human consumption are to be grown at a landspreading facility within 18 months of sewage sludge application, the sewage sludge shall be treated by a process to further reduce pathogens.

b. If sewage sludge is to be applied to land used for pasturing livestock or for growing forage crops, the pasturing or harvesting of the crop shall not take place for at least one month following the last sewage sludge application.

c. Sewage sludge containing concentrations of PCBs greater than ten milligrams per kilogram of sewage sludge solids shall be incorporated into the soil when applied to land used for producing food-chain crops.

d. Sewage sludge containing concentrations of PCBs equal to or greater than 50 milligrams per kilogram of sewage sludge solids shall not be landspread.

e. If the facility is used for growing a food-chain crop, vegetative tissue shall be sampled at the stage of development designated in 6 MCAR S 4.6133 and analyzed for cadmium if the pH of the soil and sewage sludge mixture is less than 6.5 immediately before the time food-chain crops are grown; or the annual application of cadmium exceeds one-half pound per acre on land used for the production of tobacco, leafy vegetables or root crops grown for human consumption; or the annual cadmium application rate exceeds two pounds per acre on land used for the production of other food-chain crops.

f. The cumulative addition of cadmium to any land shall not exceed the levels in Exhibit 6 MCAR S 4.6121 D.2.f.-1, unless the only food-chain crop produced is animal feed; the pH of the soil and sewage sludge mixture is 6.5 or greater immediately before the time the crop is planted and this pH level is maintained whenever food-chain crops are grown; vegetative tissue is sampled at the stage of development designated in 6 MCAR S 4.6133 and analyzed for cadmium; there is a facility operating plan which demonstrates how the animal feed will be distributed to preclude ingestion by humans and which describes the measures to be taken to safeguard against possible health hazards from cadmium entering the food-chain, which may result from alternative land uses; and future property owners are notified by a stipulation in the land record or property deed of the amount of cadmium the property has received and that food-chain crops should not be grown due to a possible health hazard.

Exhibit 6 MCAR S 4.6121 D.2.f.-1

Maximum Cumulative Addition of Cadmium

Soil Cation Exchange Capacity (milliequivalents/100 grams)	Maximum Cumulative Cadmium Addition (pounds/acre)
Less than 5	5
5 - 15	10
More than 15	20

g. The cumulative addition of lead, zinc, copper, and

nickel shall not exceed the levels in Exhibit 6 MCAR S 4.6121 D.2.g.-2 unless future property owners are notified by a stipulation in the land record or property deed of the amount of lead, zinc, copper, or nickel applied, whichever are in excess. The stipulation shall state that these levels may result in reduced crop yield.

Exhibit 6 MCAR S 4.6121 D.2.g.-2

Maximum Cumulative Heavy Metal Addition

Soil Cation Exchange Capacity (milliequivalents/100 grams)	Maximum Cumulative Heavy Metal Addition (pounds/acre)			
	Lead	Zinc	Copper	Nickel
Less than 5	500	250	125	50
5 - 15	1000	500	250	100
More than 15	2000	1000	500	200

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6 MCAR S 4.6122 Record keeping and annual reporting.

A. Record keeping. A record keeping system shall be initiated and maintained by the permittee of the landspreading facility to verify compliance with requirements and limitations in 6 MCAR S 4.6121. The information recorded in such a system shall include the following:

1. sewage sludge composition data for parameters outlined in 6 MCAR S 4.6111 A.5.;
2. the quantity and rate of sewage sludge solids applied to the facility expressed in tons per acre;
3. the amount of available nitrogen applied to the facility expressed in pounds per acre;
4. the amount of cadmium, zinc, lead, nickel, and copper applied that year and cumulatively expressed in pounds per acre;
5. vegetation grown and use of vegetation grown at the facility;
6. results of required monitoring of ground water, soils, or vegetative tissue;
7. information required in the facility operating permit;
8. a description of any adverse environmental, health, or social effects, complaints, management problems, or other difficulties encountered during the year due to sewage sludge disposal; and

9. a report of any action not in compliance with the permit or 6 MCAR S 4.6121.

At a minimum, the frequency of sewage sludge sampling and analysis shall be once a year. A frequency exceeding the minimum may be required by the director at the time of permit issuance based on the following: sewage sludge characteristics; quantity of sewage sludge applied at the facility; frequency of sewage sludge application; and design wastewater treatment system daily flow.

B. Reports. The information and records prescribed in A. shall be organized into a report to be submitted annually to the agency no later than the March 1 next following the end of the reporting year.

Chapter Eight: Appendices

6 MCAR S 4.6131 Collection and analysis of sewage sludge samples.

A. Collection of sewage sludge samples.

1. The following sampling and handling methods for liquid sewage sludge are recommended to obtain a sample that accurately represents the sewage sludge being sampled.

a. Daily grab samples of approximately one cup of sewage sludge are transferred to a two-gallon watertight container left in a refrigerator at 4 degrees Centigrade. After one month, the large composite sample is thoroughly mixed and a quart subsample removed for analysis. The quart subsample is delivered or shipped to the analytical laboratory as rapidly as possible in a very well-insulated shipping container. During very warm weather, the subsample is packed with dry ice to prevent microbial activity which would affect analytical values. If more than one day will elapse between sample collection and cold storage, enough sulfuric acid (H₂SO₄) is added to decrease the sewage sludge pH to about pH 1.0, which is approximately 10 to 20 milliliters per quart, prior to shipping.

b. Random grab samples of equal volume are taken from different depths and locations in the storage lagoon, tank, or digester. Care is exercised to obtain samples from many varied sampling points. The grab samples are composited into a single container, thoroughly mixed, and a quart subsample removed for analysis. Subsample handling then proceeds as discussed in a.

2. The following sampling and handling method is recommended for dewatered sewage sludges that are stored in stockpiles, compost piles, or drying beds. The storage area is divided up into sections of equal size using an imaginary grid. Grab samples or cores are taken from the center of each section at several depths. The samples are then composited, thoroughly mixed, and a pint subsample removed for analysis. The subsample is delivered or shipped to the analytical laboratory as rapidly

AR 013857

as possible in a well-insulated container.

B. Analysis of sewage sludge. Analytical procedures for determining constituents in sewage sludge samples shall be obtained from one of the following publications:

1. Methods for Chemical Analysis of Water and Wastes, issued by the United States Environmental Protection Agency as EPA-625/6-74-003 (1974).
2. Standard Methods for the Examination of Water and Wastes, 14th edition, issued by the American Public Health Association.
3. Analytical Procedures for Determining Organic Priority Pollutants in Municipal Sludges, issued by the United States Environmental Protection Agency as EPA 600/2-80-030 (1980).
4. Method Development for Determination of Polychlorinated Hydrocarbons in Municipal Sludge, issued by the United States Environmental Protection Agency as EPA 600/2-80-029 (1980).

6 MCAR S 4.6132 Collection and analysis of soil samples.

A. Collection of soil samples. At a minimum, one soil sample shall represent an area of no more than 40 acres. Additional soil samples may be required if there are areas differing greatly in previous fertilization, liming, cropping history, land management, or soil texture. The soil shall be sampled to a depth of six to nine inches from at least 15 to 20 random locations in the sampling area. The samples shall be composited, thoroughly mixed, and subsampled for analysis. Approximately one pint of soil is necessary for analysis.

B. Analysis of soils.

1. Acceptable analytical methods for United States Department of Agriculture textural classification, organic matter, extractable phosphorus, exchangeable potassium, pH, and soluble salts are found in one or more of the following publications:

- a. Guide to Computer Programmed Soil Test Recommendations in Minnesota, issued by the University of Minnesota, Agricultural Extension Service as Special Report No. 1 (St. Paul, Minnesota, 1978).
- b. Recommended Chemical Soil Test Procedures for the North Central Region, issued by the North Dakota State University as North Central Region Publication No. 221 (1975).
- c. Methods of Soil Analysis, edited by C.A. Black, issued by the American Society of Agronomy as Agronomy Monograph No. 9 (Madison, Wisconsin, 1965).

d. Soil Survey Laboratory Methods and Procedures for Collecting Soil Samples, issued by the Soil Conservation Service as Soil Survey Investigations Report 1 (revised) (Washington, D.C.: United States Government Printing Office, 1972).

2. Soil cation exchange capacity may be estimated on the basis of soil texture and organic matter content using Exhibit 6 MCAR S 4.6132 B.2.-1 or by direct analysis, either by the summation method for distinctly acid soils or the sodium acetate method for neutral, calcareous, or saline soils. (Methods of Soil Analysis, edited by C.A. Black, issued by the American Society of Agronomy as Agronomy Monograph No. 9 (Madison, Wisconsin, 1965).)

Exhibit 6 MCAR S 4.6132 B.2.-1

Cation Exchange Capacity
(milliequivalents/100 grams)

Soil Organic Matter Level

Texture	Low (less than 2%)	Medium (2-4%)	High (greater than 4%)
Coarse	less than 5	5 - 15	5 - 15
Medium	5 - 15	5 - 15	more than 15
Fine	more than 15	more than 15	more than 15

3. Available water-holding capacity measurements for different soil types and soil horizons may be found in Soil Conservation Service soil surveys or Soil Conservation Service soil interpretation sheets. Another acceptable alternative is the determination by direct analysis of soil samples. In general, the available water-holding capacity is the difference in water retained at 1/3 bar (1/10 bar for coarse-textured soil) and 15 bar matric suction. Acceptable procedures are discussed in the following publications:

a. Soil Survey Laboratory Methods and Procedures for Collecting Soil Samples, issued by the Soil Conservation Service as Soil Survey Investigations Report 1 (revised) (Washington, D.C.: United States Government Printing Office, 1972).

b. Chapter 8-2, "Water Retentivity of Soil at Specified Values of Matric Suction," in Methods of Soil Analysis, edited by C.A. Black, issued by the American Society of Agronomy as Agronomy Monograph No. 9 (Madison, Wisconsin, 1965).

4. Soil permeability measurements for different soil

types and soil horizons can be found in Soil Conservation Service soil surveys and Soil Conservation Service soil interpretation sheets. Other acceptable alternatives include:

a. Determination by direct measurements in the field as outlined in Chapter 15, "Field Measurement of Hydraulic Conductivity Above a Water Table," in Methods of Soil Analysis, edited by C.A. Black, issued by the American Society of Agronomy as Agronomy Monograph No. 9 (Madison, Wisconsin, 1965).

b. Determination in the laboratory using undisturbed soil samples as outlined in Chapter 13, "Laboratory Measurement of Hydraulic Conductivity of Saturated Soil," in Methods of Soil Analysis, edited by C.A. Black, issued by the American Society of Agronomy as Agronomy Monograph No. 9 (Madison, Wisconsin, 1965).

5. The depth to the seasonal high water table for different soil types can be found in Soil Conservation Service soil surveys and Soil Conservation Service soil interpretation sheets. Other acceptable alternatives include:

a. Determination of the depth of soil having mottles with a chroma of two or less as discussed on pages 48 and 49 of Soil Taxonomy, issued by the Soil Conservation Service as Agriculture Handbook No. 436 (Washington, D.C.: United States Government Printing Office, 1975).

b. Measurement of water levels at monthly intervals over the course of one year in piezometers. The highest water level measurement obtained is acceptable as the seasonal high water table. The piezometers must be installed and water levels must be measured as outlined in Chapter 11, "Hydraulic Head," in Methods of Soil Analysis, edited by C.A. Black, issued by the American Society of Agronomy as Agronomy Monograph No. 9 (Madison, Wisconsin, 1965).

6 MCAR S 4.6133 Collection and analysis of vegetative tissue samples.

A. Sample collection. Samples collected shall adequately represent the average condition of the vegetation grown at the landspreading facility. This is best accomplished by compositing many grab samples followed by subsampling to a quantity sufficient for chemical analysis. Areas that are managed differently, for example different soil type, crop, sewage sludge application rate, application method, shall be sampled separately. A sample shall represent an area no larger than ten acres.

Samples shall be taken from the following plant parts at the designated stages of development:

1. corn, leaf at, or opposite and below, ear level, at silking stage;

- 2. soybeans, the youngest mature leaves and petioles on the plant after first pod formation;
- 3. legumes, upper stem cuttings in early flower stage;
- 4. cereals, the whole plant at the boot stage; and
- 5. grasses, whole plants at early hay cutting stage.

B. Sample handling and preservation. All samples should be washed with deionized or distilled water to remove any surface contamination. Samples are then dried at 55 degrees Centigrade as quickly as possible, ground, and stored for analysis. If samples cannot be dried immediately, they shall be placed in plastic bags and stored in a refrigerator.

C. Sample analysis. Dried and ground tissue samples may be prepared for analysis by wet digestion in a suitable combination of nitric, sulfuric, or perchloric acid or by dry ashing at a temperature not to exceed 500 degrees Centigrade. Cadmium shall then be analyzed by using atomic absorption or flame emission spectroscopy.

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6 MCAR S 4.6134 Collection and analysis of ground water samples.

A. Sample collection. Construction and sampling of ground water monitoring wells at sewage sludge landspreading facilities shall be consistent with methods discussed in either of the following publications:

- 1. Water Quality Monitoring at Solid Waste Disposal Sites in Minnesota, issued by the Minnesota Pollution Control Agency (May 1979).
- 2. Procedures Manual for Ground Water Monitoring at Solid Waste Disposal Facilities, issued by the United States Environmental Protection Agency as EPA/530/SW-611 (August 1977).

B. Sample analysis. Analytical procedures for determining constituents in ground water collected in monitoring wells at sewage sludge landspreading facilities shall be obtained from one of the following publications:

- 1. Methods for Chemical Analysis of Water and Wastes, issued by the United States Environmental Protection Agency as EPA-625/6-74-003 (1974).
- 2. Standard Methods for the Examination of Water and Wastes, 14th edition, issued by the American Public Health Association.

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6 MCAR S 4.6135 Determination of sewage sludge application rate based on crop nitrogen requirements. Sewage sludge application rates shall be based upon soil texture, crop nitrogen

requirements and yield goals, sewage sludge nitrogen availability, carry-over nitrogen supplied by past sewage sludge applications, and available nitrogen added by manures or fertilizers. The procedures in A.-E. shall be used:

A. Maximum allowable available nitrogen level. Based on cropping practices and soil texture, determine the maximum allowable available nitrogen level in pounds per acre from Exhibit 6 MCAR S 4.6135 A.-1 or Exhibit 6 MCAR S 4.6135 A.-2.

Maximum allowable nitrogen levels for crops not listed in these exhibits shall be based on agricultural extension, Soil Conservation Service, or University of Minnesota recommendations.

Exhibit 6 MCAR S 4.6135 A.-1

Maximum Allowable Available Nitrogen Levels for
Various Crops, Yields, and Soil Textures

Crop	Yield/Acre	Maximum Allowable Available Nitrogen Level (pounds/acre)		
		Soil Texture		
		Coarse	Medium	Fine
Alfalfa	4 ton	180	210	230
	6 ton	280	340	370
Barley	80 bushel	100	110	120
Bluegrass	3 ton	180	210	230
Corn	75 bushel	100	120	130
	100 bushel	130	150	160
	125 bushel	150	180	190
	150 bushel	180	210	230
Oats	175 bushel	210	250	270
	75 bushel	80	90	100
Soybeans	100 bushel	130	150	160
	30 bushel	120	140	150
	40 bushel	180	210	230
	50 bushel	230	270	300
Wheat	60 bushel	280	340	370
	50 bushel	100	120	130
	75 bushel	160	180	190

Exhibit 6 MCAR S 4.6135 A.-2

Maximum Allowable Available Nitrogen
Levels for Non-Cropped, Non-Harvested Areas

Degree of Vegetative Cover	Maximum Allowable Available Nitrogen Level (pounds/acre)		
	Soil Texture		
	Coarse	Medium	Fine
High density (more than 50 percent cover)	75	100	125
Low density (25-50 percent cover)	50	75	100
Fallow (less than 25 percent cover)	0	50	75

B. Carry-over nitrogen. Determine carry-over nitrogen from the previous year's sewage sludge application using the following formula:

Carry-over N (pounds per acre) = (percentage organic sewage sludge N) x (tons sewage sludge solids applied per acre).

If sewage sludge was not applied the previous year, carry-over nitrogen is zero.

C. Net allowable available nitrogen level. To determine the net allowable available nitrogen level in pounds per acre subtract carry-over nitrogen, nitrogen added from other sources such as fertilizer or animal manure, if known, and available nitrogen applied the previous year to fallow land, from the maximum allowable available nitrogen level.

D. Sewage sludge available nitrogen. Determine the available nitrogen in sewage sludge in pounds per ton using the appropriate formula in Exhibit 6 MCAR S 4.6135 D.-3.

Exhibit 6 MCAR S 4.6135 D.-3

Formulas for Determination of Available Nitrogen in

Sewage Sludge

(pounds of available nitrogen per ton of sewage sludge solids)

Type of Stabilization	Application Method	Formula
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Digested Surface.....(% organic-N x 4)+(NH₄-N x 10)
 Incorporated
 or Injected.....(% organic-N x 4)+(NH₄-N x 15)

Chemically or Physically Surface.....(% organic-N x 6)+(NH₄-N x 10)
 Stabilized or Incorporated
 Unstabilized or Injected.....(% organic-N x 6)+(NH₄-N x 15)

E. Sewage sludge application rate. Divide the net allowable available nitrogen level in pounds per acre from C. by the available nitrogen in sewage sludge in pounds per ton from D. to obtain the sewage sludge application rate in tons of solids per acre per year.

6 MCAR S 4.6136 Pathogen reduction processes.

A. Process to significantly reduce pathogens. Paragraphs 1.-5. contain processes to significantly reduce pathogens.

1. Aerobic digestion is a process conducted by agitating sewage sludge with air or oxygen to maintain aerobic conditions at residence times ranging from 60 days at 15 degrees Centigrade to 40 days at 20 degrees Centigrade. The level of volatile solids in the sewage influent must be reduced by at least 38 percent after processing.

2. Air drying is a process by which liquid sewage sludge not exceeding nine inches in depth is allowed to drain and/or dry on underdrained sand beds or paved basins. A minimum of three months is needed, two months of which temperatures average on a daily basis above 0 degrees Centigrade.

3. Anaerobic digestion is a process conducted in the absence of air at residence times ranging from 60 days at 20 degrees Centigrade to 15 days at 35 degrees Centigrade to 55 degrees Centigrade. The level of volatile solids in the sewage influent must be reduced by at least 38 percent after processing.

4. In composting by means of the within vessel, static aerated pile, or windrow composting methods, the sewage sludge is maintained at minimum operating conditions of 40 degrees Centigrade for five days. For four hours during this period the temperature exceeds 55 degrees Centigrade.

5. Lime stabilization is a process by which sufficient lime is added to produce a pH of 12 after two hours of contact.

6. The director may determine that other methods or

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operating conditions are acceptable if pathogens, vector attraction, and volatile solids of the waste are reduced to an extent equivalent to the reduction achieved by any of the methods listed in 1.-5., or to an extent necessary for the proposed landspreading operation. The director's decision shall be based upon:

- a. sewage sludge residence time;
- b. temperatures achieved during treatment;
- c. duration of sewage sludge storage;
- d. method of sewage sludge application;
- e. crop or crops to which sewage sludge is applied;
- f. potential impact of runoff on surface waters;
- g. location of landspreading area with respect to places of habitation, residential developments, and recreational areas; and
- h. degree of public access control.

B. Processes to further reduce pathogens. Paragraphs 1.-4. contain processes to further reduce pathogens.

1. Composting consists of the aerobic thermophilic decomposition of organic constituents to a relatively stable, humus-like material. High temperature composting methods which will further reduce pathogens are:

a. Windrow, consisting of an unconfined composting process involving periodic aeration or mixing of uninsulated compost piles. At least five turnings must occur during a period of 15 days when the temperature of the mixture is at least 55 degrees Centigrade.

b. Static aerated pile, consisting of an unconfined composting process involving mechanical aeration of insulated compost piles. The sewage sludge in the insulated pile is maintained at operating conditions of 55 degrees Centigrade or greater for three days.

c. Within vessel, consisting of a confined composting process involving mechanical mixing of compost under controlled environmental conditions so that the sewage sludge is maintained at operating conditions of 55 degrees Centigrade or greater for three days.

2. Heat drying consists of a process by which dewatered sewage sludge cake is dried by direct or indirect contact with hot gases and moisture content is reduced to ten percent or lower. Sewage sludge particles must reach temperatures in excess of 80 degrees Centigrade, or the wet bulb temperature of

the gas stream in contact with the sewage sludge at the point where it leaves the dryer must be in excess of 80 degrees Centigrade.

3. Heat treatment consists of a process by which liquid sewage sludge is heated to temperatures of 180 degrees Centigrade for 30 minutes.

4. Thermophilic aerobic digestion consists of a process by which liquid sewage sludge is agitated with air or oxygen to maintain aerobic conditions at residence times of ten days at 55 to 60 degrees Centigrade. The level of volatile solids in the sewage influent must be reduced by at least 38 percent after processing.

5. The director may determine that other methods or operating conditions are acceptable if pathogens, vector attraction, and volatile solids of the sewage sludge are reduced to an extent equivalent to the reduction achieved by the methods in 1.-4.

CHAPTER ONE: WPC 1**WPC 1 Classification and Standards for the Mississippi River and Tributaries from the Rum River to the Upper Lock and Dam at St. Anthony Falls**

The classification for use and the pollution standards as hereinafter set forth are hereby adopted and established for that portion of the Mississippi River from but not including the mouth of the Rum River to the upper lock and dam at St. Anthony Falls, approximately at the northeastward extension of Fifth Avenue South in the City of Minneapolis, and streams tributary thereto.

(a) Classification for Use

(1) The primary use of the waters requiring maintenance of water quality in accordance with the standards hereinafter prescribed is as a source of public water supply for drinking, food processing, and related purposes.

(2) Other uses for which waters of such quality are suitable are industrial processing and cooling, navigation, pleasure boating, fishing, bathing, swimming, and other recreational uses, subject to such restrictions on any such uses which involve close, frequent, or prolonged contact with the water as may be necessary for protection of public health.

(3) Other beneficial uses for which water of lower quality may be suitable may be exercised in the waters, provided the effects do not actually or potentially conflict with the uses specified in paragraphs (1) and (2).

(b) Related Conditions. The waters should meet the recommended U. S. Public Health Service raw water requirements for Group IV, as defined in Public Health Bulletin No. 296, Manual of Recommended Water Sanitation Practice, 1946, so that after Class IV treatment as specified in said manual the water will meet the requirements for drinking water as specified in U. S. Public Health Service Drinking Water Standards, 1962. Waters having the quality aforesaid will be suitable for maintenance of game fish of species commonly inhabiting waters of the vicinity under natural conditions.

(c) Standards

(1) No raw sewage, and no industrial waste or other wastes, treated or untreated, containing viable pathogenic organisms or any substances which may cause disease, endanger the public health, or otherwise impair the quality of the receiving waters for public water supply shall be discharged into the waters.

(2) No treated sewage effluent shall be discharged into the waters from any source originating after the taking effect hereof, including, without limitation, discharges from watercraft.

(3) No treated sewage effluent, industrial waste, or other wastes shall be discharged into the waters so as to cause any nuisance conditions, including, without limitation, the presence of substantial amounts of floating solids, scum, oil slicks, suspended solids, material discoloration, obnoxious odors, visible gassing, sludge deposits, substantial fungus growths, or other offensive effects.

(4) No treated sewage effluent, industrial waste, or other wastes shall be discharged into the waters so as to cause any material increase in taste, odor, color, or turbidity above natural levels, or otherwise to impair the quality of the water so as to render it objectionable or unsuitable as a source of water supply.

(5) The discharge of oxygen-demanding treated sewage effluent, industrial waste, or other wastes shall be restricted so that after reasonable opportunity for mixing and dilution thereof with the receiving waters the dissolved oxygen content of such waters will be maintained at not less than 5 milligrams per liter, based on the monthly average flow which is exceeded by 90 per cent of the monthly average flows of record for the month of August or February, whichever is lower, and so that a level of not less than 4 milligrams per liter will be maintained under any instantaneous low flow conditions.

(6) The discharge of industrial waste or other wastes shall be controlled so that the heat content of such discharges, after reasonable opportunity for mixing and dilution thereof with the receiving waters, does not raise the temperature of such waters above 93° F at any point, based on the critical month of August and the monthly average flow specified in paragraph (5).

(7) The discharge of treated sewage effluent, industrial waste, or other wastes shall be restricted so that at any water supply intake the maximum limits for chemicals in the waters shall be such that after Class IV treatment has been provided as specified in Section 2 (Public Health Bulletin No. 296), the concentrations recommended in the U. S. Public Health Service Drinking Water Standards, 1962, will not be exceeded in the treated water. Such discharges shall also be restricted so that after reasonable opportunity for mixing and dilution of the discharge with the receiving waters, on the basis of the monthly average flow specified in paragraph (5), the concentrations of the substances specified below will not be exceeded in the waters.

Ammonia	2.0 milligrams per liter (as Nitrogen)
Chromium	1.0 milligrams per liter (as Chromium)
Copper	0.2 milligrams per liter (as Copper)
Cyanide	0.02 milligrams per liter (as Cyanide ion)
Oil	Not to exceed a trace
pH range	6.5 - 9.0
Radioactive materials	Not to exceed the lowest concentrations permitted to be discharged to an uncontrolled environment as prescribed by the appropriate Federal authority or by the State Board of Health.

Means for expediting mixing and dispersion of such treated sewage effluent, industrial waste, or other wastes in the receiving waters shall be provided so far as practicable whenever deemed necessary by the Commission to maintain the quality of the receiving waters in accordance with applicable standards.

(8) No treated sewage effluent, industrial waste, or other wastes shall be discharged into the waters in such quantity or in such manner alone or in combination with other substances as to cause pollution thereof as defined by law.

(9) In any case where, upon application of the responsible person or persons, the Commission finds after a hearing thereon that by reason of

exceptional circumstances the strict enforcement of a provision of these standards would cause undue hardship and would be unreasonable, that disposal of the sewage, industrial waste, or other wastes involved is necessary for public health, safety, and welfare, and that no means for such disposal in strict conformity with the standards is reasonably available, the Commission, in its discretion, may permit a variance therefrom upon such conditions as it may prescribe for prevention, control, or abatement of pollution and in harmony with the general purpose and intent of the standards.

Adopted by Water Pollution Control Commission, March 28, 1963

Filed Secretary of State, April 19, 1963

Filed Commissioner of Administration, June 22, 1964

CHAPTER FOUR: WPC 4**WPC 4 Regulation Relating to Storage or Keeping of Oil and Other Liquid Substances Capable of Polluting Waters of the State****(a) Definitions**

(1) The definitions given in this section shall obtain for the purposes of this regulation except as otherwise specified or indicated by the context.

(2) "Substance" means any liquid material which might cause pollution of any waters of the state if mixed therewith.

(3) "Safeguard" means a facility or device or any system or combination thereof designed to prevent the escape or movement of any substance or solution thereof from the place of storage or keeping thereof under such conditions that pollution of any waters of the state might result therefrom.

(4) "Site" means any tract or parcel of land, including any constructed storage tank or artificial or natural basin or containment facility, except underground or buried tanks where any substance is stored or kept and which is so located that the escape or movement of such substance or a solution therefrom the site or into the underlying ground might result in pollution of any waters of the state.

(5) "Stored liquid material" means liquid material which is within a container or containment device located within the state other than a mobile type unit while in transit, used for transporting said material from one location to another.

(b) Prohibition of Storage or Keeping Substances Without Safeguards.

No substance shall be stored, kept, or allowed to remain in or upon any site without reasonable safeguards adequate to prevent the escape or movement of the substance or a solution thereof from the site under any conditions of failure of the storage facility whereby pollution of any waters of the state might result therefrom. It shall be the duty of every owner of such stored substances, or other person responsible therefor, to obtain from the Water Pollution Control Commission a permit for the use of the site for the storage of liquid substances as provided in Section d or Section e.

(c) Safeguards. Unless otherwise prescribed by a permit issued under Section d or Section e as hereinafter provided, every safeguard shall comply with the requirements of this section, and shall consist of the following features.

(1) A continuous dike or wall entirely surrounding the site of such dimensions and construction that the emergency storage volume thereby created will be equal to not less than the total capacity of the largest storage tank or other container located within the area enclosed by the dike and will hold securely all of the aforesaid tank contents or any solution thereof in case of any failure of the container and the escape or movement of the substance or solution from its container or place of storage or keeping;

(2) A reasonably impervious bottom under the entire site and enclosure of such construction or composition either natural or artificial as to prevent in case of any failure of the container the seepage, percolation, or other movement of any substance stored or kept on the site or within the enclosure or any solution thereof into the underlying ground in such quantity that substantial pollution of the waters of the state in the vicinity might

reasonably be expected to result therefrom under conditions prevailing at the site.

(3) Any alternative method of adequate safeguards submitted by owners of stored liquid substances may be reviewed by the Water Pollution Control Commission. Upon finding that any such alternative safeguards are satisfactory and that they will reasonably protect any waters of the State against pollution by the stored liquid, the Commission may approve the use of said alternate safeguards in lieu of the above standards and may thereafter issue a permit in accordance with Section d or Section e hereunder.

(d) Permits — Issuance on Application. On application for a permit by the owner or other person responsible for the keeping or storage of any substance on any site the Water Pollution Control Commission may require plans showing the features and method of operation of existing or proposed safeguards in accordance with these regulations. Such plans must be accompanied by a certification as to the adequacy of such safeguards. The Commission may thereafter issue a permit therefor upon such conditions as it shall prescribe to prevent pollution of any waters of the State by such substance. Such permit shall be subject to modification or revocation by the Commission in like manner as provided by law for permits for the installation or operation of disposal systems or parts thereof.

(1) Before the issuance, denial, revocation or modification of a permit by the Commission any person whose vested rights may be adversely affected thereby shall, upon request therefor, be entitled to a hearing before the Commission for the purpose of presenting evidence thereat. Written notice of the hearing stating the time and place thereof shall be given by the Commission to any person known by it to be directly affected by such action of the Commission either personally or by registered mail not less than 30 days before the date of the hearing.

(e) Flammable Liquids. Notwithstanding the provisions of Section d, of these regulations, a permit may be issued to owners of a flammable liquid storage facility upon certification by the Minnesota State Fire Marshal that the requirements of the Minnesota State Fire Marshal's flammable liquids code as amended and Section b of these regulations, have been complied with and are currently being fulfilled.

(f) Inadequate Safeguards. In case the Commission shall find that any substance is stored or kept on any site without a safeguard, or that any existing safeguard is inadequate, it may by order require the owner or other responsible person to immediately remove the substance from the site and to refrain from further storage or keeping of any substance therein unless and until an adequate safeguard is provided as hereinbefore prescribed.

(g) Notice Concerning Loss. It shall be the duty of the owner of a liquid storage facility or other responsible person in charge thereof to notify the Water Pollution Control Commission at its office in the Minnesota Department of Health Building at the University Campus, Minneapolis, of any loss of stored liquids either by accident or otherwise when such loss involves a liquid substance which would be likely to enter any waters of the state. Said notice shall be by telephone or other comparable means and

shall be made immediately upon discovery of the loss. The notification shall include the location and nature of the loss and other pertinent information as may be available at the time.

(h) **Violations.** Violation of any provision of this regulation shall be punishable as provided by law.

(i) **Application.** This regulation shall not apply to the disposal of sewage, industrial waste, or other wastes under permits issued by the Commission as provided by law.

Adopted by Water Pollution Control Commission, June 26, 1964

Filed Secretary of State, July 9, 1964

Approved Commissioner of Administration, July 10, 1964

6 MCAR § 4.8014 Criteria for the classification of the intrastate waters of the state and the establishment of standards of quality and purity.

(The official policy and purpose of the State of Minnesota in regard to these matters is set forth in the Minnesota Water Pollution Control Statutes as amended by Laws of Minnesota 1973, ch. 374:

Sec. 115.42. It is the policy of the state to provide for the prevention, control and abatement of pollution of all waters of the state, so far as feasible and practical, in furtherance of conservation of such waters and protection of the public health and in furtherance of the development of the economic welfare of the state.

. . . It is the purpose of Laws 1963, Chapter 874, to safeguard the waters of the state from pollution by: (a) preventing any new pollution; and (b) abating pollution existing when Laws 1963, Chapter 874, become effective, under a program consistent with the declaration of policy above stated.

Sec. 115.44 Subd. 2. In order to attain the objectives of Laws 1963, Chapter 874, the agency after proper study, and after conducting public hearing upon due notice, shall as soon as practicable, group the designated waters of the state into classes and adopt classifications and standards of purity and quality therefor. Such classification shall be made in accordance with considerations of best usage in the interest of the public and with regard to the considerations mentioned in subdivision 3 hereof.

Sec. 115.44 Subd. 8. If the agency finds in order to comply with the federal water pollution control act or any other federal law or rule or regulation promulgated thereunder that it is impracticable to comply with the requirements of this section in classifying waters or adopting standards or in meeting any of the requirements thereof, compliance with the requirements of such section are waived to the extent necessary to enable the agency to comply with federal laws and rules and regulations promulgated thereunder. The agency may classify waters and adopt criteria and standards in such form and based upon such evidence as it may deem necessary and sufficient for the purposes of meeting requirements of such federal laws, notwithstanding any provisions in chapter 115 or any other state law to the contrary. In the event waters are classified and criteria and standards are adopted to meet the requirements of federal law, the agency shall thereafter proceed to otherwise comply with the provisions of this section which were waived as rapidly as is practicable. This authority shall extend to proceedings pending before the agency on May 20, 1973.

. . . Wherever advisable and practicable the agency may establish standards for effluent or disposal systems discharging into waters of the state regardless of whether such waters are or are not classified.

Sec. 115.03 Subd. 5. Notwithstanding any other provisions prescribed in or pursuant to chapter 115 and, with respect to the pollution of waters of the state, in chapter 116, or otherwise, the agency shall have the authority to

perform any and all acts minimally necessary including, but not limited to, the establishment and application of standards, procedures, regulations, orders, variances, stipulation agreements, schedules of compliance, and permit conditions, consistent with and, therefore, not less stringent than the provisions of the Federal Water Pollution Control Act, as amended, applicable to the participation by the state of Minnesota in the National Pollutant Discharge Elimination System (NPDES) . . .

In accordance with this declaration of policy and legislative intent, and under the powers delegated to the Agency, the following intrastate water use classifications and corresponding standards of quality and purity are hereby adopted by the Pollution Control Agency as provided by law.)

A. Introduction.

1. **Scope.** The following classification, criteria and standards of water and effluent quality and purity as hereby adopted and established shall apply to all intrastate waters of the state, notwithstanding any other intrastate water quality or effluent regulations of general or specific application, except that any more stringent water quality or effluent standards or prohibitions in the other applicable regulations are preserved.

2. **Severability.** All provisions of this rule shall be severable and the invalidity of any lettered paragraph or any subparagraph or subdivision thereof shall not void any other lettered paragraph or subparagraph, subdivision or any part thereof.

3. **Definitions.** The terms "waters of the state" for the purposes of this rule shall be construed to mean intrastate waters as herein below defined, and the terms "sewage," "industrial wastes," and "other wastes," as well as any other terms for which definitions are given in the Water Pollution Control Statutes, as used herein have the meanings ascribed to them in Minn. Stat., § 115.01 and 115.41, with the exception that disposal systems or treatment works operated under permit of the agency shall not be construed to be "waters of the state" as the term is used herein. Interstate waters are defined as all rivers, lakes, and other waters that flow across or form part of state boundaries. All of the remaining designated waters of the state which do not meet the definition of interstate waters given above are to be construed herein as constituting intrastate waters. Other terms and abbreviations used herein which are not specifically defined in applicable federal or state law shall be construed in conformance with the context, and in relation to the applicable section of the statutes pertaining to the matter at hand, and current professional usage.

4. **Uses of the intrastate waters.** The classifications are listed separately in accordance with the need for intrastate water quality protection, considerations of best use in the interest of the public and other considerations, as indicated in Minn. Stat., § 115.44. The classifications should not be construed to be an order of priority, nor considered to be exclusive or prohibitory of other beneficial uses.

5. Designation of compliance. In making tests or analyses of the intrastate waters of the state, sewage, industrial wastes or other wastes to determine compliance with the standards, samples shall be collected in such manner and place, and of such type, number and frequency as may be considered necessary by the agency from the viewpoint of adequately reflecting the condition of the intrastate waters, the composition of the effluents, and the effects of the pollutants upon the specified uses. Reasonable allowance will be made for dilution of the effluents, which are in compliance with Section C. 6., following discharge into waters of the State. The agency by allowing dilution may consider the effect on all uses of the intrastate waters into which the effluents are discharged. The extent of dilution allowed regarding any specific discharge shall not violate the applicable water quality standards. The samples shall be preserved and analyzed in accordance with procedures given in the 1971 edition of Standard Methods for the Examination of Water and Waste-Water, by the American Public Health Association, American Water Works Association, and the Water Pollution Control Federation, and any revisions or amendments thereto. The agency may accept or may develop other methods, procedures, guidelines or criteria for measuring, analyzing and collecting samples.

6. Unclassified intrastate waters: Adoption of specific classifications and standards for unclassified intrastate waters, and/or changes in existing classifications and standards, will be done as soon as practicable by the Minnesota Pollution Control Agency for individually designated waters after the necessary studies and public hearings relating to the determination of present and future quality, characteristics and uses have been completed as required by law. In the absence of such official classifications and standards for any given Intrastate waters, it shall be the policy of the agency to consider all unclassified intrastate waters as waters of the highest quality consistent with their actual or potential use, and deserving of the equivalent degree of protection from pollution, until the same may be affirmed or altered by adoption of standards or other official act of the agency; except that where sewage, industrial wastes or other wastes are being discharged to unclassified intrastate waters during such interim period the concentrations of polluting substances in such separate industrial waste or other waste effluents shall be no higher than the permissible concentrations of polluting substances of a comparable nature in the effluents of municipal sewage treatment works which discharge into the same intrastate waters, unless specifically exempted from this requirement by other effluent standards or the terms of a valid waste disposal permit issued by the agency.

7. Natural intrastate water quality. The intrastate waters may, in a state of nature, have some characteristics or properties approaching or exceeding the limits specified in the water quality standards. The standards shall be construed as limiting the addition of pollutants of human activity to those of natural origin, where such be present, so that in total the specified limiting concentrations will not be exceeded in the intrastate waters by reason of such controllable additions. Where the background level of the natural origin is reasonably definable and normally is higher than the specified standard the natural level may be used as the standard for controlling the addition of

pollutants of human activity which are comparable in nature and significance with those of natural origin. The natural background level may be used instead of the specified water quality standard as a maximum limit of the addition of pollutants, in those instances where the natural level is lower than the specified standard and reasonable justification exists for preserving the quality to that found in a state of nature.

In the adoption of standards for individual intrastate waters, the agency will be guided by the standards set forth herein but may make reasonable modifications of the same on the basis of evidence brought forth at a public hearing if it is shown to be desirable and in the public interest to do so in order to encourage the best use of the intrastate waters or the lands bordering such intrastate waters.

8. Non-degradation. Waters which are of quality better than the established standards shall be maintained at high quality unless a determination is made by the agency that a change is justifiable as a result of necessary economic or social development and will not preclude appropriate beneficial present and future uses of the waters. Any project or development which would constitute a source of pollution to waters of the state shall be required to provide the best practicable control technology currently available not later than July 1, 1977 and the best available technology economically achievable not later than July 1, 1983, and any other applicable treatment standards as defined by and in accordance with the requirements of the Federal Water Pollution Control Act, 33 U.S.C. 1251 et. seq., as amended, in order to maintain high water quality and keep water pollution at a minimum. In implementing this policy, the Administrator of the U. S. Environmental Protection Agency will be provided with such information as he requires to discharge his responsibilities under the Federal Water Pollution Control Act, as amended.

9. Variance from standards. In any case where, upon application of the responsible person or persons, the agency finds that by reason of exceptional circumstances the strict enforcement of any provision of these standards would cause undue hardship, that disposal of the sewage, industrial waste or other waste is necessary for the public health, safety or welfare; and that strict conformity with the standards would be unreasonable, impractical or not feasible under the circumstances; the agency in its discretion may grant a variance therefrom upon such conditions as it may prescribe for prevention, control or abatement of pollution in harmony with the general purposes of these classifications and standards and the intent of the applicable state and federal laws. The U. S. Environmental Protection Agency will be advised of any permits which may be issued under this clause together with information as to the need therefor.

B. Water use classifications—all intrastate waters of the state. Based on considerations of best usage in the interest of the public and in conformance with the requirements of the applicable statutes, the intrastate waters of the state shall be grouped into one or more of the following classes:

1. Domestic consumption. (To include all intrastate waters which are or may be used as a source of supply for drinking, culinary or food processing use or other domestic purposes, and for which quality control is or may be necessary to protect the public health, safety or welfare).

2. Fisheries and recreation. (To include all intrastate waters which are or may be used for fishing, fish culture, bathing or any other recreational purposes, and for which quality control is or may be necessary to protect aquatic or terrestrial life, or the public health, safety or welfare.)

3. Industrial consumption. (To include all intrastate waters which are or may be used as a source of supply for industrial process or cooling water, or any other industrial or commercial purposes, and for which quality control is or may be necessary to protect the public health, safety or welfare.)

4. Agriculture and wildlife. (To include all intrastate waters which are or may be used for any agriculture purposes, including stock watering and irrigation, or by waterfowl or other wildlife, and for which quality control is or may be necessary to protect terrestrial life or the public health, safety or welfare.)

5. Navigation and waste disposal. (To include all intrastate waters which are or may be used for any form of water transportation or navigation, disposal of sewage, industrial waste or other waste effluents, or fire prevention, and for which quality control is or may be necessary to protect the public health, safety or welfare.)

6. Other uses. (To include all intrastate waters which are or may serve the above listed uses or any other beneficial uses not listed herein, including without limitation any such uses in this or any other state, province, or nation of any intrastate waters flowing through or originating in this state, and for which quality control is or may be necessary for the above declared purposes, or to conform with the requirements of the legally constituted state or national agencies having jurisdiction over such intrastate waters, or any other considerations the agency may deem proper.)

7. Limited resource value waters. This class includes surface waters of the state which are of limited value as a water resource and where water quantities are intermittent or less than one (1) cubic feet per second at the once in ten year, seven day low flow as defined in section C. 7. These waters shall be protected so as to allow secondary body contact use, to preserve the groundwater for use as a potable water supply, and to protect aesthetic qualities of the water. It is the intent of the agency that very few waters be classified as limited resource value waters. In conjunction with those factors listed in Minn. Stat. § 115.44, subd. 2 and subd. 3 (1978), the agency, in cooperation and agreement with the Department of Natural Resources with respect to determination of fisheries values and potential, shall determine the extent to which the waters of the state demonstrate the conditions 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; or

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 agency water assessment procedure before the waters can be classified as limited resource value waters.

C. General standards applicable to all intrastate waters of the state.

1. No untreated sewage shall be discharged into any intrastate waters of the state. Effective disinfection of any discharges, including combined flows of sewage and storm water, will be required where necessary to protect the specified uses of the intrastate waters.

2. No sewage, industrial waste or other wastes shall be discharged into any intrastate waters of the state so as to cause any nuisance conditions, such as the presence of significant amounts of floating solids, scum, oil slicks, excessive suspended solids, material discoloration, obnoxious odors, gas ebullition, deleterious sludge deposits, undesirable slimes or fungus growths, or other offensive or harmful effects.

3. Existing discharges of inadequately treated sewage, industrial waste or other wastes shall be abated, treated or controlled so as to comply with the applicable standards. Separation of sanitary sewage from natural runoff may be required where necessary to ensure continuous effective treatment of sewage.

4. The highest levels of water quality, including, but not limited to, dissolved oxygen, which are attainable in the intrastate waters by continuous operation at their maximum capability of all primary and secondary units of treatment works or their equivalent discharging effluents into the intrastate waters shall be maintained in order to enhance conditions for the specified uses.

5. Means for expediting mixing and dispersion of sewage, industrial waste, or other waste effluents in the receiving intrastate waters are to be provided so far as practicable when deemed necessary by the agency to maintain the quality of the receiving intrastate waters in accordance with applicable standards. Mixing zones be established by the agency on an individual basis, with primary consideration being given to the following guidelines: (a) mixing zones in rivers shall permit an acceptable passageway for the movement of fish; (b) the total mixing zone or zones at any transect of the stream should contain no more than 25% of the crosssectional area and/or volume of flow of the stream, and should not extend over more than 50% of the width; (c) mix-

ing zone characteristics shall not be lethal to aquatic organisms; (d) for contaminants other than heat, the 96 hour median tolerance limit for indigenous fish and fish food organisms should not be exceeded at any point in the mixing zone; (e) mixing zones should be as small as possible, and not intersect spawning or nursery areas, migratory routes, water intakes, nor mouths of rivers; and (f) overlapping of mixing zones should be minimized and measures taken to prevent adverse synergistic effects. This provision shall also apply in cases where a Class 7 water is tributary to a Class 2 water.

6. It is herein established that the agency shall require secondary treatment as a minimum for all municipal sewage and biodegradable industrial or other wastes to meet the adopted water quality standards. A comparable high degree of treatment or its equivalent also shall be required of all nonbiodegradable industrial or other wastes unless the discharger can demonstrate to the agency that a lesser degree of treatment or control will provide for water quality enhancement commensurate with present and proposed future water uses and a variance is granted under the provisions of the variance clause. Secondary treatment facilities are defined as works which will provide effective sedimentation, biochemical oxidation, and disinfection, or the equivalent, including effluents conforming to the following:

Substance or Characteristic	Limiting Concentration or Range*
5-Day Biochemical Oxygen Demand*	25 milligrams per liter
Fecal coliform group organisms***	200 organisms per 100 milliliters
Total suspended solids*	30 milligrams per liter
Oil	Essentially free of visible oil
Phosphorus**	1 milligram per liter
Turbidity	25
pH range	6.5 - 8.5
Unspecified toxic or corrosive substances	None at levels acutely toxic to humans or other animals or plant life, or directly damaging to real property.

The requirements of this rule and specifically the requirement of secondary treatment as stated above shall be in addition to any requirement imposed on a discharge by the Clean Water Act, 33 U.S.C. 1251 et seq., and its implementing regulations. In the case of a conflict between the requirements of this rule and the requirements of the Clean Water Act or its implementing regulations, the more stringent requirement shall be controlling.

* The arithmetic mean for concentrations of 5-day biochemical oxygen demand and total suspended solids shall not exceed the stated values in a period of 30 consecutive days and 45 milligrams per liter in a period of 7 consecutive days.

** Where the discharge of effluent is directly to or affects a lake or reservoir. Removal of nutrients from all wastes shall be provided to the

fullest practicable extent wherever sources of nutrients are considered to be actually or potentially detrimental to preservation or enhancement of the designated water uses.

*** Disinfection of wastewater effluents to reduce the levels of fecal coliform organisms to the stated value is required from March 1 through October 31 (Class 2 waters) and May 1 through October 31 (Class 7 waters) except that where the effluent is discharged 25 miles or less upstream of a water intake supplying a potable water system, the reduction to the stated value is required year around. The stated value is not to be exceeded in any calendar month as determined by the logarithmic mean of a minimum of five samples, nor shall more than 10% of all samples taken during any calendar month individually exceed 400 organisms per 100 milliliters. The application of the fecal coliform group organism standards shall be limited to sewage or other effluents containing admixtures of sewage and shall not apply to industrial wastes except where the presence of sewage, fecal coliform organisms or viable pathogenic organisms in such wastes is known or reasonably certain. Analysis of samples for fecal coliform group organisms by either the multiple tube fermentation or the membrane filter techniques is acceptable.

7. Dischargers of sewage, industrial waste or other waste effluents 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). The period of record for determining the specific flow for the stated recurrence interval, where records are available, shall include at least the most recent ten years of record, including flow records obtained after establishment of flow regulation devices, if any. Such calculations shall not be applied to lakes and their embayments which have no comparable flow recurrence interval. Where stream flow records are not available, the flow may be estimated on the basis of available information on the watershed characteristics, precipitation, run-off and other relevant data.

Allowance shall not be made in the design of treatment works for low stream flow augmentation unless such flow augmentation of minimum flow is dependable and controlled under applicable laws or regulations.

8. In any instance where it is evident that the minimal treatment specified in Section C. 6. and dispersion are not effective in preventing pollution, or if at the applicable flows it is evident that the specified stream flow is inadequate to protect the specified water quality standards, the specific standards may be interpreted as effluent standards for control purposes. In addition, the following effluent standards may be applied without any allowance for dilution where stream flow or other factors are such as to prevent adequate dilution, or where it is otherwise necessary to protect the intrastate waters for the stated uses:

Item*	Limits**
5-day biochemical oxygen demand	5 milligrams per liter

This section shall not apply to discharges to surface waters classified as limited resource value waters pursuant to section B. 7. of this rule and 6 MCAR § 4.8024.

* The concentrations specified in section C. 6. of this rule may be used in lieu thereof if the discharge of effluent is restricted in the spring flush or other high runoff periods when the stream flow rate above the discharge point is sufficiently greater than the effluent flow rate to insure that the applicable water quality standards are met during such discharge period. If treatment works are designed and constructed to meet the specified limits given above for a continuous discharge, at the discretion of the agency the operation of such works may allow for the effluent quality to vary between the limits specified above and in section C. 6. provided the water quality standards and all other requirements of the agency and the U. S. Environmental Protection Agency are being met. Such variability of operation must be based on adequate monitoring of the treatment works and the effluent and receiving waters as specified by the agency.

** If a discharger is required by the director to implement a pretreatment program for the control of toxic pollutants from industrial contributors and the program has not yet been implemented, the discharger's effluent limitation for total suspended solids shall be 5 mg/l until such time as the program has been implemented.

9. Notwithstanding the provisions of section C. 8. and C. 16. of this rule, the agency may require a specific discharger to meet effluent limitations which are necessary to maintain the water quality of the receiving water at the standards of quality and purity established by this rule. Any effluent limitation determined to be necessary under this section shall only be required of a discharger after the discharger has been given notice of the specific effluent limitations and an opportunity for public hearing provided that compliance with the requirements of 6 MCAR § 4.8036 H. regarding notice of National Pollutant Discharge Elimination System and State Disposal System permits shall satisfy the notice and opportunity for hearing requirements of this section.

10. After providing an opportunity for public hearing the agency shall accept effective loss prevention and/or water conservation measures or process changes or other waste control measures or arrangements if it finds that such measures, changes or arrangements are equivalent to the waste treatment measures required for compliance with applicable effluent and/or water quality standards or load allocations.

11. All sources of sewage, industrial waste, or other waste which do not at present have a valid operation and discharge permit, or an application for

the same pending before the agency, shall apply for the same within 30 days of the adoption of this regulation, or the agency may abate the source forthwith. The provisions of section C. 6. relating to effluent quality standards, and the other provisions of this regulation, are applicable to existing sewage, industrial waste or other waste disposal facilities and the effluent discharged therefrom. Nothing herein shall be construed to prevent the agency subsequently from modifying any existing permits so as to conform with federal requirements and the requirements of this regulation.

12. Liquid substances which are not commonly considered to be sewage or industrial wastes but which could constitute a pollution hazard shall be stored in accordance with 6 MCAR § 4.8004, and any revisions or amendments thereto. Other wastes as defined by law or other substances which could constitute a pollution hazard shall not be deposited in any manner such that the same may be likely to gain entry into any intrastate waters of the state in excess of or contrary to any of the standards herein adopted, or cause pollution as defined by law.

13. No sewage, industrial waste or other wastes shall be discharged into the intrastate waters of the state in such quantity or in such manner alone or in combination with other substances as to cause pollution thereof as defined by law. In any case where the intrastate waters of the state into which sewage, industrial wastes or other waste effluents discharge are assigned different standards than the interstate or intrastate waters into which such receiving intrastate waters flow, the standards applicable to the intrastate waters into which such sewage, industrial waste or other wastes discharged shall be supplemented by the following:

The quality of any waters of the state receiving sewage, industrial waste or other waste effluents shall be such that no violation of the standards of any interstate or intrastate waters of the state in any other class shall occur by reason of the discharge of such sewage, industrial waste or other waste effluents.

14. Questions concerning the permissible levels, or changes in the same, of a substance, or combination of substances, of undefined toxicity to fish or other biota shall be resolved in accordance with the latest methods recommended by the U. S. Environmental Protection Agency. The agency shall consider the recommendations of the Quality Criteria for Water, USEPA 1976, in making determinations under this section. Toxic substances shall not exceed 1/10 of the 96 hour median tolerance limit (TLM) as a water quality standard except that other application factors shall be used when justified on the basis of available scientific evidence.

15. All persons operating or responsible for sewage, industrial waste or other waste disposal systems which are adjacent to or which discharge effluents to these waters or to tributaries which affect the same, shall submit regularly every month a report to the agency on the operation of the disposal system, the effluent flow, and the characteristics of the effluents and receiving waters. Sufficient data on measurements, observations, sampling and

analyses, and other pertinent information shall be furnished as may be required by the agency to adequately evaluate the condition of the disposal system, the effluent, and the waters receiving or affected by the effluent.

16. Limited resource value waters.

a. For point source discharges to surface waters classified as limited resource value waters pursuant to section B. 7. of this rule and 6 MCAR § 4.8024 the agency shall require treatment facilities which will provide effluents conforming to the following limitations:*

Substance or Characteristic	Limiting Concentration
5-Day Biochemical Oxygen Demand	15 milligrams per liter**

b. The agency shall allow treatment works to be constructed and/or operated to produce effluents to limited resource value waters at levels up to those stated in section C. 6. of this rule provided that it is demonstrated that the water quality standards for limited resource value waters will be maintained during all periods of discharge from the treatment facilities.

c. Notwithstanding the effluent limitations established by this section the quality of limited resource value waters shall not be such as to allow a violation of applicable water quality standards in waters of the state which are connected to or affected by water classified as limited resource value waters.

d. The classification of surface waters as limited resource value waters pursuant to section B. 7. of this rule and 6 MCAR § 4.8024 shall not supercede, alter or replace the classification and designation of such waters as public waters pursuant to applicable provisions and requirements of Minn. Stat. ch. 105.

* All effluent limitations specified in section C. 6. shall also be applicable to dischargers to Class 7 waters, provided that unspecified toxic or corrosive substances shall be limited to the extent necessary to protect the designated uses of the receiving water or affected downstream waters.

** As measured by the arithmetic mean of all samples taken during any calendar month.

17. No person who is in compliance with the terms and conditions of its permit issued pursuant to 6 MCAR § 4.8036 shall be deemed in violation of any water quality standard in this rule for which a corresponding effluent limitation is established in the permit. However, exceedances of the water quality standards in a receiving water shall constitute grounds for modification of a permit(s) for any discharger(s) to the receiving water who is (are) causing or contributing to the exceedances. 6 MCAR § 4.8036 shall govern the modification of any such permit.

18. For the purpose of establishing limitations to meet the ammonia water quality standard, a statistic which estimates the central value (such as the mean or median) for ambient pH and temperature of the receiving water for the critical months shall be used.

D. Specific standards of quality and purity for designated classes of intrastate waters of the state. The following standards shall prescribe the qualities or properties of the intrastate waters of the state which are necessary for the designated public use or benefit and which, if the limiting conditions given are exceeded, shall be considered indicative of a polluted condition which is actually or potentially deleterious, harmful, detrimental or injurious with respect to such designated uses or established classes of the intrastate waters:

1. Domestic consumption.

Class A—The quality of this class of the intrastate waters of the state shall be such that without treatment of any kind the raw waters will meet in all respects both the mandatory and recommended requirements of the Public Health Service Drinking Water Standards-1962 for drinking water as specified in Publication No. 956 published by the Public Health Service of the U. S. Department of Health, Education and Welfare, and any revisions, amendments or supplements thereto. This standard will ordinarily be restricted to underground waters with a high degree of natural protection. The basic requirements are given below:

Substance or Characteristic	Limit or Range
Total coliform organisms	1 most probable number per 100 milliliters
Turbidity value	5
Color value	15
Threshold odor number	3
Methylene blue active substance (MBAS)	0.5 milligram per liter
Arsenic (As)	0.01 milligram per liter
Chlorides (Cl)	250 milligrams per liter
Copper (Cu)	1 milligram per liter
Carbon Chloroform extract	0.2 milligram per liter
Cyanides (CN)	0.01 milligram per liter
Fluorides (F)	1.5 milligrams per liter
Iron (Fe)	0.3 milligram per liter
Manganese (Mn)	0.05 milligram per liter
Nitrates (NO ₃)	45 milligrams per liter
Phenol	0.001 milligram per liter
Sulfates (SO ₄)	250 milligrams per liter
Total dissolved solids	500 milligrams per liter
Zinc (Zn)	5 milligrams per liter
Barium (Ba)	1 milligram per liter
Cadmium (Cd)	0.01 milligram per liter
Chromium (Hexavalent, Cr)	0.05 milligram per liter

Lead (Pb)	0.05 milligram per liter
Selenium (Se)	0.01 milligram per liter
Silver (Ag)	0.05 milligram per liter
Radioactive material	Not to exceed the lowest concentrations permitted to be discharged to an uncontrolled environment as prescribed by the appropriate authority having control over their use.

Class B—The quality of this class of the intrastate waters of the state shall be such that with approved disinfection, such as simple chlorination or its equivalent, the treated water will meet in all respects both the mandatory and recommended requirements of the Public Health Service Drinking Water Standards-1962 for drinking water as specified in Publication No. 956 published by the Public Health Service of the U. S. Department of Health, Education and Welfare, and any revisions, amendments or supplements thereto. This standard will ordinarily be restricted to surface and underground waters with a moderately high degree of natural protection. The physical and chemical standards quoted above for Class A intrastate waters shall also supply to these intrastate waters in the untreated state.

Class C—The quality of this class of the intrastate 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 in all respects both the mandatory and recommended requirements of the Public Health Service Drinking Water Standards-1962 for drinking water as specified in Publication No. 956 published by the Public Health Service of the U. S. Department of Health, Education and Welfare, and any revisions, amendments or supplements thereto. The standard will ordinarily be restricted to surface waters, and ground waters in aquifers not considered to afford adequate protection against contamination from surface or other sources of pollution. Such aquifers normally would include fractured and channeled limestone, unprotected impervious hard rock where intrastate water is obtained from mechanical fractures, joints, etc., with surface connections, and coarse gravels subjected to surface water infiltration. The physical and chemical standards quoted above for Class A intrastate waters shall also apply to these intrastate waters in the untreated state, except as listed below:

Substance of Characteristic	Limit or Range
Turbidity value	25

Class D—The quality of this class of the intrastate waters of the state shall be such that after treatment consisting of coagulation, sedimentation, filtration, storage and chlorination, plus additional pre, post, or intermediate stages of treatment, or other equivalent treatment processes, the treated water will meet in all respects the recommended requirements of the Public Health Service Drinking Water Standards-1962 for drinking water as specified in Publication No. 956 published by the Public Health Service of the U. S. Depart-

ment of Health, Education and Welfare, and any revisions, amendments or supplements thereto. This standard will ordinarily be restricted to surface waters, and ground waters in aquifers not considered to afford adequate protection against contamination from surface or other sources of pollution. Such aquifers normally would include fractured and channeled limestone, unprotected impervious hard rock where water is obtained from mechanical fractures, joints, etc., with surface connections, and coarse gravels subjected to surface water infiltration. The concentrations or ranges given below shall not be exceeded in the raw waters before treatment:

Substance or Characteristic	Limit or Range
Arsenic (As)	0.05 milligram per liter
Barium (Ba)	1 milligram per liter
Cadmium (Cd)	0.01 milligram per liter
Chromium (Cr + 6)	0.05 milligram per liter
Cyanide (CN)	0.2 milligram per liter
Fluoride (F)	1.5 milligrams per liter
Lead (Pb)	0.05 milligram per liter
Selenium (Se)	0.01 milligram per liter
Silver (Ag)	0.05 milligram per liter
Radioactive Material	Not to exceed the lowest concentrations permitted to be discharged to an uncontrolled environment as prescribed by the appropriate authority having control over their use.

In addition to the above listed standards, no sewage, industrial waste or other wastes, treated or untreated, shall be discharged into or permitted by any person to gain access to any intrastate waters classified for domestic consumption so as to cause any material undesirable increase in the taste, hardness, temperature, toxicity, corrosiveness or nutrient content, or in any other manner to impair the natural quality or value of the intrastate waters for use as a source of drinking water.

2. Fisheries and recreation.

Class A—The quality of this class of the intrastate waters of the state shall be such as to permit the propagation and maintenance of warm or cold water sport or commercial fishes and be suitable for aquatic recreation of all kinds, including bathing, for which the waters may be usable. Limiting concentrations or ranges of substances or characteristics which should not be exceeded in the intrastate waters are given below:

Substance or Characteristic	Limit or Range
Dissolved oxygen	Not less than 7 milligrams per liter at all times (instantaneous minimum concentration)***

Temperature	No material increase
Ammonia (N)*	0.016 milligram per liter (un-ionized as N)
Chlorides (Cl)	50 milligrams per liter
Chromium (Cr)	0.02 milligram per liter
Copper (Cu)	0.01 milligram per liter or not greater than 1/10 the 96 hour TLM value.
Cyanides (CN)	0.02 milligrams per liter
Oil	0.5 milligram per liter
pH value	6.5 - 8.5
Phenols	0.01 milligram per liter and none that could impart odor or taste to fish flesh or other fresh-water edible products such as crayfish, clams, prawns and like creatures. Where it seems probable that a discharge may result in tainting of edible aquatic products, bioassays and taste panels will be required to determine whether tainting is likely or present.
Turbidity value	10
Color value	30
Fecal coliform organisms	200 organisms per 100 milliliters as a logarithmic mean measured in not less than five samples in any calendar month, nor shall more than 10% of all samples taken during any calendar month individually exceed 400 organisms per 100 milliliters. (Applies only between March 1 and October 31)
Radioactive materials	Not to exceed the lowest concentrations permitted to be discharged to an uncontrolled environment as prescribed by the appropriate authority having control over their use.
Total Residual Chlorine**	0.005 milligrams per liter

* The percent un-ionized ammoniac can be calculated for any temperature and pH by using the following formula taken from Thurston, R. V., R. C. Russo, and K. Emerson, 1974. Aqueous ammonia equilibrium calculations. Technical Report Number 74-1, Fisheries Bioassay Laboratory, Montana State University, Bozemen, MT. 18 p.

$$f = \frac{1}{10^{(pK_a - pH)} + 1} \times 100$$

where:

f = the percent of total ammonia in the un-ionized state

$pk_a = 0.0901821 + \frac{2729.92}{T}$, dissociation constant for ammonia

T = temperature in degrees Kelvin (273.16° Kelvin = 0° Celsius)

** Applies to conditions of continuous exposure, where continuous exposure refers to chlorinated effluents which are discharged for more than a total of two hours in any 24 hour period.

*** This dissolved oxygen standard shall be construed to require compliance with the standard 50 percent of the days at which the flow of the receiving water is equal to the lowest flow with a once in ten year recurrence interval (7Q10).

Class B—The quality of this class of the intrastate waters of the state shall be such as to permit the propagation and maintenance of cool or warm water sport or commercial fishes and be suitable for aquatic recreation of all kinds, including bathing, for which the waters may be usable. Limiting concentrations or ranges of substances or characteristics which should not be exceeded in the intrastate waters are given below:

Substance or Characteristic	Limit or Range
Dissolved oxygen	Not less than 5 milligrams per liter at all times (instantaneous minimum concentration)***
Temperature	5°F above natural in streams and 3°F above natural in lakes, based on monthly average of the maximum daily temperature, except in no case shall it exceed the daily average temperature of 86°F.
Ammonia (N)*	0.04 milligram per liter (un-ionized as N)
Chromium (Cr)	0.05 milligram per liter
Copper (Cu)	0.01 milligram per liter or not greater than 1/10 the 96 hour TLM value.
Cyanides (CN)	0.02 milligram per liter
Oil	0.5 milligram per liter
pH value	6.5 - 9.0
Phenols	0.01 milligram per liter and none that could impart odor or taste to fish flesh or other fresh-water edible products such as crayfish, clams, prawns and like

Phenols (cont.)	creatures. Where it seems probable that a discharge may result in tainting of edible aquatic products, bioassays and taste panels will be required to determine whether tainting is likely or present.
Turbidity value	25
Fecal coliform organisms	200 organisms per 100 milliliters as a logarithmic mean measured in not less than five samples in any calendar month, nor shall more than 10% of all samples taken during any calendar month individually exceed 2000 organisms per 100 milliliters. (Applies only between March 1 and October 31.)
Radioactive materials	Not to exceed the lowest concentration permitted to be discharged to an uncontrolled environment as prescribed by the appropriate authority having control over their use.
Total Residual Chlorine**	0.005 milligrams per liter

* See ammonia footnote for Class 2A waters.

** See chlorine footnote for Class 2A waters.

*** See dissolved oxygen footnote for Class 2A waters.

Class C—The quality of this class of the intrastate waters of the state shall be such as to permit the propagation and maintenance of rough fish or species commonly inhabiting waters of the vicinity under natural conditions, and be suitable for boating and other forms of aquatic recreation for which the intrastate waters may be usable. Limiting concentrations or ranges of substances or characteristics which should not be exceeded in the intrastate waters are given below:

Substance or Characteristic	Limit or Range
Dissolved oxygen	Not less than 5 milligrams per liter at all times (instantaneous minimum concentration).***
Temperature	5°F above natural in streams and 3°F above natural in lakes, based on monthly average of the maximum daily temperature except in no case shall it exceed

Temperature (cont.)	the daily average temperature of 90°F.
Ammonia (N)*	0.04 milligram per liter (un-ionized as N)
Chromium (Cr)	0.05 milligram per liter
Copper (Cu)	0.01 milligram per liter or not greater than 1/10 the 96 hour TLM value.
Cyanides (CN)	0.02 milligram per liter
Oil	10 milligrams per liter, and none in such quantities as to (1) produce a visible color film on the surface, (2) impart an oil odor to water or an oil taste to fish and edible invertebrates, (3) coat the banks and bottom of the watercourse or taint any of the associated biota, or (4) become effective toxicants according to the criteria recommended.
pH value	6.5 - 9.0
Phenols	0.1 milligram per liter and none could impart odor or taste to fish flesh or other fresh-water edible products such as crayfish, clams, prawns and like creatures. Where it seems probable that a discharge may result in tainting of edible aquatic products, bioassays and taste panels will be required to determine whether tainting is likely or present.
Turbidity value	25
Fecal coliform organisms	200 organisms per 100 milliliters as a logarithmic mean measured in not less than five samples in any calendar month, nor shall more than 10% of all samples taken during any calendar month individually exceed 2000 organisms per 100 milliliters. (Applies only between March 1 and October 31.)
Radioactive materials	Not to exceed the lowest concentrations permitted to be discharged to an uncontrolled environment as prescribed by the appropriate authority having control over their use.
Total Residual Chlorine**	0.005 milligrams per liter

* See ammonia footnote for Class 2A waters.

** See chlorine footnote for Class 2A waters.

*** See dissolved oxygen standard for Class 2A waters.

For all classes of fisheries and recreation waters, the aquatic habitat, which includes the intrastate waters and stream bed, shall not be degraded in any material manner, there shall be no material increase in undesirable slime growths or aquatic plants, including algae, nor shall there be any significant increase in harmful pesticide or other residues in the waters, sediments and aquatic flora and fauna; the normal fishery and lower aquatic biota upon which it is dependent and the use thereof shall not be seriously impaired or endangered, the species composition shall not be altered materially, and the propagation or migration of the fish and other biota normally present shall not be prevented or hindered by the discharge of any sewage, industrial waste or other waste effluents to the intrastate waters.

No sewage, industrial waste or other wastes shall be discharged into any of the intrastate waters of this category so as to cause any material change in any other substances or characteristics which may impair the quality of the intrastate waters or the aquatic biota of any of the above listed classes or in any manner render them unsuitable or objectionable for fishing, fish culture or recreational uses. Additional selective limits or changes in the discharge bases may be imposed on the basis of local needs.

3. Industrial consumption.

Class A—The quality of this class of the intrastate waters of the state shall be such as to permit their use without chemical treatment, except softening for ground water, for most industrial purposes, except food processing and related uses, for which a high quality of water is required. The quality shall be generally comparable to Class B waters for domestic consumption, except for the following:

Substance or Characteristic	Limit or Range
Chlorides (Cl)	50 milligrams per liter
Hardness	50 milligrams per liter
pH value	6.5 - 8.5

Class B—The quality of this class of the intrastate waters of the state shall be such as to permit their use for general industrial purposes, except for food processing, with only a moderate degree of treatment. The quality shall be generally comparable to Class D intrastate waters used for domestic consumption, except the following:

Substance or Characteristic	Limit or Range
Chlorides (Cl)	100 milligrams per liter

Hardness	250 milligrams per liter
pH value	6.0 - 9.0

Class C—The quality of this class of the intrastate waters of the state shall be such as to permit their use for industrial cooling and materials transport without a high degree of treatment being necessary to avoid severe fouling, corrosion, scaling, or other unsatisfactory conditions. The following shall not be exceeded in the intrastate waters:

Substance or Characteristic	Limit or Range
Chlorides (Cl)	250 milligrams per liter
Hardness	500 milligrams per liter
pH value	6.0 - 9.0

Additional selective limits may be imposed for any specific intrastate waters as needed.

In addition to the above listed standards, no sewage, industrial waste or other wastes, treated or untreated, shall be discharged into or permitted by any person to gain access to any intrastate waters classified for industrial purposes so as to cause any material impairment of their use as a source of industrial water supply.

4. Agriculture and wildlife.

Class A—The quality of this class of the intrastate waters of the state shall be such as to permit their use for irrigation without significant damage or adverse effects upon any crops or vegetation usually grown in the waters or area, including truck garden crops. The following concentrations or limits shall be used as a guide in determining the suitability of the waters for such uses, together with the recommendations contained in Handbook 60 published by the Salinity Laboratory of the U. S. Department of Agriculture, and any revisions, amendments or supplements thereto:

Substance or Characteristic	Limit or Range
Bicarbonates (HCO ₃)	5 milliequivalents per liter
Boron (B)	0.5 milligram per liter
pH value	6.0 - 8.5
Specific conductance	1,000 micromhos per centimeter
Total dissolved salts	700 milligrams per liter
Sodium (Na)	60% of total cations as milliequivalents per liter
Sulfates (SO ₄)	10 milligrams per liter, applicable to water used for production of wild rice during periods when the rice may be susceptible to damage by high sulfate levels.
Radioactive materials	Not to exceed the lowest concen-

Radioactive materials (cont.)

trations permitted to be discharged to an uncontrolled environment as prescribed by the appropriate authority having control over their use.

Class B—The quality of this class of the intrastate waters of the state shall be such as to permit their use by livestock and wildlife without inhibition or injurious effects. The limits or concentrations of substances or characteristics given below shall not be exceeded in the intrastate waters:

Substance or Characteristic	Limit or Range
pH value	6.0 - 9.0
Total salinity	1,000 milligrams per liter
Radioactive materials	Not to exceed the lowest concentrations permitted to be discharged to an uncontrolled environment as prescribed by the appropriate authority having control over their use.
Unspecified toxic substances	None at levels harmful either directly or indirectly.

Additional selective limits may be imposed for any specific intrastate waters as needed.

5. Navigation and waste disposal. The quality of this class of the intrastate waters of the state shall be such as to be suitable for esthetic enjoyment of scenery and to avoid any interference with navigation or damaging effects on property. The following limits or concentrations shall not be exceeded in the intrastate waters:

Substance or Characteristic	Limit or Range
pH value	6.0 - 9.0
Hydrogen sulfide	0.02 milligrams per liter

Additional selective limits may be imposed for any specific intrastate waters as needed.

6. Other uses. The uses to be protected in this class may be under other jurisdictions and in other areas to which the intrastate waters of the state are tributary, and may include any or all of the uses listed in the foregoing categories, plus any other possible beneficial uses. The agency therefore reserves the right to impose any standards necessary for the protection of this class, consistent with legal limitations.

- 7. Limited resource value waters. The quality of this class of intrastate waters shall be such as to protect aesthetic qualities, secondary body contact

use, and ground water for use as a potable water supply. The limits or concentrations of substances or characteristics given below shall not be exceeded in the intrastate waters:

Substance or Characteristic	Limit or Range
Fecal Coliform Organisms	1,000 organisms per 100 milliliters* (Applies only between May 1 and October 31).
pH	6.0 - 9.0
Dissolved Oxygen	At concentrations which will avoid odors, or putrid conditions in the receiving water or at concentrations at not less than 1 mg/l (daily average) provided that measurable concentrations are present at all times.
Unspecified Substances	Unspecified substances shall not be allowed in such quantities or concentrations that will impair the specified uses.

* The stated value is not to be exceeded in any calendar month as determined by the logarithmic mean of a minimum of 5 samples, nor shall more than 10% of all samples taken during any calendar month individually exceed 2,000 organisms per 100 milliliters.

6 MCAR § 4.8015 Criteria for the classification of the interstate waters of the state and the establishment of standards of quality and purity.

(The official policy and purpose of the State of Minnesota in regard to these matters is set forth in the Minnesota Water Pollution Control Statutes as amended by Laws of Minnesota 1973, ch. 374:

Sec. 115.42. It is the policy of the state to provide for the prevention, control and abatement of pollution of all waters of the state, so far as feasible and practical, in furtherance of conservation of such waters and protection of the public health and in furtherance of the development of the economic welfare of the state.

. . . It is the purpose of Laws 1963, Chapter 874, to safeguard the waters of the state from pollution by: (a) preventing any new pollution; and (b) abating pollution existing when Laws 1963, Chapter 874, become effective, under a program consistent with the declaration of policy above stated.

Sec. 115.44 Subd. 2. In order to attain the objectives of Laws 1963, Chapter 874, the agency after proper study, and after conducting public hearing upon due notice, shall as soon as practicable, group the designated waters of the state into classes and adopt classifications and standards of purity and quality therefor. Such classification shall be made in accordance with considerations of best usage in the interest of the public and with regard to the considerations mentioned in subdivision 3 hereof.

Sec. 115.44 Subd. 8. If the agency finds in order to comply with the federal water pollution control act or any other federal law or rule or regulation promulgated thereunder that it is impracticable to comply with the requirements of this section in classifying waters or adopting standards or in meeting any of the requirements thereof, compliance with the requirements of such section are waived to the extent necessary to enable the agency to comply with federal laws and rules and regulations promulgated thereunder. The agency may classify waters and adopt criteria and standards in such form and based upon such evidence as it may deem necessary and sufficient for the purposes of meeting requirements of such federal laws, notwithstanding any provisions in chapter 115 or any other state law to the contrary. In the event waters are classified and criteria and standards are adopted to meet the requirements of federal law, the agency shall thereafter proceed to otherwise comply with the provisions of this section which were waived as rapidly as is practicable. This authority shall extend to proceedings pending before the agency on May 20, 1973.

. . . Wherever advisable and practicable the agency may establish standards for effluent or disposal systems discharging into waters of the state regardless of whether such waters are or are not classified.

Sec. 115.03 Subd. 5. Notwithstanding any other provisions prescribed in or pursuant to chapter 115 and, with respect to the pollution of waters of the state, in chapter 116, or otherwise, the agency shall have the authority

to perform any and all acts minimally necessary including, but not limited to, the establishment and application of standards, procedures, regulations, orders, variances, stipulation agreements, schedules of compliance, and permit conditions, consistent with and, therefore, not less stringent than the provisions of the Federal Water Pollution Control Act, as amended, applicable to the participation by the state of Minnesota in the National Pollutant Discharge Elimination System (NPDES) . . .

In accordance with this declaration of policy and legislative intent, and under the powers delegated to the Agency, the following interstate water use classifications and corresponding standards of quality and purity are hereby adopted by the Pollution Control Agency as provided by law.)

A. Introduction.

1. **Scope.** The following classification, criteria and standards of water and effluent quality and purity as hereby adopted and established shall apply to all intrastate waters of the state, notwithstanding any other intrastate water quality or effluent regulations of general or specific application, except that any more stringent water quality or effluent standards or prohibitions in the other applicable regulations are preserved.

2. **Severability.** All provisions of this rule shall be severable and the invalidity of any lettered paragraph or any subparagraph or subdivision thereof shall not void any other lettered paragraph or subparagraph, subdivision or any part thereof.

3. **Definitions.** The terms "waters of the state" for the purposes of this rule shall be construed to mean interstate waters as herein below defined, and the terms "sewage," "industrial wastes," and "other wastes," as well as any other terms for which definitions are given in the Water Pollution Control Statutes, as used herein have the meanings ascribed to them in Minn. Stat., § 115.01 and 115.41, with the exception that disposal systems or treatment works operated under permit of the agency shall not be construed to be "waters of the state" as the term is used herein. Interstate waters are defined as all rivers, lakes, and other waters that flow across or form part of state boundaries. Other terms and abbreviations used herein which are not specifically defined in applicable federal or state law shall be construed in conformance with the context, and in relation to the applicable section of the statutes pertaining to the matter at hand, and current professional usage.

4. **Uses of the interstate waters.** The classifications are listed separately in accordance with the need for interstate water quality protection, considerations of best use in the interest of the public and other considerations, as indicated in Minn. Stat. § 115.44. The classifications should not be construed to be an order of priority, nor considered to be exclusive or prohibitory of other beneficial uses.

5. **Determination of compliance.** In making tests or analyses of the interstate waters of the state, sewage, industrial wastes or other wastes to

determine compliance with the standards, samples shall be collected in such manner and place, and of such type, number and frequency as may be considered necessary by the agency from the viewpoint of adequately reflecting the condition of the interstate waters, the composition of the effluents, and the effects of the pollutants upon the specified uses. Reasonable allowance will be made for dilution of the effluents, which are in compliance with Section C. 6., following discharge into waters of the State. The agency by allowing dilution may consider the effect on all uses of the interstate waters into which the effluents are discharged. The extent of dilution allowed regarding any specific discharge shall not violate the applicable water quality standards. The samples shall be preserved and analyzed in accordance with procedures given in the 1971 edition of Standard Methods for the Examination of Water and Waste-Water, by the American Public Health Association, American Water Works Association, and the Water Pollution Control Federation, and any revisions or amendments thereto. The agency may accept or may develop other methods, procedures, guidelines or criteria for measuring, analyzing and collecting samples.

6. Natural interstate water quality. The interstate waters may, in a state of nature, have some characteristics or properties approaching or exceeding the limits specified in the water quality standards. The standards shall be construed as limiting the addition of pollutants of human activity to those of natural origin, where such be present, so that in total the specified limiting concentrations will not be exceeded in the interstate waters by reason of such controllable additions. Where the background level of the natural origin is reasonably definable and normally is higher than the specified standard the natural level may be used as the standard for controlling the addition of pollutants of human activity which are comparable in nature and significance with those of natural origin. The natural background level may be used instead of the specified water quality standard as a maximum limit of the addition of pollutants, in those instances where the natural level is lower than the specified standard and reasonable justification exists for preserving the quality to that found in a state of nature.

In the adoption of standards for individual interstate waters, the agency will be guided by the standards set forth herein but may make reasonable modifications of the same on the basis of evidence brought forth at a public hearing if it is shown to be desirable and in the public interest to do so in order to encourage the best use of the interstate waters or the lands bordering such interstate waters.

7. Non-degradation. Waters which are of quality better than the established standards shall be maintained at high quality unless a determination is made by the agency that a change is justifiable as a result of necessary economic or social development and will not preclude appropriate beneficial present and future uses of the waters. Any project or development which would constitute a source of pollution to waters of the state shall be required to provide the best practicable control technology currently available not later than July 1, 1977 and the best available technology economically achievable not later than July 1, 1983, and any other applicable treatment

standards as defined by and in accordance with the requirements of the Federal Water Pollution Control Act, 33 U.S.C. 1251 et. seq., as amended, in order to maintain high water quality and keep water pollution at a minimum. In implementing this policy, the Administrator of the U. S. Environmental Protection Agency will be provided with such information as he requires to discharge his responsibilities under the Federal Water Pollution Control Act, as amended.

8. Variance from standards. In any case where, upon application of the responsible person or persons, the agency finds that by reason of exceptional circumstances the strict enforcement of any provision of these standards would cause undue hardship, that disposal of the sewage, industrial waste or other waste is necessary for the public health, safety or welfare; and that strict conformity with the standards would be unreasonable, impractical or not feasible under the circumstances; the agency in its discretion may grant a variance therefrom upon such conditions as it may prescribe for prevention, control or abatement of pollution in harmony with the general purposes of these classifications and standards and the intent of the applicable state and federal laws. The U. S. Environmental Protection Agency will be advised of any permits which may be issued under this clause together with information as to the need therefor.

B. Water use classifications—All Interstate Waters of the State. Based on considerations of best usage in the interest of the public and in conformance with the requirements of the applicable statutes, the interstate waters of the state shall be grouped into one or more of the following classes:

1. Domestic consumption. (To include all interstate waters which are or may be used as a source of supply for drinking, culinary or food processing use or other domestic purposes, and for which quality control is or may be necessary to protect the public health, safety or welfare.)

2. Fisheries and recreation. (To include all interstate waters which are or may be used for fishing, fish culture, bathing or any other recreational purposes, and for which quality control is or may be necessary to protect aquatic or terrestrial life, or the public health, safety or welfare.)

3. Industrial consumption. (To include all interstate waters which are or may be used as a source of supply for industrial process or cooling water, or any other industrial or commercial purposes, and for which quality control is or may be necessary to protect the public health, safety or welfare.)

4. Agriculture and wildlife. (To include all interstate waters which are or may be used for any agriculture purposes, including stock watering and irrigation, or by waterfowl or other wildlife, and for which quality control is or may be necessary to protect terrestrial life or the public health, safety or welfare.)

5. Navigation and waste disposal. (To include all interstate waters which are or may be used for any form of water transportation or navigation,

disposal of sewage, industrial waste or other waste effluents, or fire prevention, and for which quality control is or may be necessary to protect the public health, safety or welfare.)

6. Other uses. (To include interstate waters which are or may serve the above listed uses or any other beneficial uses not listed herein, including without limitation any such uses in this or any other state, province, or nation of any interstate waters flowing through or originating in this state, and for which quality control is or may be necessary for the above declared purposes, or to conform with the requirements of the legally constituted state or national agencies having jurisdiction over such interstate waters, or any other considerations the agency may deem proper.)

7. Limited resource value waters. This class includes surface waters of the state which are of limited value as a water resource and where water quantities are intermittent or less than one (1) cubic feet per second at the once in ten year, seven day low flow as defined in section C. 7. These waters shall be protected so as to allow secondary body contact use, to preserve the groundwater for use as a potable water supply, and to protect aesthetic qualities of the water. It is the intent of the agency that very few waters be classified as limited resource value waters. In conjunction with those factors listed in Minn. Stat. § 115.44, subd. 2 and subd. 3 (1978), the agency, in cooperation and agreement with the Department of Natural Resources with respect to determination of fisheries values and potential, shall determine the extent to which the waters of the state demonstrate the conditions 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; or

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 agency water assessment procedure before the waters can be classified as limited resource value waters.

C. General standards applicable to all interstate waters of the state.

1. No untreated sewage shall be discharged into any interstate waters of the state. Effective disinfection of any discharges, including combined flows of sewage and storm water, will be required where necessary to protect the specified uses of the interstate waters.

2. No sewage, industrial waste or other wastes shall be discharged into any interstate waters of the state so as to cause any nuisance conditions, such as the presence of significant amounts of floating solids, scum, oil slicks,

excessive suspended solids, material discoloration, obnoxious odors, gas ebullition, deleterious sludge deposits, undesirable slimes or fungus growths, or other offensive or harmful effects.

3. Existing discharges of inadequately treated sewage, industrial waste or other wastes shall be abated, treated or controlled so as to comply with the applicable standards. Separation of sanitary sewage from natural runoff may be required where necessary to ensure continuous effective treatment of sewage.

4. The highest levels of water quality, including, but not limited to, dissolved oxygen, which are attainable in the interstate waters by continuous operation at their maximum capability of all primary and secondary units of treatment works or their equivalent discharging effluents into the interstate waters shall be maintained in order to enhance conditions for the specified uses.

5. Means for expediting mixing and dispersion of sewage, industrial waste, or other waste effluents in the receiving interstate waters are to be provided so far as practicable when deemed necessary by the agency to maintain the quality of the receiving interstate waters in accordance with applicable standards. Mixing zones be established by the agency on an individual basis, with primary consideration being given to the following guidelines: (a) mixing zones in rivers shall permit an acceptable passageway for the movement of fish; (b) the total mixing zone or zones at any transect of the stream should contain no more than 25% of the cross-sectional area and/or volume of flow of the stream, and should not extend over more than 50% of the width; (c) mixing zone characteristics shall not be lethal to aquatic organisms; (d) for contaminants other than heat, the 96 hour median tolerance limit for indigenous fish and fish food organisms should not be exceeded at any point in the mixing zone; (e) mixing zones should be as small as possible, and not intersect spawning or nursery areas, migratory routes, water intakes, nor mouths of rivers; and (f) overlapping of mixing zones should be minimized and measures taken to prevent adverse synergistic effects. This provision shall also apply in cases where a Class 7 water is tributary to a Class 2 water.

6. It is herein established that the agency shall require secondary treatment as a minimum for all municipal sewage and biodegradable industrial or other wastes to meet the adopted water quality standards. A comparable high degree of treatment or its equivalent also shall be required of all nonbiodegradable industrial or other wastes unless the discharger can demonstrate to the agency that a lesser degree of treatment or control will provide for water quality enhancement commensurate with present and proposed future water uses and a variance is granted under the provisions of the variance clause. Secondary treatment facilities are defined as works which will provide effective sedimentation, biochemical oxidation, and disinfection, or the equivalent, including effluents conforming to the following:

Substance or Characteristic	Limiting Concentration or Range*
5-Day Biochemical Oxygen Demand*	25 milligrams per liter

Fecal coliform group organisms***	200 organisms per 100 milliliters
Total suspended solids*	30 milligrams per liter
Oil	Essentially free of visible oil
Phosphorus**	1 milligram per liter
Turbidity	25
pH range	6.5 - 8.5
Unspecified toxic or corrosive substances	None at levels acutely toxic to humans or other animals or plant life, or directly damaging to real property.

The requirements of this rule and specifically the requirement of secondary treatment as stated above shall be in addition to any requirement imposed on a discharge by the Clean Water Act, 33 U.S.C. 1251 et seq., and its implementing regulations. In the case of a conflict between the requirements of this rule and the requirements of the Clean Water Act or its implementing regulations, the more stringent requirement shall be controlling.

* The arithmetic mean for concentrations of 5-day biochemical oxygen demand and total suspended solids shall not exceed the stated values in a period of 30 consecutive days and 45 milligrams per liter in a period of 7 consecutive days.

** Where the discharge of effluent is directly to or affects a lake or reservoir. Removal of nutrients from all wastes shall be provided to the fullest practicable extent wherever sources of nutrients are considered to be actually or potentially detrimental to preservation or enhancement of the designated water uses.

*** Disinfection of wastewater effluents to reduce the levels of fecal coliform organisms to the stated value is required from March 1 through October 31 (Class 2 waters) and May 1 through October 31 (Class 7 waters) except that where the effluent is discharged 25 miles or less upstream of a water intake supplying a potable water system, the reduction to the stated value is required year around. The stated value is not to be exceeded in any calendar month as determined by the logarithmic mean of a minimum of five samples, nor shall more than 10% of all samples taken during any calendar month individually exceed 400 organisms per 100 milliliters. The application of the fecal coliform group organism standards shall be limited to sewage or other effluents containing admixtures of sewage and shall not apply to industrial wastes except where the presence of sewage, fecal coliform organisms or viable pathogenic organisms in such wastes is known or reasonably certain. Analysis of samples for fecal coliform group organisms by either the multiple tube fermentation or the membrane filter techniques is acceptable.

7. Dischargers of sewage, industrial waste or other waste effluents 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 con-

secutive daily average flows of record (the lowest weekly flow with a once in ten year recurrence interval) for the critical month(s). The period of record for determining the specific flow for the stated recurrence interval, where records are available, shall include at least the most recent ten years of record, including flow records obtained after establishment of flow regulation devices, if any. Such calculations shall not be applied to lakes and their embayments which have no comparable flow recurrence interval. Where stream flow records are not available, the flow may be estimated on the basis of available information on the watershed characteristics, precipitation, run-off and other relevant data.

Allowances shall not be made in the design of treatment works for low stream flow augmentation unless such flow augmentation of minimum flow is dependable and controlled under applicable laws or regulations.

8. In any instance where it is evident that the minimal treatment specified in Section C. 6. and dispersion are not effective in preventing pollution, or if at the applicable flows it is evident that the specified stream flow is inadequate to protect the specified water quality standards, the specific standards may be interpreted as effluent standards for control purposes. In addition, the following effluent standards may be applied without any allowance for dilution where stream flow or other factors are such as to prevent adequate dilution, or where it is otherwise necessary to protect the interstate waters for the stated uses:

Item*	Limits**
5-day biochemical oxygen demand	5 milligrams per liter

This section shall not apply to discharges to surface waters classified as limited resource value waters pursuant to section B. 7. of this rule and 6 MCAR § 4.8025.

* The concentrations specified in section C. 6. of this rule may be used in lieu thereof if the discharge of effluent is restricted to the spring flush or other high runoff periods when the stream flow rate above the discharge point is sufficiently greater than the effluent flow rate to insure that the applicable water quality standards are met during such discharge period. If treatment works are designed and constructed to meet the specified limits given above for a continuous discharge, at the discretion of the agency the operation of such works may allow for the effluent quality to vary between the limits specified above and in section C. 6. provided the water quality standards and all other requirements of the agency and the U. S. Environmental Protection Agency are being met. Such variability of operation must be based on adequate monitoring of the treatment works and the effluent and receiving waters as specified by the agency.

** If a discharger is required by the director to implement a pretreatment program for the control of toxic pollutants from industrial contributors

and the program has not yet been implemented, the discharger's effluent limitation for total suspended solids shall be 5 mg/l until such time as the program has been implemented.

9. Notwithstanding the provisions of section C. 8. and C. 16. of this rule, the agency may require a specific discharger to meet effluent limitations which are necessary to maintain the water quality of the receiving water at the standards of quality and purity established by this rule. Any effluent limitation determined to be necessary under this section shall only be required of a discharger after the discharger has been given notice of the specific effluent limitations and an opportunity for public hearing provided that compliance with the requirements of 6 MCAR § 4.8036 H. regarding notice of National Pollutant Discharge Elimination System and State Disposal System permits shall satisfy the notice and opportunity for hearing requirements of this section.

10. After providing an opportunity for public hearing the agency shall accept effective loss prevention and/or water conservation measures or process changes or other waste control measures or arrangements if it finds that such measures, changes or arrangements are equivalent to the waste treatment measures required for compliance with applicable effluent and/or water quality standards or load allocations.

11. All sources of sewage, industrial waste, or other waste which do not at present have a valid operation and discharge permit, or an application for the same pending before the agency, shall apply for the same within 30 days of the adoption of this regulation, or the agency may abate the source forthwith. The provisions of section C. 6. relating to effluent quality standards, and the other provisions of this regulation, are applicable to existing sewage, industrial waste or other waste disposal facilities and the effluent discharged therefrom. Nothing herein shall be construed to prevent the agency subsequently from modifying any existing permits so as to conform with federal requirements and the requirements of this regulation.

12. Liquid substances which are not commonly considered to be sewage or industrial wastes but which could constitute a pollution hazard shall be stored in accordance with 6 MCAR § 4.8004, and any revisions or amendments thereto. Other wastes as defined by law or other substances which could constitute a pollution hazard shall not be deposited in any manner such that the same may be likely to gain entry into any interstate waters of the state in excess of or contrary to any of the standards herein adopted, or cause pollution as defined by law.

13. No sewage, industrial waste or other wastes shall be discharged into the interstate waters of the state in such quantity or in such manner alone or in combination with other substances as to cause pollution thereof as defined by law. In any case where the interstate waters of the state into which sewage, industrial wastes or other waste effluents discharge are assigned different standards than the interstate waters into which such receiving interstate waters flow, the standards applicable to the interstate waters into which such

sewage, industrial waste or other wastes discharged shall be supplemented by the following:

The quality of any waters of the state receiving sewage, industrial waste or other waste effluents shall be such that no violation of the standards of any interstate waters of the state in any other class shall occur by reason of the discharge of such sewage, industrial waste or other waste effluents.

14. Questions concerning the permissible levels, or changes in the same, of a substance, or combination of substances, of undefined toxicity to fish or other biota shall be resolved in accordance with the latest methods recommended by the U. S. Environmental Protection Agency. The agency shall consider the recommendations of the Quality Criteria for Water, USEPA 1976, in making determinations under this section. Toxic substances shall not exceed 1/10 of the 96 hour median tolerance limit (TLM) as a water quality standard except that other application factors shall be used when justified on the basis of available scientific evidence.

15. All persons operating or responsible for sewage, industrial waste or other waste disposal systems which are adjacent to or which discharge effluents to these waters or to tributaries which affect the same, shall submit regularly every month a report to the agency on the operation of the disposal system, the effluent flow, and the characteristics of the effluents and receiving waters. Sufficient data on measurements, observations, sampling and analyses, and other pertinent information shall be furnished as may be required by the agency to adequately evaluate the condition of the disposal system, the effluent, and the waters receiving or affected by the effluent.

16. Limited resource value waters.

a. For point source discharges to surface waters classified as limited resource value waters pursuant to section B. 7. of this rule and 6 MCAR § 4.8025 the agency shall require treatment facilities which will provide effluents conforming to the following limitations:*

Substance or Characteristic	Limiting Concentration
5-Day Biochemical Oxygen Demand	15 milligrams per liter**

b. The agency shall allow treatment works to be constructed and/or operated to produce effluents to limited resource value waters at levels up to those stated in section C. 6. of this rule provided that it is demonstrated that the water quality standards for limited resource value waters will be maintained during all periods of discharge from the treatment facilities.

c. Notwithstanding the effluent limitations established by this section the quality of limited resource value waters shall not be such as to allow a violation of applicable water quality standards in waters of the state which are connected to or affected by water classified as limited resource value waters.

d. The classification of surface waters as limited resource value waters pursuant to section B. 7. of this rule and 6 MCAR § 4.8025 shall not supercede, alter or replace the classification and designation of such waters as public waters pursuant to applicable provisions and requirements of Minn. Stat. ch. 105.

* All effluent limitations specified in section C. 6. shall also be applicable to dischargers to Class 7 waters, provided that unspecified toxic or corrosive substances shall be limited to the extent necessary to protect the designated uses of the receiving water or affected downstream waters.

** As measured by the arithmetic mean of all samples taken during any calendar month.

17. No person who is in compliance with the terms and conditions of its permit issued pursuant to 6 MCAR § 4.8036 shall be deemed in violation of any water quality standard in this rule for which a corresponding effluent limitation is established in the permit. However, exceedances of the water quality standards in a receiving water shall constitute grounds for modification of a permit(s) for any discharger(s) to the receiving water who is (are) causing or contributing to the exceedances. 6 MCAR § 4.8036 shall govern the modification of any such permit.

18. For the purpose of establishing limitations to meet the ammonia water quality standard, a statistic which estimates the central value (such as the mean or median) for ambient pH and temperature of the receiving water for the critical months shall be used.

D. Specific standards of quality and purity for designated classes of interstate waters of the state. The following standards shall prescribe the qualities or properties of the interstate waters of the state which are necessary for the designated public use or benefit and which, if the limiting conditions given are exceeded, shall be considered indicative of a polluted condition which is actually or potentially deleterious, harmful, detrimental or injurious with respect to such designated uses or established classes of the interstate waters:

1. Domestic consumption.

Class A—The quality of this class of the interstate waters of the state shall be such that without treatment of any kind the raw waters will meet in all respects both the mandatory and recommended requirements of the Public Health Service Drinking Water Standards-1962 for drinking water as specified in Publication No. 956 published by the Public Health Service of the U. S. Department of Health, Education and Welfare, and any revisions, amendments or supplements thereto. This standard will ordinarily be restricted to underground waters with a high degree of natural protection. The basic requirements are given below:

Substance or Characteristic	Limit or Range
Total coliform organisms	1 most probable number per 100 milliliters

Turbidity value	5
Color value	15
Threshold odor number	3
Methylene blue active substance (MBAS)	0.5 milligram per liter
Arsenic (As)	0.01 milligram per liter
Chlorides (Cl)	250 milligrams per liter
Copper (Cu)	1 milligram per liter
Carbon Chloroform extract	0.2 milligram per liter
Cyanides (CN)	0.01 milligram per liter
Fluorides (F)	1.5 milligrams per liter
Iron (Fe)	0.3 milligram per liter
Manganese (Mn)	0.05 milligram per liter
Nitrates (NO ₃)	45 milligrams per liter
Phenol	0.001 milligram per liter
Sulfates (SO ₄)	250 milligrams per liter
Total dissolved solids	500 milligrams per liter
Zinc (Zn)	5 milligrams per liter
Barium (Ba)	1 milligram per liter
Cadmium (Cd)	0.01 milligram per liter
Chromium (Hexavalent, Cr)	0.05 milligram per liter
Lead (Pb)	0.05 milligram per liter
Selenium (Se)	0.01 milligram per liter
Silver (Ag)	0.05 milligram per liter
Radioactive material	Not to exceed the lowest concentrations permitted to be discharged to an uncontrolled environment as prescribed by the appropriate authority having control over their use.

Class B—The quality of this class of the interstate waters of the state shall be such that with approved disinfection, such as simple chlorination or its equivalent, the treated water will meet in all respects both the mandatory and recommended requirements of the Public Health Service Drinking Water Standards-1962 for drinking water as specified in Publication No. 956 published by the Public Health Service of the U. S. Department of Health, Education and Welfare, and any revisions, amendments or supplements thereto. This standard will ordinarily be restricted to surface and underground waters with a moderately high degree of natural protection. The physical and chemical standards quoted above for Class A interstate waters shall also apply to these interstate waters in the untreated state.

Class C—The quality of this class of the interstate 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 in all respects both the mandatory and recommended requirements of the Public Health Service Drinking Water Standards-1962 for drinking water as specified in Publication No. 956 published by the Public Health Service of the U. S. Department of Health, Education and Welfare,

and any revisions, amendments or supplements thereto. This standard will ordinarily be restricted to surface waters, and ground waters in aquifers not considered to afford adequate protection against contamination from surface or other sources of pollution. Such aquifers normally would include fractured and channeled limestone, unprotected impervious hard rock where interstate water is obtained from mechanical fractures, joints, etc., with surface connections, and coarse gravels subjected to surface water infiltration. The physical and chemical standards quoted above for Class A interstate waters shall also apply to these interstate waters in the untreated state, except as listed below:

Substance or Characteristic	Limit or Range
Turbidity value	25

Class D—The quality of this class of the interstate waters of the state shall be such that after treatment consisting of coagulation, sedimentation, filtration, storage and chlorination, plus additional pre, post, or intermediate stages of treatment, or other equivalent treatment processes, the treated water will meet in all respects the recommended requirements of the Public Health Service Drinking Water Standards-1962 for drinking water as specified in Publication No. 956 published by the Public Health Service of the U. S. Department of Health, Education and Welfare, and any revisions, amendments or supplements thereto. This standard will ordinarily be restricted to surface waters, and ground waters in aquifers not considered to afford adequate protection against contamination from surface or other sources of pollution. Such aquifers normally would include fractured and channeled limestone, unprotected impervious hard rock where water is obtained from mechanical fractures, joints, etc., with surface connections, and coarse gravels subjected to surface water infiltration. The concentrations or ranges given below shall not be exceeded in the raw waters before treatment:

Substance or Characteristic	Limit or Range
Arsenic (As)	0.05 milligram per liter
Barium (Ba)	1 milligram per liter
Cadmium (Cd)	0.01 milligram per liter
Chromium (Cr + 6)	0.05 milligram per liter
Cyanide (CN)	0.2 milligram per liter
Fluoride (F)	1.5 milligrams per liter
Lead (Pb)	0.05 milligram per liter
Selenium (Se)	0.01 milligram per liter
Silver (Ag)	0.05 milligram per liter
Radioactive Material	Not to exceed the lowest concentrations permitted to be discharged to an uncontrolled environment as prescribed by the appropriate authority having control over their use.

In addition to the above listed standards, no sewage, industrial waste or other

wastes, treated or untreated, shall be discharged into or permitted by any person to gain access to any interstate waters classified for domestic consumption so as to cause any material undesirable increase in the taste, hardness, temperature, toxicity, corrosiveness or nutrient content, or in any other manner to impair the natural quality or value of the interstate waters for use as a source of drinking water.

2. Fisheries and recreation.

Class A—The quality of this class of the interstate waters of the state shall be such as to permit the propagation and maintenance of warm or cold water sport or commercial fishes and be suitable for aquatic recreation of all kinds, including bathing, for which the waters may be usable. Limiting concentrations or ranges of substances or characteristics which should not be exceeded in the interstate waters are given below:

Substance or Characteristic	Limit or Range
Dissolved oxygen	Not less than 7 milligrams per liter at all times (instantaneous minimum concentration)***
Temperature	No material increase
Ammonia (N)*	0.016 milligram per liter (un-ionized as N)
Chlorides (Cl)	50 milligrams per liter
Chromium (Cr)	0.02 milligram per liter
Copper (Cu)	0.01 milligram per liter or not greater than 1/10 the 96 hour TLM value.
Cyanides (CN)	0.02 milligrams per liter
Oil	0.5 milligram per liter
pH value	6.5 - 8.5
Phenols	0.01 milligram per liter and none that could impart odor or taste to fish flesh or other fresh-water edible products such as crayfish, clams, prawns and like creatures. Where it seems probable that a discharge may result in tainting of edible aquatic products, bio-assays and taste panels will be required to determine whether tainting is likely or present.
Turbidity value	10
Color value	30
Fecal coliform organisms	200 organisms per 100 milliliters as a logarithmic mean measured in not less than five samples in any calendar month, nor shall more than 10% of all samples

Fecal coliform organisms (cont.)	taken during any calendar month individually exceed 400 organisms per 100 milliliters. (Applies only between March 1 and October 31.)
Radioactive materials	Not to exceed the lowest concentrations permitted to be discharged to an uncontrolled environment as prescribed by the appropriate authority having control over their use.
Total Residual Chlorine**	0.005 milligrams per liter

* The percent un-ionized ammonia can be calculated for any temperature and pH by using the following formula taken from Thurston, R. V., R. C. Russo, and K. Emerson, 1974. Aqueous ammonia equilibrium calculations. Technical Report Number 74-1, Fisheries Bioassay Laboratory, Montana State University, Bozeman, MT. 18 p.

$$f = \frac{1}{10^{(pk_a - pH)} + 1} \times 100$$

where:

f = the percent of total ammonia in the un-ionized state

pk_a = 0.0901821 + $\frac{2729.92}{T}$, dissociation constant for ammonia

T = temperature in degrees Kelvin (273.16° Kelvin = 0° Celsius)

** Applies to conditions of continuous exposure, where continuous exposure refers to chlorinated effluents which are discharged for more than a total of two hours in any 24 hour period.

*** This dissolved oxygen standard shall be construed to require compliance with the standard 50 percent of the days at which the flow of the receiving water is equal to the lowest weekly flow with a once in ten year recurrence interval (7Q10).

Class B—The quality of this class of the interstate waters of the state shall be such as to permit the propagation and maintenance of cool or warm water sport or commercial fishes and be suitable for aquatic recreation of all kinds, including bathing, for which the waters may be usable. Limiting concentrations or ranges of substances or characteristics which should not be exceeded in the interstate waters are given below:

Substance or Characteristic	Limit or Range
Dissolved oxygen****	Not less than 5 milligrams per liter at all times (instantaneous minimum concentration)*****

Temperature*	5°F above natural in streams and 3°F above natural in lakes, based on monthly average of the maximum daily temperature, except in no case shall it exceed the daily average temperature of 86°F.
Ammonia (N)**	0.04 milligram per liter (un-ionized as N)
Chromium (Cr)	0.05 milligram per liter
Copper (Cu)	0.01 milligram per liter or not greater than 1/10 the 96 hour TLM value.
Cyanides (CN)	0.02 milligram per liter
Oil	0.5 milligram per liter
pH value	6.5 - 9.0
Phenols	0.01 milligram per liter and none that could impart odor or taste to fish flesh or other fresh-water edible products such as crayfish, clams, prawns and like creatures. Where it seems probable that a discharge may result in tainting of edible aquatic products, bio- assays and taste panels will be required to determine whether tainting is likely or present.
Turbidity value	25
Fecal coliform organisms	200 organisms per 100 milliliters as a logarithmic mean measured in not less than five samples in any calendar month, nor shall more than 10% of all samples taken during any calendar month indi- vidually exceed 2000 organisms per 100 milliliters. (Applies only between March 1 and October 31.)
Radioactive materials	Not to exceed the lowest concen- tration permitted to be dis- charged to an uncontrolled environment as prescribed by the appropriate authority having control over their use.
Total Residual Chlorine***	0.005 milligrams per liter

* The following temperature criteria will be applicable for the Mississippi River from Lake Itasca to the outlet of the Metro Wastewater Treatment Works in St. Paul in addition to or superseding the above. The

weekly average temperature shall not exceed the following temperatures during the specified months:

January	40°F	July	83°F
February	40°F	August	83°F
March	48°F	September	78°F
April	60°F	October	68°F
May	72°F	November	50°F
June	78°F	December	40°F

For the Mississippi River from Lock and Dam No. 2 at Hastings to the Iowa Border, the weekly average temperature shall not exceed the following temperatures during the specified months:

January	40°F	July	84°F
February	40°F	August	84°F
March	54°F	September	82°F
April	65°F	October	73°F
May	75°F	November	58°F
June	84°F	December	48°F

** See ammonia footnote for Class 2A waters.

*** See chlorine footnote for Class 2A waters.

**** This standard shall apply to all interstate waters of the state except for the reach of the Mississippi River from the outlet of the Metro wastewater treatment works in St. Paul (River Mile 835) to Lock and Dam No. 2 at Hastings (River Mile 815). For this reach of the Mississippi River the standard shall be not less than 5 milligrams per liter from April 1 through November 30, and not less than 4 milligrams per liter at other times.

***** See dissolved oxygen footnote for Class 2A waters.

Class C—The quality of this class of the interstate waters of the state shall be such as to permit the propagation and maintenance of rough fish or species commonly inhabiting waters of the vicinity under natural conditions, and be suitable for boating and other forms of aquatic recreation for which the interstate waters may be usable. Limiting concentrations or ranges of substances or characteristics which should not be exceeded in the interstate waters are given below:

Substance or Characteristic	Limit or Range
Dissolved oxygen*****	Not less than 5 milligrams per liter at all times (instantaneous minimum concentration)*****
Temperature*	5°F above natural in streams and

Temperature* (cont.)	3°F above natural in lakes, based on monthly average of the maximum daily temperature except in no case shall it exceed the daily average temperature of 90°F.
Ammonia (N)**	0.04 milligram per liter (un-ionized as N)
Chromium (Cr)	0.05 milligram per liter
Copper (Cu)	0.01 milligram per liter or not greater than 1/10 the 96 hour TLM value.
Cyanides (CN)	0.02 milligram per liter
Oil	10 milligrams per liter, and none in such quantities as to (1) produce a visible color film on the surface, (2) impart an oil odor to water or an oil taste to fish and edible invertebrates, (3) coat the banks and bottom of the watercourse or taint any of the associated biota, or (4) become effective toxicants according to the criteria recommended.
pH value	6.5 - 9.0
Phenols	0.1 milligram per liter and none that could impart odor or taste to fish flesh or other fresh-water edible products such as crayfish, clams, prawns and like creatures. Where it seems probable that a discharge may result in tainting of edible aquatic products, bioassays and taste panels will be required to determine whether tainting is likely or present.
Turbidity value	25
Fecal coliform organisms	200 organisms per 100 milliliters as a logarithmic mean measured in not less than five samples in any calendar month, nor shall more than 10% of all samples taken during any calendar month individually exceed 2000 organisms per 100 milliliters. (Applies only between March 1 and October 31.)
Radioactive materials	Not to exceed the lowest concentrations permitted to be discharged to an uncontrolled

Radioactive materials (cont.)

environment as prescribed by the appropriate authority having control over their use.

Total Residual Chlorine***

0.005 milligrams per liter.

* The following temperature criteria will be applicable for the Mississippi River from the outlet of the Metro Wastewater Treatment Works in St. Paul to Lock and Dam No. 2 at Hastings in addition to or superseding the above. The weekly average temperature shall not exceed the following temperatures during the specified months.

January	40°F	July	83°F
February	40°F	August	83°F
March	48°F	September	78°F
April	60°F	October	68°F
May	72°F	November	50°F
June	78°F	December	40°F

** See Ammonia footnote for Class 2A waters.

*** See Chlorine footnote for Class 2A waters.

**** This standard shall apply to all interstate waters of the state except for the reach of the Mississippi River from outlet of the Metro wastewater treatment works in St. Paul (River Mile 835) to Lock and Dam No. 2 at Hastings (River Mile 815). For this reach of the Mississippi River the standard shall be not less than 5 milligrams per liter from April 1 through November 30, and not less than 4 milligrams per liter at other times.

***** See dissolved oxygen footnote for Class 2A waters.

For all classes of fisheries and recreation waters, the aquatic habitat, which includes the interstate waters and stream bed, shall not be degraded in any material manner, there shall be no material increase in undesirable slime growths or aquatic plants, including algae, nor shall there be any significant increase in harmful pesticide or other residues in the waters, sediments and aquatic flora and fauna; the normal fishery and lower aquatic biota upon which it is dependent and the use thereof shall not be seriously impaired or endangered, the species composition shall not be altered materially, and the propagation or migration of the fish and other biota normally present shall not be prevented or hindered by the discharge of any sewage, industrial waste or other waste effluents to the interstate waters.

No sewage, industrial waste or other wastes shall be discharged into any of the interstate waters of this category so as to cause any material change in any other substances or characteristics which may impair the quality of the interstate waters or the aquatic biota of any of the above listed classes or in any manner render them unsuitable or objectionable for fishing, fish culture or recreational uses. Additional selective limits or changes in the discharge bases may be imposed on the basis of local needs.

3. Industrial consumption.

Class A—The quality of this class of the interstate waters of the state shall be such as to permit their use without chemical treatment, except softening for ground water, for most industrial purposes, except food processing and related uses, for which a high quality of water is required. The quality shall be generally comparable to Class B waters for domestic consumption, except for the following:

Substance or Characteristic	Limit or Range
Chlorides (Cl)	50 milligrams per liter
Hardness	50 milligrams per liter
pH value	6.5 - 8.5

Class B—The quality of this class of the interstate waters of the state shall be such as to permit their use for general industrial purposes, except for food processing, with only a moderate degree of treatment. The quality shall be generally comparable to Class D interstate waters used for domestic consumption, except the following:

Substance or Characteristic	Limit or Range
Chlorides (Cl)	100 milligrams per liter
Hardness	250 milligrams per liter
pH value	6.0 - 9.0

Class C—The quality of this class of the interstate waters of the state shall be such as to permit their use for industrial cooling and materials transport without a high degree of treatment being necessary to avoid severe fouling, corrosion, scaling, or other unsatisfactory conditions. The following shall not be exceeded in the interstate waters:

Substance or Characteristic	Limit or Range
Chlorides (Cl)	250 milligrams per liter
Hardness	500 milligrams per liter
pH value	6.0 - 9.0

Additional selective limits may be imposed for any specific interstate waters as needed.

In addition to the above listed standards, no sewage, industrial waste or other wastes, treated or untreated, shall be discharged into or permitted by any person to gain access to any interstate waters classified for industrial purposes so as to cause any material impairment of their use as a source of industrial water supply.

4. Agriculture and wildlife.

Class A—The quality of this class of the interstate waters of the state shall be

such as to permit their use for irrigation without significant damage or adverse effects upon any crops or vegetation usually grown in the waters or area, including truck garden crops. The following concentrations or limits shall be used as a guide in determining the suitability of the waters for such uses, together with the recommendations contained in Handbook 60 published by the Salinity Laboratory of the U. S. Department of Agriculture, and any revisions, amendments or supplements thereto:

Substance or Characteristic	Limit or Range
Bicarbonates (HCO ₃)	5 milliequivalents per liter
Boron (B)	0.5 milligram per liter
pH value	6.0 - 8.5
Specific conductance	1,000 micromhos per centimeter
Total dissolved salts	700 milligrams per liter
Sodium (Na)	60% of total cations as milliequivalents per liter
Sulfates (SO ₄)	10 milligrams per liter, applicable to water used for production of wild rice during periods when the rice may be susceptible to damage by high sulfate levels.
Radioactive materials	Not to exceed the lowest concentrations permitted to be discharged to an uncontrolled environment as prescribed by the appropriate authority having control over their use.

Class B—The quality of this class of the interstate waters of the state shall be such as to permit their use by livestock and wildlife without inhibition or injurious effects. The limits or concentrations of substances or characteristics given below shall not be exceeded in the interstate waters:

Substance or Characteristic	Limit or Range
pH value	6.0 - 9.0
Total salinity	1,000 milligrams per liter
Radioactive materials	Not to exceed the lowest concentrations permitted to be discharged to an uncontrolled environment as prescribed by the appropriate authority having control over their use.
Unspecified toxic substances	None at levels harmful either directly or indirectly.

Additional selective limits may be imposed for any specific interstate waters as needed.

5. Navigation and waste disposal. The quality of this class of the inter-

state waters of the state shall be such as to be suitable for esthetic enjoyment of scenery and to avoid any interference with navigation or damaging effects on property. The following limits or concentrations shall not be exceeded in the interstate waters:

Substance or Characteristic	Limit or Range
pH value	6.0 - 9.0
Hydrogen sulfide	0.02 milligrams per liter

Additional selective limits may be imposed for any specific interstate waters as needed.

6. Other uses. The uses to be protected in this class may be under other jurisdictions and in other areas to which the interstate waters of the state are tributary, and may include any or all of the uses listed in the foregoing categories, plus any other possible beneficial uses. The agency therefore reserves the right to impose any standards necessary for the protection of this class, consistent with legal limitations.

7. Limited resource value waters. The quality of this class of interstate waters shall be such as to protect aesthetic qualities, secondary body contact use, and ground water for use as a potable water supply. The limits or concentrations of substances or characteristics given below shall not be exceeded in the interstate waters:

Substance or Characteristic	Limit or Range
Fecal Coliform Organisms	1,000 organisms per 100 milliliters* (Applies only between May 1 and October 31)
pH	6.0 - 9.0
Dissolved Oxygen	At concentrations which will avoid odors, or putrid conditions in the receiving water or at concentrations at not less than 1 mg/l (daily average) provided that measurable concentrations are present at all times.
Unspecified Substances	Unspecified substances shall not be allowed in such quantities or concentrations that will impair the specified uses.

* The stated value is not to be exceeded in any calendar month as determined by the logarithmic mean of a minimum of 5 samples, nor shall more than 10% of all samples taken during any calendar month individually exceed 2,000 organisms per 100 milliliters.

CHAPTER TWENTY-TWO: WPC 22
CLASSIFICATION OF UNDERGROUND WATERS OF THE STATE
AND STANDARDS FOR WASTE DISPOSAL

WPC 22: It is the purpose of this regulation to preserve and protect the underground waters of the state by: (a) Preventing any new pollution, and (b) Abating existing pollution. It is the policy of the Agency to consider the actual or potential use of the underground waters for potable water supply as constituting the highest priority use and as such to provide maximum protection to all underground waters. The ready availability nearly statewide of underground water constitutes a natural resource of immeasurable value which must be protected as nearly as possible in its natural condition. For the conservation of underground water supplies for present and future generations and prevention of possible health hazards, it is necessary and proper that the Agency employ a non-degradation policy to prevent pollution of the underground waters of the State.

Regulation WPC 14 also applies to underground waters. Where differences exist between regulation WPC 14 and this regulation, the more stringent of the conditions shall be construed to apply.

(a) Definitions

(1) **Underground Water** means the water contained below the surface of the earth in the saturated zone including, without limitation, all waters whether under confined, unconfined or perched conditions, in near surface unconsolidated sediment or regolith, or in rock formations deeper underground. The term ground water shall be synonymous with underground water.

(2) **Confined ground water** means the water which is under pressure greater than atmospheric, and its upper limit is the bottom of a bed of distinctly lower hydraulic conductivity than that of the material in which the confined water occurs.

(3) **Unconfined ground water** is water in a formation that has a water table.

(4) **Perched ground water** is unconfined ground water separated from an underlying body of ground water by an unsaturated zone. Perched ground water may be either permanent where recharge is frequent enough to maintain a saturated zone above the perching bed, or temporary where intermittent recharge is not great or frequent enough to prevent the perched water from disappearing from time to time as a result of drainage over the edge or through the perching bed.

(5) **Saturated zone** is that part of the earth's crust in which all the voids, large and small, are ideally filled with water under pressure greater than atmospheric.

(6) **Unsaturated zone** is the zone between the land surface and the water table. It includes the capillary fringe. Generally, the water is under less than atmospheric pressure.

(7) **Water table** is the surface of the ground water at which the pressure is atmospheric. Generally this is the top of the saturated zone.

(8) **Toxic pollutant** means those pollutants, or combination of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will, on the basis of information available, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring.

Other terms used herein which are defined in Minnesota Statutes, Chapters 115 and 116, shall be given the meaning ascribed to them therein. Terms not defined in this regulation or in Chapters 115 and 116 shall be construed in accordance with accepted professional usage and practice.

(b) **Uses of Underground Waters.** The waters of the state are classified according to their highest priority use, which for underground waters of suitable natural quality is their use now or in the future as a source of drinking, culinary, or food processing water. Suitability is to be construed as meaning that the waters in their natural state can be used for such purposes after such purification or treatment processes as may be prescribed by the Minnesota Department of Health or the Minnesota Department of Agriculture. This classification is established to protect the underground waters as potable water supplies by preventing and abating pollution. In making this classification, the Agency recognizes that the underground waters of the state are contained in a series of related and often interconnected aquifers, such that if sewage, industrial waste, other waste, or other pollutants enter the underground water system, they may spread both vertically and horizontally. Thus, all underground waters are best classified for use as potable water supply in order to preserve high quality waters by minimizing spreading of pollutants, by prohibiting further discharges of wastes thereto, and to maximize the possibility of rehabilitating degraded waters for their priority use.

(c) **Non-Degradation.** It is the policy of the Agency that the disposal of sewage, industrial waste and other wastes shall be controlled as may be necessary to ensure that to the maximum practicable extent the underground waters of the state are maintained at their natural quality unless a determination is made by the Agency that a change is justifiable by reason of necessary economic or social development and will not preclude appropriate beneficial present and future uses of the waters.

(d) **Standards**

(1) No sewage, industrial waste, or other wastes shall be discharged directly into the zone of saturation by such means as injection wells or other devices used for the purpose of injecting materials into the zone of saturation, except that the discharge of cooling water under existing permits of the Agency may be continued, subject to review of the permit by the Agency for conformance with section (d)(3).

(2) No sewage, industrial waste, other waste, or other pollutants shall be allowed to be discharged to the unsaturated zone or deposited in such place, manner or quantity that the effluent or residue therefrom, upon reaching the water table, may actually or potentially preclude or limit the use of the underground waters as a potable water supply, nor shall any such discharge or deposit be allowed which may pollute the underground waters. All such possible sources of pollutants shall be monitored at the discharger's expense as directed by the Agency.

(3) Treatment, safeguards or other control measures shall be provided by the person responsible for any sewage, industrial waste, other waste, or other pollutants which are to be or have been discharged to the unsaturated zone or deposited there, or which have been discharged to the zone of saturation, to the extent necessary to ensure that the same will not constitute or continue to be a source of pollution of the underground waters or impair the natural quality thereof.

(4) Toxic pollutants including, but not limited to, radioactive substances, chemicals, metals, solvents, petroleum products, plating wastes, and acids and bases, shall not be discharged or deposited in any manner such as to endanger the quality or uses of the underground waters.

(5) This regulation shall not be construed as prohibiting the use of septic tank systems or holding tanks for disposal or storage of sewage or other acceptable organic wastes where public or other sewage or other waste disposal systems with surface discharge of effluent are not available or cannot reasonably be made available (except as Agency regulations may in the future apply to the construction, location, maintenance or use of such disposal systems), nor shall it be construed as prohibiting land disposal of acceptable organic wastes or the use of chemicals and fertilizers for the production or protection of agricultural crops or products, nor the recharge of ground waters under controlled conditions, provided that such practices do not pose a significant pollution hazard.

(6) All persons operating or responsible for sewage, industrial waste or other waste disposal systems, except septic tanks and related soil adsorption systems, which discharge effluent to the unsaturated zone, or deposits of pollutants or other operations from which residues may reach the underground waters, shall submit regularly every month a report to the Agency on the operation of the disposal system, the waste flow, and the characteristics of the influent, effluent and underground waters of the vicinity. Sufficient data on measurements, observations, sampling and analyses, and other pertinent information shall be furnished as may be required by the Agency to, in its judgment, adequately reflect the condition of the disposal system, raw wastes, deposited material, effluent, residues, and the receiving or affected soils and underground waters. These data shall be collected under the supervision and direction of the Agency.

(7) The long term storage underground for later treatment of sewage, industrial waste or other wastes, except solid wastes under permit of the Agency, is prohibited. Liquids or other substances not sewage or industrial waste which may pollute or tend to pollute the underground waters of the state shall not be stored underground without safeguards adequate to reasonably assure proper retention against entry into the underground waters. The use of sewer systems for purposes of conveyance or control of the flow to outlets or treatment works, including temporary storage for such purposes, shall not be construed to be long term storage within the meaning of this regulation.

(8) The ground water may in its natural state have some characteristics or properties exceeding the standards for potable water supplies. Where the background level of natural origin is reasonably definable and is higher than the accepted standard for potable water and the hydrology and extent of the aquifer are known, the natural level may be used as the standard.

(e) **Severability.** If any provision of this regulation or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions of the regulation or application of any other part of this regulation which can be given effect without application of the invalid provision. To this end the provisions of all sections, subsections or subdivisions herein and the various applications thereof are declared to be severable.

(f) **Determination of Compliance.** In making tests or analyses of the underground waters of the state, or of sewage, industrial wastes or other wastes, to determine compliance with the standards, samples shall be collected in such manner and place and of such type, number and frequency as may be considered satisfactory by the Agency from the viewpoint of adequately reflecting the condition of the underground water and the effects of the pollutants upon the specified water uses. The samples shall be preserved and analyzed in accordance with procedures described in the 13th edition of Standard Methods for the Examination of Water and Wastewater, 1971, by the American Public Health Association, American Water Works Association, and the Water Pollution Control Federation, and any revisions or amendments thereto, or other methods acceptable to the Agency.

(g) **Variance.** In any cases where, upon application of the responsible person or persons, the Agency finds that by reason of exceptional circumstances the strict enforcement of any provision of these standards would cause undue hardship, that disposal of the sewage, industrial waste or other waste is necessary for the public health, safety or welfare, or that strict conformity with the standards would be unreasonable, impractical or not feasible under the circumstances, the Agency in its discretion may permit a variance therefrom upon such conditions as it may prescribe for prevention, control or abatement of pollution in harmony with the general purpose of these standards and the intent of the applicable state and federal laws.

Filed August 14, 1973.

6 MCAR § 4.8024 Classifications of intrastate waters of Minnesota. The following rule establishing classifications pertains to all intrastate surface waters of the state.

A. All intrastate waters are included, although some minor watercourses such as unnamed streams or interconnecting waters and/or intermittently flowing creeks, ditches, or draws, etc., are not listed individually herein. All intrastate waters are classified herein and this classification shall supersede the classification of the intrastate waters given in WPC 1.

B. All known present uses and/or uses which may be made of the waters in the future are included. In addition to the classification given below, all of the waters named herein are also included in Classes 3C, 4A, and B, 5 and 6, where such uses are possible. All other waters not specifically named herein shall be classified as 2B, 2C, 3B, 3C, 4A, and B, 5 and 6. Where specific criteria are common to two or more listed classes the more restrictive value shall apply. For additional information refer to 6 MCAR § 4.8014, Criteria for the classification of the intrastate waters of the state and the establishment of standards of quality and purity.

C. Interstate waters are defined in the Federal Water Pollution Control Act, as amended (33 U.S.C. 466 et seq.), Section 13(e) thereof as including all rivers, lakes and other waters that flow across or form a part of state boundaries. All of the remaining designated waters of the state which do not meet the definition of interstate waters given above are to be construed herein as constituting intrastate waters.

D. The provisions of this rule shall be severable and the invalidity of any lettered paragraph or any subparagraph or subdivision thereof shall not make void any other lettered paragraph, subparagraph, subdivision or any other part thereof.

E. Supplement 1 to this rule lists intrastate waters that are classified as limited resource value waters, Class 7. For those intrastate waters identified with an asterisk (*), the revised classification in Supplement 1 shall supersede any previous classification; provided, however that the limited resource value classification shall apply only to that portion of the water specifically described in Supplement 1.

TABLE OF CONTENTS

LAKE SUPERIOR BASIN	4
1. St. Louis River Watershed	4
2. Lake Superior Watershed	7
LAKE OF THE WOODS BASIN	18
3. Rainy Lake Watershed	18
4. Little Fork River Watershed	25
5. Big Fork River Watershed	26
6. Lake of the Woods Watershed	27
RED RIVER OF THE NORTH BASIN	28
7. Mustinka-Boise de Sioux Rivers Watershed	28
8. Otter Tail River Watershed	28
9. Buffalo River Watershed	29
10. Wild Rice River Watershed	30
11. Red Lake River Watershed	31
12. Middle River Watershed	32
13. Two Rivers Watershed	33
14. Roseau River Watershed	33
UPPER MISSISSIPPI RIVER BASIN	33
15. Mississippi River Headwaters Watershed	33
16. Crow Wing River Watershed	38
17. Crow River Watershed	41
18. Rum River Watershed	42
19. Mississippi-Sauk Rivers Watershed	42
MINNESOTA RIVER BASIN	45
20. Big Stone Lake Watershed	45
21. Pomme de Terre River Watershed	45
22. Lac qui Parle River Watershed	45
23. Chippewa River Watershed	45
24. Yellow Medicine River Watershed	46
25. Redwood River Watershed	46
26. Cottonwood River Watershed	46
27. Blue Earth River Watershed	47
28. Minnesota River-Hawk Creek	48
29. Lower Minnesota River Watershed	48
ST. CROIX RIVER BASIN	49
30. Kettle River Watershed	49
31. Snake River Watershed	51
32. Lower St. Croix River Watershed	52
LOWER MISSISSIPPI RIVER BASIN	53
33. Metropolitan Area Watershed	53
34. Cannon River Watershed	53
35. Zumbro River Watershed	54

TABLE OF CONTENTS (CONT.)

36. Root River Watershed	55
MISSOURI-CEDAR-DES MOINES RIVERS BASIN	60
37. Cedar River Watershed	60
38. Des Moines River Watershed	60
39. Rock River Watershed	61

Waters	Reach or Area Involved or Location	Classification
Lake Superior Basin St. Louis River Watershed (No. 1)		
Streams		
Anderson Creek	(S. 14, 15, 22, 26, 27, T. 46, R. 17)	1B, 2A, 3B
Artichoke Creek	(S. 7, 8, 18, T. 52, R. 17)	1B, 2A, 3B
Athlenius Creek	(S. 9, 10, T. 53, R. 14)	1B, 2A, 3B
First (Mud) Creek	(S. 3, 10, 11, T. 58, R. 15; S. 27, 34, T. 59, R. 15)	2A, 3B
Banner Brook	(S. 16, 21, T. 58, R. 13)	1B, 2A, 3B
Beartrap Creek	(S. 15, 16, 21, 22, 25, 26, 27, 28, T. 51, R. 17)	1B, 2A, 3B
Beaver River	(T. 52, R. 16, 17)	2B
Berry Creek	(S. 2, 10, 11, 12, 15, 21, 28, 29, 31, T. 56, R. 12; S. 6, 7, 18, 19, T. 55, R. 12; S. 12, 13, T. 55, R. 13)	1B, 2A, 3B
Blackhoof River	(S. 6, 7, 8, 10, 14, 15, 18, 19, 20, 22, 16, 17, 25, 26, 27, T. 47, R. 17; S. 30, 31, T. 48, R. 17; S. 26, 30, T. 47, R. 16)	1B, 2A, 3B
Boulder Creek	(T. 53, 54, R. 14)	2C
Bug Creek	(T. 54, R. 15, 16)	2B
Canutrup Creek	(S. 19, T. 46, R. 17)	2B
Carey Creek	(S. 28, 33, T. 53, R. 14)	1B, 2A, 3B
Chalberg Creek	(S. 1, 2, 3, 10, T. 51, R. 17)	1B, 2A, 3B
Clear Creek	(S. 6, T. 46, R. 16; S. 1, 10, 11, 12, 15, 16, 21, T. 46, R. 17)	1B, 2A, 3B
Cloquet River	(T. 51, 52, 53, 54, 55, R. 12, 13, 14, 15, 16, 17, 18)	2B
Little Cloquet River	(T. 53, 54, R. 12, 13)	2B
Cloquet River, West Branch	(T. 55, 56, R. 12, 13)	2B
Coolidge Creek	(S. 19, 20, 30, T. 55, R. 14; S. 25, 35, 36, T. 55, R. 15)	1B, 2A, 3B
Cranberry Creek	(T. 58, R. 13)	2C
Crystal Creek	(S. 6, T. 48, R. 16; S. 1, T. 48, R. 17; S. 36, T. 49, R. 17)	1B, 2A, 3B
Deer Creek	(S. 19, 20, 29, T. 47, R. 16; S. 12, 13, 24, T. 47, R. 17)	1B, 2A, 3B
Dutchess Slough Creek	(S. 9, 10, 13, 14, 15, 24, T. 50, R. 17)	1B, 2A, 3B
Elbow Creek	(T. 56, 57, R. 18)	2B
Embarrass River	(T. 59, 60, R. 13, 14, 15)	2B

Waters	Reach or Area Involved or Location	Classification
Elm Creek	(S. 1, 2, T. 49, R. 16; S. 35, T. 50, R. 16)	1B, 2A, 3B
Floodwood River Hay Creek	(T. 52, 53, 54, R. 20, 21) (S. 27, 28, 29, 32, 33, T. 50, R. 16; S. 3, 4, 9, 10, 15, T. 49, R. 16)	2B 1B, 2A, 3B
Hellwig Creek	(S. 13, 14, 24, 25, 35, T. 53, R. 17; S. 3, 10, 14, 15, 23, 26, T. 52, R. 17)	1B, 2A, 3B
Hornby Junction Creek (called Whiteface River)	(S. 5, 6, 7, T. 55, R. 13; S. 28, 32, 33, T. 56, R. 13)	1B, 2A, 3B
Humphrey Creek	(S. 23, 26, 27, 33, 34, T. 54, R. 14)	1B, 2A, 3B
Indian Creek	(S. 23, 26, 27, 34, T. 56, R. 12; S. 3, T. 55, R. 12)	1B, 2A, 3B
Jenkins Creek	(T. 54, R. 17, 18)	2B
Joe Martins Creek	(S. 4, 7, 8, T. 50, R. 18; S. 12, T. 50, R. 19)	1B, 2A, 3B
Johnson Creek	(S. 13, 14, T. 50, R. 17)	1B, 2A, 3B
Keene Creek	(S. 1, 12, 14, T. 49, R. 15; S. 25, 26, T. 50, R. 15)	1B, 2A, 3B
Kehtel Creek	(S. 8, 17, 18, 19, T. 51, R. 15)	1B, 2A, 3B
Kenross Creek	(S. 7, 18, 19, 30, 31, T. 58, R. 18)	1B, 2A, 3B
Kingsbury Creek	(S. 4, 10, 13, 14, T. 49, R. 15)	1B, 2A, 3B
Langley River	(T. 56, R. 10, 11)	2B
Little Langley River	(T. 55, 56, R. 10, 11)	2B
McCarthy Creek	(S. 1, 12, 13, T. 53, R. 12)	1B, 2A, 3B
Midway River (except trout waters)	(T. 48, 49, 50, R. 15, 16)	2B
Midway River	(S. 1, 12, 13, 14, 15, 22, T. 49, R. 16; S. 21, 22, 28, 32, 33, T. 50, R. 15; S. 5, 6, T. 49, R. 15)	1B, 2A, 3B
Mirbat Creek	(T. 50, R. 20)	2B
Mission Creek	(T. 48, 49, R. 15)	1B, 2A, 3B
Mud Creek	(S. 20, 21, 22, 29, 30, T. 54, R. 12)	1B, 2A, 3B
Mud Creek, Little	(S. 12, 14, 22, 23, 27, T. 57, R. 11)	1B, 2A, 3B
Mud Hen Creek	(T. 56, R. 17)	2B
Murphy Creek	(S. 23, 24, 27, 33, T. 57, R. 11; S. 4, 8, 18, 19, T. 56, R. 11)	1B, 2A, 3B
Nemadji Creek (North Fork Creek)	(S. 9, 8, 7, 18, T. 46, R. 17; S. 12, 13, 14, 15, 16, 21, T. 46, R. 18)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Net River, Big	(S. 17, 20, 21, 29, T. 46, R. 16)	1B, 2A, 3B
Net River, Little	(S. 3, 10, 15, 22, 26, 27, 34, 35, T. 46, R. 16)	1B, 2A, 3B
O'Rourke Creek	(S. 17, 19, 20, 30, T. 56, R. 19; S. 25, 26, 35, T. 56, R. 20)	1B, 2A, 3B
Otter Creek, Big (ex- cept trout waters)	(T. 48, 49, R. 16, 17, 18)	2B
Otter Creek, Big	(S. 7, 8, T. 48, R. 16; S. 19, 20, 26, 27, 28, 29, 30, 32, 33, 34, 35, T. 49, R. 17; S. 23, 25, 26, 27, T. 49, R. 18; S. 3, 10, 11, 12, T. 48, R. 17)	1B, 2A, 3B
Little Otter Creek	(S. 5, 6, 7, 15, 16, 17, 18, T. 48, R. 17; S. 11, 12, 13, 14, T. 48, R. 18)	1B, 2A, 3B
Paleface River	(T. 54, 55, R. 16, 17)	2B
Pancake Creek	(S. 28, 29, 32, 33, T. 54, R. 22)	1B, 2A, 3B
Partridge River	(T. 58, R. 13, 14, 15)	2B
Pine River	(S. 4, 8, 9, 17, 20, T. 50, R. 16; S. 23, 24, 26, T. 50, R. 17)	1B, 2A, 3B
Railroad Creek	(S. 1, 11, 12, 14, T. 50, R. 17)	1B, 2A, 3B
Rocky Run	(S. 12, 13, 24, 25, T. 50, R. 16; S. 30, 31, T. 50, R. 15)	1B, 2A, 3B
Ryan Creek	(S. 14, 15, 22, T. 55, R. 14)	1B, 2A, 3B
Sand Creek	(T. 54, R. 19, 20)	2B
Sargent Creek	(S. 4, 5, 9, 10, T. 48, R. 15; S. 28, 29, 32, T. 49, R. 15)	1B, 2A, 3B
Silver Creek, Big	(S. 11, 12, 14, 23, 24, 25, T. 46, R. 17)	1B, 2A, 3B
Silver Creek, Little	(S. 15, 16, 21, T. 48, R. 16)	1B, 2A, 3B
Simian Creek	(T. 50, R. 17, 18)	2B
Skunk Creek	(S. 36, T. 47, R. 17)	2B
Spider Creek	(S. 19, 20, 21, 27, 28, 29, 30, T. 52, R. 18; S. 9, 10, 14, 15, 24, T. 52, R. 19)	1B, 2A, 3B
Spring Creek	(S. 1, 2, T. 54, R. 12)	1B, 2A, 3B
Squaw Creek	(S. 9, 16, 17, 18, 19, 20, 21, T. 49, R. 17)	1B, 2A, 3B
Stephens (Stevens) (Second) Creek	(S. 2, T. 58, R. 15; S. 13, 23, 24, 26, 35, T. 59, R. 15)	2A, 3B
Stewart Creek	(S. 21, 26, 27, T. 49, R. 15)	1B, 2A, 3B
Stewart River Tributary	(T. 55, R. 11, 12)	1B, 2A, 3B
Stone River	(T. 55, R. 19, 20)	2B
Stony Brook	(S. 10, 11, T. 46, R. 17)	2B
Sullivans Creek	(S. 1, 2, 10, 11, 15, T. 56, R. 11; S. 19, T. 57, R. 10; S. 24, 25, 36, T. 57, R. 11)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Swan Creek, Little	(S. 17, 19, 20, 30, T. 56, R. 19; S. 25, 26, 35, T. 56, R. 20)	1B, 2A, 3B
East Swan River	(T. 55, 56, 57, 58, R. 19, 20)	2B
Swan River (East Swan River)	(S. 18, 19, 30, 31, T. 55, R. 19; S. 1, 2, 12, 13, 14, T. 55, R. 20; S. 11, 14, 23, 26, 27, T. 56, R. 20)	1B, 2A, 3B
West Swan River	(T. 55, R. 20, 21)	2C
Tower Creek	(S. 8, 9, 17, 18, 19, T. 55, R. 14; S. 13, 24, 25, 26, T. 55, R. 15)	1B, 2A, 3B
Trappers Creek	(T. 56, R. 11)	2C
East Two Rivers	(T. 57, 58, R. 18)	2B
West Two Rivers	(T. 57, 56, R. 18, 19)	2B
Ugstad Creek	(S. 21, 22, 27, 28, T. 51, R. 15)	1B, 2A, 3B
Ushkabwakka River	(T. 53, R. 15, 16)	2B
Water Hen Creek	(T. 56, R. 15, 16)	2B
South Branch Water Hen Creek	(T. 56, 57, R. 14, 15)	2B
Whiteface River	(T. 52, 53, 54, R. 17, 18, 19)	2B
Little Whiteface River	(T. 53, R. 18, 19)	2B
Wolf Creek	(T. 56, R. 12, 13)	2B
Wyman Creek	(S. 3, 4, T. 58, R. 14; S. 13, 14, 23, 24, 26, 27, 34, T. 59, R. 14)	1B, 2A, 3B
Lakes		
Cedar Lake	(S. 20, T. 58, R. 15)	1B, 2A, 3B
Clear Lake	(S. 23, T. 52, R. 15)	1B, 2A, 3B
Colby Lake	(T. 58, R. 14)	1B, 2B, 3B
Corona Lake	(S. 11, 12, T. 48, R. 19)	1B, 2A, 3B
Cub Lake	(S. 2, T. 61, R. 14)	1B, 2A, 3B
Little Elbow Lake	(S. 9, T. 57, R. 18)	1B, 2A, 3B
Loaine (Sand) Lake	(S. 16, 17, T. 54, R. 12)	1B, 2A, 3B
Mirror (Myers) Lake	(S. 19, 30, T. 52, R. 14)	1B, 2A, 3B
Norberg Lake	(S. 1, T. 61, R. 14)	1B, 2A, 3B
Olson Lake	(S. 23, T. 52, R. 15)	1B, 2A, 3B
St. Mary's Lake	(S. 9, 16, 17, T. 57, R. 17)	1C, 2B, 3B
Silver Lake	(S. 1, T. 57, R. 16; S. 36, T. 58, R. 16)	1B, 2A, 3B
Sullivan Lake	(S. 1, T. 56, R. 11; S. 36, T. 57, R. 11)	2B
Lake Superior Watershed (No. 2)		
Ada Creek	(T. 63, R. 4W)	1B, 2C

Waters	Reach or Area Involved or Location	Classification
Amenda Creek	(T. 59, R. 5W)	2C
Amity Creek	(S. 5, 6, T. 50, R. 13W; S. 31, 32, T. 51, R. 13W; S. 1, T. 50, R. 14W; S. 14, 24, 25, 27, 28, 35, 36, T. 51, R. 14W)	1B, 2A, 3B
Assinika Creek	(T. 63, R. 2E)	1B, 2A, 3B
Ball Club Creek	(T. 63, R. 2W)	2B
Bally Creek	(S. 7, 8, 9, 10, T. 61, R. 1W; S. 12, T. 61, R. 2W)	1B, 2A, 3B
Baptism River (West Baptism River) (except trout waters)	(T. 56, 57, 58, 59, R. 7, 8)	2C
Baptism River (West Baptism River)	(S. 3, 4, 10, 15, T. 56, R. 7W; S. 1, 7, 9, 10, 11, 12, 16, 17, 18, 20, 27, 28, 29, 33, 34, T. 57, R. 7W; S. 1, 2, 12, 13, T. 57, R. 8W; S. 31, T. 58, R. 6W; S. 21, 22, 23, 25, 26, 29, 30, 36, T. 58, R. 7W; S. 21, 28, 33, 34, 35, T. 58, R. 8W)	1B, 2A, 3B
Barker Creek	(T. 60, R. 3W, 4W)	1B, 2A, 3B
Beaver Dam Creek	(T. 63, R. 3E)	1B, 2A, 3B
Beaver River	(S. 11, 12, T. 55, R. 8W)	1B, 2A, 3B
Beaver River (North Branch) (East Branch Beaver River)	(S. 2, T. 55, R. 8W; S. 5, 6, 8, 9, 16, 21, 22, 26, 27, 35, T. 56, R. 8W; S. 7, 18, 19, 31, T. 57, R. 8W; S. 11, 12, 13, 25, 36, T. 57, R. 9W)	1B, 2A, 3B
Beaver River (West Branch)	(S. 2, 6, 7, 8, 9, 19, 17, 18, T. 55, R. 8W; S. 1, 13, 14, T. 55, R. 9W; S. 9, 16, 22, 25, 26, 27, 36, T. 56, R. 9W)	1B, 2A, 3B
Beaver River	(T. 57, R. 8W, 9W)	2B
Blesner Creek	(S. 29, 31, 19, 20, T. 58, R. 6W)	1B, 2A, 3B
Brule River (except trout waters)	(T. 62, 63, 64, R. 1W, 1E, 2E, 3E)	1B, 2B
Brule River (Arrowhead)	(S. 4, 5, 6, 9, 10, 15, 22, 27, T. 62, R. 3E; S. 21, 22, 23, 25, 26, 36, T. 63, R. 2E; S. 30, 31, T. 63, R. 3E)	1B, 2A, 3B
South Branch Brule River	(T. 63, R. 1W, 1E)	2B
Bud Creek	(S. 17, 20, 21, T. 55, R. 9W)	1B, 2A, 3B
Burnt Creek	(T. 62, R. 4W)	1B, 2A, 3B
Captain Jacobson Creek	(S. 1, T. 52, R. 12W)	1B, 2A, 3B
Caribou River (except trout waters)	(T. 58, 59, R. 6)	2C

Waters	Reach or Area Involved or Location	Classification
Caribou River	(S. 1, 2, 11, 14, 23, 24, 25, 26, 36, T. 58, R. 6W; S. 23, 26, 35, 26, T. 59, R. 6W)	1B, 2A, 3B
Carlson Creek	(T. 62, 63, R. 4E)	1B, 2A, 3B
Cascade River	(S. 1, T. 60, R. 2W; S. 1, 12, 13, 24, 25, 26, 35, T. 61, R. 2W; S. 3, 10, 11, 14, 15, 23, 24, 25, 36, T. 62, R. 2W)	1B, 2A, 3B
Cedar Creek	(S. 13, 14, 23, 26, T. 56, R. 8W)	1B, 2A, 3B
Chester Creek	(S. 4, 9, 15, 16, 23, T. 50, R. 14W)	1B, 2A, 3B
Cliff (East) Creek	(S. 32, T. 62, R. 2E; S. 4, 5, 9, 10, T. 61, R. 2E)	1B, 2A, 3B
Colville Creek, East	(S. 32, T. 62, R. 3E; S. 25, T. 62, R. 2E)	1B, 2A, 3B
Crocildle River	(T. 64, R. 1E)	2B
Cross River (except trout waters)	(T. 59, 60, R. 5W, 6W)	2B
Cross River	(S. 24, 25, T. 60, R. 6W; S. 4, 5, 9, 15, 16, 22, 23, 25, 26, 35, 36, T. 59, R. 5W; S. 30, 32, T. 60, R. 5W)	1B, 2A, 3B
Crow Creek	(S. 1, T. 53, R. 10W)	1B, 2A, 3B
Crown Creek	(S. 2, 3, 4, T. 57, R. 8W; S. 5, 6, 7, 19, 20, 29, 32, T. 58, R. 8W; S. 12, 13, 24, T. 58, R. 9W)	1B, 2A, 3B
Cutface Creek	(S. 34, T. 61, R. 1W)	1B, 2A, 3B
Little Devils Track River	(S. 6, 7, 8, 9, 10, T. 61, R. 1E)	1B, 2A, 3B
Devils Track River	(S. 3, 10, 11, 12, 13, T. 61, R. 1E; S. 30, 31, 32, 33, 34, T. 62, R. 1E)	1B, 2A, 3B
Dislocation Creek (Fiddle Creek)	(S. 10, 15, T. 63, R. 1W)	1B, 2A, 3B
Dragon Creek	(S. 16, 21, T. 57, R. 6W)	1B, 2A, 3B
Durfee Creek	(S. 5, 6, 8, T. 61, R. 2E; S. 25, 36, T. 62, R. 1E; S. 31, T. 62, R. 2E)	1B, 2A, 3B
Egge Creek	(S. 2, 3, 4, 11, T. 57, R. 7W)	1B, 2A, 3B
Elbow Creek	(T. 62, 63, R. 1E)	1B, 2A, 3B
Elbow Creek, Little	(S. 2, 3, 4, 10, 11, T. 62, R. 1E)	1B, 2A, 3B
Encampment River	(S. 3, 10, 11, T. 53, R. 10W; S. 16, 20, 21, 27, 28, 34, T. 54, R. 10W)	1B, 2A, 3B
Farquhar (East Carlson Creek)	(S. 2, 11, T. 62, R. 4E; S. 27, 34, 35, T. 63, R. 4E)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Fiddle Creek	(T. 63, 64, R. 1W)	1B, 2A, 3B
Flute Reed River	(S. 1, 2, 3, 10, 13, 14, T. 62, R. 3E; S. 17, 18, 19, 20, T. 62, R. 4E; S. 36, T. 63, R. 3E)	1B, 2A, 3B
Four Mile Creek (Stumble Creek)	(S. 17, 18, 19, T. 60, R. 5W; S. 24, T. 60, R. 6W)	1B, 2A, 3B
Fox Farm Creek	(S. 19, 30, T. 62, R. 1E; S. 24, T. 62, R. 1W)	1B, 2A, 3B
Fredenberg Creek	(S. 7, 17, 18, T. 51, R. 12W; 34, T. 59, R. 5W)	1B, 2A, 3B
French River	(S. 7, 17, 18, T. 41, R. 12W; S. 1, 2, 12, T. 51, R. 13W; S. 8, 9, 16, 21, 27, 28, 34, 35, T. 52, R. 13W)	1B, 2A, 3B
Gauthier Creek	(S. 27, T. 62, R. 3E)	1B, 2A, 3B
Gooseberry River	(S. 4, 9, 16, 18, 19, 20, 21, 22, 27, T. 54, R. 9W; S. 4, 5, 9, 10, 11, 12, 13, T. 54, R. 10W; S. 19, 29, 30, 32, 33, T. 55, R. 9W; S. 4, 9, 16, 17, 20, 29, 30, 31, 32, T. 55, R. 10W; S. 27, 28, 33, 34, T. 56, R. 10W)	1B, 2A, 3B
Little Gooseberry River	(S. 6, T. 54, R. 10W; S. 1, T. 54, R. 11W; S. 34, 35, 36, T. 55, R. 11W)	1B, 2A, 3B
Grand Portage Creek	(S. 1, 2, T. 63, R. 5E; S. 4, 6, T. 63, R. 6E; S. 31, 32, T. 64, R. 6E)	1B, 2A, 3B
Greenwood River	(S. 2, 3, 11, 12, 13, 24, T. 63, R. 2E; S. 34, T. 64, R. 2E)	1B, 2A, 3B
Hand Creek	(T. 63, R. 2W)	2B
Hanson's Creek	(S. 3, 10, T. 62, R. 3E)	1B, 2A, 3B
Hartley Creek	(S. 10, 11, 14, 23, 26, T. 50, R. 14W)	1B, 2A, 3B
Heffelfinger (Hockamin Creek)	(S. 17, 18, 19, T. 57, R. 7W; S. 21, 22, 24, 25, 26, 27, 29, 32, T. 57, R. 8W)	1B, 2A, 3B
Hollow Rock Creek	(S. 9, 10, 14, 15, 23, 24, 25, T. 63, R. 5E)	1B, 2A, 3B
Horn Creek	(T. 62, R. 4W)	1B, 2B
Houghtaling Creek	(S. 2, 3, 4, T. 59, R. 6W; S. 32, 33, 36, T. 60, R. 6W)	1B, 2A, 3B
Indian Camp Creek	(S. 3, 10, 11, T. 60, R. 2W)	1B, 2A, 3B
Irish Creek	(S. 9, 10, 13, 14, 15, 16, T. 63, R. 3E; S. 17, 18, T. 63, R. 4E)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Java Creek	(T. 63, R. 4W)	1B, 2B
Jonvick Creek	(S. 19, T. 60, R. 2W; S. 12, 13 24, T. 60, R. 3W)	1B, 2A, 3B
Kandunce Creek	(S. 2, T. 61, R. 3E; S. 9, 10, 13, 14, 15, 16, 23, 24, 26, 35, T. 62, R. 2E)	1B, 2A, 3B
Kelso River	(T. 63, R. 4W, 5W)	1B, 2B
Kimball Creek	(S. 3, 4, 10, T. 61, R. 2E; S. 16, 17, 18, 20, 21, 28, 29, 33, T. 62, R. 2E)	1B, 2A, 3B
Knife River (except trout waters)	(T. 52, 53, 54, R. 11W, 12W)	2B
Knife River	(S. 4, 5, 6, 8, 17, 18, 19, 31, T. 52, R. 11W; S. 5, 8, 17, 18, 20, 29, 32, 33, T. 53, R. 11W; S. 28, 32, 33, T. 54, R. 11W; S. 1, 24, 25, 36, T. 52, R. 12W; S. 2, 3, 10, 15, 16, 22, 23, 27, 28, 34, 35, 36, T. 53, R. 12W; S. 35, T. 54, R. 12W)	1B, 2A, 3B
Last Creek	(S. 16, T. 58, R. 5W)	1B, 2A, 3B
Leppanen (Leskinen) Creek	(S. 15, 21, 22, 28, T. 57, R. 7W)	1B, 2A, 3B
Lester River	(S. 4, T. 50, R. 13W; S. 7, 8, 16, 17, 21, 27, 28, 33, T. 51, R. 13W; S. 1, 2, 12, T. 51, R. 14W; S. 21, 27, 28, 34, 35, T. 52, R. 14W)	1B, 2A, 3B
Leveaux Creek	(T. 59, R. 4W)	1B, 2A, 3B
Lindstrom Creek	(S. 30, 31, 32, 33, T. 57, R. 7W)	1B, 2A, 3B
Little Brule River	(T. 62, R. 3E)	2C
Lutsen Creek	(S. 14, 22, 23, 24, 25, 26, T. 60, R. 3W)	1B, 2A, 3B
McCarthy Creek	(S. 18, T. 53, R. 11W)	1B, 2A, 3B
Manitou River	(S. 3, 10, T. 57, R. 6W; S. 6, 7, 8, 17, 20, 21, 28, 33, 34, T. 58, R. 6W; S. 1, 7, 8, 9, 11, 12, 16, 17, T. 58, R. 7W; S. 18, 19, 21, 26, 27, 28, 35, 36, 22, T. 59, R. 7W)	1B, 2A, 3B
Little Manitou River	(S. 2, T. 57, R. 6W)	1B, 2A, 3B
Little Marais Creek	(S. 5, 8, 16, 17, 21, T. 57, R. 6W)	1B, 2A, 3B
Mark Creek	(S. 1, 2, 3, 9, 10, T. 61, R. 2W)	1B, 2A, 3B
Martin Creek	(S. 2, 3, 11, T. 58, R. 6W)	1B, 2A, 3B
Mile Post 43 Creek	(S. 2, 3, 10, 11, 14, 15, T. 56, R. 8W)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Millers Creek	(S. 12, 13, T. 50, R. 15W; S. 18, 19, 29, 30, 32, T. 50, R. 14W)	1B, 2A, 3B
Mississippi Creek	(S. 1, T. 61, R. 2W; S. 32, 33, 34, 35, T. 62, R. 2W)	1B, 2A, 3B
Mons Creek	(T. 62, 63, R. 3E)	1B, 2A, 3B
Moose Creek	(S. 31, 32, 33, 34, T. 59, R. 6W)	1B, 2A, 3B
Mud Creek	(S. 16, 21, 22, T. 62, R. 1E)	1B, 2A, 3B
Murmur Creek	(T. 61, R. 2W)	1B, 2A, 3B
Myhre's Creek	(S. 23, 26, T. 62, R. 3E)	1B, 2A, 3B
Nester Creek	(S. 4, 5, 6, T. 61, R. 1W; S. 1, T. 61, R. 2W)	1B, 2A, 3B
Nicadood Creek	(S. 1, 12, T. 56, R. 8W; S. 6, T. 56, R. 7W; S. 36, T. 57, R. 8W)	1B, 2A, 3B
Nine Mile Creek	(S. 3, 4, 7, 9, 16, T. 58, R. 6W; S. 27, 33, 34, T. 59, R. 6W)	1B, 2A, 3B
Oliver Creek	(S. 1, T. 57, R. 8W; S. 23, 26, 35, 36, T. 58, R. 8W)	1B, 2A, 3B
Onion Creek	(S. 1, 2, 3, 4, 12, T. 59, R. 4W; S. 24, 25, 26, 35, T. 60, R. 4W)	1B, 2A, 3B
Palasade Creek	(S. 8, 16, 17, 18, 19, 20, 21, 22, T. 56, R. 7W)	1B, 2A, 3B
Pancake Creek	(T. 60, R. 4W, 5W)	1B, 2A, 3B
Pecore Creek	(T. 61, R. 4W)	1B, 2A, 3B
Pike Lake Creek	(S. 15, T. 61, R. 2W)	1B, 2A, 3B
Pine Mountain Creek	(S. 26, 27, T. 63, R. 1E)	1B, 2A, 3B
Pine River	(T. 64, R. 3E)	2B
Plouffs Creek	(S. 17, 18, T. 61, R. 4W; S. 2, 11, 13, 14, 15, T. 61, R. 5W; S. 26, 35, T. 62, R. 5W)	1B, 2A, 3B
Poplar River (except trout waters)	(T. 60, 61, R. 3W, 4W)	2B
Poplar River	(S. 3, 4, 5, 6, 9, 10, 15, 16, 20, 21, 28, 33, T. 60, R. 3W; S. 31, T. 61, R. 3W; S. 10, 14, 15, 22, 23, 25, 26, 36, T. 61, R. 4W)	1B, 2A, 3B
Portage Brook	(S. 24, 25, 26, 27, 28, 33, T. 64, R. 3E; S. 19, 20, T. 64, R. 4E)	1B, 2A, 3B
Red Rock Creek	(S. 26, T. 63, R. 5E)	1B, 2A, 3B
Reservation River	(S. 6, T. 62, R. 5E; S. 18, 19, 30, 31, T. 63, R. 5E)	1B, 2A, 3B
Rock Creek (Stoney Creek)	(S. 15, 22, 23, 24, 25, T. 55, R. 10W)	1B, 2A, 3B
Rock Cut Creek	(S. 18, 19, 20, 21, T. 58, R. 6W; S. 13, 24, T. 58, R. 7W)	1B, 2A, 3B
Rollins Creek	(S. 5, 6, T. 59, R. 3W; S. 36, T. 60, R. 4W)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Rosebush (Fall) Creek	(S. 12, 13, 24, 25, T. 61, R. 1W)	1B, 2A, 3B
Sawbill Creek	(S. 7, 18, 19, 20, 29, T. 62, R. 4W)	1B, 2A, 3B
Sawmill Creek	(S. 1, 12, 13, 23, 24, 26, 27, 34, T. 57, R. 7W)	1B, 2A, 3B
Schmidt Creek	(S. 17, T. 51, R. 12W)	1B, 2A, 3B
Schoolhouse Creek	(S. 35, 36, T. 58, R. 7W)	1B, 2A, 3B
Section 6 Creek	(S. 6, T. 54, R. 8W)	1B, 2A, 3B
Section 15 Creek	(S. 15, T. 58, R. 5W)	1B, 2A, 3B
Section 16 Creek	(S. 16, T. 58, R. 5W)	1B, 2A, 3B
Section 29 Creek	(S. 29, T. 58, R. 5W)	1B, 2A, 3B
Silver (South) Creek	(S. 6, 7, 16, 17, 18, 21, T. 53, R. 10W; S. 25, 36, T. 54, R. 11W)	1B, 2A, 3B
Silver (North) Creek	(S. 1, 12, T. 57, R. 8W; S. 6, T. 57, R. 7W; S. 31, 32, T. 58, R. 7W)	1B, 2A, 3B
Six Mile Creek	(S. 13, 14, 15, 22, 27, 28, 33, T. 60, R. 4W)	1B, 2A, 3B
Skunk Creek	(S. 13, 14, 24, T. 55, R. 10W)	1B, 2A, 3B
Split Rock River	(S. 26, 35, 36, T. 55, R. 9W; S. 1, 12, T. 54, R. 9W)	1B, 2A, 3B
East Branch Split Rock River	(S. 4, 5, 9, 10, 15, 23, 26, T. 55, R. 9W; S. 31, T. 56, R. 9W; S. 12, 13, 14, 24, 25, T. 56, R. 10W)	1B, 2A, 3B
West Branch Split Rock River	(S. 6, 7, 8, 16, 17, 21, 22, 26, 27, T. 55, R. 9W; S. 1, T. 55, R. 10W; S. 15, 16, 22, 26, 27, 35, 36, T. 56, R. 10W)	1B, 2A, 3B
Split Rock Branch Tributary	(S. 1, T. 54, R. 8W)	1B, 2A, 3B
Spring Creek (Honeymoon)	(S. 31, 32, 33, T. 61, R. 4W)	1B, 2A, 3B
Spruce (Deer Yard) Creek	(S. 4, 5, 6, 7, 8, 9, 10, 15, 16, 17, T. 60, R. 2W; S. 32, T. 61, R. 2W)	1B, 2A, 3B
Little Stoney Creek	(S. 4, 9, 16, 21, T. 63, R. 2E)	1B, 2A, 3B
Stoney Creek	(S. 10, T. 63, R. 4E)	1B, 2A, 3B
Stewart River	(S. 18, 19, 20, 29, T. 53, R. 10W; S. 2, 3, 10, 11, 13, 14, 15, T. 53, R. 11W; S. 9, 10, 15, 22, 26, 27, 34, T. 54, R. 11W)	1B, 2A, 3B
Little Stewart River	(S. 19, T. 53, R. 10W)	1B, 2A, 3B
Stone Creek	(S. 2, T. 61, R. 2E)	1B, 2A, 3B
Stream No. 30	(S. 5, 6, T. 54, R. 8W)	1B, 2A, 3B
Stump River	(T. 64, R. 3E)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Sucker River	(S. 3, 4, 10, T. 51, R. 12W; S. 18, 19, 29, 30, 31, 32, 33, T. 52, R. 12W; S. 1, 12, 13, 24, 25, T. 52, R. 13W; S. 19, 20, 30, 31, T. 53, R. 12W; S. 24, 36, T. 53, R. 13W)	1B, 2A, 3B
Sugar Loaf Creek	(S. 18, 20, 29, T. 58, R. 5W)	1B, 2A, 3B
Sundling Creek (Cherry Creek)	(S. 17, 18, T. 61, R. 1W; S. 13, 15, 16, T. 61, R. 2W)	1B, 2A, 3B
Swamp River (Junco Creek)	(S. 1, 2, 11, 12, 13, 14, 15, 16, 21, T. 62, R. 1W)	1B, 2A, 3B
Swamp River (except trout waters)	(T. 63, 64, R. 3E, 4E)	2B
Swamp River	(S. 25, 26, T. 63, R. 3E; S. 29, 30, T. 63, R. 4E)	1B, 2A, 3B
Swamper Creek	(T. 64, R. 1E)	2B
Swanson Creek	(T. 61, R. 4W)	1B, 2A, 3B
Tait River	(T. 61, 62, R. 3W)	1B, 2A, 3B
Talmadge Creek	(S. 9, 10, 13, 14, 15, 24, T. 51, R. 13W)	1B, 2A, 3B
Blind Temperance Creek	(T. 60, R. 4W)	1B, 2A, 3B
Little Temperance Creek	(T. 59, 60, R. 4W, 5W)	1B, 2A, 3B
Temperance River (excluding trout waters)	(T. 59, 60, 61, 62, R. 4W)	1B, 2B
Temperance River	(S. 5, 8, 18, 19, 30, 31, T. 59, R. 4W; S. 6, 7, 8, 17, 20, 28, 29, 32, 33, T. 60, R. 4W; S. 4, 8, 9, 17, 19, 20, 30, 31, T. 61, R. 4W)	1B, 2A, 3B
Big Thirty Nine Creek	(S. 4, 5, 6, T. 55, R. 8W; S. 29, 30, 32, 33, T. 56, R. 8W; S. 1, 2, 12, 13, 24, 25, T. 56, R. 9W)	1B, 2A, 3B
Thompson Creek	(S. 19, T. 62, R. 1W; S. 24, T. 62, R. 2W)	1B, 2A, 3B
Tikkanen Creek	(S. 8, 16, 17, T. 57, R. 7W)	1B, 2A, 3B
Timber Creek	(T. 62, 63, R. 1E, 2E)	1B, 2A, 3B
Tischers Creek	(S. 2, 3, 4, 11, 13, 14, T. 50, R. 14W)	1B, 2A, 3B
Torguson Creek	(S. 30, T. 61, R. 4W; S. 24, 25, T. 61, R. 5W)	1B, 2A, 3B
Tower Creek	(S. 4, 9, T. 57, R. 7W)	1B, 2A, 3B
Twin Rivers (Mistletoe Creek)	(S. 3, T. 60, R. 3W; S. 2, 10, 11, 14, 15, 23, 24, 25, 26, 34, 35, T. 61, R. 3W)	1B, 2A, 3B
Twin Points Creek	(S. 13, T. 54, R. 9W)	1B, 2A, 3B
Two Island River	(S. 12, T. 59, R. 6W; S. 2, 3, 4, 11, T. 58, R. 5W; S. 7, 17, 18,	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Two Island River (Cont.)	20, 21, 28, 32, 33, T. 59, R. 5W)	
Vern River	(T. 63, R. 3W)	1B, 2B
Wanless Creek	(S. 25, 33, 34, 35, 36, T. 60, R. 6W)	1B, 2A, 3B
Willow Creek	(T. 62, R. 3W)	2B
Woodpile Creek	(T. 64, R. 1E)	2B
Woods Creek	(S. 13, T. 61, R. 1E)	1B, 2A, 3B
All other streams in Boundary Waters Canoe Area		1B, 2B
Lakes		
Alder Lake	(S. 1, 2, 3, 4, 9, 10, 11, 12, T. 64, R. 1E)	1B, 2A, 3B
Alton Lake	(S. 6, T. 32, R. 4W; S. 1, 11, 12, 13, 14, T. 62, R. 5W; S. 31, T. 63, R. 4W; S. 36, T. 63, R. 5W)	1B, 2A, 3B
Bath Lake	(S. 31, 32, T. 63, R. 1W; S. 5, 6, T. 62, R. 1W)	1B, 2A, 3B
Bearskin East Lake	(S. 4, 5, 7, 8, 9, T. 64, R. 1E; S. 11, 12, 13, 14, T. 64, R. 1W)	1B, 2A, 3B
Bearskin West Lake	(S. 4, T. 64, R. 1W; S. 33, 34, 35, 36, T. 65, R. 1W)	1B, 2A, 3B
Benson Lake	(S. 29, T. 58, R. 6W)	1B, 2A, 3B
Birch Lake	(S. 31, T. 65, R. 1W; S. 34, 35, 36, T. 65, R. 2W)	1B, 2A, 3B
Bogus Lake	(S. 12, T. 62, R. 2E)	1B, 2A, 3B
Bone Lake	(S. 13, 14, T. 61, R. 6W)	1B, 2A, 3B
Boys (Rat, Third Kimball Lake) Lake	(S. 5, 8, T. 62, R. 2E)	1B, 2A, 3B
Briar Lake (Twin Lake)	(S. 14, 15, 23, T. 53, R. 13W)	1B, 2A, 3B
Brule Lake	(S. various, T. 63, R. 2W, 3W)	1B, 2A, 3B
Cam Lake	(S. 5-8, T. 63, R. 3W)	1B, 2A, 3B
Caribou Lake	(S. 32-36, T. 65, R. 1E)	1B, 2A, 3B
Carrot Lake	(S. 17, T. 64, R. 2E)	1B, 2A, 3B
Chester Lake	(S. 32, 33, T. 64, R. 3E)	1B, 2A, 3B
Clearwater (Embry) Lake	(S. 23, 25, 26, 27, 28, 29, 30, 31, 32, T. 65, R. 1E)	1B, 2A, 3B
Cone, North Lake	(S. 3, T. 63, R. 3W; S. 34, 35, T. 64, R. 3W)	1B, 2A, 3B
Crystal Lake	(S. 1, T. 64, R. 1E)	1B, 2A, 3B
Daniels Lake	(S. 19, 30, T. 65, R. 1E; S. 25, 26, 27, 34, 35, 36, T. 65, R. 1W)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Davis Lake	(S. 27, 28, 32, 33, 34, T. 64, R. 3W)	1B, 2A, 3B
Devilfish Lake	(S. 19, 29, 30, T. 64, R. 3E)	1B, 2A, 3B
Dislocation Lake	(S. 3, T. 63, R. 1W)	1B, 2A, 3B
Divide (Towhey) Lake	(S. 7, 8, T. 59, R. 7W)	1B, 2A, 3B
Duck (Goldeneye) Lake	(S. 15, T. 59, R. 6W)	1B, 2A, 3B
Duke Lake	(S. 30, T. 63, R. 1E)	1B, 2A, 3B
Duncan Lake	(S. 27, 28, 29, 32, 33, 34, T. 65, R. 1W)	1B, 2A, 3B
Dunn Lake	(S. 30, T. 65, R. 1W; S. 25, T. 65, R. 2W)	1B, 2A, 3B
Dyers Lake	(S. 4, 5, 8, 9, T. 58, R. 5W)	1B, 2A, 3B
Echo Lake	(S. 14, 15, 22, 23, T. 59, R. 6W)	1B, 2A, 3B
Eggers Lake	(S. 24, T. 63, R. 1W; S. 19, T. 63, R. 1E)	1B, 2A, 3B
Esther Lake	(S. 6, T. 63, R. 3E; S. 31, T. 64, R. 3E)	1B, 2A, 3B
Flour Lake	(S. 5, 6, T. 64, R. 1E; S. 1, 2, 11, 12, T. 64, R. 1W)	1B, 2A, 3B
Gadwell Lake	(S. 3, T. 64, R. 2E)	1B, 2A, 3B
Gaskin Lake	(S. 21-27, T. 64, R. 2W)	1B, 2A, 3B
Gogebic Lake	(S. 30, 31, T. 65, R. 2E)	1B, 2A, 3B
Greenwood Lake	(S. 21-28, 34, T. 64, R. 2E)	1B, 2A, 3B
Hare Lake	(S. 11, T. 59, R. 6W)	1B, 2A, 3B
Hungry Jack Lake	(S. 2, 3, 4, T. 64, R. 1W; S. 35, T. 65, R. 1W)	1B, 2A, 3B
Jap Lake	(S. 19, 24, T. 65, R. 5W)	1B, 2A, 3B
Jap (Jerry) (Jim) Lake	(S. 26, 27, T. 64, R. 1E)	1B, 2A, 3B
Junco (Swamp) Lake	(S. 11, 12, 13, T. 62, R. 1W)	1B, 2A, 3B
Kemo Lake	(S. 27, 34, 35, T. 63, R. 1W)	1B, 2A, 3B
Kimball Lake	(S. 7, 8, 17, T. 62, R. 2E)	1B, 2A, 3B
Leo Lake	(S. 4, 5, T. 64, R. 1W)	1B, 2A, 3B
Lappanen Lake (Leskinen)	(S. 21, 22, T. 57, R. 7W)	2B
Lily Lake	(S. 12, T. 63, R. 3W)	1B, 2A, 3B
Lost Lake	(S. 29, 32, T. 63, R. 3E)	1B, 2A, 3B
Lost (Pancore) Lake	(S. 22, 27, T. 61, R. 4W)	1B, 2A, 3B
Margaret Lake	(S. 28, T. 64, R. 3E)	1B, 2A, 3B
McFarland Lake	(S. 3, 4, 5, 6, 9, 10, T. 64, R. 3E)	1B, 2A, 3B
Mink Lake	(S. 8, T. 62, R. 2E)	1B, 2A, 3B
Misurah Lake	(S. 32, T. 64, R. 1W)	1B, 2A, 3B
Monkers Lake	(S. 6, T. 61, R. 1E)	1B, 2A, 3B
Moosehorn (Moosehead) Lake	(S. 36, T. 63, R. 3E; S. 31, T. 63, R. 4E)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Morgan Lake	(S. 27, 28, T. 64, R. 1W)	1B, 2A, 3B
Moss Lake	(S. 31, 32, 33, T. 65, R. 1W)	1B, 2A, 3B
Muckwa Lake	(S. 21, 28, T. 63, R. 1E)	1B, 2A, 3B
Mulligan Lake	(S. 1, 12, T. 63, R. 3W)	1B, 2A, 3B
Musquash Lake	(S. 20, 28, 29, T. 63, R. 1E)	1B, 2A, 3B
Normanna Lake	(S. 7, 8, T. 52, R. 13W)	1B, 2A, 3B
Olson Lake	(S. 9, 16, T. 62, R. 1W)	1B, 2A, 3B
Otto, South, Lake	(S. 29, T. 64, R. 2W)	1B, 2A, 3B
Partridge Lake	(S. 29, 30, 31, T. 65, R. 1W)	1B, 2A, 3B
Pemmican Lake	(S. 22, T. 65, R. 2E)	1B, 2A, 3B
Pierz (Beaver) Lake	(S. 12, T. 64, R. 1E; S. 7, T. 64, R. 2E)	1B, 2A, 3B
Pike, East Lake	(S. 25, 26, 35, 36, T. 65, R. 2E, S. 28-32, T. 65, R. 3E)	1B, 2A, 3B
Pike, West Lake	(S. 26-30, T. 65, R. 2E)	1B, 2A, 3B
Pine Lake	(S. various, T. 64, 65, R. 3E, 2E, 1E)	1B, 2A, 3B
Pine Lake	(S. 35, 36, T. 63, R. 1W)	1B, 2A, 3B
Pine Mountain Lake	(S. 26, 27, 34, 35, T. 63, R. 1E)	1B, 2A, 3B
Pits Lake	(S. 3, T. 62, R. 1W)	1B, 2A, 3B
Poplar Lake	(S. 6, 7, 8, T. 64, R. 1W; S. 1, 2, 11, 12, T. 64, R. 2W)	1B, 2A, 3B
Ram Lake	(S. 9, 10, T. 63, R. 1W)	1B, 2A, 3B
Section 8 Lake	(S. 8, T. 59, R. 7W)	1B, 2A, 3B
Shady, North, Lake	(S. 21, 22, T. 64, R. 2E)	1B, 2A, 3B
Sock Lake	(S. 26, T. 65, R. 2W)	1B, 2A, 3B
Speckled Trout Lake (Reservation Trout Lake)	(S. 7, 8, T. 63, R. 5E)	1B, 2A, 3B
Squaw Lake	(S. 6, T. 63, R. 3E; S. 31, T. 64, R. 3E)	1B, 2A, 3B
State Lake	(S. 1, T. 63, R. 2W; S. 35, 36, T. 64, R. 2W)	1B, 2A, 3B
Steer Lake	(S. 32, T. 60, R. 6W)	1B, 2A, 3B
Strobus Lake	(S. 20, T. 61, R. 3W)	1B, 2A, 3B
Sunfish Lake	(S. 26, 35, T. 64, R. 2E)	1B, 2A, 3B
Swan Lake	(S. 11, 12, T. 63, R. 2W)	1B, 2A, 3B
Talus Lake	(S. 26, 27, T. 63, R. 1W)	1B, 2A, 3B
Taylor Lake	(S. 16, 17, T. 63, R. 5E)	1B, 2A, 3B
Thompson Lake	(S. 19, 20, 29, 30, T. 62, R. 1W)	1B, 2A, 3B
Thrasher Lake	(S. 31, T. 63, R. 1W)	1B, 2A, 3B
Thrush Lake	(S. 31, T. 63, R. 1W)	1B, 2A, 3B
Topper Lake	(S. 27, T. 65, R. 2W)	1B, 2A, 3B
Trout Lake	(S. 10, 11, T. 62, R. 2E)	1B, 2A, 3B
Trout, Little, Lake	(S. 6, T. 63, R. 1W)	1B, 2A, 3B
Twin Lakes	(S. 33, T. 50, R. 14W)	1B, 2A, 3B
Twin, Upper (Bear) Lake	(S. 25, T. 56, R. 8W)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Vale Lake	(S. 3, T. 64, R. 2E)	1B, 2A, 3B
Vernon Lake	(S. 10, 15, 16, T. 63, R. 2W)	1B, 2A, 3B
Vista (South) Lake	(S. 19, T. 65, R. 1W; S. 21, 22, 23, 24, 27, 28, T. 65, R. 2W)	1B, 2A, 3B
Wanihigan (Trap) Lake	(S. 1, T. 63, R. 3W; S. 31, T. 64, R. 2W; S. 36, T. 64, R. 3W)	1B, 2A, 3B
Wench Lake	(S. 7, 18, T. 63, R. 3W)	1B, 2A, 3B
Winchell Lake	(S. 26-33, T. 64, R. 2W; S. 25, 36, T. 64, R. 3W)	1B, 2A, 3B
All other lakes in Boundary Waters Canoe Area		1B, 2B
Lake of the Woods Basin Rainy Lake Watershed (No. 3)		
Arrowhead Creek	(S. 14, 15, 21, 22, 27, 28, 34, T. 61, R. 8; S. 3, 10, 11, 13, 14, 23, T. 60, R. 8)	1B, 2A, 3B
Ash River (excluding trout waters)	(T. 66, 67, 68, R. 19, 20)	2B
Ash River	(S. 4, 5, 9, T. 66, R. 20; S. 5, 8, 17, 19, 20, 29, 30, 32, T. 67, R. 20; S. 13, 14, 20, 21, 22, 23, 24, 28, 29, 32, 33, T. 68, R. 20)	1B, 2A, 3B
August Creek	(T. 61, 62, R. 10)	2B
Barto Creek	(T. 63, R. 5, 6)	2B
Bear Creek	(T. 63, R. 15)	2B
Beauty Creek	(S. 36, T. 68, R. 21; S. 31, T. 68, R. 20; S. 5, 6, T. 67, R. 20)	1B, 2A, 3B
Beaver Creek	(S. 15, 21, 22, 28, T. 67, R. 20)	1B, 2A, 3B
Blackduck Creek	(S. 6, 7, 8, 17, T. 66, R. 19; S. 1, T. 66, R. 20; S. 3, 4, 10, 14, 15, 23, 25, 26, 36, T. 67, R. 20; S. 33, T. 68, R. 20)	1B, 2A, 3B
Camp Creek	(S. 3, 4, 9, 10, 16, T. 60, R. 8; S. 33, T. 61, R. 8)	1B, 2A, 3B
Camp E. Creek	(S. 7, 18, T. 60, R. 9; S. 12, T. 60, R. 10)	1B, 2A, 3B
Cross River (Inlet Gunflint Lake)	(S. 24, 25, 26, T. 65, R. 4W)	1B, 2A, 3B
Daley Brook	(T. 68, R. 20, 21)	2B
Dumbell River	(T. 60, 61, R. 7)	2B
Dunka River	(T. 59, 60, R. 12)	2B
East Creek	(T. 64, R. 16)	2B

Waters	Reach or Area Involved or Location	Classification
Echo River	(T. 66, 67, R. 16)	2B
Elbow River	(T. 64, R. 18, 19)	2B
Fawn Creek	(S. 15, 21, 22, 23, 26, 35, T. 67, R. 20; S. 1, 2, T. 66, R. 20)	1B, 2A, 3B
Grassy Creek	(S. 6, T. 61, R. 13; S. 1, T. 61, R. 14)	1B, 2A, 3B
Greenwood River	(T. 59, R. 10)	2B
Gustafson (Armstrong) Creek	(T. 62, 63; R. 12, 13)	2B
Harris Lake Creek	(S. 19, 30, 31, T. 61, R. 10)	1B, 2A, 3B
Hill Creek	(S. 19, 30, T. 60, R. 8; S. 24, 25, T. 60, R. 9)	1B, 2A, 3B
Hog Creek	(T. 61, 62, R. 5)	2B
Horse River	(T. 65, R. 11)	2B
Hunting Shack River	(T. 65, 66, R. 16)	2B
Little Isabella River (ex- cluding trout waters)	(T. 59, 60, 61, 62, R. 8, 9)	2B
Little Isabella River	(S. 3, 4, 5, 9, 10, 15, 16, T. 59, R. 8; S. 31, 32, T. 60, R. 8; S. 25, 26, 27, 36, T. 60, R. 9)	1B, 2A, 3B
Island River	(T. 61, R. 7, 8)	1B, 2B
Kinmount Creek	(S. 19, T. 67, R. 20; S. 13, 14, 15, 21, 22, 23, 24, T. 67, R. 21)	1B, 2A, 3B
Laurentian Creek	(S. 7, 18, T. 59, R. 17; S. 1, 12, 13, 24, T. 59, R. 18)	1B, 2A, 3B
Legat Creek	(T. 61, R. 5)	2B
Lehtinens Creek	(S. 13, 14, T. 61, R. 17)	1B, 2A, 3B
Little Indian Sioux River	(T. 64, 65, R. 15)	1B, 2B
Little Pony River	(T. 65, R. 15)	2B
Lone Creek	(T. 66, R. 5)	1B, 2C
Longstorff Creek	(S. 6, 7, T. 62, R. 12; S. 30, 31, T. 63, R. 12)	1B, 2A, 3B
Mike Kelly Creek	(S. 14, 15, 23, T. 60, R. 11)	1B, 2A, 3B
Mitawan Creek	(S. 1, 12, T. 60, R. 9; S. 24, 25, 36, T. 61, R. 9; S. 19, T. 61, R. 8)	1B, 2A, 3B
Moose River (Northwest St. Louis County)	(T. 68, R. 18, 19)	1B, 2B
Moose River (Northeast St. Louis County)	(T. 64, 65, 66, R. 14)	1B, 2B
Mule Creek	(T. 65, 66, R. 13)	1B, 2B
Nine Mile Creek	(S. 13, 14, 23, T. 67, R. 20; S. 18, 19, 20, 28, 33, T. 67, R. 19)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Nina Moose River	(T. 66, R. 14)	1B, 2B
Norway Creek	(T. 64, R. 15)	2B
Pelican River	(T. 64, 65, 66, R. 19, 20)	2B
Picket River	(T. 65, R. 16)	2B
Pike River	(T. 59, 60, 61, R. 15, 16)	2B
Pine Creek	(T. 63, R. 15)	1B, 2B
Portage River	(T. 65, 66, R. 14)	1B, 2B
Purvis Creek	(S. 28, 29, 33, T. 62, R. 13)	1B, 2A, 3B
East Branch Rat Root River	(T. 68, 69, R. 21, 22, 23)	2B, 3C
Rat Root River	(T. 67, 68, 69, R. 22, 23, 24)	2B, 3C
Sandy River	(T. 59, R. 17, 18)	2B
Scott Creek	(S. 9, 10, 15, 16, 21, 22, 27, 33, 34, T. 60, R. 7)	1B, 2A, 3B
Sea Gull Creek	(T. 65, R. 4)	2B
Section Thirty Creek	(S. 19, 30, T. 63, R. 11; S. 24, 25, T. 63, R. 12)	1B, 2A, 3B
Sioux River	(T. 65, 66, R. 19)	2B
Snake River	(T. 61, R. 9)	1B, 2B
Spahagnum Creek	(S. 4, T. 60, R. 9; S. 28, 29, 33, T. 61, R. 9)	1B, 2A, 3B
Stony River	(T. 58, 59, 60, R. 9, 10, 11)	2B
Stuart River	(T. 65, 66, R. 13)	1B, 2C
Tomlinson Creek	(S. 18, 19, 31, T. 60, R. 7; S. 24, 25, 36, T. 60, R. 8)	1B, 2A, 3B
East Two Rivers	(S. 1, 2, 3, 4, T. 61, R. 15; S. 31, 32, T. 62, R. 14; S. 33, 34, 35, 36, T. 62, R. 15)	1B, 2A, 3B
West Two Rivers	(S. 6, 7, 8, 9, 15, 16, T. 61, R. 15)	1B, 2A, 3B
West Two Rivers Tributary	(S. 10, 14, 15, T. 61, R. 15)	1B, 2A, 3B
Unnamed Creek	(S. 4, 5, 7, 8, 16, 17, 20, 21, 29, T. 60, R. 8; S. 33, T. 61, R. 8)	1B, 2A, 3B
Vermilion River	(T. 63-67, R. 17, 18)	2B
Victor Creek	(S. 12, 13, T. 60, R. 9)	1B, 2A, 3B
Weiss Creek	(S. 1, 2, 3, 11, T. 59, R. 9; S. 27, 34, T. 60, R. 9)	1B, 2A, 3B
All other streams in the Boundary Waters Canoe Area		1B, 2B
Lakes		
Adams Lake	(S. 29, 30, 31, 32, 33, T. 64, R. 6W)	1B, 2A, 3B
Agamok Lake	(S. 31, T. 65, R. 5; S. 36, T. 65, R. 6)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Ahmakose Lake	(S. 14, T. 64, R. 7)	1B, 2A, 3B
Ahsub Lake	(S. 27, 28, T. 64, R. 8)	1B, 2A, 3B
Alpine Lake	(S. 4, 5, 7, 8, 9, 16, 17, T. 65, R. 5W)	1B, 2A, 3B
Alruss Lake	(S. 12, T. 64, R. 12)	1B, 2A, 3B
Amoeber Lake	(S. 7, 8, 17, 18, T. 65, R. 6; S. 12, T. 65, R. 7)	1B, 2A, 3B
Arkose (Skoota) Lake	(S. 5, T. 64, R. 7; S. 32, 33, T. 65, R. 7)	1B, 2A, 3B
Ashdick (Caribou) Lake	(S. 23, 24, 25, 26, T. 66, R. 6)	1B, 2A, 3B
Bat Lake	(S. 1, 2, T. 64, R. 5; S. 35, 36, T. 65, R. 5)	1B, 2A, 3B
Beartrack Lake	(S. 12, 13, T. 67, R. 15)	1B, 2A, 3B
Beast (Wilson) Lake	(S. 28, 33, 34, T. 70, R. 19)	1B, 2A, 3B
Beaver (Elbow) Lake	(S. 31, T. 64, R. 6; S. 36, T. 64, R. 7; S. 1, 2, T. 63, R. 7)	1B, 2A, 3B
Beetle Lake	(S. 7, T. 60, R. 9)	1B, 2A, 3B
Beta Lake	(S. 18, T. 64, R. 2)	1B, 2A, 3B
Bingshick Lake	(S. 30, T. 65, R. 4; S. 25, T. 65, R. 5)	1B, 2A, 3B
Brant (Everett) Lake	(S. 29, 31, 32, T. 65, R. 4)	1B, 2A, 3B
Burntside Lake	(S. various, T. 63, R. 12, 13)	1B, 2A, 3B
Cash Lake	(S. 29, 30, 31, 32, T. 64, R. 3)	1B, 2A, 3B
Chant Lake	(S. 10, T. 63, R. 15)	1B, 2A, 3B
Cherokee Lake	(S. 1, 2, 3, 10, 11, T. 63, R. 4; S. 35, 36, T. 64, R. 4)	1B, 2A, 3B
Cherry Lake	(S. 3, 4, 9, T. 65, R. 6)	1B, 2A, 3B
Clark Lake	(S. 23, T. 63, R. 14)	1B, 2B
Clearwater Lake	(S. 5, 6, 7, 8, T. 62, R. 9; S. 1, 12, T. 62, R. 10)	1B, 2B
Copper Lake	(S. 9, 10, T. 64, R. 4)	1B, 2A, 3B
Crab Lake	(S. 29, 30, T. 65, R. 2; S. 25, T. 65, R. 3)	1B, 2A, 3B
Crab Lake	(S. 7, 18, T. 63, R. 13; S. 12, 13, T. 63, R. 14)	1B, 2A, 3B
Crooked Lake	(S. 10, 11, 12, T. 64, R. 5)	1B, 2A, 3B
Cruiser (Trout) Lake	(S. 5, 6, T. 69, R. 19; S. 31, 32, T. 70, R. 19)	1B, 2A, 3B
Dry Lake	(S. 4, 9, T. 63, R. 12)	1B, 2A, 3B
Eddy Lake	(S. 20, 21, 28, 29, T. 65, R. 6)	1B, 2A, 3B
Elixir (Spring) Lake	(S. 31, 30, T. 60, R. 6W; S. 36, T. 60, R. 7W)	2B
Eugene Lake	(S. 2, 11, 14, T. 67, R. 15)	1B, 2A, 3B
Explorer (South Three) Lake	(S. 6, 7, T. 64, R. 7; S. 1, 12, T. 64, R. 8)	1B, 2A, 3B
Fat Lake	(S. 14, T. 67, R. 15)	1B, 2A, 3B
Fay Lake	(S. 25, 26, T. 65, R. 5)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Fern Lake	(S. 3, T. 64, R. 5)	1B, 2A, 3B
Fern, West Lake	(S. 4, 5, T. 64, R. 5)	1B, 2A, 3B
Finger Lake	(S. 7, 8, 17, 18, T. 67, R. 14)	1B, 2A, 3B
Finn Lake	(S. 13, 14, 15, T. 64, R. 3; S. 18, T. 64, R. 2)	1B, 2A, 3B
Fishdance Lake	(S. 22, 27, 28, T. 63, R. 7)	1B, 2A, 3B
Found Lake	(S. 10, 15, T. 64, R. 9)	1B, 2A, 3B
Fraser Lake	(S. 22, 23, 24, 26, 27, T. 64, R. 7)	1B, 2A, 3B
French Lake	(S. 3, T. 64, R. 5; S. 34, 35, T. 65, R. 5)	1B, 2A, 3B
Frost Lake	(S. 26, 27, 34, 35, T. 64, R. 4)	1B, 2A, 3B
Gabimichigami Lake	(S. 6, T. 64, R. 5; S. 1, 12, T. 64, R. 6; S. 29, 30, 31, 32, T. 65, R. 5; S. 6, T. 65, R. 6)	1B, 2A, 3B
Gabrielson Lake	(S. 20, T. 64, R. 20)	1B, 2A, 3B
Ge-be-one-e-guet Lake	(S. 14, 15, 16, 21, 22, 23, T. 67, R. 14)	1B, 2A, 3B
Gijikiki (Cedar) Lake	(S. 4, 5, T. 65, R. 6; S. 32, 33, T. 66, R. 6)	1B, 2A, 3B
Gillis Lake	(S. 1, 2, 3, 10, 11, T. 64, R. 5; S. 35, T. 65, R. 5)	1B, 2A, 3B
Glacier Pond No. 2	(S. 11, T. 63, R. 10)	1B, 2A, 3B
Glacier Pond No. 3 (Jewell Lake)	(S. 14, T. 63, R. 10)	1B, 2A, 3B
Gordon Lake	(S. 25, 26, 35, 36, T. 64, R. 4)	1B, 2A, 3B
Green Lake	(S. 36, T. 65, R. 5; S. 31, T. 65, R. 4)	1B, 2A, 3B
Gun Lake	(S. 1, T. 67, R. 15; S. 36, T. 68, R. 15)	1B, 2A, 3B
Hanson Lake	(S. 2, 3, 10, T. 65, R. 6; S. 34, 35, T. 66, R. 6)	1B, 2A, 3B
Hanson Lake	(S. 36, T. 64, R. 13)	1B, 2A, 3B
High Lake	(S. 3, 4, 5, T. 63, R. 12; S. 33, 34, T. 64, R. 12)	1B, 2A, 3B
Hogback (Twin) Lakes	(S. 31, T. 60, R. 6)	1B, 2A, 3B
Holt Lake	(S. 11, 13, 14, T. 65, R. 6)	1B, 2A, 3B
Howard Lake	(S. 28, 29, 32, 33, T. 65, R. 5)	1B, 2A, 3B
Hustler Lake	(S. 4, 5, 6, 8, T. 66, R. 14; S. 31, 32, T. 67, R. 14)	1B, 2A, 3B
Ima (Slate) Lake	(S. 17, 18, 19, 20, T. 64, R. 7; S. 13, 24, 25, T. 64, R. 8)	1B, 2A, 3B
Jap (Ray) Lake	(S. 19, 24, T. 65, R. 4, 5)	1B, 2A, 3B
Jasper Lake	(S. 17, 18, 19, T. 65, R. 5)	1B, 2A, 3B
Johnson Lake	(S. various, T. 67, 68, R. 17, 18)	1B, 2A, 3B
Karl Lake	(S. 18, 19, T. 64, R. 3; S. 13, T. 64, R. 4)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Kekekabic Lake	(S. 2, 3, 4, 11, T. 64, R. 7; S. 29, 30, 31, 32, T. 65, R. 6; S. 34, 35, 36, T. 65, R. 7)	1B, 2A, 3B
Kek, Little, Lake	(S. 31, T. 65, R. 6; S. 36, T. 65, R. 7)	1B, 2A, 3B
Lake of the Clouds	(S. 4, T. 56, R. 6)	1B, 2A, 3B
Little Dry Lake	(S. 9, T. 63, R. 12)	1B, 2A, 3B
Long Island Lake	(S. 17, 19, 20, 29, 30, T. 64, R. 3; S. 13, T. 64, R. 4)	1B, 2A, 3B
Loon Lake	(S. 25, 26, 27, 28, 32, 33, 34, 35, 36, T. 65, R. 3)	1B, 2A, 3B
Louis (Jacob) Lake	(S. 11, 12, T. 64, R. 12)	1B, 2A, 3B
Lunar (Moon) Lake	(S. 4, T. 65, R. 6)	1B, 2A, 3B
Lynx Lake	(S. 6, 7, T. 66, R. 14; S. 1, 12, T. 66, R. 15)	1B, 2A, 3B
Macaba Lake	(S. 2, 3, 4, T. 63, R. 5)	1B, 2A, 3B
Makwa (Bear) Lake	(S. 23, 26, 27, T. 64, R. 6)	1B, 2A, 3B
Marble Lake	(S. 2, 3, 10, T. 64, R. 6)	1B, 2A, 3B
Mavis Lake	(S. 4, T. 64, R. 4)	1B, 2A, 3B
Mayhew Lake	(S. 27, 28, 29, 32, 33, 34, T. 65, R. 2W)	1B, 2A, 3B
Mayhew, Little, Lake	(S. 29, 30, T. 65, R. 2)	1B, 2A, 3B
Meditation Lake	(S. 7, 8, T. 65, R. 4)	1B, 2A, 3B
Missing Link Lake	(S. 4, T. 64, R. 4)	1B, 2A, 3B
Missionary (East Three) Lake	(S. 6, T. 64, R. 7; S. 1, T. 64, R. 8)	1B, 2A, 3B
Moose Lake	(S. 20, 21, 22, 28, 29, 30, 31, 32, T. 64, R. 9; S. 25, 36, T. 64, R. 10)	1B, 2A, 3B
Mora Lake	(S. 14, 15, 22, 23, T. 64, R. 5)	1B, 2A, 3B
Mukooda Lake	(S. 26, 27, 34, 35, T. 68, R. 17)	1B, 2A, 3B
Ogishkemuncie Lake	(S. 13, 22, 23, 24, 26, 27, T. 65, R. 6)	1B, 2A, 3B
Ojibway (Upper Twin) Lake	(S. 7, 18, T. 63, R. 9; S. 11, 12, 13, 14, T. 63, R. 10)	1B, 2A, 3B
O'Leary Lake	(S. 4, T. 68, R. 17; S. 32, 33, T. 69, R. 17)	1B, 2A, 3B
Omega Lake	(S. 19, 30, T. 64, R. 2; S. 23, 24, 25, T. 64, R. 3)	1B, 2A, 3B
Oyster Lake	(S. 2, 3, 10, 11, T. 66, R. 14)	1B, 2A, 3B
Owl Lake	(S. 12, T. 64, R. 5)	1B, 2A, 3B
Peter Lake	(S. 5, T. 64, R. 5; S. 32, 33, 34, T. 65, R. 5)	1B, 2A, 3B
Portage Lake	(S. 3, 4, 5, T. 64, R. 2; S. 33, T. 65, R. 2)	1B, 2A, 3B
Portage Lake	(S. 35, 36, T. 65, R. 8)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Powell Lake	(S. 3, 4, T. 64, R. 5; S. 34, T. 65, R. 5)	1B, 2A, 3B
Rabbit Lake	(S. 27, 34, T. 66, R. 6)	1B, 2A, 3B
Raven (Lynx) Lake	(S. 7, 18, T. 64, R. 6)	1B, 2A, 3B
Red Rock Lake	(S. 4, 5, T. 65, R. 5; S. 28, 29, 32, 33, 34, T. 66, R. 5)	1B, 2A, 3B
Regenbogan Lake	(S. 18, T. 64, R. 12)	1B, 2A, 3B
Rog Lake	(S. 16, 17, T. 65, R. 5)	1B, 2A, 3B
Ruby Lake	(S. 6, 7, 8, T. 66, R. 14)	1B, 2A, 3B
Rush Lake	(S. 5, 7, 8, 9, T. 64, R. 2)	1B, 2A, 3B
Saganaga, Little, Lake	(S. 5, 6, 7, 8, 9, 15, 16, 17, 18, 19, T. 64, R. 5; S. 12, 13, 24, T. 64, R. 6)	1B, 2A, 3B
Saucer Lake	(S. 20, T. 65, R. 2)	2B
Scarp (Cliff) Lake	(S. 31, 32, T. 60, R. 6)	1B, 2A, 3B
Seagull Lake	(S. 5, 6, 7, T. 65, R. 4; S. 31, 32, T. 66, R. 4; S. 1, 2, 3, 9, 10, 11, 12, 13, 14, 15, 16, T. 65, R. 5)	1B, 2A, 3B
Seahorse Lake	(S. 34, T. 65, R. 5)	1B, 2A, 3B
Sema (Coon) Lake	(S. 25, T. 65, R. 7)	1B, 2A, 3B
Skull Lake	(S. 14, T. 64, R. 9)	1B, 2A, 3B
Snipe Lake	(S. 3, 4, 9, 10, T. 64, R. 4)	1B, 2A, 3B
Snowbank Lake	(S. 1, 2, 3, 11, 12, T. 63, R. 9; S. 23-27, 34-36, T. 64, R. 9; S. 19, 20, 29-31, T. 64, R. 8)	1B, 2A, 3B
Spoon (Fames) Lake	(S. 25, 26, 27, 34, T. 65, R. 7)	1B, 2A, 3B
Spring Lake	(S. 14, 15, 23, T. 68, R. 18)	1B, 2A, 3B
Strup Lake	(S. 11, T. 64, R. 7)	1B, 2A, 3B
Surber (Lake X) Lake	(S. 24, T. 65, R. 2)	1B, 2A, 3B
Takuemich Lake	(S. 5, 6, T. 67, R. 14; S. 31, 32, T. 68, R. 14)	1B, 2A, 3B
Tarry Lake	(S. 14, T. 64, R. 5)	1B, 2A, 3B
Thumb Lake	(S. 18, T. 67, R. 14)	1B, 2A, 3B
Thomas Lake	(S. 5, 6, T. 63, R. 7; S. 27, 28, 29, 31, 32, 33, 34, T. 64, R. 7)	1B, 2A, 3B
Tofte Lake	(S. 2, 3, 10, 11, T. 63, R. 10; S. 35, T. 64, R. 10)	1B, 2A, 3B
Topaz (Star) Lake	(S. 8, 9, T. 65, R. 6)	1B, 2A, 3B
Town Lake	(S. 6, T. 63, R. 3; S. 1, T. 63, R. 4; S. 31, T. 64, R. 3W; S. 36, T. 64, R. 4)	1B, 2A, 3B
Trappers Lake	(S. 27, 34, T. 60, R. 8W)	1B, 2A, 3B
Trout, Big, Lake	(S. various, T. 63, 64, R. 15, 16)	1B, 2A, 3B
Trout, Little, Lake	(S. 3, 4, 9, 10, T. 68, R. 17)	1B, 2A, 3B
Trygg Lake	(S. 31, T. 68, R. 14; S. 36, T. 68, R. 15)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Tuscarora Lake	(S. 1, 12, T. 64, R. 4; S. 6, 7, 8, 17, 18, T. 64, R. 5)	1B, 2A, 3B
Vera Lake	(S. 1, 2, 3, T. 64, R. 8)	1B, 2A, 3B
Virgin Lake	(S. 5, T. 64, R. 5)	1B, 2A, 3B
Wine Lake	(S. 10, 11, 14, 15, T. 63, R. 5)	1B, 2A, 3B
Wisini Lake	(S. 11, 12, 13, 14, T. 64, R. 7)	1B, 2A, 3B
All other lakes in the Boundary Waters Canoe Area		1B, 2B
Little Fork River (No. 4)		
Streams		
Angora Creek	(S. 9, 10, 15, 16, 21, 22, 27, T. 61, R. 18)	1B, 2A, 3B
Balkan Creek (Borium)	(S. 9, 10, 16, 21, 22, T. 59, R. 20)	1B, 2A, 3B
Bear River	(T. 60, 61, 62, R. 21, 22, 23)	2B
Bearskin River	(T. 62, R. 21)	2B
Beaver Brook	(T. 67, 68, R. 23, 24, 25)	2B
Beaver Creek	(T. 62, 63, R. 20)	2C
Cross River	(T. 67, R. 25)	2B
Dark River (ex- cluding trout waters)	(T. 59, 60, R. 19, 20)	2B
Dark River	(S. 19, 20, 29, 30, 32, T. 60, R. 19; S. 11, 12, 13, 24, T. 60, R. 20)	1B, 2A, 3B
Dean Creek	(S. 26, 27, 32, 33, T. 61, R. 21)	1B, 2A, 3B
Feeder Creek	(S. 3, 9, 10, T. 60, R. 18)	1B, 2A, 3B
Flint Creek	(T. 62, R. 18, 19)	2B
Forsman Creek	(S. 5, 6, T. 60, R. 17; S. 1, T. 60, R. 18; S. 32, 33, T. 61, R. 17)	1B, 2A, 3B
Little Fork River	(T. 62-69, R. 17-25)	2B, 3B
Gardner Brook	(T. 63, 64, R. 23)	2C
Harrigan Creek	(S. 3, 10, T. 62, R. 23)	1B, 2A, 3B
Johnson Creek	(S. 6, 7, 8, 16, 17, 20, T. 60, R. 18)	1B, 2A, 3B
Lost River	(S. 5, 6, T. 65, R. 20; S. 1, 2, 3, 10, T. 65, R. 21; S. 25, 31, 32, 33, 34, 35, 36, T. 66, R. 20)	1B, 2A, 3B
McNiven Creek	(S. 9, 10, 15, 16, 21, 28, 32, 33, T. 59, R. 19)	1B, 2A, 3B
Portage Creek	(T. 65, R. 21)	2C
Prairie Creek	(T. 64, R. 21, 22, 23)	2B
Puutio Creek	(S. 1, 2, T. 60, R. 18; S. 28, 29, 30, 31, T. 61, R. 17; S. 25, 36, T. 61, R. 18)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Rice River	(T. 60, 61, 62, R. 18, 17)	2B
Sand Creek (ex- cluding trout waters)	(T. 60, 61, 62, R. 21)	2B
Sand Creek	(S. 2, 3, 11, T. 60, R. 21; S. 27, 34, 35, T. 61, R. 21)	1B, 2A, 3B
Spring Creek	(S. 8, 9, T. 60, R. 18)	1B, 2A, 3B
Stoney Brook	(S. 2, 3, 4, T. 60, R. 22; S. 13, 24, 25, 35, 36, T. 61, R. 22; S. 7, 18, T. 61, R. 21)	1B, 2A, 3B
Sturgeon River	(T. 60, 61, 62, R. 20, 21)	2B
Valley River (except trout waters)	(T. 62, 63, R. 22, 23)	2B
Valley River	(S. 25, 36, T. 63, R. 24; S. 25, 26, 31, 32, 33, 35, T. 63, R. 23; S. 1, 2, 3, 4, 10, 11, 12, 13, T. 62, R. 23)	1B, 2A, 3B
Venning Creek	(S. 1, 2, 11, 12, T. 60, R. 23; S. 35, T. 61, R. 23)	1B, 2A, 3B
Watercress Creek	(S. 23, 26, 27, T. 60, R. 19)	1B, 2A, 3B
Willow River	(T. 63, R. 20, 21, 22)	2B
Lakes		
Camps Four (Wessman) Lake	(S. 4, T. 59, R. 19)	1B, 2A, 3B
Caribou Lake	(S. 25, T. 60, R. 22)	1B, 2A, 3B
Dollar Lake	(S. 25, T. 59, R. 21)	1B, 2A, 3B
Jammer Lake	(S. 27, T. 60, R. 18)	1B, 2A, 3B
Nett Lake	(T. 65, R. 21, 22)	1B, 2A, 3B
Pickerel Lake	(S. 17, T. 60, R. 21)	1B, 2A, 3B
Rainbow Lake	(S. 22, T. 60, R. 24)	1B, 2A, 3B

Big Fork River Watershed (No. 5)**Streams**

Big Fork River	(T. 149, 59-69, R. 25-27)	2B, 3B
Bear River	(T. 67, 68, 69, R. 26)	2B
Beemans Creek	(S. 23, 25, 26, T. 148, R. 26)	1B, 2A, 3B
Bowerman Brook	(T. 62, 63, R. 26, 27)	2B
Bowstring River	(T. 58, R. 27; T. 149, R. 27)	2B
Caldwell Brook	(T. 151, 152, R. 25, 26, 27)	2B
Coon Creek	(T. 61, R. 24, 25)	2B
Deer Creek	(T. 62, R. 24, 25)	2B
Dinner Creek	(T. 153, 154, 155, R. 26, 27)	2B
Fletcher Creek	(S. 7, 17, 18, 19, 30, T. 149, R. 25)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Gale Brook	(T. 60, R. 25, 26)	2B
Moose Brook	(T. 150, R. 27)	2B
Popple River	(T. 148, 149, 150, R. 28)	2B
Reilly Brook	(T. 63, 64, R. 24, 25, 26)	2B
Shine Brook	(S. 11, 14, 15, 16, T. 62, R. 25)	1B, 2A, 3B
South Fork Coon Creek	(T. 60, 61, R. 25)	2B
Sturgeon River	(T. 155, R. 25, 26, 27, 28)	2B
Trout Creek	(S. 19, 30, T. 66, R. 26; S. 24, 25, T. 66, R. 27)	1B, 2A, 3B
Turtle River	(T. 59, R. 27)	2B
Lakes		
Lake Erskine	(S. 2, 3, T. 61, R. 24)	1B, 2A, 3B
Larson Lake	(S. 16, 21, T. 61, R. 24)	1B, 2A, 3B
Lake of the Woods Watershed (No. 6)		
Streams		
Bartons Brook	(T. 158, 159, R. 30, 31)	2B
Baudette River	(T. 159, 160, R. 31)	2B
Baudette River, South Fork	(T. 159, R. 31)	2B
Black River, West Branch	(T. 158, 159, R. 25, 26)	2B
Bostick Creek	(T. 162, R. 32)	2B
Bulldog Run River	(T. 162, R. 36)	2B
Canfield Creek	(T. 161, R. 33)	2B
Chase Brook	(T. 157, 158, R. 31, 32)	2B
Miller Creek	(T. 157, 158, R. 31, 32)	2B
Peppermint Creek	(T. 159, 160, R. 32, 33)	2B
Rapid River	(T. 158, 159, 160, R. 29, 30, 31)	2B
North Branch Rapid River (except trout waters)	(T. 158, R. 31, 32, 33, 34)	2B
Rapid River, North Branch	(S. 1, T. 157, R. 34; S. 26, 27, 28, 34, 35, 36, T. 158, R. 34; S. 31, T. 158, R. 33)	1B, 2A, 3B
South Branch Rapid River	(T. 157, R. 35)	2B
East Fork Rapid River	(T. 158, 159, 160, R. 29)	2B
Silver Creek	(T. 160, R. 30)	2B
Thompson Creek	(T. 157, R. 31, 32)	2B
Tomato Creek	(S. 2, 3, 9, 10, T. 161, R. 34; S. 35, T. 162, R. 34)	1B, 2A, 3B
Troy Creek	(T. 156, 157, 158, R. 31)	2B
Warroad River	(T. 163, R. 36)	2B, 3B

Waters	Reach or Area Involved or Location	Classification
West Branch Warroad River	(T. 160-163, R. 36, 37)	2B
East Branch Warroad River	(T. 161, 162, R. 35, 36)	2B
Williams Creek	(T. 161, R. 33, 34)	2B
Willow Creek	(T. 161; 162, R. 34, 35)	2B
Winter Road River	(T. 160, 161, 162, R. 31, 32, 33, 34)	2B
South Branch Zippel Creek	(T. 162, R. 33)	2B
West Branch Zippel Creek	(T. 162, R. 33, 34)	2C

**Red River of the North Basin
Mustinka-Bois de Sioux Rivers Watershed (No. 7)**

Streams

Mustinka River	(T. 127, 128, R. 45, 46, 47)	2C
West Branch Mustinka River	(T. 125, 126, 127, 128, R. 45, 46, 47)	2C
Doran Slough	(T. 131, 132, R. 46, 47)	2C
Eighteen Mile Creek	(T. 127, R. 46, 47)	2C
Five Mile Creek	(T. 127, 128, R. 45)	2C
Rabbit River	(T. 130, 131, R. 45, 46, 47)	2C
South Fork Rabbit River	(T. 130, R. 45, 46)	2C
Twelve Mile Creek	(T. 126, 127, R. 45, 44, 43)	2C
West and East Fork Twelve Mile Creek	(T. 125, 126, R. 45, 44)	2C

Otter Tail River Watershed (No. 8)

Streams

Otter Tail River (Height of Land Lake through Fergus Falls)	(T. 133, 134, 135, 136, 137, 138, 139, R. 39, 40, 41, 42, 43)	1C, 2B, 3B
Otter Tail River (Fergus Falls to mouth)	(T. 132, 133, R. 43-47)	1C, 2B, 3B
Brandberg Creek	(S. 20, 21, 28, 29, 30, T. 133, R. 38)	1B, 2A, 3B
Dead Horse Creek	(S. 3, 4, 7, 8, 9, T. 138, R. 38)	1B, 2A, 3B
Dead River	(T. 134, R. 40)	2B
Elbow Lake Creek	(S. 31, 32, T. 143, R. 38; S. 6, T. 142, R. 38)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Holmstad Creek	(S. 7, T. 136, R. 37; S. 12, 13, 14, T. 136, R. 38)	1B, 2A, 3B
Long Lake Creek	(S. 7, T. 134, R. 42)	1B, 2A, 3B
Pelican River	(T. 133, 134, 135, 136, 137, R. 43, 44)	2B, 3C
Rush Lake Creek	(S. 23, 26, 27, 28, T. 135, R. 38)	1B, 2A, 3B
Sucker Creek	(S. 7, 18, T. 138, R. 40; S. 13, T. 138, R. 41)	1B, 2A, 3B
Toad River (except trout waters)	(T. 137, 138, 139, R. 38, 39)	2B
Toad River	(S. 6, 7, 18, 19, T. 138, R. 38; S. 28, 29, 30, 31, T. 139, R. 38)	1B, 2A, 3B
Lakes		
Bass Lake	(S. 10, 11, T. 135, R. 42)	1B, 2A, 3B
Cow Lake	(S. 15, T. 135, R. 42)	1B, 2A, 3B
Deadwood Lake	(S. 35, T. 136, R. 42)	1B, 2A, 3B
Fladmark Lake	(S. 13, 14, 24, T. 135, R. 42)	1B, 2A, 3B
Fogard Lake	(S. 13, T. 134, R. 42; S. 18, T. 134, R. 41)	1B, 2A, 3B
Hanson Lake	(S. 6, T. 139, R. 39W)	1B, 2A, 3B
Hoot Lake	(S. 30, T. 133, R. 42; S. 25, T. 133, R. 43)	1B, 2A, 3B
Kerbs Lake	(S. 4, 9, T. 136, R. 40)	1B, 2A, 3B
Otter Lake	(S. 31, T. 137, R. 41; S. 1, T. 136, R. 42; S. 6, T. 136, R. 41)	1B, 2A, 3B
Pickerel Lake	(S. 31, 32, T. 136, R. 40)	1B, 2A, 3B
Pine Lake	(S. 13, 14, 23, T. 135, R. 40)	1B, 2A, 3B
Pine Lake	(S. 1, T. 135, R. 41; S. 6, T. 135, R. 40, S. 31, T. 136, R. 40; S. 36, T. 136, R. 41)	1B, 2A, 3B
Buffalo River Watershed (No. 9)		
Buffalo River	(T. 139, 140, 141, 142, R. 45, 46, 47, 48)	2B
South Branch Buffalo River	(T. 135, 136, 137, 138, 139, R. 45, 46, 47)	2B
Deerhorn Creek	(T. 136, R. 44, 45, 46)	2C
Felton Creek	(S. 13, 14, 15, T. 141, R. 46)	1B, 2A, 3B
Hay Creek	(T. 137, 138, R. 44, 45, 46)	3C
Lawndale Creek	(S. 5, 6, T. 135, R. 45; S. 1, 2, T. 135, R. 46; S. 22, 27, 34, 35, T. 136, R. 46)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Stony Creek	(T. 137, R. 45, 46)	2C
Whiskey Creek (Clay County)	(T. 137, R. 44, 45, 46)	2C
Whiskey Creek (Wilkin County)	(T. 133, 134, R. 47, 48)	2C
Wolverton Creek	(T. 135, 136, 137, R. 48)	2C
Wild Rice River Watershed (No. 10)		
Streams		
Wild Rive River	(T. 144, 145, R. 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49)	2B
South Branch Wild Rice River	(T. 141, 142, 143, R. 42, 43, 44, 45, 46, 47)	2B
Agonash Creek	(S. 27, 28, 31, 32, 33, T. 145, R. 38)	1B, 2A, 3B
Bad Boy Creek	(S. 13, 14, 22, 23, 27, 28, 34, 35, 36, T. 144, R. 39)	1B, 2A, 3B
Buckboard Creek	(S. 12, 13, 24, T. 144, R. 38; S. 19, 20, 30, 31, 32, T. 144, R. 37)	1B, 2A, 3B
Maple Creek	(T. 147, 148, R. 44, 45, 46)	2C
Marsh Creek	(T. 144, 145, 146, R. 41, 42, 43)	2C
Marsh River	(T. 144, 145, 146, R. 46, 47, 48, 49)	2B
Mud Creek	(S. 13, 14, 23, 24, T. 144, R. 37)	1B, 2A, 3B
Roy (Roy Lake) Creek	(T. 144, 145, R. 39)	2C
Schermerhorn Creek	(S. 25, 26, 36, T. 145, R. 40)	1B, 2A, 3B
Sand Hill River	(T. 147, 148, R. 41, 42, 43, 44, 45, 46, 47, 48)	2B
Spring Creek (Mahnomen-Norman County)	(T. 145, 146, R. 45, 46, 47)	2C
Spring Creek (South Branch Wild Rice River (except trout waters)	(T. 142, R. 41, 42)	2C
Spring Creek (South Branch Wild Rice River)	(S. 30, T. 142, R. 41; S. 25, 26, 27, T. 142, R. 42)	1B, 2A, 3B
Twin Lake Creek	(T. 144, 145, R. 40)	2C
White Earth River	(T. 143, 144, R. 40, 41, 42)	2C

Waters	Reach or Area Involved or Location	Classification
Red Lake River Watershed (No. 11)		
Red Lake River (outlet of Lower Red Lake through Crookston)	(T. 150, 151, 152, 153, 154, R. 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46)	1C, 2B, 3B
Red Lake River (Crookston to mouth)	(T. 150, 151, R. 46, 47, 48, 49)	1C, 2B, 3B
Badger Creek	(T. 149, 150, 151, R. 42, 43, 44)	2C
Barnums Creek (Burnham Creek)	(T. 148, 149, 150, R. 44, 45, 46, 47, 48)	2C
Battle River	(T. 152, R. 32)	2B
North Branch Battle River	(T. 152, R. 31, 32)	2B
South Branch Battle River (excluding trout waters)	(T. 151, 152, R. 29, 30, 31, 32)	2B
South Branch Battle River	(S. 2, 3, 4, 5, T. 151, R. 30; S. 32, T. 152, R. 30)	1B, 2A, 3B
Beaver Dam Creek	(S. 11, 12, 13, 24, 25, 36, T. 152, R. 29)	1B, 2A, 3B
Big Rock Creek	(T. 150, 151, R. 35)	2B
Blackduck River	(T. 149, 150, 151, R. 31, 32)	2B
Little Black River	(S. 2, 11, 14, 23, 26, 35, T. 152, R. 36)	1B, 2A, 3B
Black River	(T. 151, 152, 153, 154, R. 45)	2B
Clearwater River (ex- cluding trout waters)	(T. 147-152, R. 35-44)	2B
Clearwater River	(S. 5, 6, 8, 17, 20, 29, 31, 32, T. 148, R. 35; S. 20, 29, 31, 32, T. 149, R. 35)	1B, 2A, 3B
North Cormorant River	(T. 151, 152, R. 29, 30, 31, 32)	2B
South Cormorant River	(T. 150, 151, R. 30, 31, 32)	2B
Deer River	(T. 155, R. 32)	2B
Dumas Creek	(T. 154, R. 30)	2B
Elm Creek	(S. 4, 9, 10, 14, 15, T. 152, R. 28)	1B, 2A, 3B
Gentilly River	(T. 149, 150, R. 45)	2C
Grand Marais River	(T. 150, 151, 152, 153, R. 48, 49, 50)	2B
Hay Creek	(T. 149, 150, 151, R. 32, 33)	2B
Hill River	(T. 148, 149, 150, R. 39, 40, 41, 42)	2C
Hoover Creek (ex- cluding trout waters)	(T. 152, 153, 154, R. 29, 30)	2C
Hoover Creek	(S. 19, 26, 27, 28, 29, 30, 35, T. 152, R. 29; S. 13, 24, T. 152, R. 30)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Knife Creek	(T. 150, R. 36)	2B
Lengby Creek	(S. 33, 34, T. 147, R. 39)	1B, 2A, 3B
Lost River (excluding trout waters)	(T. 149, 150, 151, R. 38-42)	2B
Lost River	(S. 20, 21, 27, 28, 33, 34, T. 148, R. 38)	1B, 2A, 3B
Manomin Creek	(T. 154, R. 34, 35)	2B
Meadow Creek (excluding trout waters)	(T. 151, R. 30, 31)	2B
Meadow Creek	(S. 6, T. 151, R. 30; S. 1, 2, T. 151, R. 31)	1B, 2A, 3B
Moose Creek	(T. 155, R. 31)	2B
Moose River	(T. 157, 158, R. 39, 40)	2B
Mud River (excluding trout waters)	(T. 149, 150, 151, R. 33, 34)	2B
Mud River	(S. 21, 28, 29, 31, 32, T. 150, R. 33)	1B, 2A, 3B
Nassett Creek	(S. 20, 28, 29, T. 148, R. 38)	1B, 2A, 3B
O'Brien (Dorringans) Creek	(S. 2, T. 149, R. 32; S. 23, 24, 26, 35, T. 150, R. 32)	1B, 2A, 3B
Pike Creek	(T. 150, 151, R. 34)	2B
Poplar River	(T. 147, 148, 149, 150, R. 39, 40, 41, 42)	2B
Ruffy Brook	(T. 148, 149, 150, R. 37)	2B
Sandy River	(T. 149, 150, 151, R. 35, 36)	2B
Shotly Brook	(T. 153, R. 30, 31)	2B
Spring Creek	(S. 4, 5, 9, 10, T. 149, R. 30; S. 32, T. 150, R. 30)	1B, 2A, 3B
Sucker Creek	(T. 150, R. 30, 31)	2B
Tamarac River	(T. 153, 154, R. 29, 30)	2B
Thief River	(T. 154, 155, 156, 157, 158, R. 41, 42, 43)	2B
Lakes		
Upper and Lower Red Lake		2B, 3B
Long Lake	(S. 26, 27, T. 150, R. 36)	2B
Middle River Watershed (No. 12)		
Middle River	(T. 156, 157, R. 43, 44, 45, 46, 47, 48, 49, 50)	2B
Snake River	(T. 154, 155, 156, R. 45, 46, 47, 48, 49, 50)	2B
Tamarack River (Stephen to mouth)	(T. 158, R. 48, 49, 50)	2B, 3B

Waters	Reach or Area Involved or Location	Classification
Tamarack River (Source to Stephen)	(T. 157, 158, R. 45, 46, 47, 48)	1C, 2B, 3B

Two Rivers Watershed (No. 13)

Streams

North Branch Two Rivers	(T. 161, 162, R. 46, 47, 48, 49, 50)	2B
South Branch Two Rivers	(T. 161, R. 41-49)	1C, 2B, 3B
Middle Branch Two Rivers (Source to Hallock)	(T. 161, R. 45, 46)	1C, 2B, 3B
Middle Branch Two Rivers (Hallock to mouth)	(T. 161, R. 49)	2B
Little Joe River	(T. 163, R. 47, 48)	2C

Lakes

Lake Bronson	(S. 32, 33, 24, T. 161, R. 46)	1C, 2B, 3B
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Roseau River Watershed (No. 14)

Streams

South Fork Roseau River	(T. 158, 159, 160, 161, R. 38, 39, 40)	2B
Bemis Hill Creek	(S. 19, 20, 21, 28, 29, 30, 31, 32, T. 161, R. 37)	1B, 2A, 3B
Hay Creek	(T. 161, 162, 163, R. 37, 38, 39)	2C
Sucker Creek	(T. 160, 161, R. 39)	2C

Lakes

Lost Lake	(S. 5, T. 158, R. 35)	2B
Marvin Lake	(S. 28, 33, T. 164, R. 37)	2B

**Upper Mississippi River Basin
Mississippi River Headwaters Watershed (No. 15)**

Streams

Ada Brook	(T. 138, 139, R. 29)	2B
Alcohol Creek	(T. 143, 144, R. 34)	2C

Waters	Reach or Area Involved or Location	Classification
Bear Brook	(T. 144, R. 27)	2C
Bear Creek	(T. 145, R. 36)	2C
Bear River	(T. 143, 144, R. 26)	2B
Birch Brook	(T. 141, R. 25)	2C
Bishop Creek	(S. 1, 2, 11, T. 141, R. 29)	1B, 2A, 3B
Blackberry Creek	(T. 54, R. 24)	2B
Blackwater Creek	(T. 55, R. 26)	2C
Boy River	(T. 140, 141, 142, 143, R. 27, 28, 29, 30)	2C
Bray Creek	(S. 3, 4, T. 57, R. 23; S. 33, 34, T. 58, R. 23)	1B, 2A, 3B
Buebber Creek (Beuber)	(S. 6, 7, T. 139, R. 30)	1B, 2A, 3B
Bruce Creek	(S. 6, 7, T. 53, R. 22; S. 12, 13, 14, 23, T. 53, R. 23; S. 31, T. 54, R. 22; S. 36, 25, T. 54, R. 23)	1B, 2A, 3B
Buffalo Creek	(T. 44, R. 30, 31)	2B
Bunge Brook (Bungo Creek)	(S. 6, T. 137, R. 30; S. 31, 32, T. 138, R. 30; S. 1, 11, 12, 14, 22, 23, 26, 27, T. 137, R. 31)	1B, 2A, 3B
Bungashing Creek	(S. 28, 29, 30, T. 145, R. 32; S. 25, 26, 34, 35, T. 145, R. 33)	1B, 2A, 3B
Cedar Creek	(T. 47, R. 27)	2B
Clearwater Creek	(T. 56, 57, R. 24, 25)	2C
Cold Creek	(S. 19, T. 145, R. 33)	1B, 2A, 3B
Cullen Brook	(S. 18, 19, T. 136, R. 28)	1B, 2A, 3B
Daggett Brook	(T. 138, 139, 140, R. 26, 27)	2B
Dam Brook (except trout waters)	(T. 45, 46, 47, R. 24, 25)	2B
Dam Brook	(S. 6, 5, 8, 9, 10, T. 45, R. 24, S. 1, T. 45, R. 25, S. 26, 35, 36, 22, 23, 15, 10, T. 46, R. 25)	1B, 2A, 3B
Day Brook	(T. 59, R. 21, 22, 23)	2B
Deer River	(T. 57, R. 27; T. 145, R. 27)	2B
Everton Creek	(T. 149, R. 30)	2C
Farley Creek	(T. 147, R. 28)	2C
Foley Brook	(T. 141, R. 25)	2C
Frontenac Creek	(T. 145, R. 34)	2C
Grant Creek	(T. 146, 147, R. 34, 35)	2B
Grassy (Gultch) Creek	(S. 23, 24, 25, 26, T. 143, R. 33)	1B, 2A, 3B
Hay Creek	(T. 137, R. 29)	2B
Hennepin Creek (ex- cept trout waters)	(T. 144, 145, 146, R. 34, 35)	2C

Waters	Reach or Area Involved or Location	Classification
Hennepin Creek	(S. 3, 10, 15, 16, 21, T. 144, R. 35; S. 34, T. 145, R. 35)	1B, 2A, 3B
Little Hill River	(T. 52, 53, R. 25, 26, 27)	2B
Johnson Creek	(T. 137, R. 28)	2C
Kabekona River	(S. 6, 7, 18, 19, T. 143, R. 32; S. 2, 3, 4, 9, 11, 12, 24, T. 143, R. 33; S. 29, 30, 32, 33, T. 144, R. 33; S. 24, 25, 36, T. 144, R. 34)	1B, 2A, 3B
Kawishiwash Creek	(S. 11, 12, 13, T. 142, R. 32)	1B, 2A, 3B
Kitchi Creek	(T. 146, 147, R. 29, 30)	2C
La Salle Creek (ex- cept trout waters)	(T. 143, 144, R. 35)	2C
La Salle Creek	(S. 6, T. 143, R. 35; S. 19, 30, 31, T. 144, R. 35)	1B, 2A, 3B
La Salle River	(T. 144, 145, R. 35)	2C
Laura Brook	(T. 141, R. 26)	2C
Libby Brook	(S. 1, 2, T. 50, R. 24; S. 5, 6, T. 50, R. 23)	1B, 2A, 3B
Long Lake Creek	(S. 10, 14, 15, T. 46, R. 25)	1B, 2A, 3B
Matushka's (Smith) Creek	(S. 35, 36, T. 54, R. 26)	1B, 2A, 3B
Merritt Creek	(S. 7, 18, T. 141, R. 29)	1B, 2A, 3B
Moose Creek	(S. 21, 22, 27, 34, T. 149, R. 29; S. 3, T. 148, R. 29)	1B, 2A, 3B
Moose River	(T. 139, 140, 141, 50, R. 25, 26, 27, 28)	2B
Morrison Brook	(S. 5, 7, 8, 18, 19, 20, 29, 30, 31, 32, 33, T. 53, R. 26; S. 4, 9, 10, 15, T. 52, R. 26)	1B, 2A, 3B
Nolan Creek	(S. 3, 4, 9, 10, 16, T. 141, R. 30)	1B, 2A, 3B
Northby Creek	(T. 140, R. 27)	2C
Norway Brook	(T. 139, R. 30)	2C
Nosti Brook	(T. 49, R. 20)	2B
O'Brien Creek	(T. 56, 57, R. 22)	2C
Pelican Brook	(T. 136, R. 27)	2B
Pickerel Creek	(S. 7, 18, T. 56, R. 22; S. 13, T. 56, R. 23)	1B, 2A, 3B
Pigeon River	(T. 147, R. 27)	2C
Pine River Headwater	(S. 30, 31, 32, T. 138, R. 30; S. 10, 14, 15, 16, 21, 22, 23, 25, 26, T. 138, R. 31)	1B, 2A, 3B
Little Pine River	(T. 136, 137, 138, R. 25, 26)	2B
South Fork Pine River	(T. 137, 138, R. 29, 30, 31)	2B
Pockedee Creek	(S. 29, 30, T. 144, R. 32; S. 24, 25, T. 144, R. 33)	1B, 2A, 3B
Pohl Creek	(T. 56, R. 26)	2B

Waters	Reach or Area Involved or Location	Classification
Pokegama Creek	(T. 51, 52, R. 24)	2B
Pokegama Creek	(S. 22, 23, 26, T. 54, R. 26)	1B, 2A, 3B
Pokegama Creek (Little)	(S. 26, 27, T. 54, R. 26)	1B, 2A, 3B
Portage Brook	(T. 47, R. 25)	2B
Prairie River	(T. 50, 51, 52, 53, 54, 55, 56, 57, R. 22, 23, 24, 25)	2B
Rabbit Creek	(T. 46, R. 25)	2B
Rat Creek	(T. 144, 145, R. 34)	2C
Rice River	(T. 45, 46, 47, 48, R. 23, 24, 25, 26)	2B
Ripple River	(T. 45, 46, R. 26, 27)	2B
Rosholt Creek	(S. 22, 23, T. 55, R. 23)	1B, 2A, 3B
Sand Creek	(S. 15, 22, 27, 28, 29, 32, 33, T. 55, R. 23)	1B, 2A, 3B
Sandy River	(T. 48, R. 24)	2B
Savanna River	(T. 50, R. 23)	2B
Schoolcraft Creek	(S. 5, 7, 8, 17, T. 142, R. 34)	1B, 2A, 3B
Schoolcraft Creek (ex- cluding trout waters)	(T. 143, 144, 145, R. 34)	2B
Schoolcraft River	(S. 20, 29, 32, T. 143, R. 34)	1B, 2A, 3B
Shingobee Creek	(S. 26, 35, T. 141, R. 32)	1B, 2A, 3B
Shingobee River	(S. 24, T. 141, R. 32; S. 11, 15, 16, 17, 18, 19, T. 141, R. 31)	1B, 2A, 3B
Sisabagamah Creek	(T. 47, R. 26)	2B
Six Mile Brook	(T. 143, 144, R. 26, 27)	2C
Skimmerhorn Creek	(T. 149, R. 30)	2C
Skunk Creek	(T. 144, R. 34)	2C
Smith Creek	(S. 1, 9, 10, 11, 12, 13, 14, 15, T. 53, R. 26)	1B, 2A, 3B
Snowball Creek	(T. 56, R. 23)	2C
Split Hand Creek	(T. 53, R. 24)	2C
Spring Brook	(T. 138, R. 28)	2B
Spring Creek	(S. 26, 27, T. 55, R. 23)	1B, 2A, 3B
Spring Lake Creek	(S. 34, 35, T. 148, R. 35)	1B, 2A, 3B
Stall Creek	(S. 12, 13, 14, T. 143, R. 33)	1B, 2A, 3B
Stony Creek	(T. 140, R. 28)	2C
Stony Point Brook	(T. 147, R. 28)	2C
Sucker Creek (Clear- water County) (Gould Creek) (ex- cluding trout waters)	(T. 143, 144, R. 36)	2C
Sucker Creek	(S. 5, T. 143, R. 36, S. 27, 28, 32, 33, T. 144, R. 36)	1B, 2A, 3B
Sugar Creek	(T. 54, R. 26)	2B
Swan River	(T. 52, 53, 54, 55, 56, R. 22, 23, 24)	2B
Swift River	(T. 142, R. 27)	2C

Waters	Reach or Area Involved or Location	Classification
Tamarack River	(T. 48, 49, R. 20, 21, 22)	2B
Little Tamarack River	(T. 49, R. 21, 22)	2B
Third River	(T. 147, 148, R. 29)	2B
Thompson Creek	(T. 138, R. 28)	2B
Three Spring Creek (Spring Creek)	(S. 3, 10, 11, T. 139, R. 28; S. 34, T. 140, R. 28)	1B, 2A, 3B
Tibbetts Creek	(S. 15, 16, T. 147, R. 27)	1B, 2A, 3B
Turtle River	(T. 147, 148, R. 31, 32, 33, 34)	2B
North Turtle River	(T. 147, 148, R. 31)	2B
Two Rivers	(S. 24, 25, 26, T. 51, R. 24; S. 19, T. 51, R. 23)	1B, 2A, 3B
Van Sickle Brook	(T. 138, R. 26)	2B
Vermillion River	(T. 142, 143, R. 25)	2B
Wakefield Brook	(T. 47, R. 22, 23)	2B
Warba Creek	(S. 15, 21, 22, T. 54, R. 23)	1B, 2A, 3B
Welcome Creek	(S. 56, 57, R. 22)	2C
White Elk Brook	(T. 49, 50, R. 26)	2B
Whitleys Creek	(S. 15, 16, 17, T. 45, R. 30)	1B, 2A, 3B
Willow Creek	(T. 137, 138, R. 28, 29)	2B
Little Willow River	(T. 47, 48, 49, R. 26, 27)	2B
Willow River	(T. 49-51, R. 24-27, T. 141, 142, R. 25)	2B
North Fork Willow River	(T. 142, R. 25)	2C
South Fork Willow River	(T. 142, R. 25)	2C
Wilson Creek	(T. 137, R. 30)	2C
Lakes		
Allen Lake	(S. 5, T. 138, R. 26)	1B, 2A, 3B
Benjamin Lake	(S. 7, 18, T. 148, R. 30; S. 13, T. 148, R. 31)	1B, 2A, 3B
Bear Lake (Little Bear)	(S. 11, T. 57, R. 26)	1B, 2A, 3B
Benedict Lake	(S. 1, 2, 3, 11, 12, T. 142, R. 32)	1B, 2A, 3B
Blue Lake	(S. 3, 4, T. 46, R. 27; S. 33, 34, T. 47, R. 27)	1B, 2A, 3B
Bluewater Lake	(S. 8, 17, 18, 19, 20, T. 57, R. 25)	1B, 2A, 3B
Carter Lake	(S. 8, 17; T. 148, R. 31)	1B, 2A, 3B
Diamond Lake	(S. 26, 27, 34, T. 141, R. 30)	1B, 2A, 3B
Greeley Lake	(S. 9, T. 147, R. 27)	1B, 2A, 3B
Hazel Lake	(S. 25, T. 141, R. 29)	1B, 2A, 3B
Holywater Lake	(S. 3, T. 52, R. 27)	1B, 2A, 3B
Kabekona Lake	(S. various, T. 142, R. 32, T. 143, R. 33)	1B, 2A, 3B
Kremer Lake	(S. 33, 34, T. 58, R. 26)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Kennedy Lake	(S. 21, T. 58, R. 23)	1B, 2A, 3B
La Salle, Lower Lake	(S. 30, 31, 32, T. 145, R. 35)	1B, 2A, 3B
Little Horn Lake	(S. 3, 10, T. 57, R. 26)	1B, 2A, 3B
Long Lake	(S. 19, T. 144, R. 36; S. 13, 24, T. 144, R. 37)	1B, 2A, 3B
Lower Hay Lake	(S. 18, 19, 30, T. 137, R. 28; S. 13, 24, 25, T. 137, R. 29)	1B, 2A, 3B
Lucky Lake	(S. 14, T. 57, R. 26)	1B, 2A, 3B
Margaret Lake	(S. 16, T. 139, R. 26)	1B, 2A, 3B
Marion Lake	(S. 16, 17, T. 139, R. 26)	1B, 2A, 3B
Little Moonshine Lake (Moonshine)	(S. 28, 33, T. 58, R. 25)	1B, 2A, 3B
Newman (Putman) Lake	(S. 10, 11, T. 145, R. 34)	1B, 2A, 3B
Nickel Lake	(S. 12, T. 59, R. 25)	1B, 2A, 3B
Perch Lake	(S. 33, T. 139, R. 31)	1B, 2A, 3B
Pleasant Lake	(S. 19, T. 137, R. 27)	1B, 2A, 3B
Robertson (Coon) Lake	(S. 32, T. 143, R. 33)	1B, 2A, 3B
Roosevelt Lake	(S. 3, 4, 5, 8, 9, T. 138, R. 26; S. 14, 23, 26, 27, 33, 34, T. 139, R. 26)	1B, 2A, 3B
Snowshoe (Little Andrus) Lake	(S. 29, 30, T. 139, R. 26)	1B, 2A, 3B
Spring Lake	(S. 35, 36, T. 148, R. 35)	1B, 2A, 3B
Strawberry Lake	(S. 27, 34, T. 137, R. 28)	1B, 2A, 3B
Surprise Lake	(S. 34, T. 58, R. 26)	1B, 2A, 3B
Taylor Lake	(S. 16, T. 52, R. 25)	1B, 2A, 3B
Tepee Lake	(S. 30, T. 141, R. 29; S. 25, T. 141, R. 30)	1B, 2A, 3B
Little Turtle Lake	(S. 19, T. 46, R. 26; S. 24, T. 46, R. 27)	1B, 2A, 3B
Trout Lake	(S. various, T. 55, R. 24; T. 56, R. 24)	1B, 2A, 3B
Big Trout Lake	(T. 137, R. 27, 28, various sections)	1B, 2A, 3B
Big Trout Lake	(S. various, T. 57, R. 25, T. 58, R. 25)	1B, 2A, 3B
Little Trout Lake	(S. 8, T. 57, R. 25)	1B, 2A, 3B
Townline Lake	(S. 7, T. 50, R. 22; S. 12, 13, T. 50, R. 23)	1B, 2A, 3B
Wabana Lake	(S. various, T. 57, R. 25)	1B, 2A, 3B
Willard Lake	(S. 15, T. 139, R. 30)	1B, 2A, 3B

Crow Wing River Watershed (No. 16)

Streams

Crow Wing River	(T. 133-139, R. 29-34)	2B
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Waters	Reach or Area Involved or Location	Classification
Basswood Creek	(T. 141, 142, R. 36)	2C
Beaver Creek	(T. 136, 137, R. 32, 33)	2C
Blueberry River	(T. 138, 139, R. 35, 36)	2C
Bluff Creek	(T. 135, 136, R. 36, 37)	2C
Bly Creek	(T. 127, 128, R. 38, 39)	2B
Big Swamp Creek	(T. 137, 138, 139, R. 32, 33)	2C
Calamas Creek	(T. 129, R. 36)	2B
Cat River (Cat Creek)	(S. 4, 9, 10, 11, 12, 13, T. 137, R. 35)	1B, 2A, 3B
Cat River (ex- cept trout waters)	(T. 136, 137, R. 33, 34, 35)	2C
Corey Brook (Covy)	(S. 9, 16, 21, 22, 27, T. 135, R. 30)	1B, 2A, 3B
Corey Brook (Covy) (except trout waters)	(T. 135, 136, R. 30, 31)	2B
Dismal Creek	(T. 129, 130, R. 35)	2B
Dittbrenner Creek	(T. 130, R. 38)	2B
Duel Creek	(S. 20, T. 129, R. 32)	1B, 2A, 3B
Eagle Creek	(T. 130, 131, R. 33, 34, 35)	2B
Egly Creek	(T. 133, R. 34)	2B
Farnham Creek (ex- cept trout waters)	(T. 135, 136, R. 32, 33)	2B
Farnham Creek (Farnum Brook)	(S. 5, 6, 7, T. 135, R. 32; S. 20, 21, 29, 31, 32, 16, T. 136, R. 32)	1B, 2A, 3B
Fawn Creek	(S. 22, 27, 33, T. 134, R. 33)	1B, 2A, 3B
Finn Creek	(S. 2, 3, 11, T. 134, R. 37; S. 27, 34, T. 135, R. 37)	1B, 2A, 3B
Fishhook River	(T. 140, R. 35)	2B
Freeman's Creek	(T. 129, 130, R. 34)	2B
Gull River	(T. 133, 134, R. 29)	2B
Harris Creek	(T. 130, R. 33, 34)	2B
Hay Creek (Cass County)	(S. 7, 18, T. 135, R. 31)	1B, 2A, 3B
Hay Creek (Wadena County)	(S. 7, 8, 9, 10, 11, 17, 18, T. 134, R. 33)	1B, 2A, 3B
Hayden Brook	(T. 133, 134, R. 32)	2B
Home Brook	(T. 134, R. 30)	2B
Indian Creek	(T. 141, 142, R. 36, 37)	2C
Irene-Miltona Creek	(T. 130, R. 37)	2B
Iron Creek	(T. 135, R. 32)	2C
Kettle Creek	(T. 138, R. 37, 36, 35)	2C
Kitten Creek	(T. 137, R. 34, 35)	2C
Leaf River	(T. 134, 135, R. 33, 34, 35, 36, 37)	2B
Little Partridge River	(T. 132, 133, R. 34)	2B

Waters	Reach or Area Involved or Location	Classification
Little Swamp Creek	(T. 136, 137, R. 33)	2C
Little Swan Creek	(T. 135, R. 32)	2C
Long Prairie River	(T. 129-133, R. 32, 33, 34, 35, 36, 37)	2B, 3B
Mayo Brook	(T. 136, R. 29, 30, 31)	2B
Miltona-Ida Creek	(T. 129, 130, R. 37, 38)	2B
Moran Brook	(T. 132, 133, R. 33, 34)	2B
Mosquito Creek	(T. 133, 134, 135, R. 31)	2B
Muckey Creek	(S. 1, 2, 10, 11, 12, T. 139, R. 33)	1B, 2A, 3B
Oak Ridge Creek (Oak)	(T. 133, 134, R. 36)	2C
Olson Brook	(S. 12, 13, 14, T. 136, R. 30)	1B, 2A, 3B
Partridge Creek (Bear Creek)	(T. 131, 132, 133, R. 34, 35)	2B
Peterson Creek	(S. 30, 31, 32, T. 134, R. 30)	1B, 2A, 3B
Pillager Creek	(T. 133, R. 30)	2C
Poplar Brook	(S. 5, 6, T. 135, R. 32; S. 22, 27, 28, 32, 33, T. 136, R. 32)	1B, 2A, 3B
Redeye River	(T. 138-135, R. 37-34)	2C, 3B
Rogers Creek	(S. 29, 32, T. 134, R. 30)	1B, 2A, 3B
Seven Mile Creek	(T. 133, 134, R. 30, 31)	2C
Shell River	(T. 140, 139, 138, R. 37-33)	2B
Spruce Creek (ex- cept trout waters)	(T. 129, 130, 131, R. 36, 37)	2B
Spruce Creek	(S. 28, 29, 30, 31, 32, 33, 34, T. 131, R. 36; S. 3, 4, 9, 10, T. 130, R. 36)	1B, 2A, 3B
Straight River (ex- cept trout waters)	(T. 139, 140, 141, R. 35, 36, 37)	2B
Straight River	(S. 28, 29, 33, 34, 35, 36, T. 140, R. 36; S. 1, T. 139, R. 36)	1B, 2A, 3B
Straight Creek, Upper (Straight River)	(S. 6, 7, T. 140, R. 36; S. 30, 31, T. 141, R. 36; S. 24, 25, T. 141, R. 37; S. 4, 5, 6, 9, 10, 11, 12, T. 139, R. 35)	1B, 2A, 3B
Straight Lake Creek	(S. 1, 2, T. 140, R. 37)	1B, 2A, 3B
Stocking Creek	(T. 138, R. 35)	2C
Stony Brook (ex- cept trout waters)	(T. 135, 136, R. 29, 30, 31)	2B
Stony Brook	(S. 5, 8, T. 135, R. 29; S. 31, 32, T. 136, R. 29; S. 20, 21, 22, 25, 26, 27, 29, T. 136, R. 30; S. 24, 25, 26, 30, 35, T. 136, R. 31)	1B, 2A, 3B
Swan Creek	(T. 134, 135, R. 32)	2C
Trap Brook	(T. 132, R. 32)	2B

Waters	Reach or Area Involved or Location	Classification
Turtle Creek	(T. 129, 130, 131, R. 32, 33)	2B
Tower Creek	(T. 135, R. 32, 33)	2C
Union Creek	(S. 18, 19, 30, 31, T. 134, R. 35)	1B, 2A, 3B
Wallingford Brook	(S. 1, 2, 11, T. 139, R. 33; S. 25, 36, T. 140, R. 33)	1B, 2A, 3B
Willow Creek	(S. 2, 11, 13, 14, 23, 24, T. 133, R. 38; S. 35, T. 134, R. 38)	1B, 2A, 3B

Lakes

Beauty Lake	(S. 21, T. 134, R. 30)	1B, 2A, 3B
Blue Lake	(S. 17, 20, 21, T. 141, R. 34)	1B, 2A, 3B
Long, Little, (Long) Lake	(S. 25, 26, T. 139, R. 36)	1B, 2A, 3B

Crow River Watershed (No. 17)

Streams

Crow River	(T. 118, 119, 120, R. 22, 23, 24)	2B
Middle Fork Crow River	(T. 120, 121, 122, R. 31, 32, 33, 34)	2B
North Fork Crow River	(T. 119, 120, 121, 122, 123, 124, 125, R. 24-36)	2B
South Fork Crow River	(T. 116, 117, 118, R. 25, 26, 27, 28, 29, 30, 31, 32, 33)	2B
Battle Creek	(T. 120, R. 30, 31)	2C
Bear Creek	(T. 116, 117, R. 28, 29)	2B
Belle Creek	(T. 117, 118, R. 32)	2C
Buffalo Creek	(T. 115, 116, R. 26-32)	2B
Crane Creek	(T. 116, 117, R. 26, 27)	2C
Deer Creek	(T. 117, R. 24)	2B
Eagle Creek	(T. 120, R. 29)	2C
Frederick Creek	(T. 119, R. 25)	2C
Jewett Creek	(T. 119, 120, R. 30, 31)	2C
McCuen Creek	(T. 116, R. 29)	2B
Mill Creek	(T. 120, R. 26)	2B
Pioneer Creek	(T. 118, R. 24)	2C
Sarah Creek	(T. 119, R. 24)	2B
Sedan Brook	(T. 124, R. 35, 36)	2B
Silver Creek	(T. 118, R. 29)	2B
Skunk River	(T. 123, R. 34, 35)	2B
Stag Brook	(T. 121, 122, R. 30, 31)	2C
Sucker Creek	(S. 4, 5, 6, T. 118, R. 30)	1B, 2A, 3B
Twelve Mile Creek	(T. 118, 119, R. 26, 27)	2B

Waters	Reach or Area Involved or Location	Classification
Rum River Watershed (No. 18)		
Streams		
Rum River	(T. 31-42, R. 23-27)	2B
Beckins Creek	(T. 36, R. 23)	2B
Black Brook	(T. 41, 42, R. 26)	2C
Bogus Brook	(T. 37, 38, R. 26)	2C
Borden Creek	(S. 5, 6, 8, 9, 16, 17, T. 44, R. 28)	1B, 2A, 3B
Cedar Creek	(T. 32, 33, 34, R. 23, 24)	2B
Chase Brook	(T. 38, 39, R. 27)	2C
Crooked Brook	(T. 33, R. 23)	2B
Estes Brook	(T. 36, 37, 38, R. 27, 28)	2C
Ford Brook	(T. 32, 33, 34, R. 25)	2B
Green Lake Brook	(T. 36, R. 25)	2B
Hanson Brook	(T. 40, R. 27)	2C
Mike Drew Brook	(T. 38, 39, R. 26, 27)	2C
O'Neill Brook	(T. 38, R. 26)	2C
Prairie Brook	(T. 36, R. 27)	2C
Seelye Brook	(T. 33, 34, R. 24, 25)	2B
Spencer Brook	(T. 35, R. 25)	2B
Stanchfield Brook	(T. 37, 38, R. 23, 24)	2B
Tibbetts (Brook) Creek (except trout waters)	(T. 39, 40, R. 27, 28)	2C
Tibbetts Creek	(S. 2, 11, 12, 13, 24, T. 39, R. 28; S. 13, 24, 25, 26, 27, 36, T. 40, R. 28)	1B, 2A, 3B
Trott Brook	(T. 32, R. 25)	2B
Whitney Brook	(T. 39, R. 26, 27)	2C
Wyanett Creek	(T. 35, 36, R. 25)	2B
Vandell Brook	(T. 37, 38, R. 26)	2C

Mississippi-Sauk Rivers Watershed (No. 19)

Streams		
Sauk River	(T. 123, 124, 125, R. 28, 29, 30, 31, 32, 33)	2B, 3B
Adley Creek	(T. 126, R. 33)	2B
Ashley Creek	(T. 126, 127, R. 34, 35, 36)	2B
Arramba Creek	(T. 40, R. 30)	2C
Battle Brook	(T. 35, R. 26, 27)	2C
Beautiful Creek	(T. 127, R. 31)	2C
Black Brook	(T. 42, 43, R. 30)	2C
Boss Creek	(T. 128, 129, R. 34, 35)	2B
Briggs Creek	(S. 2, 11, 12, 14, 15, 22, T. 35, R. 29)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Buckman Creek	(T. 39, 40, R. 30, 31)	2C
Bunker Hill Creek	(T. 38, R. 31)	2B
Clearwater River	(T. 121, 122, 123, R. 27, 28, 29, 30)	2B, 3B
Cold Spring Creek	(S. 14, 15, T. 123, R. 30)	1B, 2A, 3B
Coon Creek	(T. 43, R. 29, 30)	2C
Crooked Lake Ditch	(T. 128, R. 35, 36)	2B
Dagget Brook	(T. 43, R. 29, 30)	2C
Elk River	(T. 38-32, R. 30-26)	2B, 3B
Fairhaven Creek	(S. 5, T. 121, R. 28; S. 32, T. 122, R. 28)	1B, 2A, 3B
Fish Creek	(T. 127, R. 32)	2B
Fletcher Creek	(T. 42, R. 31)	2C
Getchell Creek	(T. 125, 126, R. 31, 32)	2B
Hanson (3-Mile) Brook	(S. 21, 22, 25, 26, 27, 36, T. 122, R. 28)	1B, 2A, 3B
Hay Creek	(T. 43, 44, R. 30, 31)	2C
Hazel Creek	(T. 127, R. 29, 30)	2C
Hillman Creek	(T. 40, 41, R. 28, 29, 30)	2B
Irish Creek	(T. 129, R. 31)	2C
Karlen Creek	(S. 4, 20, 29, 32, 33, T. 127, 128, R. 33)	1B, 2A, 3B
Kinzer Creek	(S. 27, 34, T. 123, R. 30)	1B, 2A, 3B
Krain Creek	(T. 126, R. 31)	2B
Kuntz Creek	(T. 39, R. 30)	2B
Larson Creek	(S. 1, 6, 7, T. 128, 129, R. 32, 33)	1B, 2A, 3B
Little Elk River	(T. 130, 131, R. 30, 31)	2C
So. Branch Little Elk River	(T. 130, R. 30, 31, 32)	2C
Little Rock Creek (excluding trout waters)	(T. 38, 39, R. 30, 31)	2B
Little Rock Creek	(S. 3, 4, 10, 15, 21, 22, T. 38, R. 31)	1B, 2A, 3B
Luxemburg Creek	(S. 15, 16, 17, 19, 20; 21, 22, 30, T. 123, R. 28)	1B, 2A, 3B
Meadow Creek	(T. 128, R. 30)	2C
Meyers (Johnson) Creek	(S. 22, 27, 33, 34, T. 123, R. 28)	1B, 2A, 3B
Big Mink Creek	(T. 41, 42, R. 30, 31)	2C
Little Mink Creek	(T. 41, 42, R. 29, 30, 31)	2C
Little Osakis Creek	(T. 129, R. 34, 35)	2B
Meyers Creek	(S. 25, 24, 13, T. 123, R. 28)	1B, 2A, 3B
Molly Creek	(S. 12, 13, 24, 25, 36, T. 128, R. 32)	1B, 2A, 3B
Moose Lake Creek	(T. 128, R. 32)	2B
Nelson-Hay Creek	(S. 1, 2, T. 130, R. 31)	1B, 2A, 3B
Nokasippi River	(T. 45-43, R. 29, 30, 31, 32)	2B, 3B

Waters	Reach or Area Involved or Location	Classification
Pike Creek	(T. 129, R. 30)	2C
Platte River	(T. 38, 39, 40, R. 31, 32)	2B, 3C
Prairie Brook	(T. 127, R. 33)	2B
Rice Creek	(T. 35, R. 29)	2C
Robinson Hill Creek	(S. 4, 9, 10, 15, T. 123, R. 28; S. 32, 33, T. 124, R. 28)	1B, 2A, 3B
Round Prairie Creek	(S. 4, T. 127, R. 33; S. 20, 29, 33, T. 128, R. 33)	1B, 2A, 3B
Round Lake Creek	(S. 14, 15, T. 43, R. 31)	1B, 2A, 3B
St. Augusta Creek	(T. 123, R. 27, 28)	2B
Sauk Creek, Little	(S. 1, 2, T. 127, R. 34; S. 36, T. 128, R. 34)	1B, 2A, 3B
Skunk River	(T. 42-40, R. 28, 29, 30, 31)	2B
Spunk Creek	(T. 125, 126, 127, R. 29, 30)	2B
Smarts Creek	(S. 17, 20, T. 126, R. 28)	1B, 2A, 3B
Snake River	(T. 33, 34, 35, R. 27, 28)	1B, 2A, 3B
Spring Brook	(S. 7, T. 121, R. 28; S. 12, T. 121, R. 29)	1B, 2A, 3B
Stony Brook	(T. 35, 36, 37, R. 29)	2B
Stony Creek (excluding trout waters)	(T. 124, R. 33, 34)	2B
Stony Creek	(S. 15, 16, 17, 21, 22, 23, T. 124, R. 33)	1B, 2A, 3B
Sucker Creek	(T. 37, R. 30, 31)	2B
Swan River	(T. 128, R. 29, 30, 31, 32, 33)	2B
Taylor Creek	(T. 128, R. 31)	2C
Ted Brook Creek	(T. 130, R. 31)	2C
Thiel Creek (Teal)	(S. 6, 7, T. 121, R. 28)	1B, 2A, 3B
Tibbits Brook	(T. 33, 34, R. 26, 27)	2C
Two Rivers	(T. 127, 128, R. 29, 30, 31)	2B
North Branch Two Rivers	(T. 127, 128, R. 29, 30)	2B
South Branch Two Rivers	(T. 125, 126, 127, R. 30, 31)	2B
Watab River	(T. 124, 125, R. 29, 30)	2B
Willow Creek	(S. 3, 10, 11, 14, T. 121, R. 29)	1B, 2A, 3B
Wolf Creek	(T. 42, R. 30)	2C
Zuleger Creek	(T. 38, R. 31)	2B
Lakes		
Dodd's Quarry, No. 20	(S. 6, T. 35, R. 30)	1B, 2A, 3B
Big Watab Lake	(S. 9, 16, 21, T. 124, R. 30)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Minnesota River Basin Big Stone Lake Watershed (No. 20)		
Streams		
Emily Creek	(T. 118, 119, R. 43)	2C
Fish Creek	(T. 123, 124, R. 47, 48)	2C
Five Mile Creek	(T. 120, R. 44)	2C
Stony Run	(T. 121, 122, R. 45, 46)	2C
Pomme de Terre River Watershed (No. 21)		
Streams		
Pomme de Terre River	(T. 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, R. 43, 42, 41)	2B
Dry Wood Creek	(T. 122, R. 42, 43)	2C
Mud Creek	(T. 124, 125, 126, R. 42, 43)	2B
Pelican Creek	(T. 130, R. 41, 42)	2C
Lac qui Parle River Watershed (No. 22)		
Streams		
Ten (Three) Mile Creek	(S. 1, 2, 11, T. 117, R. 42; S. 26, 35, 36, T. 118, R. 42)	1B, 2A, 3B
Chippewa River Watershed (No. 23)		
Streams		
Chippewa River	(T. 117-129, R. 41-22)	2B, 3B
East Branch Chippewa River	(T. 122-126, R. 37-39)	2B
Little Chippewa River	(T. 125, 126, R. 39)	2B
Cottonwood Creek	(T. 119, 120, 121, R. 41, 42)	2C
Dry Weather Creek	(T. 117, 118, R. 39, 40, 41)	2C
Hassel Creek	(T. 122, 123, R. 38, 39)	2C
Mud Creek	(T. 122, 123, R. 36, 37, 38)	1B, 2A, 3B
Outlet Creek	(T. 124, 125, R. 39)	
Perkins Creek	(S. 7, T. 125, R. 37; S. 12, T. 125, R. 38)	1B, 2A, 3B
Shakopee Creek	(T. 119, 120, R. 36, 37, 38, 39, 40)	2C
Signalness Creek	(T. 124, R. 39)	2B
Spring Creek	(T. 117, R. 40)	2C
Trapper Run	(T. 125, 126, R. 38, 39)	2B

Waters	Reach or Area Involved or Location	Classification
Yellow Medicine River Watershed (No. 24)		
Streams		
Yellow Medicine River (source to the mouth of the North Fork Yellow Medicine River)	(T. 112, 113, 114, 115, R. 38, 39, 40, 41, 42, 43, 44)	2B
South Fork Yellow Medicine River	(T. 111, 112, 113, R. 42, 43, 44, 45)	2B
Boiling Spring Creek	(T. 113, 114, R. 37, 38)	2C
Echo Creek	(T. 114, R. 37)	2C
Hazel Run	(T. 115, R. 39, 40, 41, 42)	2C
Mud Creek	(T. 114, R. 44, 43, 45)	2C
Spring Creek	(T. 114, 115, R. 40, 41)	2B
Stony Run Creek	(T. 116, R. 40)	2C
Wood Lake Creek	(T. 113, 114, R. 38, 39)	2C
Redwood River Watershed (No. 25)		
Streams		
Redwood River (except trout waters)	(T. 108-113, R. 35-44)	2B
Redwood River	(S. 5, 8, T. 110, R. 42; S. 32, T. 111, R. 42)	1B, 2A, 3B
Clear Creek	(T. 111, 112, R. 37, 38, 39, 40)	2B
Coon Creek	(T. 110, 111, R. 43, 44, 45)	2B
Ramsey Creek	(T. 112, 113, R. 36, 37, 38)	1B, 2A, 3B
Three Mile Creek	(T. 111, 112, R. 40, 41, 42, 43)	2B
Cottonwood River Watershed (No. 26)		
Streams		
Cottonwood River	(T. 108-110, R. 30-42)	2B
Little Cottonwood River	(T. 107, 108, 109, R. 29, 30, 31, 32, 33, 34, 35, 36)	2B
Crow Creek	(T. 112, R. 35)	2C
Dry Creek	(T. 108, 109, R. 36)	2C
Dutch Charley's Creek	(T. 107, 108, 109, R. 37, 38)	2B
Highwater Creek	(T. 107, 108, 109, R. 37)	2B
Hindeman Creek	(S. 19, 20, 21, 28, T. 111, R. 32)	1B, 2A, 3B
John's Creek	(S. 31, T. 111, R. 31)	1B, 2A, 3B
Meadow Creek	(T. 110, 111, R. 40, 41)	2B
Mine Creek (Coal Mine)	(T. 109, R. 35, 36, 37)	2B
Minneopa Creek	(T. 107, 108, R. 28, 29)	2B

Waters	Reach or Area Involved or Location	Classification
Morgan Creek	(T. 109, R. 29, 30)	2C
Mound Creek	(T. 108, R. 35, 36)	2B
Pell Creek	(T. 108, 109, R. 37, 38, 39)	2B
Plum Creek	(T. 108, 109, R. 39, 38, 40)	2B
Ramsey Creek	(S. 36, T. 112, R. 36)	1B, 2A, 3B
Sleepy Eye Creek	(T. 109, 110, 111, R. 33, 34, 35, 36, 37, 38)	2B
Spring Creek	(T. 110, 111, R. 32, 33, 34)	2C
Wabasha Creek	(T. 112, R. 34)	2C

Blue Earth River Watershed (No. 27)

Streams

East Fork Blue Earth River (Source to Brush Creek)	(T. 102, R. 24, 25)	2B
Badger Creek	(T. 101, 102, R. 28)	2C
Boot Creek	(T. 105, 106, R. 22, 23)	2C
Butterfield Creek	(T. 106, 107, R. 31, 32, 33)	2C
Cedar Run Creek	(T. 103, 104, R. 32, 33)	2C
Center Creek	(T. 103, R. 28, 29, 30)	2B
Big Cobb River	(T. 104, 105, 106, 107, R. 23, 24, 25, 26)	2C
Little Cobb River	(T. 105, 106, R. 23, 24, 25, 26)	2C
Elm Creek	(T. 103, 104, R. 28, 29, 30, 31, 32, 33, 34)	2B
North Fork Elm Creek	(T. 104, R. 34)	2C
South Fork Elm Creek	(T. 103, R. 34)	2C
Foster Creek	(T. 102, 103, R. 24)	2C
Iosco Creek	(T. 108, R. 23)	2C
Le Sueur River	(T. 105, 106, 107, 108, R. 22, 23, 24, 25, 26, 27)	2B
Little Le Sueur River	(T. 106, R. 22)	2C
Lily Creek	(T. 102, 103, R. 31, 32)	2B
Little Bull Run Creek	(T. 106, R. 24, 25)	2C
Maple River	(T. 104, 105, 106, 107, R. 24, 25, 26, 27)	2B
Mink Creek	(T. 104, R. 30, 31)	2C
Perch Creek	(T. 104, 105, 106, R. 29, 30)	2C
St. James Creek	(T. 105, 106, 107, R. 31, 32, 33)	2C
Silver Creek	(T. 108, R. 23, 24)	2C
Spring Branch Creek	(T. 106, R. 29, 30)	2C
Watowan River	(T. 106, 107, R. 27, 28, 29, 30, 31, 32, 33, 34, 35)	2B
North Fork Watowan River	(T. 107, R. 31, 32, 33, 34, 35)	2B

Waters	Reach or Area Involved or Location	Classification
South Fork Watonwan River	(T. 104, 105, 106, 107, R. 30, 31, 32, 33, 34, 35)	2B
Willow Creek	(T. 104, 105, R. 31, 32)	2C
Lakes		
Amber Lake	(T. 102, R. 30)	1C, 2B, 3B
Bardwell Lake	(T. 102, R. 30)	1C, 2B, 3B
Budd Lake	(T. 102, R. 30)	1C, 2B, 3B
George Lake	(T. 102, R. 30)	1C, 2B, 3B
Hall Lake	(T. 102, R. 30)	1C, 2B, 3B
Mud Lake	(T. 102, R. 30)	1C, 2B, 3B
North Silver Lake	(T. 101, R. 30)	1C, 2B, 3B
Sisseton Lake	(T. 102, R. 30)	1C, 2B, 3B
Wilmert Lake	(T. 101, R. 30)	1C, 2B, 3B

Minnesota River-Hawk Creek (No. 28)**Streams**

Beaver Creek	(T. 113, 114, R. 34, 35)	2B
East Fork Beaver Creek	(T. 114, 115, R. 34, 35)	2B
West Fork Beaver Creek	(T. 114, 115, 116, R. 35, 36)	2B
Birch Coulee Creek	(T. 112, 113, 114, R. 34)	2B
Brafees Creek	(T. 116, 117, R. 40)	2C
Chetomba Creek	(T. 116, 117, R. 36, 37, 38)	2C
Eight Mile Creek	(T. 111, 112, 113, R. 31)	2C
Fort Ridgely Creek	(T. 111, 112, 113, R. 33)	2B
Hawk Creek	(T. 115, 116, 117, 118, R. 37, 38, 39)	2B
Little Rock Creek	(T. 111, 112, 113, 114, R. 32)	2B
Middle Creek	(T. 113, 114, R. 36)	2C
Nicollet Creek	(T. 109, R. 28)	2B
Palmer Creek	(T. 116, 117, 118, R. 39)	2C
Sacred Heart Creek	(T. 114, 115, 116, R. 37)	2B
Smith Creek	(T. 113, R. 35, 36)	2C
Three Mile Creek	(T. 112, R. 33)	2C
Timms Creek	(T. 114, 115, R. 36)	2C

Lower Minnesota River Watershed (No. 29)**Streams**

Barney Fry Creek	(T. 111, R. 26, 27)	2B
Bevens Creek	(T. 115, 114, R. 24, 25, 26)	2B
Bluff Creek	(T. 116, R. 23)	2B
Buffalo Creek	(T. 113, R. 26, 27)	2B

Waters	Reach or Area Involved or Location	Classification
Carver Creek	(T. 115, 116, R. 23, 24, 25)	2B
Chaska Creek	(T. 115, 116, R. 23)	2B
Credit River	(T. 114, 115, R. 23, 24)	2B
Cherry Creek	(T. 110, R. 25, 26)	2B
Eagle Creek	(S. 7, 18, T. 115, R. 21; S. 13, T. 115, R. 22)	1B, 2A, 3B
Eagle Creek, East Branch	(S. 18, T. 115, R. 21)	1B, 2A, 3B
Forest Prairie Creek	(T. 112, R. 24, 25)	2B
High Island Creek	(T. 113, 114, R. 26, 27, 28)	2B
Le Sueur Creek	(T. 111, 112, R. 24, 25)	2B
Nine Mile Creek	(T. 115, 116, 117, R. 24, 22, 21)	2B
Paul's Creek	(S. 14, T. 110, R. 26)	1B, 2A, 3B
Porter Creek	(T. 113, 114, R. 21, 22, 23)	2B
Purgatory Creek	(S. 29, 31, 32, T. 117, R. 22)	1B, 2A, 3B
Purgatory Creek (except trout waters)	(T. 116, 117, R. 22)	2B
Raven Stream	(T. 112, 113, 114, R. 23, 24)	2B
Riley Creek	(T. 116, R. 22, 23)	2B
Rush Creek (Rush River)	(T. 112, 113, R. 26, 27, 28)	2B
North Fork Rush River	(T. 112, R. 27, 28)	2B
Middle Fork Rush River	(T. 112, 113, R. 27, 28, 29, 30, 31)	2B
South Fork Rush River	(T. 112, 113, R. 26, 27, 28, 29)	2B
Sand Creek	(T. 115, 114, 113, 112, 111, R. 23, 22)	2B
Shakopee Mill Pond Creek	(S. 5, 6, T. 115, R. 22; S. 32, T. 116, R. 22)	1B, 2A, 3B
Shanaska Creek	(T. 109, 110, R. 26)	2B
Silver Creek	(T. 114, R. 24, 25)	2B
Lakes		
Courthouse Lake	(S. 9, T. 115, R. 23)	1B, 2A, 3B
St. Croix River Basin Kettle River Watershed (No. 30)		
Kettle River	(T. 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, R. 19, 20)	2B
Bang's Brook	(S. 15, 20, 21, 22, 29, T. 41, R. 17)	1B, 2A, 3B
Barnes Spring	(S. 1, 12, T. 41, R. 18)	1B, 2A, 3B
Bear Creek	(T. 40, 41, 42, 43, R. 18, 19, 20)	2B
Birch Creek	(T. 45, R. 20, 21, 22)	2B
Bjork Creek	(S. 2, 9, 10, 11, T. 42, R. 16)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Bremen Creek	(T. 44, R. 21, 22)	2B
Little Bremen Creek	(T. 44, 45, R. 21)	2B
Cedar Creek	(T. 40, R. 20)	2B
Cons Creek	(S. 15, 22, T. 41, R. 17)	1B, 2A, 3B
East Fork Crooked Creek	(T. 41, 42, 43, 44, R. 17, 18)	2B
Crooked Creek, West Fork	(S. 11, 12, T. 41, R. 18; S. 3, 4, 9, 10, 16, T. 42, R. 18; S. 27, 34, T. 43, R. 18)	1B, 2A, 3B
Crooked Creek	(S. 18, 19, 20, 29, 30, T. 41, R. 17; S. 12, 13, T. 41, R. 18)	1B, 2A, 3B
Crystal Creek	(S. 9, 10, 15, T. 41, R. 16)	1B, 2A, 3B
Dead Moose River	(T. 46, 47, R. 20, 21, 22)	2B
Deer Creek	(T. 41, R. 20)	2B
Fox Brook	(T. 41, R. 20)	2B
North Fork Grind- stone River	(T. 41, 42, R. 21)	2B
Grindstone River	(S. 20, 21, 29, T. 42, R. 21)	1B, 2A, 3B
South Fork Grind- stone River	(T. 41, 42, R. 21, 22)	2B
Hay Creek (Clover Creek)	(S. 6, 7, 8, 18, 19, T. 40, R. 18; S. 10, 15, 20, 21, 22, 29, 33, T. 41, R. 18)	1B, 2A, 3B
Hanson Creek	(T. 42, R. 16)	2B
Johnson Creek	(T. 43, R. 17)	2B
Keene Creek	(T. 42, 43, 44, R. 17)	2B
Kenny's Creek	(T. 41, R. 17)	2B
Kennedy Brook	(T. 40, R. 19)	2B
King Creek	(T. 47, R. 19)	2C
Langstrom Creek	(T. 42, R. 16)	2B
Larson Creek	(S. 4, 5, T. 44, R. 17; S. 29, 32, T. 45, R. 17)	1B, 2A, 3B
Little Hay Creek	(S. 8, 9, T. 40, R. 18)	1B, 2A, 3B
Lost Creek	(S. 9, 10, 15, T. 40, R. 19)	1B, 2A, 3B
Mark Andrews (Trout) Brook	(T. 41, 42, R. 16)	1B, 2A, 3B
McCullen (Albrechts) Creek	(S. 28, 33, T. 42, R. 16)	1B, 2A, 3B
McDermott Creek	(T. 42, 43, 44, R. 16, 17)	2B
Moose Horn River (except trout waters)	(T. 46, 47, 48, R. 18, 19)	2B
Moose Horn River	(S. 3, 9, 10, 14, 15, 16, 23, 26, T. 48, R. 18)	1B, 2A, 3B
West Fork Moose Horn River	(T. 47, R. 19)	2B
O'Mix Creek	(T. 43, 44, R. 20)	2B
Ox Creek	(T. 43, R. 17)	2B

Waters	Reach or Area Involved or Location	Classification
Pine River	(T. 43, 44, R. 20, 21)	2B
Little Pine River	(T. 43, R. 21)	2B
Sand River (except trout waters)	(T. 40-44, R. 18, 19)	2B
Sand River	(S. 4, 5, 7, 8, 18, 19, T. 43, R. 18; S. 33, T. 44, R. 18)	1B, 2A, 3B
Little Sand Creek	(T. 40, 41, 42, R. 18, 19)	2B
Son-Ke-Ta (Sonqueta) Creek	(T. 41, R. 16)	2B
Split Rock River	(T. 45, 46, R. 20, 21, 22)	2B
Spring Brook (Creek)	(S. 16, 17, 18, 21, T. 41, R. 20)	1B, 2A, 3B
Squib Creek	(T. 42, 43, R. 16, 17)	2B
Lower Tamarack River	(T. 41, 42, 43, 44, R. 16, 17)	2B
Thunder Creek	(T. 41, 42, R. 18)	2B
Wilbur Brook	(S. 29, 30, T. 41, R. 17; S. 23, 25, 26, T. 41, R. 18)	1B, 2A, 3B
Willow River (except trout waters)	(T. 44, 45, R. 17-20)	2B
Willow River	(S. 19, 22, 27, 28, 29, 30, T. 45, R. 17; S. 13, 14, 15, 24, T. 45, R. 18)	1B, 2A, 3B
Little Willow River	(T. 44, 45, R. 18, 19)	2B
Wolf Creek	(S. 4, 9, 16, T. 42, R. 18; S. 32, 33, T. 43, R. 18)	1B, 2A, 3B
Lakes		
Greigs Lake	(S. 10, T. 41, R. 17)	1B, 2A, 3B
Grindstone Lake	(S. 5, 8, 16, 17, 21, T. 42, R. 21)	1B, 2A, 3B
Snake River Watershed (No. 31)		
Streams		
Snake River	(T. 38-44, R. 19-23)	2B
Ann River	(T. 39, 40, R. 24)	2B
Little Ann River	(T. 40, 41, R. 24, 25)	2B
Bear Creek	(T. 43, R. 23, 24)	2C
Bergman Brook	(T. 42, 43, R. 23, 24)	2C
Chelsey Brook	(T. 42, 43, 44, R. 22, 23)	2B
Cowan Brook	(T. 42, 43, 44, R. 23)	2B
Groundhouse River	(T. 38, 39, 40, 41, R. 24, 25, 26)	2B
South Fork Ground- house River	(T. 38, 39, R. 25, 26)	2B
West Fork Ground- house River	(T. 39, 40, R. 26)	2C
Hay Creek (1)	(T. 42, R. 23, 24)	2B

Waters	Reach or Area Involved or Location	Classification
Hay Creek (2)	(T. 38, R. 22)	2B
Knife River	(T. 40, 41, 42, R. 23, 24, 25)	2B
Mission Creek (except trout waters)	(T. 39-41, R. 20, 21)	1B, 2B
Mission Creek	(S. 1, 2, T. 40, R. 21; S. 31, T. 41, R. 20; S. 36, T. 41, R. 21)	1B, 2A, 3B
Mud Creek	(T. 38, 39, 40, R. 22, 23)	2B
Pokegama Creek	(T. 40, 41, R. 22)	2B
Red Horse Creek	(T. 39, R. 19)	2B
Snowshoe Brook	(T. 41, 42, R. 23)	2B
Spring Creek	(T. 39, R. 23, 24)	2B

Lower St. Croix River Watershed (No. 32)

Streams

Beaver Creek	(S. 7, 8, 17, T. 35, R. 20; S. 3, 4, 10, 12, 13, 14, 15, T. 35, R. 21; S. 33, 34, T. 36, R. 21)	1B, 2A, 3B
Beaver Creek, South Tributary	(S. 15, T. 35, R. 21)	1B, 2A, 3B
Brown's Creek	(S. 20, 21, T. 30, R. 20)	1B, 2A, 3B
Dry Creek	(T. 34, R. 19)	2B
Goose Creek	(T. 36, R. 20, 21, 22)	2B
Hay Creek (except trout waters)	(T. 35, R. 20, 21)	2B
Hay Creek	(S. 7, 8, T. 35, R. 20)	1B, 2A, 3B
Lawrence Creek	(S. 2, 3, 10, T. 33, R. 19)	1B, 2A, 3B
Old Mill Stream	(S. 6, T. 31, R. 19; S. 1, T. 31, R. 20; S. 36, T. 32, R. 20)	1B, 2A, 3B
Rock Creek	(T. 37, 38, R. 20, 21)	1B, 2B
Rush Creek	(T. 37, R. 20, 21)	1B, 2B
Sunrise River	(T. 33, 34, 35, R. 20, 21)	2B
Silver Creek	(T. 30, R. 20)	2B
North Branch Sunrise River	(T. 35, R. 20, 21, 22, 23)	2B
West Branch Sunrise River	(T. 34, R. 21, 22)	1B, 2B
South Branch Sunrise River	(T. 33, 34, R. 21, 22)	2B
Trout Brook	(T. 27, R. 20)	2B
Valley Branch	(T. 28, R. 20)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Lower Mississippi River Basin Metropolitan Area Watershed (No. 33)		
Streams		
Vermilion River	(T. 113, 114, R. 15-21)	2B
South Branch Vermilion River	(T. 113, 114, R. 18, 19, 20)	2B
Bass Creek	(T. 118, 119, R. 21, 22)	2B
Basset Creek	(T. 118, R. 22, 21, 24)	2B
Battle Creek	(T. 28, R. 21, 22)	2B
Clearwater Creek (Hardwood Creek)	(T. 31, 32, R. 22, 21)	2B
Coon Creek	(T. 31, 32, R. 24, 23)	2B
Diamond Creek	(T. 120, R. 22)	2B
Elm Creek	(T. 120, 119, 118, R. 21, 22, 23)	2B
Fish Creek	(T. 28, R. 22)	2C
Minnehaha Creek	(T. 117, R. 24, 21, 22)	2B
Rice Creek	(T. 30, 31, 32, R. 24, 23, 22)	1C, 2B, 3B
Rush Creek	(T. 119, 120, R. 22, 23)	2B
Shingle Creek	(T. 118, 119, R. 24, 21)	2B
Cannon River Watershed (No. 34)		
Streams		
Cannon River	(T. 109, 110, 111, 112, 113, R. 15, 16, 17, 18, 19, 20, 21, 22, 23)	2B
Big Cannon River	(T. 109, 110, R. 22, 23, 24)	2B
Little Cannon River	(T. 110, 111, 112, R. 18, 17)	2B, 3B
Belle Creek (except trout waters)	(T. 111, 112, 113, R. 16, 17)	2B
Belle Creek	(S. 25, 35, 36, T. 111, R. 17; S. 19, 20, 30, T. 111, R. 16)	1B, 2A, 3B
Chub Creek	(T. 112, R. 19, 20)	2B
North Branch Chub Creek	(T. 112, 113, R. 19)	2C
Crookers Creek	(T. 109, 110, R. 21)	2B
Crane Creek	(T. 107, 108, R. 20, 21, 22)	2C
Devil Creek	(T. 109, 110, R. 22)	2B
Dutch Creek	(T. 112, R. 20, 21)	2C
Falls Creek	(T. 110, R. 19, 20)	2B
Heath Creek	(T. 111, R. 20, 21)	2B
MacKenzie Creek	(T. 108, 109, R. 21)	2C
Maple Creek	(T. 107, R. 19, 20)	2B
Mud Creek	(T. 108, 109, R. 20, 21)	2C

Waters	Reach or Area Involved or Location	Classification
Pine Creek	(T. 112, 113, R. 17, 18)	2C
Prairie Creek	(T. 112, 111, 110, R. 18, 19, 20)	2C
Rush Creek	(T. 105, 106, 107, 108, 109, R. 19, 20)	2B
Straight River	(T. 105, 106, 107, 108, 109, 110, R. 20, 21)	2B
Turtle Creek	(T. 106, 107, R. 20)	2B
Wolf Creek	(T. 111, R. 20, 21)	2B

Zumbro River Watershed (No. 35)

Streams

Zumbro River	(T. 108, 109, 110, R. 9, 10, 11, 12, 13, 14)	2B
North Fork Zumbro River	(T. 109, 110, R. 14-20)	2B
North Branch Middle Fork Zumbro River	(T. 108, 109, R. 14-17)	2B
South Fork Zumbro River	(T. 105-108, R. 14, 15, 16, 17)	2B
South Branch Middle Fork Zumbro River	(T. 107, 108, R. 14-18)	2B
Middle Fork Zumbro River	(T. 107, 108, 109, R. 14-18)	2B
Badger Run	(T. 106, R. 13)	2B
Bear Creek (ex- cluding trout waters)	(T. 106, R. 12, 13)	2B
Bear Creek	(S. 15, 16, 17, 18, 21, T. 106, R. 12)	1B, 2A, 3B
Bullard Creek	(T. 112, R. 14)	2B
Cascade Creek	(T. 106, 107, R. 14, 15)	2B
Cold Creek	(T. 110, 111, R. 14)	2C
Cold Spring Brook	(S. 25, 36, T. 110, R. 14; S. 30, 31, T. 110, R. 13)	1B, 2A, 3B
Devlin Creek	(S. 26, 27, 34, 35, T. 109, R. 17)	1B, 2A, 3B
Dodge Center Creek	(T. 106, 107, R. 17, 18)	2B
Gilbert Creek (ex- cluding trout waters)	(T. 111, R. 12, 13)	2B
Gilbert Creek	(S. 1, 11, 12, T. 111, R. 13)	1B, 2A, 3B
Harkcom Creek	(T. 108, R. 16)	2C
Hay Creek (ex- cluding trout waters)	(T. 111, 112, R. 14, 15)	2B
Hay Creek	(S. 23, 24, 26, 27, 33, 34, T. 112, R. 15)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
King Creek	(T. 111, R. 11, 12)	2C
Long Creek	(T. 108, 109, R. 12)	2C
Masten Creek	(S. 22, 27, T. 107, R. 16)	1B, 2A, 3B
Mazepa Creek	(S. 24, 25, T. 110, R. 15; S. 4, 5, 9, T. 109, R. 14; S. 19, 29, 30, 32, T. 110, R. 14)	1B, 2A, 3B
Miller Creek	(T. 111, R. 12)	2B
Pine Island Creek	(T. 109, R. 14, 15, 16)	2B
Pleasant Valley Creek	(S. 9, 10, 14, T. 112, R. 13)	1B, 2A, 3B
Plum Creek	(T. 108, R. 15)	2C
Milliken Creek	(T. 108, R. 16, 17, 18)	2B
Salem Creek	(T. 106, R. 15, 16)	2C
Shingle Creek	(T. 109, 110, R. 17)	2C
Silver Creek	(T. 107, R. 12, 13)	2B
Silver Spring Creek	(T. 108, 109, R. 13)	2C
Spring Creek	(T. 110, R. 12, 13)	2B
Spring Creek	(S. 6, 7, 18, T. 112, R. 15)	1B, 2A, 3B
Sugar Creek (Sugarloaf Creek)	(T. 111, 112, R. 12, 13)	2C
Trout Brook	(T. 110, 111, R. 14, 15)	2B
Wells Creek (ex- cluding trout waters)	(T. 111, 112, R. 13, 14)	2B
Wells Creek	(S. 3, 4, : , 6, 7, 8, T. 111, R. 14; S. 33, 34, T. 112, R. 14)	1B, 2A, 3B
West Albany Creek	(T. 110, 111, R. 12, 13)	2C
West Indian Creek (ex- cluding trout waters)	(T. 108, 109, 110 R. 11)	2B
West Indian Creek	(S. 16, 21, 28, T. 109, R. 11)	1B, 2A, 3B
Willow Creek	(T. 105, 106, R. 14)	2B

Root River Watershed (No. 36)

Streams

Badger Creek (ex- cluding trout waters)	(T. 103, R. 6)	2B
Badger Creek	(S. 16, 21, 27, 28, T. 103, R. 6)	1B, 2A, 3B
Bear Creek (ex- cluding trout waters)	(T. 107, R. 9)	2C
Bear Creek	(S. 13, 14, 15, T. 107, R. 9)	1B, 2A, 3B
Beaver Creek (ex- cluding trout waters)	(T. 108, R. 10, 11)	2B
Beaver Creek (Wabasha County)	(S. 24, T. 108, R. 11; S. 15, 16, 19, 20, 21, T. 108, R. 10)	1B, 2A, 3B
Beaver Creek (ex- cluding trout waters) (Houston County)	(T. 102, 103, R. 6)	2B

Waters	Reach or Area Involved or Location	Classification
Beaver Creek (Houston County)	(S. 5, T. 102, R. 6; S. 31, 32, T. 103, R. 6)	1B, 2A, 3B
East Beaver Creek	(S. 5, 8, 17, T. 102, R. 6)	1B, 2A, 3B
West Beaver Creek	(S. 13, 24, 25, 26, T. 102, R. 7; S. 5, 6, 7, 18, 19, 30, T. 102; R. 6)	1B, 2A, 3B
Bee Creek	(S. 29, 32, 33, T. 101, R. 6)	1B, 2A, 3B
Big Trout Creek (Pickwick)	(T. 106, R. 6)	2B
Big Springs Creek (ex- cluding trout waters)	(T. 104, R. 9)	2B
Big Springs Creek	(S. 21, 22, 26, 27, T. 104, R. 9)	1B, 2A, 3B
Brush Valley Creek	(T. 104, R. 5)	2C
Butterfield Creek (ex- cluding trout waters)	(T. 103, R. 4)	2B
Butterfield Creek	(S. 17, 18, 20, T. 103, R. 4)	1B, 2A, 3B
Camp Creek (ex- cluding trout waters)	(T. 102, R. 10)	2B
Camp Creek	(S. 5, 7, 17, 20, T. 102, R. 10)	1B, 2A, 3B
Carters Creek	(T. 103, R. 12)	2C
Carey Creek (ex- cluding trout waters)	(T. 104, R. 14)	2B
Carey Creek	(S. 19, 20, T. 104, R. 14)	1B, 2A, 3B
Cedar Valley Creek	(S. 21, 22, 28, 29, 31, 32, T. 106, R. 6)	1B, 2A, 3B
Clear Creek	(T. 102, R. 4)	2C
Crystal Creek	(T. 103, 104, R. 5, 6)	2B
Dakota Creek	(T. 105, R. 5)	2C
Dry Creek	(T. 108, R. 12, 13)	2C
Daley Creek	(S. 4, 5, T. 103, R. 7; S. 33, T. 104, R. 7)	1B, 2A, 3B
Deer Creek	(T. 102, 103, R. 12, 13, 14, 15)	2B
Dexter Creek	(S. 12, 13, 14, 15, 16, T. 103, R. 5)	1B, 2A, 3B
Diamond Creek	(S. 18, 19, T. 103, R. 8; S. 2, 3, 11, 10, 13, 14, 24, T. 103, R. 9)	1B, 2A, 3B
Duschee Creek (ex- cluding trout waters)	(T. 102, 103, R. 10)	2B
Duschee Creek	(S. 1, T. 102, R. 10; S. 24, 25, 26, 36, T. 103, R. 10)	1B, 2A, 3B
East Burns Valley Creek (excluding trout waters)	(T. 106, 107, R. 7)	2B
East Burns Valley Creek	(S. 3, 10, 15, T. 106, R. 7)	1B, 2A, 3B
Etna Creek	(S. 25, 35, 36, T. 102, R. 13)	1B, 2A, 3B
Ferndale Creek	(T. 104, R. 7)	2B

Waters	Reach or Area Involved or Location	Classification
Ferguson Creek	(S. 18, T. 105, R. 8; S. 12, 13, T. 105, R. 9)	1B, 2A, 3B
Frego Creek	(S. 11, 14, 15, 22, 23, 27, T. 101, R. 9)	1B, 2A, 3B
North Branch Forest- ville Creek	(S. 13, 14, 15, T. 102, R. 12)	1B, 2A, 3B
South Branch Forest- ville Creek	(S. 24, 25, T. 102, R. 12)	1B, 2A, 3B
Garvin Brook (ex- cluding trout waters)	(T. 106, 107, R. 8)	2B
Garvin Brook	(S. 4, 5, 8, 17, T. 106, R. 8; S. 33, 34, T. 107, R. 8)	1B, 2A, 3B
Gilmore Creek (ex- cluding trout waters)	(T. 107, R. 7)	2C
Gilmore Creek	(S. 31, T. 107, R. 7)	1B, 2A, 3B
Gibben (Gibb) Creek	(S. 9, 16, 21, 27, 28, T. 103, R. 9)	1B, 2A, 3B
Gorman Creek	(T. 110, R. 10)	2B
Hamilton Creek	(S. 6, T. 103, R. 13; S. 1, T. 103, R. 14; S. 36, T. 104, R. 14)	1B, 2A, 3B
Hemingway Creek	(S. 26, 34, 35, T. 105, R. 9)	1B, 2A, 3B
Homer Creek	(T. 106, R. 6)	2C
Indian Spring Creek	(T. 103, R. 5)	2C
East Indian Creek (ex- cluding trout waters)	(T. 109, R. 9, 10, 11)	2B
East Indian Creek	(S. 22, 28, 29, 31, T. 109, R. 10; S. 36, T. 109, R. 11)	1B, 2A, 3B
Jordan Creek (ex- cluding trout waters)	(T. 104, R. 12)	2B
Little Jordan Creek (Jordan Creek)	(S. 21, 22, 26, 27, T. 104, R. 12)	1B, 2A, 3B
Kedron Creek (ex- cluding trout waters)	(T. 104, R. 13)	2B
Kedron Creek	(S. 26, 35, 36, T. 104, R. 13)	1B, 2A, 3B
Little Kingsley Creek	(T. 103, R. 12, 13)	2B
Kinney Creek	(S. 1, 12, 13, T. 105, R. 13; S. 36, T. 106, R. 13)	1B, 2A, 3B
Lanesboro Park Pond	(S. 13, T. 103, R. 10)	1B, 2A, 3B
Little Trout Creek	(T. 106, R. 5, 6)	2C
Lost Creek (ex- cluding trout waters)	(T. 104, R. 11, 12)	2B
Lost (Upper Bear) Creek	(S. 18, T. 104, R. 11; S. 8, 9, 10, 11, 13, 14, 15, 16, T. 104, R. 12)	1B, 2A, 3B
Lynch Creek	(S. 2, 11, 14, T. 104, R. 11)	1B, 2A, 3B
Mahoney Creek	(T. 103, R. 10)	2C

Waters	Reach or Area Involved or Location	Classification
Mill Creek	(S. 14, 23, 25, 26, 36, T. 105, R. 12)	1B, 2A, 3B
Money Creek (ex- cluding trout waters)	(T. 104, 105, R. 6, 7)	2B
Money Creek	(S. 3, 4, 7, 8, 9, 16, T. 105, R. 7)	1B, 2A, 3B
Mound Prairie Creek	(T. 104, R. 5)	2C
Nepstad Creek	(S. 4, 5, 7, 8, 9, T. 102, R. 8)	1B, 2A, 3B
Old Channel Zumbro River	(T. 109, 110, R. 9, 10)	2B
Partridge Creek (ex- cluding trout waters)	(T. 101, 102, R. 10)	2B
Partridge Creek (Doxbury)	(S. 20, 21, 28, 33, T. 102, R. 10)	1B, 2A, 3B
Peterson Creek	(S. 7, 8, T. 106, R. 8)	1B, 2A, 3B
Pine Creek (ex- cluding trout waters)	(T. 104, 105, R. 9)	2B
Pine Creek (Southern Winona County)	(S. 25, 26, 27, 34, 35, T. 105, R. 9)	1B, 2A, 3B
Pine Creek (South Fork)	(S. 18, 19, T. 105, R. 5; S. 13, 24, T. 105, R. 6)	1B, 2A, 3B
Pleasant Valley Creek	(T. 106, 107, R. 6, 7)	2C
Rice Creek (ex- cluding trout waters)	(T. 103, 104, R. 11)	2B
Rice Creek	(S. 3, 4, T. 103, R. 11; S. 14, 22, 23, T. 104, R. 11)	1B, 2A, 3B
Riceford Creek	(S. 6, 7, 18, 19, T. 101, R. 7; S. 1, 12, 13, T. 101, R. 8)	1B, 2A, 3B
Robinson Creek	(T. 104, 105, R. 14, 15)	2B
Rollingstone Creek (Rupprecht Creek) (excluding trout waters)	(T. 107, R. 8, 9)	2B
Rollingstone (Rupprecht) Creek	(S. 13, 24, 25, 26, 35, T. 107, R. 9)	1B, 2A, 3B
Root River	(T. 103, 104, R. 4, 5, 6, 7, 8, 9, 10, 11, 12)	2B
North Branch Root River	(T. 104, 105, R. 11, 12, 13, 14, 15, 16)	2B
South Branch Root River (excluding trout waters)	(T. 102, 103, R. 9-14)	2B
Root River, South Branch	(S. 5, 6, T. 102, R. 10; S. 1, 2, 3, 4, 5, 7, 8, 9, 18, T. 102, R. 11; S. 13, 21, 22, 23, 24, 26, 27, T. 102, R. 12)	1B, 2A, 3B
Root River, South Fork	(S. 17, 18, 19, T. 102, R. 8; S. 24, 25, 26, T. 102, R. 9)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
Rush Creek (excluding trout waters)	(T. 104, 105, 106, R. 8, 9)	2B
Rush Creek	(S. 7, 18, 19, 20, 29, T. 105, R. 8)	1B, 2A, 3B
Silver Creek (excluding trout waters)	(T. 104, 105, R. 6)	2C
Silver Creek	(S. 35, T. 105, R. 6; S. 1, 2, 11, 12, T. 104, R. 6)	1B, 2A, 3B
Snake Creek	(T. 109, R. 10)	2C
Speltz Creek	(T. 107, R. 9)	2B
Spring Valley Creek	(S. 8, 17, 18, 19, 20, 30, T. 103, R. 12; S. 23, 24, 25, 26, 27, 32, 33, T. 103, R. 13)	1B, 2A, 3B
Stockton Valley Creek (South Branch)	(S. 2, 3, 10, 11, 14, 23, T. 106, R. 8)	1B, 2A, 3B
Storer Creek	(S. 19, 30, T. 104, R. 5)	1B, 2A, 3B
Sullivan Creek	(T. 103, R. 5)	2C
Swede Bottom Creek (Stockholm)	(S. 10, 11, 14, 15, T. 103, R. 6)	1B, 2A, 3B
Thompson Creek (excluding trout waters)	(T. 103, R. 4, 5)	2B
Thompson Creek	(S. 12, 13, 14, 23, 24, 25, 26, T. 103, R. 5)	1B, 2A, 3B
Torkelson Creek (excluding trout waters)	(T. 104, R. 10)	2B
Torkelson Creek	(S. 25, 36, T. 104, R. 10)	1B, 2A, 3B
Trout Creek	(T. 108, 109, R. 9)	2B
Trout Run Creek (Trout) (excluding trout waters)	(T. 104, 105, R. 10)	2C
Trout Run Creek	(S. 4, 5, 8, 9, 16, 17, 20, 21, T. 104, R. 10; S. 18, 19, 30, 31, 32, T. 105, R. 10)	1B, 2A, 3B
Watson Creek (excluding trout waters)	(T. 103, R. 10, 11, 12)	2B
Watson Creek	(S. 30, T. 103, R. 11)	1B, 2A, 3B
West Burns Creek	(T. 106, 107, R. 7)	2B
North Branch Whitewater River (excluding trout waters)	(T. 107, 108, R. 10, 11, 12)	2B
North Branch White-water River	(S. 33, 34, T. 108, R. 11; S. 5, 6, 7, 8, 9, T. 107, R. 10; S. 1, 2, 3, T. 107, R. 11)	1B, 2A, 3B
Middle Branch White-water River (excluding trout waters)	(T. 106, 107, R. 10, 11, 12)	2B
Middle Branch White-water River	(S. 24, 25, 26, 32, 33, 34, 35, T. 107, R. 11; S. 16, 17, 19, 20, 9, 10, T. 107, R. 10)	1B, 2A, 3B

Waters	Reach or Area Involved or Location	Classification
South Branch White-water River (excluding trout waters)	(T. 106, 107, R. 9, 10, 11, 12)	2B
South Branch White-water River	(S. 1, T. 106, R. 10; S. 3, 10, 11, 14, 24, 25, 36, T. 107, R. 10; S. 6, T. 106, R. 9; S. 31, T. 107, R. 9)	1B, 2A, 3B
Wildcat Creek	(T. 103, R. 4)	2C
Willow Creek (excluding trout waters)	(T. 101, 102, R. 11)	2B
Willow Creek	(S. 1, 12, 13, T. 102, R. 11)	1B, 2A, 3B
Winnebago Creek	(S. 7, 8, 15, 16, 17, 22, 23, 24, T. 101, R. 5)	1B, 2A, 3B
Wisel Creek (Wesel)	(S. 19, 20, 29, 30, 31, 32, T. 102, R. 8; S. 1, 10, 11, 15, 16, 21, T. 101, R. 9; S. 5, 6, T. 101, R. 8)	1B, 2A, 3B

**Missouri-Cedar-Des Moines Rivers Basin
Cedar River Watershed (No. 37)**

Streams

Bancroft Creek	(T. 103, 104, R. 21)	2C
West Fork Cedar River	(T. 105, R. 18, 19)	2B
East Fork Cedar River	(T. 105, R. 17, 18)	2B
Dobbins Creek	(T. 103, R. 16, 17)	2C
Goose Creek	(T. 101, R. 21, 22)	2C
Little Iowa River	(T. 101, 102, R. 14)	2C
Murphy Creek	(T. 103, R. 18)	2C
Orchard Creek	(T. 102, R. 18, 19)	2C
Roberts Creek	(T. 103, 104, R. 16, 17, 18)	2C
Rose Creek	(T. 102, 103, R. 18, 17, 16)	2C
Turtle Creek	(T. 103, R. 20, 19, 18)	2C
Wolf Creek	(T. 103, R. 16, 17, 18)	2C
Woodbury Creek	(T. 101, 102, R. 18, 19)	2C

Des Moines River Watershed (No. 38)

Streams

Beaver Creek	(T. 106, 107, R. 40, 41, 42)	2B
Elk Creek	(T. 102, 103, R. 40, 39)	2B
Heron Lake Outlet	(T. 104, 105, R. 37)	2C
Jack Creek	(T. 104, R. 38, 39, 40, 41)	2B
Lime Creek	(T. 105, 106, R. 39, 40)	2B

Waters	Reach or Area Involved or Location	Classification
Okabena Creek	(T. 102, 103, R. 40, 39, 38, 37)	2C
Scheldorf Creek	(S. 19, 30, 31, T. 106, R. 36; S. 13, 24, 25, T. 106, R. 37)	1B, 2A, 3B

Rock River Watershed (No. 39)

Streams

Ash Creek	(T. 101, R. 45)	2C
Champapadan Creek	(T. 103, 104, 105, R. 44, 43, 42)	2B
Chanarambie Creek	(T. 105, R. 42, 43, 44)	2B
Elk Creek	(T. 102, 103, R. 44, 45)	2B
Mound Creek	(T. 103, 104, R. 45)	2C
Poplar Creek	(T. 104, 105, R. 44, 45)	2B
Skunk Creek	(T. 101, 102, R. 37, 38, 39)	2C
Willow Creek	(T. 108, 109, R. 46)	2B

SUPPLEMENT 1*(Effective February 1, 1982)***CLASS 7 LIMITED RESOURCE VALUE WATERS****Lake Superior Basin
St. Louis River Watershed (No. 1)****Streams**

*Barber Creek (East Swan River) (Chisholm Creek) Chisholm	T. 58, R. 20, S. 21, 22, 26, 27, 34, 35
Buhl Creek Buhl	T. 58, R. 19, S. 20, 29
*Elbow Creek Eveleth	T. 57, R. 17, S. 6 T. 57, R. 18, S. 1
Unnamed Creek Meadowlands	T. 53, R. 19, S. 22, 23
Unnamed Ditch Eveleth	T. 57, R. 17, S. 6
Unnamed Ditch Gilbert	T. 58, R. 17, S. 23, 24, 25, 36

Lake Superior Watershed (No. 2)**Lake of the Woods Basin
Rainy Lake Watershed (No. 3)**

Unnamed Swamp Winton	T. 63, R. 11, S. 19 T. 63, R. 12, S. 24
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Little Fork River Watershed (No. 4)**Big Fork River Watershed (No. 5)****Lake of the Woods Watershed (No. 6)****Red River of the North Basin
Mustinka-Boise De Sioux Rivers Watershed (No. 7)****Streams**

*Twelve Mile Creek (County Ditch No. 1) Donnelly	T. 126, R. 43, S. 16, 17, 18, 19, 21, 22, 25, 26, 27 T. 126, R. 44, S. 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33 T. 126, R. 45, S. 25, 26, 27, 28, 36
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CLASS 7 LIMITED RESOURCE VALUE WATERS (Cont.)**Otter Tail River Watershed (No. 8)****Streams**

County Ditch No. 65	T. 135, R. 37, S. 18
New York Mills	T. 135, R. 38, S. 13
Willow Creek	T. 135, R. 38, S. 13, 14, 15, 16, 17, 18
New York Mills	

Lakes

Unnamed Slough	T. 137, R. 40, S. 18
Vergas	T. 137, R. 41, S. 13, 24

Buffalo River Watershed (No. 9)**Streams**

County Ditch No. 6A-2	T. 135, R. 45, S. 21, 28, 33
Rothsay	
County Ditch No. 32	T. 138, R. 48, S. 13, 14, 15, 16, 17, 18
Sabin	
Unnamed Creek	T. 135, R. 45, S. 21, 22, 23, 25, 26
Rothsay	
Unnamed Ditch	T. 139, R. 42, S. 4, 9
Audubon	
Unnamed Ditch	T. 139, R. 43, S. 4
Lake Park	T. 140, R. 43, S. 33
Unnamed Ditch	T. 139, R. 47, S. 1, 2, 12
Glyndon	T. 140, R. 47, S. 35
Unnamed Ditch	T. 140, R. 41, S. 6
Callaway	T. 140, R. 42, S. 1, 2, 10, 11

Wild Rice River Watershed (No. 10)

Unnamed Ditch	T. 145, R. 44, S. 22, 27, 34
Gary	

Red Lake River Watershed (No. 11)**Streams**

Judicial Ditch No. 13	T. 154, R. 40, S. 16, 17, 18
Goodridge	
Judicial Ditch No. 18	T. 154, R. 40, S. 18, 19, 27, 28, 29, 30
Goodridge	T. 154, R. 41, S. 13, 14, 15, 16, 17, 18
	T. 154, R. 42, S. 7, 8, 13, 14, 15, 16
	T. 154, R. 43, S. 9, 10, 11, 12, 16

CLASS 7 LIMITED RESOURCE VALUE WATERS (Cont.)**Red Lake River Watershed (No. 11) (Cont.)**

Unnamed Creek	T. 147, R. 36, S. 17, 18
Shevlin	T. 147, R. 37, S. 11, 12, 13, 14
Unnamed Ditch	T. 149, R. 42, S. 34, 35
Erskine	
Unnamed Ditch	T. 154, R. 43, S. 31, 32, 33
Thief River Falls	

Middle River Watershed (No. 12)**Two Rivers Watershed (No. 13)****Roseau River Watershed (No. 14)****Streams**

Unnamed Ditch	T. 163, R. 37, S. 19, 20, 21, 22, 23
Warroad	T. 163, R. 38, S. 19, 20, 21, 22, 23, 24, 30
	T. 163, R. 39, S. 25, 31, 32, 33, 34, 35, 36

Upper Mississippi River Basin**Mississippi River Headwaters Watershed (No. 15)****Streams**

County Ditch No. 42	T. 48, R. 23, S. 29, 32
McGregor	
*Sandy River	T. 48, R. 23, S. 19, 29, 30
McGregor	T. 48, R. 24, S. 13, 24
Unnamed Creek	T. 56, R. 23, S. 21
Calumet	
Unnamed Ditch	T. 48, R. 23, S. 31, 32
McGregor	
Unnamed Ditch	T. 56, R. 22, S. 4, 5
Nashwauk	T. 57, R. 22, S. 32
Unnamed Ditch	T. 56, R. 24, S. 22
Taconite	

Lakes

Unnamed Swamp	T. 56, R. 24, S. 22
Taconite	

Crow Wing River Watershed (No. 16)**Streams**

County Ditch No. 15	T. 132, R. 35, S. 2
(Bear Creek)	T. 133, R. 34, S. 7
Bertha	T. 133, R. 35, S. 12, 13, 24, 25, 26, 35

CLASS 7 LIMITED RESOURCE VALUE WATERS (Cont.)**Crow Wing River Watershed (No. 16) (Cont.)**

County Ditch No. 23 Garfield	T. 129, R. 38, S. 26, 27
Unnamed Creek Miltona	T. 129, R. 36, S. 6 T. 130, R. 36, S. 30, 31
Unnamed Ditch Miltona	T. 130, R. 36, S. 30 T. 130, R. 37, S. 25, 36

Lakes

Unnamed Slough Miltona	T. 130, R. 37, S. 26, 35, 36
Unnamed Swamp Staples	T. 133, R. 33, S. 1

Crow River Watershed (No. 17)**Streams**

County Ditch No. 23A Willmar	T. 119, R. 34, S. 29, 30 T. 119, R. 35, S. 23, 25, 26
County Ditch No. 132 Lakeside Lakeside Coop Cry.	T. 116, R. 31, S. 16, 21
*Crane Creek Winsted	T. 117, R. 27, S. 14, 20, 21, 22, 23, 24, 25
Judicial Ditch No. 1 Lakeside Lakeside Coop Cry.	T. 116, R. 31, S. 28, 33
Judicial Ditch No. 15 Buffalo Lake Iowa Pork Industries Hector	T. 115, R. 31, S. 15, 16, 20, 21, 29, 30 T. 115, R. 32, S. 22, 25, 26, 27, 28, 32, 33
*Skunk River (Co. Dt. No. 37) (Co. Dt. No. 29) Brooten	T. 123, R. 35, S. 4, 5, 9 T. 123, R. 35, S. 9, 10, 11, 12 T. 123, R. 34, S. 3, 4, 5, 6, 7, 8
Unnamed Creek Hiller Mobile Home Court	T. 119, R. 26, S. 22, 26, 27, 35
Unnamed Ditch Glencoe Green Giant	T. 115, R. 28, S. 14, 23
Unnamed Ditch Glencoe Green Giant	T. 115, R. 28, S. 21, 22, 27, 28

CLASS 7 LIMITED RESOURCE VALUE WATERS (Cont.)**Crow River Watershed (No. 17) (Cont.)**

County Ditch No. 63 Near Hutchinson West Lynn Coop Creamery	T. 116, R. 30, S. 19, 20, 21, 28, 33
Unnamed Ditch Winsted Green Giant	T. 117, R. 27, S. 10, 11
Unnamed Ditch Hiller Mobile Home Court	T. 119, R. 26, S. 34, 35
Unnamed Ditch Kandioyohi	T. 119, R. 34, S. 10, 15, 21, 22, 28, 29, 32
Unnamed Ditch Belgrade	T. 123, R. 34, S. 19, 30
Unnamed Stream Winsted	T. 117, R. 27, S. 11, 12

Rum River Watershed (No. 18)**Streams**

Lower Stanchfield Brook Braham	T. 37, R. 23, S. 3, 10, 15, 22
Unnamed Ditch Braham	T. 37, R. 23, S. 2, 3
Unnamed Ditch Ramey Ramey Farmers Coop Cry.	T. 38, R. 28, S. 4, 5 T. 39, R. 28, S. 29, 30, 32 T. 39, R. 29, S. 25, 26, 27, 28

Mississippi-Sauk Rivers Watershed (No. 19)**Streams**

*Buckman Creek Buckman Buckman Coop Cry.	T. 39, R. 30, S. 4, 5, 6, 9 T. 39, R. 31, S. 1, 2, 10, 11 T. 40, R. 30, S. 31 T. 40, R. 31, S. 36
*Bunker Hill Creek Little Rock Little Rock Coop Cry.	T. 38, R. 30, S. 6 T. 38, R. 31, S. 1 T. 39, R. 30, S. 31, 32, 33
*Pike Creek Flensburg	T. 129, R. 30, S. 17, 18, 19, 20
*Stony Brook (Stoney Brook) Foley	T. 36, R. 29, S. 2, 9, 10, 11, 16 T. 37, R. 29, S. 35, 36

CLASS 7 LIMITED RESOURCE VALUE WATERS (Cont.)**Mississippi-Sauk Rivers Watershed (No. 19) (Cont.)**

*Two Rivers, South	
Branch	T. 125, R. 31, S. 21, 22, 23
Albany	
Unnamed Creek	T. 121, R. 23, S. 30
Albertville	T. 121, R. 24, S. 25, 36
Unnamed Creek	T. 121, R. 31, S. 2
Eden Valley	T. 122, R. 31, S. 35
Ruhland Feeds	
Unnamed Creek	T. 123, R. 33, S. 11, 14
Lake Henry	
Unnamed Ditch	T. 129, R. 30, S. 30
Flensburg	T. 129, R. 31, S. 25
Unnamed Stream	T. 129, R. 30, S. 19, 30
Flensburg	

Lakes

Unnamed Swamp	T. 129, R. 31, S. 25
Flensburg	

**Minnesota River Basin
Big Stone Lake Watershed (No. 20)****Streams**

Old Whetstone River	
Channel	T. 121, R. 46, S. 16, 21
Ortonville	
Big Stone Canning Co.	

Lakes

Unnamed Marsh	T. 124, R. 47, S. 8
Barry	

Pomme de Terre River Watershed (No. 21)**Streams**

*Muddy Creek	T. 124, R. 42, S. 6, 7, 15, 16, 17, 18, 21, 22, 23
(Mud Creek)	T. 124, R. 43, S. 1, 4, 5, 6, 7, 8
(County Ditch No. 2)	T. 124, R. 44, S. 1, 2, 3, 12
(County Ditch No. 4)	T. 125, R. 43, S. 34, 35, 36
Chokio	
Unnamed Ditch	T. 124, R. 43, S. 3, 4
Alberta	

Lac qui Parle River Watershed (No. 22)**Streams**

County Ditch No. 5	T. 117, R. 45, S. 6, 7, 18
Marietta	T. 117, R. 46, S. 1
	T. 118, R. 46, S. 23, 25, 26, 36
County Ditch No. 27	T. 117, R. 43, S. 3, 4, 5, 6
Madison	T. 117, R. 44, S. 1
	T. 118, R. 43, S. 34
	T. 118, R. 44, S. 35, 36
County Ditch No. 28	T. 118, R. 46, S. 22, 23, 26
Marietta	
Unnamed Ditch	T. 118, R. 44, S. 27, 28, 34, 35
Madison	
Unnamed Stream	T. 117, R. 43, S. 22
Dawson	
Dawson Mills	
Soy Isolate	

Chippewa River Watershed (No. 23)**Streams**

County Ditch No. 7	T. 126, R. 39, S. 25, 26
Lowry	
*County Ditch No. 60	T. 130, R. 39, S. 14, 22, 23, 27, 28, 32, 33
(Chippewa River)	
Millerville	
Millerville Coop Cry.	
County Ditch No. 61	T. 120, R. 37, S. 21, 22
Kerkhoven	
Judicial Ditch No. 5	T. 120, R. 38, S. 4, 5, 6, 9, 10, 11
Murdock	T. 120, R. 39, S. 1, 4, 9, 10, 11, 12
Mud Creek	T. 121, R. 37, S. 31
DeGraff/Murdock	T. 121, R. 38, S. 18, 19, 20, 28, 29, 33, 34, 35, 36
	T. 121, R. 39, S. 11, 12, 13
Unnamed Creek	T. 120, R. 38, S. 1, 2
Murdock	T. 121, R. 38, S. 35
Unnamed Ditch	T. 121, R. 38, S. 19, 29, 30
DeGraff	
Unnamed Ditch	T. 122, R. 40, S. 6
Hancock	T. 122, R. 41, S. 1, 12
	T. 123, R. 40, S. 18, 19, 30, 31
	T. 123, R. 41, S. 11, 12
Unnamed Ditch	T. 126, R. 39, S. 6
Farwell	
Farwell Coop Cry.	
Assn.	
Unnamed Ditch	T. 126, R. 39, S. 26, 35
Lowry	

CLASS 7 LIMITED RESOURCE VALUE WATERS (Cont.)**Chippewa River Watershed (No. 23) (Cont.)**

Unnamed Ditch Brandon	T. 129, R. 39, S. 21, 22
Unnamed Ditch Evansville	T. 129, R. 40, S. 10, 11
Lakes	
Unnamed Slough Kensington	T. 127, R. 40, S. 34
Unnamed Slough Brandon	T. 129, R. 39, S. 21, 22
Unnamed Swamp Sunburg	T. 122, R. 36, S. 30
Unnamed Swamp Sunburg Coop. Cry.	T. 126, R. 39, S. 35, 36
Unnamed Swamp Lowry	

Yellow Medicine River Watershed (No. 24)**Streams**

*Boiling Springs Creek (County Ditch No. 1B)	T. 113, R. 38, S. 5, 8 T. 114, R. 37, S. 19, 30
Echo	T. 114, R. 38, S. 25, 26, 27, 32, 33, 34
County Ditch No. 1 Echo	T. 113, R. 38, S. 8, 9
County Ditch No. 4 Arco	T. 110, R. 44, S. 5 T. 111, R. 44, S. 31, 33
County Ditch No. 12 (Rice Creek)	T. 113, R. 36, S. 7, 8, 18, 19 T. 113, R. 37, S. 15, 21, 22, 23, 24
Belview	
Judicial Ditch No. 29 Arco	T. 111, R. 44, S. 21, 28, 33
Rice Creek	See County Ditch No. 12
Unnamed Ditch Porter	T. 114, R. 44, S. 21, 28
Unnamed Ditch Clarkfield	T. 115, R. 41, S. 16
Unnamed Ditch Clarkfield	T. 115, R. 41, S. 16, 21
County Ditch No. 14	T. 109, R. 43, S. 18

CLASS 7 LIMITED RESOURCE VALUE WATER (Cont.)**Redwood River Watershed (No. 25) (Cont.)**

County Ditch No. 14	T. 109, R. 43, S. 18
Tyler	T. 109, R. 44, S. 2, 3, 11, 13, 14
	T. 110, R. 44, S. 33, 34
Judicial Ditch No. 12.	T. 109, R. 43, S. 9, 15, 16, 17, 18
Tyler	

Cottonwood River Watershed (No. 26)**Streams**

Altermatts Creek	T. 108, R. 33, S. 17, 19, 20, 30
(County Ditch No. 39)	T. 108, R. 34, S. 24, 25, 35, 36
Comfrey	
County Ditch No. 38	T. 107, R. 37, S. 28, 29
Storden	
County Ditch No. 63	T. 108, R. 30, S. 11, 12, 14, 17, 18, 19, 20, 21,
Hanska	22, 23, 27, 28
County Ditch No. 109	T. 111, R. 34, S. 4, 5, 8, 17
Morgan	T. 112, R. 34, S. 22, 23, 27, 28, 33
Judicial Ditch No. 6	T. 107, R. 30, S. 4
Hanska	T. 108, R. 30, S. 28, 33
Judicial Ditch No. 10	T. 108, R. 30, S. 1
Hanska	T. 109, R. 30, S. 35, 36
Judicial Ditch No. 30	T. 109, R. 32, S. 4, 5, 6
Sleepy Eye	T. 110, R. 32, S. 31
Del Monte Corp.	
Lone Tree Creek	T. 109, R. 39, S. 2, 3, 4, 7, 8, 9
Tracy	T. 110, R. 38, S. 19, 20, 30
	T. 110, R. 39, S. 25, 34, 35, 36
*Minneopa Creek	T. 108, R. 28, S. 26, 27, 32, 33, 34
Lake Crystal	
*Pell Creek	T. 109, R. 38, S. 25, 26, 27, 28
Walnut Grove	
Unnamed Ditch	T. 107, R. 36, S. 21
Jeffers	
Unnamed Ditch	T. 107, R. 37, S. 19, 30
Storden	
Unnamed Dry Run	T. 108, R. 27, S. 16
Near Minneopa	
Blue Earth-Nicollet	
Elec.	
Unnamed Ditch	T. 109, R. 38, S. 28
Walnut Grove	
Unnamed Ditch	T. 109, R. 39, S. 18
Tracy	T. 109, R. 40, S. 13
Unnamed Ditch	T. 110, R. 36, S. 3
Wabasso	T. 111, R. 36, S. 18, 19, 20, 28, 29, 33, 34
	T. 111, R. 37, S. 13

CLASS 7 LIMITED RESOURCE VALUE WATERS (Cont.)**Cottonwood River Watershed (No. 26) (Cont.)**

Unnamed Ditch T. 111, R. 37, S. 13, 24
 Wabasso

Lakes

Unnamed Swamp T. 107, R. 37, S. 30
 Storden

Blue Earth River Watershed (No. 27)**Streams**

*Boot Creek T. 105, R. 22, S. 6, 7
 New Richland T. 105, R. 23, S. 12, 13, 24
 Cobb Creek T. 104, R. 23, S. 7, 8, 17
 Freeborn T. 104, R. 24, S. 11, 12
 Cobb Creek Ditch T. 103, R. 23, S. 2
 Freeborn T. 104, R. 23, S. 14, 15, 16, 23, 26, 35
 County Ditch No. 6 T. 107, R. 24, S. 4, 8, 9, 17, 18
 Janesville T. 107, R. 25, S. 13
 County Ditch No. 87 T. 103, R. 24, S. 6
 Wells T. 104, R. 24, S. 31
 T. 104, R. 25, S. 36
 *Foster Creek T. 103, R. 23, S. 31
 Alden T. 103, R. 24, S. 25, 36
 Judicial Ditch No. 1 T. 104, R. 27, S. 23, 25, 26, 36
 Delavan
 Judicial Ditch No. 49 T. 105, R. 27, S. 18, 19
 (Providence Creek)
 Amboy
 *St. James Creek T. 106, R. 31, S. 5, 7, 8, 18
 St. James T. 107, R. 31, S. 21, 22, 28, 32, 33
 Unnamed Ditch T. 102, R. 23, S. 4, 5
 Alden T. 103, R. 23, S. 31, 32
 Unnamed Ditch T. 104, R. 30, S. 2, 11
 Truman T. 105, R. 30, S. 25, 26, 35
 Unnamed Ditch T. 105, R. 22, S. 17, 18, 19
 New Richland T. 105, R. 23, S. 24
 Unnamed Ditch T. 105, R. 30, S. 3
 Lewisville T. 106, R. 30, S. 14, 23, 26, 34, 35
 Unnamed Ditch T. 106, R. 24, S. 34
 Waldorf
 Unnamed Ditch T. 108, R. 25, S. 18, 19
 Eagle Lake T. 108, R. 26, S. 13

CLASS 7 LIMITED RESOURCE VALUE WATERS (Cont.)**Blue Earth River Watershed (No. 27) (Cont.)****Lakes**

One hundred Acre Slough	T. 106, R. 31, S. 7
St. James	
Unnamed Swamp	T. 104, R. 25, S. 3, 4
Minnesota Lake	

Minnesota River-Hawk Creek Watershed (No. 28)**Streams**

*Beaver Creek, East Fork (County Ditch No. 63)	T. 115, R. 34, S. 1, 2, 3, 4, 5, 6 T. 115, R. 35, S. 1, 12, 13, 14, 23, 24, 25, 26
Olivia	T. 116, R. 34, S. 16, 20, 21, 28, 29, 30, 32, 33, 34, 35
Olivia Canning Co.	
County Ditch No. 45	T. 114, R. 36, S. 5, 6, 7, 18
Renville	T. 114, R. 37, S. 13 T. 115, R. 36, S. 7, 18, 19, 29, 30, 32
County Ditch No. 46	T. 119, R. 35, S. 19, 20, 29
Willmar	
County Ditch No. 66	T. 115, R. 34, S. 15, 16, 17, 18, 22, 23
Bird Island	
County Ditch No. 104	T. 114, R. 38, S. 1, 2
Sacred Heart	T. 115, R. 37, S. 7, 18 T. 115, R. 38, S. 13, 24, 25, 35, 36
East Fork Beaver Creek	See Beaver Creek, East Fork
*Hawk Creek	T. 118, R. 36, S. 2, 3, 8, 10, 15, 16, 17, 18, 19
(County Ditch No. 10)	T. 118, R. 37, S. 5, 6, 7, 8, 9, 14, 15, 16, 18, 19, 23, 24, 30, 31
Willmar/Pennock	T. 119, R. 35, S. 19 T. 119, R. 36, S. 24, 25, 26, 35
Unnamed Creek	T. 118, R. 37, S. 2, 3, 4, 5
Pennock	T. 119, R. 36, S. 4, 5, 6, 7, 18, 19 T. 119, R. 37, S. 24, 25, 26, 35
Unnamed Ditch	T. 119, R. 36, S. 2, 3, 4, 9, 10
Pennock	

Lower Minnesota River Watershed (No. 29)**Streams**

*Cherry Creek	T. 110, R. 25, S. 7, 8, 16, 17
Cleveland	T. 110, R. 26, S. 12
County Ditch No. 4	T. 115, R. 25, S. 30
Norwood	T. 115, R. 26, S. 13, 14, 24, 25

CLASS 7 LIMITED RESOURCE VALUE WATERS (Cont.)**Lower Minnesota River Watershed (No. 29) (Cont.)**

County Ditch No. 22 Montgomery Green Giant Co.	T. 111, R. 23, S. 4, 9, 10 T. 112, R. 23, S. 33
County Ditch No. 40A Lafayette	T. 111, R. 29, S. 8, 14, 15, 16, 17, 23, 24
County Ditch No. 42 Winthrop	T. 112, R. 29, S. 6, 7
County Ditch No. 51 Le Center	T. 110, R. 24, S. 5, 6 T. 11, R. 24, S. 31, 32 T. 111, R. 25, S. 26, 35, 36
County Ditch No. 54 Montgomery	T. 112, R. 23, S. 26, 33, 34, 35
Judicial Ditch No. 1A Lafayette	T. 111, R. 27, S. 5, 6, 7 T. 111, R. 28, S. 10, 11, 12, 15, 16, 17, 18, 19 T. 111, R. 29, S. 24
*Rush River, Middle Branch Winthrop	T. 112, R. 27, S. 16, 19, 20, 21, 30 T. 112, R. 28, S. 18, 19, 20, 21, 22, 25, 26, 27 T. 112, R. 29, S. 7, 8, 9, 13, 14, 15, 16, 17, 18
Unnamed Creek Green Isle	T. 114, R. 26, S. 2, 3, 4, 8, 9, 17
Unnamed Ditch Green Isle	T. 114, R. 26, S. 19 T. 114, R. 27, S. 11, 12, 13, 14, 24
Unnamed Ditch Burnsville Freeway Sanitary Landfill	T. 27, R. 24, S. 28, 33
Unnamed Dry Run Mankato Southview Hts Coop Assn	T. 108, R. 26, S. 19, 30 T. 108, R. 27, S. 24
Unnamed Ditch Lafayette	T. 111, R. 29, S. 6, 7, 8 T. 111, R. 30, S. 12
Unnamed Ditch Montgomery	T. 112, R. 23, S. 33
Unnamed Ditch Near Fernando Round Grove Coop. Creamery	T. 113, R. 30, S. 5 T. 114, R. 29, S. 19, 20, 30 T. 114, R. 30, S. 25, 26, 27, 28, 29, 32
Unnamed Ditch Bongards Bongards Creameries	T. 115, R. 25, S. 9, 16
Unnamed Stream Mankato Midwest Electric Products	T. 109, R. 26, S. 20, 21, 28
Unnamed Stream Savage	T. 115, R. 21, S. 8, 9

CLASS 7 LIMITED RESOURCE VALUE WATERS (Cont.)**St. Croix River Basin
Kettle River Watershed (No. 30)****Streams**

Unnamed Ditch T. 46, R. 19, S. 30
Moose Lake

Snake River Watershed (No. 31)**Streams**

Unnamed Dry Run T. 41, R. 25, S. 3
Wahkon T. 42, R. 25, S. 29, 32, 33, 34

Lower St. Croix River Watershed (No. 32)**Streams**

Unnamed Ditch T. 34, R. 20, S. 19, 29, 30, 31, 32
Chisago City
Unnamed Ditch T. 35, R. 20, S. 25
Almelund
Almelund Coop Cry.
Unnamed Stream T. 34, R. 19, S. 32, 33, 34
Shafer

Lakes

Unnamed Swamp T. 34, R. 19, S. 31, 32
Shafer

**Lower Mississippi River Basin
Metropolitan Area Watershed (No. 33)****Streams**

Unnamed Ditch T. 113, R. 18, S. 5, 6
Hampton T. 114, R. 18, S. 31

Lakes

Unnamed Swamp T. 113, R. 18, S. 8
Hampton

Cannon River Watershed (No. 34)**Streams**

County Ditch No. 15 T. 110, R. 23, S. 22, 23
Kilkenny

CLASS 7 LIMITED RESOURCE VALUE WATERS (Cont.)**Cannon River Watershed (No. 34) (Cont.)**

Unnamed Ditch Lonsdale	T. 112, R. 22, S. 25, 35, 36
Unnamed Dry Run Owatonna	T. 107, R. 20, S. 6 T. 107, R. 21, S. 1
Owatonna Canning Co. Unnamed Dry Run Owatonna	T. 107, R. 20, S. 6 T. 107, R. 21, S. 1
Owatonna Canning Co.	

Lakes

Unnamed Marsh Kilkenny	T. 110, R. 23, S. 22, 23
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Zumbro River Watershed (No. 35)**Streams**

*Trout Brook (Mazeppa Creek) Goodhue	T. 110, R. 15, S. 3, 4 T. 111, R. 15, S. 28, 33, 34
Unnamed Creek Byron	T. 107, R. 15, S. 17, 20, 29
Unnamed Creek West Concord	T. 108, R. 17, S. 17, 20, 21
Unnamed Ditch Claremont	T. 107, R. 18, S. 27, 34
Unnamed Stream Dodge Center Owatonna Canning Co.	T. 107, R. 17, S. 27, 34

Root River Watershed (No. 36)**Streams**

*Carters Creek Wykoff	T. 103, R. 12, S. 4, 9, 15, 16, 22
North Fork White- water River	See Whitewater River, North Fork
Unnamed Creek Spring Grove	T. 101, R. 7, S. 14, 22, 23, 27
Unnamed Creek Canton	T. 101, R. 9, S. 20
Unnamed Creek Plainview	T. 108, R. 11, S. 16, 17, 20, 21, 22, 27, 34
Unnamed Dry Run Altura	T. 107, R. 9, S. 7, 18
*Whitewater River, North Fork Elgin	T. 108, R. 12, S. 25, 26, 27

CLASS 7 LIMITED RESOURCE VALUE WATERS (Cont.)**Missouri-Cedar-Des Moines Rivers Basin
Cedar River Watershed (No. 37)****Streams**

County Ditch No. 48	T. 102, R. 22, S. 19, 20
Conger	T. 102, R. 23, S. 24, 25, 26, 35
*Goose Creek	T. 101, R. 20, S. 31
Twin Lakes	T. 101, R. 21, S. 16, 17, 18, 21, 22, 26, 27, 35, 36
	T. 101, R. 22, S. 12, 13
Unnamed Creek	T. 103, R. 17, S. 4, 9
Brownsdale	
Unnamed Creek	T. 104, R. 18, S. 5, 8, 9, 16
Blooming Prairie	T. 105, R. 18, S. 31

Des Moines River Watershed (No. 38)**Streams**

County Ditch No. 11	T. 101, R. 32, S. 4, 9, 10
Sherburn	T. 102, R. 32, S. 7, 8, 16, 17, 21, 27, 28, 33, 34
*Jack Creek	T. 104, R. 41, S. 25, 26, 30, 31, 32, 33, 34, 35, 36
Wilmont	
*Okabena Creek	T. 102, R. 38, S. 6, 7
Worthington	T. 102, R. 39, S. 7, 8, 9, 10, 11, 12, 14, 15, 16, 18
Worthington Lagoons and Allied Mills	T. 102, R. 40, S. 13
Unnamed Creek	T. 105, R. 41, S. 3, 4, 9
Iona	T. 106, R. 40, S. 19, 29, 30, 32 T. 106, R. 41, S. 24, 25, 26, 34, 35

Rock River Watershed (No. 39)**Streams**

Unnamed Creek	T. 104, R. 46, S. 6
Jasper	
Unnamed Creek	T. 105, R. 44, S. 6, 7, 8
Hatfield	T. 105, R. 45, S. 1 T. 106, R. 45, S. 36
Unnamed Creek	T. 106, R. 45, S. 34, 35, 36
Hatfield	
Unnamed Ditch	T. 109, R. 45, S. 17, 19, 20
Lake Benton	

6 MCAR § 4.8025 Classifications of interstate waters of Minnesota. The following rule establishing classifications applies to all interstate surface waters of the state.

A. All interstate waters are included, although some minor watercourses such as unnamed streams or interconnecting waters and/or intermittently flowing creeks, ditches, or draws, etc., are not listed individually herein. All interstate waters are classified herein and this classification shall supersede the classification of the interstate waters listed in previously adopted WPC 1.

B. The rule includes known present uses and/or uses which may be made of the waters in the future. In addition to the classification(s) given below, all of the interstate waters whether or not specifically named herein are also included in Classes 2C, 3C, 4A and B, 5 and 6 for all reaches or areas where such uses are possible, provided that waters specifically classified as limited resource value shall only be included in the following additional classes: 3C, 4A, 4B, 5 and 6. Where specific criteria are common to two or more listed classes the more restrictive value shall apply. For additional information refer to 6 MCAR § 4.8015, Criteria for the classification of the interstate waters of the state and the establishment of standards of quality and purity.

C. The provisions of this rule shall be severable and the invalidity of any lettered paragraph or any subparagraph or subdivision thereof shall not make void any other lettered paragraph, subparagraph, subdivision or any other part thereof.

D. Supplement 1 to this rule lists interstate waters that are classified as limited resource value waters, Class 7. For those interstate waters identified with an asterisk (*), the revised classification in Supplement 1 shall supersede any previous classification; provided, however, that the limited resource value classification shall apply only to that portion of the water specifically described in Supplement 1.

Waters	Reach or Area Involved or Location	Classification
Red Cedar River Basin		
Streams		
Little Cedar River	Source to Iowa border	2C, 3B
Red Cedar River	Source to Austin	2B, 3B
Red Cedar River	Austin to Iowa border	2C, 3B
Deer Creek	Source to Iowa border	2C, 3B
Lime Creek	Source to Iowa border	2C, 3B
Otter Creek	Source to Iowa border	2B, 3B
Shell Rock River	Source to Iowa border	2B, 3B
Lakes		
Albert Lea Lake	(T. 102; R. 20, 21)	2B, 3B
Bear Lake	(T. 101; R. 22)	2B, 3B
Fountain Lake	(T. 102; R. 20, 21)	2B
State Line Lake	(T. 101; R. 22)	2B, 3B
Des Moines River Basin		
Streams		
East Fork of the Des Moines River	Source to Iowa border	2B, 3B
West Fork of the Des Moines River	Lake Yankton outlet to Iowa border	2C, 3B
Soldier Creek	Source to Iowa border	2C, 3B
Lakes		
Long Lake	(T. 108, 109; R. 41)	2B, 3B
Okamanpedan Lake	(T. 101; R. 31)	2B, 3B
Lake Shetek	(T. 107, 108; R. 40, 41)	2B, 3B
Talcot Lake	(T. 105; R. 38, 39)	2B, 3B
Tuttle Lake	(T. 101; R. 31)	2B, 3B
Lake Yankton	(T. 109; R. 42)	2B, 3B
Minnesota River Basin		
Streams		
Brush Creek	Iowa border to mouth	2C, 3B
Canby Creek	South Dakota border to mouth, except trout waters	2C, 3B
Canby Creek	(S. 8, 9, 17, 18, T. 114, R. 45; S. 13, 14, 22, 23, T. 114, R. 46)	2A, 3B

Waters	Reach or Area Involved or Location	Classification
Minnesota River Basin (Cont.)		
Streams (Cont.)		
Blue Earth River	Iowa border to mouth	2B, 3B
East Fork of the Blue Earth River	Brush Creek to mouth	2C, 3B
West Fork of the Blue Earth River	Iowa border to mouth	2C, 3B
Florida Creek	South Dakota border to mouth	2C, 3B
West Fork of the Lac Qui Parle River	South Dakota border to mouth	2C, 3B
Lazarus Creek	South Dakota border to Canby Creek	2C, 3B
Minnesota River	Big Stone Lake outlet to Granite Falls	1C, 2B, 3B
Minnesota River	Granite Falls to Mankato	2B, 3B
Minnesota River	Mankato to River mile 22 (Head of 9 feet navigation channel)	2B, 3B
Minnesota River	River Mile 22 to mouth	2C, 3B
Little Minnesota River	South Dakota border crossing to Big Stone Lake	2C, 3B
North Fork of the Yellow Bank River	South Dakota border to mouth	2C, 3B
South Fork of the Yellow Bank River	South Dakota border to mouth	2C, 3B
Yellow Medicine River	North Fork mouth to Minnesota River	2C, 3B
North Fork of the Yellow Medicine River	South Dakota border to mouth	2C, 3B
Lac qui Parle River	Lake Hendricks outlet to Minnesota River	2C, 3B
South Creek	Rose Lake to mouth	2C, 3B
Whetstone River	South Dakota border to mouth	2C, 3B
Lakes		
East Chain Lake	(T. 101 ; R. 29, 30)	2B, 3B
Lake Hendricks	(T. 112 ; R. 46)	2B, 3B
Iowa Lake	(T. 101 ; R. 30)	2B, 3B
Rose Lake	(T. 102 ; R. 30)	2B, 3B
Sager Lake	(T. 102 ; R. 30)	2B, 3B
Salt Lake	(T. 117 ; R. 46)	2B, 3B
South Silver Lake	(T. 101 ; R. 30)	2B, 3B
Big Stone Lake	(T. 121, 122, 123, 124 ; R. 46, 47, 48, 49)	2B, 3B
Swan Lake	(T. 101 ; R. 30)	2B, 3B

Waters	Reach or Area Involved or Location	Classification
Lower Mississippi River Basin		
Streams		
Bear Creek	Source to Iowa border	2C, 3B
Beaver Creek	Source to Iowa border	2C, 3B
Crooked Creek	Source to mouth	1B, 2A, 3B
Upper Iowa River	Source to Iowa border and Iowa border to Iowa border	2B, 3B
Mississippi River	Outlet of Metro Wastewater Treatment Works in St. Paul to river mile 830 (Rock Island RR Bridge)	2C, 3B
Mississippi River	River mile 830 to Iowa border	2B, 3B
Pine Creek	Source to Iowa border	2C, 3B
Riceford Creek	Source to mouth	2B, 3B
Root River	South Fork mouth to mouth	2B, 3B
South Fork of the Root River	Riceford Creek mouth to mouth	2B, 3B
Wapsipinicon River	Source to Iowa border	2C, 3B
Waterloo Creek	Source to Iowa border	1B, 2B, 3B
Lakes		
Lake Pepin	(T. 111, 112, 113; R. 11, 12, 13 & 14)	2B, 3B
Minnesota Slough	(T. 101; R. 3, 4)	2B, 3B
Upper Mississippi River Basin		
Streams		
Mississippi River	Lake Itasca to Fort Ripley	2B, 3B
Mississippi River	Fort Ripley to the Upper Lock and Dam at St. Anthony Falls in Minneapolis	1C, 2B, 3B
Mississippi River	Upper Lock and Dam at St. Anthony Falls in Minneapolis to outfall of the Metro waste- water treatment plant in St. Paul	2B, 3B
Lakes		
Lake Andrusia	(T. 146; R. 31)	2B, 3B
Lake Bemidji	(T. 146, 147; R. 33)	2B, 3B
Cass Lake	(T. 145, 146; R. 30, 31)	2B, 3B

Waters	Reach or Area Involved or Location	Classification
Upper Mississippi River Basin (Cont.)		
Lakes (Cont.)		
Lake Itasca	(T. 143; R. 36)	2B, 3B
Pokegama Lake	(T. 54, 55; R. 25, 26)	2A, 3B
Winnibigoshish Lake	(T. 145, 146, 147; R. 27, 28, 29)	2B, 3B
Missouri River Basin		
Streams		
Beaver Creek	Source to South Dakota border	2C, 3B
Flandreau Creek	Source to South Dakota border	2C, 3B
Kanaranzi Creek	Source to Iowa border	2C, 3B
Medary Creek	Source to South Dakota border	2C, 3B
Mud Creek	Source to Iowa border	2C, 3B
Ocheyedan River	Ocheda Lake outlet to Iowa border	2B, 3B
Pipestone Creek	Source to South Dakota border	2C, 3B
Rock River	Source to Iowa border	2C, 3B
Little Rock River	Source to Iowa border	2C, 3B
Little Sioux River	Source to Iowa border	2C, 3B
West Fork of the Little Sioux River	Source to Iowa border	2C, 3B
Split Rock Creek	Source to Split Rock Lake	2B, 3B
Split Rock Creek	Split Rock Lake outlet to South Dakota border	2C, 3B
Lakes		
Illinois Lake	(T. 101; R. 38)	2B, 3B
Iowa Lake	(T. 101; R. 38, 39)	2B, 3B
Loon Lake	(T. 101; R. 35, 36)	2B, 3B
Ocheda Lake	(T. 101, 102; R. 39, 40)	2B, 3B
Pearl Lake	(T. 101; R. 36)	2B, 3B
Round Lake	(T. 101; R. 38)	2B, 3B
Rush Lake	(T. 101; R. 37)	2B, 3B
Spirit Lake	(T. 101; R. 35, 36)	2B, 3B
Split Rock Lake	(T. 105; R. 46)	2B, 3B
Little Spirit Lake	(T. 101; R. 36)	2B, 3B
Red River of the North Basin		
Streams		
Joe River	Source to Canadian border	2C

Waters	Reach of Area Involved or Location	Classification
Red River of the North Basin (Cont.)		
Streams (Cont.)		
Pine Creek	Canadian border to Roseau River	2B, 3B
Pine Creek Diversion	Canadian border to and including Pine Creek diversion pools	2B, 3B
Red River of the North	Breckenridge to Canadian border	1C, 2C, 3B
Roseau River	Source to Canadian border	2B, 3B
Bois de Sioux River	Mud Lake outlet to Breckenridge	2C
Sprague Creek	Canadian border to Roseau River	2B
Lakes		
Mud Lake	(T. 127; R. 47)	2B
Lake Traverse	(T. 125, 126; R. 47, 48, 49)	2B
St. Croix River Basin		
Streams		
Hay Creek	Wisconsin border to mouth	1B, 2B, 3B
St. Croix River	Wisconsin border crossing to Taylors Falls	1B, 2B
St. Croix River	Taylors Falls to mouth	1C, 2B, 3B
Lower Tamarack River	Hay Creek to mouth	1B, 2B, 3B
Upper Tamarack River (Spruce River)	Wisconsin border to mouth	1B, 2B, 3B
Lake Superior Basin		
Streams		
Clear Creek	Source to Wisconsin border	1B, 2A
Mud Creek	Source to Wisconsin border	1B, 2B
Nemadji River	Source to Wisconsin border	1B, 2A
Pigeon River	South of Fowl Lake to Pigeon Bay of Lake Superior	1B, 2B, 3A
Little Pokegama River	Source to Wisconsin border	2B, 3B
Red River	Source to Wisconsin border	1B, 2A, 3B
St. Louis River	Seven Beaver Lake outlet to Cloquet	2B, 3B
St. Louis River	Cloquet to Clough Island	2C, 3B

Waters	Reach of Area Involved or Location	Classification
Lake Superior Basin (Cont.)		
Streams (Cont.)		
South Fork of Nemadji River	Source to Wisconsin border	1B, 2A
State Line Creek	Source to Wisconsin border	1B, 2A, 3B
Lakes		
Black Lake	(T. 45; R. 15)	1B, 2B, 3B
Fan Lake	(T. 65; R. 2E)	1B, 2B, 3A
North Fowl Lake	(T. 64, 65; R. 3E)	1B, 2B, 3A
South Fowl Lake	(T. 64, 65; R. 3E)	1B, 2B, 3A
Lily Lakes	(T. 65; R. 2E)	1B, 2B, 3A
Moose Lake	(T. 65; R. 2, 3E)	1B, 2A, 3A
Mountain Lake	(T. 65; R. 1, 2E)	1B, 2A
Rat Lake	(T. 65; R. 1W)	1B, 2B
Rose Lake	(T. 65; R. 1W)	1B, 2A
Rove Lake	(T. 65; R. 1E)	1B, 2B
St. Louis Bay	(T. 49, 50; R. 14, 15)	2B, 3B
Seven Beaver Lake	(T. 58; R. 11, 12)	2B, 3A
South Lake	(T. 65; R. 1, 2W)	1B, 2A
Superior Bay	(T. 49, 50; R. 13, 14)	2B, 3B
Lake Superior	(T. 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64; R. 14W-7E)	1B, 2A, 3A
Watab Lake	(T. 65; R. 1E)	1B, 2B
Lake of the Woods Basin		
Streams		
Basswood River	Basswood Lake to Crooked Lake	1B, 2B
Bear Creek	Canadian border to Lake of the Woods	2B, 3B
Bottle River	Bottle Lake to Lac La Croix	1B, 2B
Granite River	Clove Lake to Gneiss Lake	1B, 2B
Harrison Creek	Canadian border to Lake of the Woods	2B, 3B
Kawishiwi River	Source to Fall Lake	1B, 2B, 3B
Knife River	Seed Lake to Carp Lake	1B, 2B
Loon River	Loon Lake to Little Vermillion Lake	1B, 2B
Pine River	Magnetic Lake to Clove Lake	1B, 2B
Poplar Creek	Canadian border to Lake of the Woods	2B, 3B

Waters	Reach of Area Involved or Location	Classification
Lake of the Woods Basin (Cont.)		
Streams (Cont.)		
Rainy River	Outlet of Rainy Lake to Dam in International Falls	1B, 2B, 3A
Rainy River	Dam in International Falls to Railroad Bridge in Baudette	1C, 2B, 3A
Rainy River	Railroad Bridge in Baudette to Lake of the Woods	2B, 3A
Stony Creek	Canadian border to Lake of the Woods	2B, 3B
Lakes		
Basswood Lake	(T. 64, 65; R. 9, 10, 11)	1B, 2A
Birch Lake	(T. 64, 65; R. 8, 9)	1B, 2B
Bottle Lake	(T. 67; R. 13)	1B, 2B
Carp Lake	(T. 65; R. 8)	1B, 2B
Clove (Pine) Lake	(T. 65; R. 4)	1B, 2B
Crane Lake	(T. 67, 68; R. 16, 17)	1B, 2A, 3A
Crooked Lake	(T. 65, 66; R. 12, 13)	1B, 2A
Cypress Lake	(T. 66; R. 6)	1B, 2B
Fall Lake	(T. 63, 64; R. 11, 12)	1B, 2B
Gneiss Lake	(T. 66; R. 4)	1B, 2B
Gunflint Lake	(T. 65; R. 2, 3, 4)	1B, 2A
Little Gunflint Lake	(T. 65; R. 2)	1B, 2B
Iron Lake	(T. 66, 67; R. 12, 13)	1B, 2B
Kabetogama Lake	(T. 69, 70; R. 20, 21, 22)	1B, 2B, 3A
Knife Lake	(T. 64, 65; R. 7, 8)	1B, 2A
Little Knife Lake	(T. 65, 66; R. 6, 7)	1B, 2B
Lac La Croix	(T. 67, 68; R. 13, 14, 15)	1B, 2B
Loon Lake	(T. 66, 67; R. 15)	1B, 2A
Magnetic Lake	(T. 65; R. 3, 4)	1B, 2A
Maraboeuf Lake	(T. 66; R. 4)	1B, 2B
Melon Lake	(T. 65; R. 8)	1B, 2B
Namakan Lake	(T. 69; R. 17, 18, 19)	1B, 2B, 3A
Newton Lake	(T. 63, 64; R. 11)	1B, 2B
North Lake	(T. 65; R. 2)	1B, 2A
Little North Lake	(T. 65; R. 2)	1B, 2B
Pipestone Bay	(T. 64, 65; R. 10, 11)	1B, 2B
Rainy Lake	(T. 70, 71; R. 18, 19, 20, 21, 22, 23)	1B, 2B, 3A
Saganaga Lake	(T. 66; R. 4, 5)	1B, 2A
Sand Point Lake	(T. 68, 69; R. 17)	1B, 2A, 3A
Seed Lake	(T. 65; R. 8)	1B, 2B
Sucker Lake	(T. 64; R. 8, 9)	1B, 2B

Waters	Reach or Area Involved or Location	Classification
Lake of the Woods Basin (Cont.)		
Lakes (Cont.)		
Swamp Lake	(T. 66; R. 5, 6)	1B, 2B
Little Vermillion Lake	(T. 67; R. 16)	1B, 2B
Lake of the Woods	(T. 161, 162, 163, 164, 165, 166, 167, 168; R. 30, 31, 32, 33, 34, 35)	1B, 2B, 3A

SUPPLEMENT 1**CLASS 7 LIMITED RESOURCE VALUE WATERS****Red Cedar River Basin****Streams**

Unnamed Creek Emmons	T. 101, R. 22, S. 31
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Lower Mississippi River Basin**Streams**

*Bear Creek, North Spring Grove	T. 101, R. 7, S. 26, 27, 35
*Pine Creek Harmony	T. 101, R. 9, S. 31 T. 101, R. 10, S. 24, 25, 36
*Riceford Creek Mabel	T. 101, R. 8, S. 24, 25, 26

Missouri River Basin**Streams**

*Flandreau Creek Lake Benton	T. 108, R. 46, S. 1, 2, 11 T. 109, R. 45, S. 30, 31 T. 109, R. 46, S. 36
*Rock River Holland	T. 107, R. 44, S. 18, 19, 20, 29 T. 107, R. 45, S. 12, 13
Unnamed Ditch Hills	T. 101, R. 46, S. 28, 33

CHAPTER TWENTY-SEVEN: WPC 27

EFFLUENT STANDARDS FOR DISPOSAL SYSTEMS DISCHARGING TO THE INTRASTATE WATERS OF THE LAKE SUPERIOR BASIN, AND TO THE INTERSTATE WATERS OF LAKE ST. CROIX

WPC 27: The following standard of effluent quality and purity is hereby adopted and established for all of the intrastate waters of the state lying within the drainage basin of Lake Superior in the counties of Aitkin, Carlton, Cook, Itasca, Lake, Pine, and St. Louis (Townships 45-65 North, Ranges 7 East — 23 West), and for the interstate waters of Lake St. Croix in Washington County (Townships 26-30 North, Range 20 West). This standard requirement shall be in addition to the standards imposed by any other regulations applying to these waters, and shall supersede any conflicting provisions.

(a) **Definitions.** The terms "person," "sewage," "industrial wastes," "other wastes," "treatment works," "disposal systems," and "waters of the state," as well as any other pertinent terms for which definitions are given in the water pollution control statutes, as used herein have the meanings ascribed to them in Minnesota Statutes (1969), Chapters 115 and 116. Intrastate waters include all of the waters of the state except interstate waters as defined in the Federal Water Pollution Control Act as amended (33 U.S.C. 466 et seq.), Section 13(e). Thus the intrastate waters are all of the waters of the state that do not flow across or form a part of the state boundary. Other terms and abbreviations used herein not specifically defined in the law shall be construed in conformance with the context and professional usage.

(b) **Severability.** The provisions of this regulation shall be severable and the invalidity of any lettered paragraph or any subparagraph or subdivision thereof shall not make void any other lettered paragraph, subparagraph, subdivision or any other part thereof.

(c) **Standard of Effluent Quality and Purity.** Except as otherwise provided herein it is hereby established as a minimum requirement applicable to all persons operating or causing to be operated or in any way responsible for the operation of a disposal system which discharges sewage, industrial waste or other wastes directly to the above delineated waters, or which may affect these waters, that all effluents shall be treated prior to discharge so as to meet the following limiting permissible concentration:

Substance or Characteristic	Limiting Concentration
Phosphorus	1 milligram per liter

(d) **Monthly Reports.** All persons operating sewage, industrial waste or other waste disposal systems adjacent to or discharging to the waters covered by this regulation shall submit every month a report to the Minnesota Pollution Control Agency on the operation of such disposal system, the effluent flow, and the characteristics and concentration of the effluents and receiving waters. Sufficient data on measurements, observations, sampling and analyses

and other pertinent information shall be furnished as may be required by the Agency to reflect adequately the condition of the disposal system, the effluent and the waters receiving the effluent.

(c) **Determination of Compliance.** In making tests or analyses of the sewage, industrial wastes or other wastes to determine compliance with the standards, samples shall be collected in such manner and place, and of such type, number and frequency as may be considered satisfactory by the Agency. No allowance will be made for dilution of the effluents in the waters of the state into which they are discharged. The samples shall be preserved and analyzed in accordance with procedures given in Standard Methods for the Examination of Water and Waste Water, by the American Public Health Association, American Water Works Association, and the Water Pollution Control Federation which is in effect on the effective date of this regulation, or other methods acceptable to the Agency.

(f) **Variance from Standard.** In any case where, upon application of the responsible person or persons, the Agency finds that by reason of exceptional circumstances the strict enforcement of any provision of these standards would cause undue hardship, that disposal of the sewage, industrial waste or other waste is necessary for the public health, safety or welfare, or that strict conformity with the standards would be unreasonable, impractical or not feasible under the circumstances, the Agency in its discretion may permit a variance therefrom upon such conditions as it may prescribe for prevention, control or abatement of pollution in harmony with the general purposes of this standard and the intent of the applicable state and national laws.

*Filed with the Secretary of State and Commissioner of Administration
February 4, 1971.*

CHAPTER TWENTY-EIGHT: WPC 28**EFFLUENT STANDARDS FOR DISPOSAL SYSTEMS DISCHARGING TO THE ST. LOUIS RIVER FROM ITS SOURCE TO AND INCLUDING ST. LOUIS BAY AND SUPERIOR BAY; THE MISSISSIPPI RIVER FROM ITS SOURCE TO THE BLANDIN DAM IN GRAND RAPIDS INCLUDING LAKES ANDRUSIA, BEMIDJI, CASS, ITASCA, POKEGAMA, AND WINNIBIGOSHISH; AND THE LITTLE MINNESOTA RIVER AND BIG STONE LAKE, AND ALBERT LEA LAKE**

WPC 28: The following standards of effluent quality and purity are hereby adopted and established for the waters of the St. Louis River from its source at Seven Beaver Lake (Township 58 North, Range 12 West) to and including St. Louis Bay (Townships 49 and 50 North, Ranges 14 and 15 West) and Superior Bay (Townships 49 and 50 North, Ranges 13 and 14 West), the Mississippi River from its source to the Blandin dam at the outlet of Paper Mill Reservoir in the City of Grand Rapids approximately 400 feet upstream from the bridge on U.S. Highway 169 including Lake Andrusia (Township 146 North, Range 31 West), Lake Bemidji (Townships 146 and 147 North, Range 33 West), Cass Lake (Townships 145 and 146 North, Ranges 30 and 31 West), Lake Itasca (Township 143 North, Range 36 West), Pokegama Lake (Townships 54 and 55 North, Ranges 25 and 26 West), and Winnibigoshish Lake (Townships 145, 146, and 147 North, Ranges 27, 28, and 29 West), the Little Minnesota River and Big Stone Lake from the South Dakota border crossing to the outlet of Big Stone Lake at the dam immediately upstream from the U.S. Highway 12 bridge in Ortonville, and Albert Lea Lake (Township 102 North, Ranges 20 and 21 West) in Freeborn County.

(a) **Definitions.** The terms "person," "sewage," "industrial wastes," "other wastes," "treatment works," "disposal systems," and "waters of the state," as well as any other pertinent terms for which definitions are given in the water pollution control statutes, as used herein have the meanings ascribed to them in Minnesota Statutes (1969), Chapters 115 and 116. Other terms and abbreviations used herein not specifically defined in the law shall be construed in conformance with the context and professional usage.

(b) **Severability.** The provisions of this regulation shall be severable and the invalidity of any lettered paragraph or any subparagraph or subdivision thereof shall not make void any other lettered paragraph, subparagraph, subdivision or any other part thereof.

(c) **Standards of Effluent Quality and Purity.** Except as otherwise provided herein it is hereby established as a requirement applicable to all persons operating or causing to be operated or in any way responsible for the operation of a disposal system which discharges sewage, industrial waste or other wastes directly to the above delineated waters, or which may affect these waters, that all effluents shall be treated prior to discharge so as to meet any or all of the following limiting permissible concentrations:

Substance or Characteristic	Limiting Concentration
5-day biochemical oxygen demand	25 milligrams per liter
Total suspended solids	30 milligrams per liter
Fecal coliform group organisms	200 most probable number per 100 milliliters
Total coliform group organisms*	1,000 most probable number per 100 milliliters
Pathogenic organisms	None
Oil	Essentially free of visible oil
Turbidity value	25
pH	6.5-8.5
Phosphorus	1 milligram per liter
Unspecified toxic or corrosive substances	None at levels acutely toxic to humans or other animals or plant life, or directly damaging to real property.

(d) **Monthly Reports.** All persons operating sewage, industrial waste or other waste disposal systems adjacent to or discharging to the waters covered by this regulation shall submit every month a report to the Minnesota Pollution Control Agency on the operation of such disposal system, the effluent flow, and the characteristics and concentration of the effluent and receiving waters. Sufficient data on measurements, observations, sampling and analyses and other pertinent information shall be furnished as may be required by the Agency to reflect adequately the condition of the disposal system, the effluent and the waters receiving the effluent.

(e) **Determination of Compliance.** In making tests or analyses of the sewage, industrial wastes or other wastes to determine compliance with the standards, samples shall be collected in such manner and place, and of such type, number and frequency as may be considered satisfactory by the Agency. No allowance will be made for dilution of the effluents in the waters of the state into which they are discharged. The samples shall be preserved and analyzed in accordance with procedures given in Standard Methods for the Examination of Water and Waste Water, by the American Public Health Association, American Water Works Association, and the Water Pollution Control Federation which is in effect on the effective date of this regulation, or other methods acceptable to the Agency.

For the purpose of determining compliance with this regulation the characteristics of the sewage industrial waste, or other wastes to be controlled shall be construed to be those which are attributable to changes resulting from the use or conveyance of surface water by an industry, or other person within the meaning of the statute.

(f) **Variance from Standards.** In any case where, upon application of the responsible person or persons, the Agency finds that by reason of exceptional circumstances the strict enforcement of any provision of these standards

**May be used as the control parameter in lieu of fecal coliforms if desired.*

would cause undue hardship, that disposal of the sewage, industrial waste or other waste is necessary for the public health, safety or welfare, or that strict conformity with the standards would be unreasonable, impractical or not feasible under the circumstances, the Agency in its discretion may permit a variance therefrom upon such conditions as it may prescribe for the prevention, control or abatement of pollution in harmony with the general purpose of these standards and the intent of the applicable state and national laws.

*Filed with the Secretary of State and Commissioner of Administration
February 4, 1971.*

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MINNESOTA CODE OF AGENCY RULES

RULES OF THE MINNESOTA POLLUTION CONTROL AGENCY

1982 Reprint



All rules as in effect on September 15, 1982

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For Table of Contents See Volume 34A.

CHAPTER THIRTY: WPC 30

EFFLUENT STANDARDS FOR DISPOSAL SYSTEMS DISCHARGING TO THE ST. CROIX RIVER FROM THE WISCONSIN BORDER CROSSING TO TAYLORS FALLS

WPC 30: The following standards of effluent quality and purity are hereby adopted and established for the waters of the St. Croix River from the Wisconsin border crossing (Section 31, Township 42 North, Range 15 West), to the Northern States Power Company Dam in Taylors Falls, approximately at the eastward extension of the boundary between sections 24 and 25 Shafer Township, Chisago County.

(a) **Definitions.** The terms "person," "sewage," "industrial wastes," "other wastes," "treatment works," disposal systems," and "waters of the state," as well as any other pertinent terms for which definitions are given in the water pollution control statutes, as used herein have the meanings ascribed to them in Minnesota Statutes (1969), Chapters 115 and 116. Other terms and abbreviations used herein not specifically defined in the law shall be construed in conformance with the context and professional usage.

(b) **Severability.** The provisions of this regulation shall be severable and the invalidity of any lettered paragraph or any subparagraph or subdivision thereof shall not make void any other lettered paragraph, subparagraph, subdivision or any other part thereof.

(c) **Standards of Effluent Quality and Purity.** Except as otherwise provided herein it is hereby established as a minimum requirement applicable to all persons operating or causing to be operated or in any way responsible for the operation of a disposal system which discharges sewage, industrial waste or other wastes to the above delineated waters, or which may affect these waters, that all effluents shall be treated prior to discharge so as to meet any or all of the following limiting permissible concentrations:

Substance or Characteristic	Limiting Concentration
5-day biochemical oxygen demand	25 milligrams per liter
Total suspended solids	30 milligrams per liter
Fecal coliform group organisms	10 most probable number per 100 milliliters
Total coliform group organisms*	50 most probable number per 100 milliliters
Pathogenic organisms	None
Oil	Essentially free of visible oil
Turbidity value	10
pH	6.5-8.5
Unspecified toxic or corrosive substances	None at levels acutely toxic to humans or other animals or plant life, or directly damaging to real property.

*May be used as the control parameter in lieu of fecal coliforms if desired.

(d) **Monthly Reports.** All persons operating sewage, industrial waste or other waste disposal systems adjacent to or discharging to the waters covered by this regulation shall submit every month a report to the Minnesota Pollution Control Agency on the operation of such disposal system, the effluent flow, and the characteristics and concentration of the effluents and receiving waters. Sufficient data on measurements, observations, sampling and analyses and other pertinent information shall be furnished and may be required by the Agency to reflect adequately the condition of the disposal system, the effluent and the waters receiving the effluent.

(e) **Determination of Compliance.** In making tests or analyses of the sewage, industrial wastes or other wastes to determine compliance with the standards, samples shall be collected in such manner and place, and of such type, number and frequency as may be considered satisfactory by the Agency. No allowance will be made for dilution of the effluents in the waters of the state into which they are discharged. The samples shall be preserved and analyzed in accordance with procedures given in Standard Methods for the Examination of Water and Waste Water by the American Public Health Association, American Water Works Association, and the Water Pollution Control Federation, which is in effect on the effective date of this regulation, or other methods acceptable to the Agency.

(f) **Variance from Standards.** In any case where, upon application of the responsible person or persons, the Agency finds that by reason of exceptional circumstances the strict enforcement of any provision of these standards would cause undue hardship, that disposal of the sewage, industrial waste or other waste is necessary for the public health, safety or welfare, or that strict conformity with the standards would be unreasonable, impractical or not feasible under the circumstances, the Agency in its discretion may permit a variance therefrom upon such conditions as it may prescribe for the prevention, control or abatement of pollution in harmony with the general purposes of these standards and the intent of the applicable state and national laws.

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February 4, 1971.*

See new: AR03245T →

6 MCAR § 4.8034 Rule for the administration of the Minnesota State Water Pollution Control Fund and federal grant funds allotted to Minnesota.

A. Purpose. This rule is herein adopted and promulgated by the Minnesota Pollution Control Agency to implement the provisions of Minn. Stat. chs. 115 and 116 (1976 and 1977 Supp.) and to comply with the Federal Water Pollution Control Act 33 U.S.C. § 1251 et seq., and guidelines and regulations pursuant thereto, by the establishment of procedures relating to the federal construction grants and state construction grant and loan programs.

The promulgation of this rule, in association with the agency's enabling legislation, provides authority for the State of Minnesota, upon approval by the Regional Administrator of the United States Environmental Protection Agency, to certify applicants for Federal construction grants and subsequently, to the extent funds are available, provide state construction grants. The Minnesota Pollution Control Agency is the State agency designated by State law to administer this program. Except as specifically provided herein, this rule shall apply with equal force to state financial assistance and Federal grant funds.

B. Definitions. The terms "person", "sewage", "industrial wastes", "other wastes", "treatment works", "sewer system", "disposal system", "waters of the state", "pollution control fund", "municipality", "director", "agency", "pollution of water", "eligible cost", "wastewater treatment facility", as well as any other pertinent terms for which definitions are given in Minn. Stat. chs. 115 and 116 shall have the meanings ascribed to them therein.

The terms specified below shall have the meanings ascribed to them:

1. "Act" means the Federal Water Pollution Control Act, 33 USC 1251 et seq.
2. "EPA" means the United States Environmental Protection Agency.
3. "Administrator" means the Administrator of the United States Environmental Protection Agency.
4. "Regional Administrator" means the EPA Regional Administrator for the region in which Minnesota is located (now Region Five).
5. "Need" means a determination that a new or upgraded disposal system is currently required, or will be required within a five-year period to comply with State Water Pollution Control Rules; provided, the situation does not exist primarily due to inadequate operation and maintenance or primarily due to negligence on the part of any person.
6. "Category of Project" means the part of the disposal system the municipality intends to construct.

7. "Type of Project" means its "STEP":

a. "Step 1" means all necessary preliminary engineering studies for the project.

b. "Step 2" means the preparation of construction plans and specifications for the project.

c. "Step 3" means the construction of the project.

8. "Project" means the scope of work for which grant assistance is awarded.

9. "Metropolitan Area" means Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington Counties.

10. "Non-metropolitan Area" means all counties of the state not in the metropolitan area.

11. "Secondary Treatment" shall have the meaning ascribed to it in Minn. Rule WPC 14 or 15 or amendments thereto.

12. "Tertiary Treatment" means any level of treatment of higher quality than secondary treatment.

13. "Primary Treatment" means any level of treatment of lesser quality than secondary treatment.

14. "Scope of Project" means Step 1, Step 2, or Step 3 of disposal system construction or segments thereof.

15. "Planning Loan" means a loan for Step 1 and/or Step 2 projects.

16. "Construction Loan" means a loan for a Step 3 project.

17. "Resident Inspection" means that the consulting engineer or his agent shall be present on-site, during the hours of construction for purposes of inspection. It does not mean the inspector has to be a resident of the community.

18. "Adequate Errors and Omissions Insurance" means a policy of insurance which provides the minimum amount of coverage for the corresponding estimated project construction cost as determined from the following table, which is maintained for a minimum of two years after acceptance of the project by the grantee.

Estimated Project Construction Cost	Minimum Amount of Coverage
less than \$1,000,000	\$ 250,000
\$1,000,000 to \$2,999,999	\$ 500,000
\$3,000,000 to \$9,999,999	\$1,000,000
\$10,000,000 or over	\$2,000,000

If an engineer has more than one project, the policy must provide for the minimum coverage applicable to the highest estimated project construction cost. Requests for variances from the requirements of this section shall be governed by section E.9.1.

19. "Contract" means a contract between a municipality and an engineer or a contractor for the planning, design, or construction of a disposal system, or part thereof, which will be paid for, in all or in part, by state construction grant funds.

20. "Grantee" means the grantee of a state construction grant.

Other terms and abbreviations used herein which are not specifically defined by law shall be construed in conformance with the context and professional usage.

C. Severability. If any provision of this rule or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions of the rule or application of any other part of this rule which can be given effect without application of the invalid provision. To this end, the provisions of all sections, subsections, or subdivisions herein and the various applications thereof are declared to be severable.

D. Priority of programs. Minn. Stat. § 116.16 et seq. (1976) establishes a pollution control fund and authorizes grants and loans for the construction of municipal disposal systems. To the extent funds are available and requested, the agency shall disburse funds from the pollution control fund in the following order:

1. Grants for projects tendered a 75% federal grant under the Act and, to the extent authorized by statute, grants for projects utilizing innovative or alternative wastewater treatment processes and techniques which have been tendered an 85% federal grant under the Act.

2. Grants to reduce or eliminate the local contribution of a municipality meeting the criteria set forth in 6 MCAR § 4.8034 E.9.b.(4).

3. Grants to municipalities which would qualify for a federal grant but which desire to initiate construction of the project without a federal grant.

4. Loans for the construction of municipal disposal systems.

E. Construction grant program.

1. Summary of construction grants program.

a. The construction grants program generally consists of three steps:

(1) Step 1: preparation of all necessary preliminary engineering studies;

and (2) Step 2: preparation of construction plans and specifications;

(3) Step 3: construction of the disposal system or part thereof.

b. Grants may be awarded for a Step 1, Step 2, or Step 3 project or, as authorized by the Act, for a project which combines steps.

c. The scope of the project is initially defined by the applicant but may be revised by the agency or by EPA.

d. Grants are awarded to municipalities on a priority basis. Priority is determined as follows:

(1) The director shall develop a municipal discharge inventory which lists in priority order, pursuant to 6 MCAR § 4.8034 E.2.c., all municipalities which maintain a discharge of effluent, including those municipalities which utilize land application or individual sewage treatment systems. This inventory includes municipalities which have adequate disposal systems as well as those which have a need for a new or upgraded disposal system.

(2) The agency shall develop a municipal needs list from the municipal discharge inventory. The municipal needs list shall rank in priority order, pursuant to 6 MCAR § 4.8034 E.3.b.(2) all municipalities or projects for which a need exists.

(3) A municipal project list shall be developed by the agency from the municipal needs list. The municipal project list shall list in priority order, pursuant to 6 MCAR § 4.8034 E.4.b., all projects which will be funded during the current fiscal year. The municipal project list shall also list any nonproject uses of the state's allotment of federal construction grant funds.

e. Public participation shall be sought by the agency prior to the adoption of the municipal needs list and the municipal project list, pursuant to 6 MCAR § 4.8034 E.7.

f. Each applicant must apply to the agency for each proposed grant in the manner set forth in 6 MCAR § 4.8034 E.7.

g. The agency shall certify applications which have been determined to be complete for a grant of federal funds from EPA.

h. Funds shall be disbursed to a municipality in the manner set forth in 6 MCAR § 4.8034 E.9.e.

2. Municipal discharge inventory.

a. The director shall develop and maintain a municipal discharge inventory listing all those municipalities which maintain a discharge of ef-

fluent, including those which utilize land application or individual sewage treatment systems.

b. The municipal discharge inventory shall include those municipalities which have adequate disposal systems as well as those which have a need for a new or upgraded disposal system.

c. Each municipality shall be awarded points pursuant to the criteria set forth in 6 MCAR § 4.8034 E.2.d. below. The municipalities shall be listed on the municipal discharge inventory in descending order according to the number of points awarded to each.

d. Criteria.

(1) Extent and nature of pollution. Priority points shall be awarded as set forth below from a determination of the highest single beneficial water use seriously affected, or if no pollution problem currently exists, from a determination of the highest single beneficial water use to be preserved.

Water Use	Point Rating
Class 1 Domestic water supply:	
A. Direct consumption (groundwater)	70
B. Consumption after only disinfection by chlorination	65
C. Consumption after moderate water treatment process	60
D. Consumption after very complete water treatment process	55
Class 2 Fisheries and recreation waters:	
A. Propagation and maintenance of cold water fishery and all recreation uses	60
B. Propagation and maintenance of mixed fishery and all recreational uses	50
C. Propagation and maintenance of rough fishery and non-contact recreational uses	40
Class 3 Industrial consumption, except food processing and related uses:	
A. Direct use without chemical treatment	40

B. Use with moderate treatment	30
C. Use for cooling and material transport	20
Class 4 Agriculture and wildlife:	
A. Irrigation and agricultural crops of all kinds	35
B. Watering of livestock and wildlife	30
Class 5 Commercial navigation and waste disposal	10

(2) Population affected. Priority points shall be assigned for each type of project based on the population of the municipality, or population of the municipalities served by such project as determined by the most recent reliable census, as follows:

	Point Rating
(a) Municipal population under 250	2
(b) Municipal population from 251-500	4
(c) Municipal population from 501-750	6
(d) Municipal population from 751-1000	8
(e) Municipal population from 1001-1500	10
(f) Municipal population from 1501-3000	12
(g) Municipal population from 3001-5000	14
(h) Municipal population from 5001-10,000	16
(i) Municipal population from 10,001-20,000	20
(j) Municipal population from 20,001-50,000	25
(k) Municipal population from 50,001-450,000	35
(l) Municipal population in excess of 450,000	50

(3) List of segments. Pursuant to Section 303(e) of the Act and guidelines and regulations thereto relating to the state continuing planning process, all waters of the state shall be divided into segments and each seg-

ment classified as either water quality or effluent limited. The director shall annually develop a list of segments, and after giving consideration to:

- (a) severity of pollution problems;
 - (b) population;
 - (c) need for preservation of high quality waters; and
 - (d) national priorities as determined by the Administrator;
- priority points will be established in accordance with criteria approved by the agency and the EPA.

The segment ranked number one shall be awarded priority rating equal to the total number (N) of segments with any subsequent segment receiving a priority rating of N + 1 minus the numerical ranking of the segment. Priority points shall be accordingly awarded to a municipality for the type of project located in a segment.

3. Municipal needs list.

a. The agency shall develop, and update whenever necessary, a municipal needs list listing all municipalities for which a need exists or which desire to construct eligible projects which do not meet the enforceable requirements of the Act.

b. Each municipality shall be awarded points in the following manner:

(1) Points awarded pursuant to 6 MCAR § 4.8034 E.2.d. in the development of the municipal discharge inventory; and,

(2) Points awarded pursuant to the criteria set forth in 6 MCAR § 4.8034 E.3.c. below. The municipalities or projects shall be ranked on the municipal needs list according to the number of points awarded to each.

c. Criteria.

(1) Category of project. Priority points shall be allocated on the basis of the single highest disposal system or part thereof, improvement to prevent, control, and abate the source of pollution as follows:

	Point Rating
(a) Provision of tertiary treatment. For the purpose of this regulation, treatment works which provide for regulated discharge of effluents in lieu of tertiary treatment shall be construed to provide tertiary treatment.	160
(b) Provision of secondary treatment.	150

- (c) Provision of a new sewer system or portion thereof for a municipality, in existence on October 18, 1972 with sufficient existing or planned capacity to adequately treat such collected sewage or industrial waste. 10
- (d) Provision by a municipality of storm water disposal system, including sewer systems to separate existing combined sanitary and storm sewers or treatment works. 10
- (e) A municipality having only primary treatment. 20
- (f) A municipality or an area part of an area-wide study having a sewer system with no treatment including septic tanks overflowing to a sewer system. 30
- (g) Subsections (a), or (b), whichever is applicable, shall also include treatment works and/or any portion of sewer system improvements deemed necessary by the director to insure the integrity and performance of a disposal system.
- (h) An interceptor sewer which eliminates any existing treatment works or which, in accordance with an approved basin plan, eliminates the need for construction of new treatment works shall be considered equivalent to tertiary or secondary treatment and allocated the appropriate priority points pursuant to subsections (a) or (b), whichever is applicable.
- (i) In the case of a sanitary sewer system being tributary to sewerage facilities which are on the municipal project list for funding but which the EPA will not fund until an infiltration/inflow analysis, and where required, a sewer system evaluation survey has been performed, this sewer system project shall be awarded by the director an equal number of priority points as the project on the municipal project list.

(2) Financial aspects. Priority points shall be awarded by summing up the applicable rating points for the project from Tables 1, 2, and 3 relative to per capita project cost, the ratio of municipal bonded debt to adjusted assessed values of municipalities and per capita buying income.

TABLE I

Per Capita Cost of Project

Per Capita Cost (\$)	Point Rating
0-280	1
281-400	3
401-600	5
601-800	7

TABLE I (Cont.)

Per Capita Cost of Project

Per Capita Cost (\$)	Point Rating
801-1000	9
1001-1300	11
1301-1600	13
over 1600	15

TABLE II

Ratio of Municipal Bonded Debt to
Adjusted Assessed Values of Municipalities

Ratio x 100	Point Rating
0-3	3
4-9	5
10-15	7
16-21	9
22-27	11
28-33	13
over 33	15

TABLE III

Per Capita Buying Income

Percent of Average	Point Rating
0-50	15
51-60	13
61-70	11
71-80	9
81-90	7
91-100	5
101-110	3
over 110	1

(3) Ten additional points will be awarded to an application which includes planned participation in a sanitary district and/or other multi-municipal disposal system.

d. If a municipality or project is not included on the municipal needs list, the municipality may petition the agency for inclusion on the list. The municipality must document its need in the following manner:

(1) Sewered communities: submission of data regarding: concentration of pollutants in existing discharge; volume of discharge; and waters of the state presently or potentially impacted by the discharge;

(2) Unsewered communities: submission of data regarding: type of soil in unsewered area; depth to seasonally high water table; size of all lots in the area; and age and type of existing system.

Following submission of this data, the director will review the material and determine if a need has been shown. In so, the municipality will be added to the municipal needs list, in the manner set forth above. If not, the municipality will be notified of the reasons for the decision of the director.

e. If in the determination of the order of priority on the municipal needs list, two or more municipalities have the same total number of priority points, the municipality in accordance with 6 MCAR § 4.8034 E.2.d.(1) that has the highest single beneficial water use seriously affected or to be preserved shall be ranked higher. If two or more municipalities have the same total number of priority points and the same highest single beneficial water use seriously affected or to be preserved, the municipalities shall be ranked based on population as determined by the most recent federal census in descending order below the municipality with the largest population.

4. Municipal project list.

a. The agency shall prepare a municipal project list each fiscal year which shall list in order of priority those projects for which federal grant funds will be requested from current allotments. The municipal project list shall also list any nonproject uses of the state's allotment of federal construction grant funds, including but not limited to training grants and costs of administration.

b. Projects with the highest priority on the municipal needs list will be placed on the municipal project list in the following manner:

(1) Funds shall be allocated between the metropolitan area and the non-metropolitan area in approximately the same ratio which the population of seweried municipalities of the metropolitan area bears to the seweried population of the non-metropolitan area.

(2) Funds will be set aside for such classifications of projects and in such amounts as is required by the Act. Such classification presently include:

(a) Treatment works utilizing innovative or alternative wastewater treatment processes and techniques for which an 85% federal grant may be tendered;

(b) Alternatives to conventional sewage treatment works for municipalities having a population of three thousand five hundred or less or for the highly dispersed sections of larger municipalities, as defined by the administrator; and

(c) Construction of publicly owned treatment works for major sewer system rehabilitation, new collector sewers and appurtenances, new interceptors and appurtenances, and, correction of combined sewer overflows, if such projects are on the municipal project list for that year and are otherwise eligible for funding in that fiscal year.

These classifications are presently required by Sections 205 and 216 of the Act. 6 MCAR § 4.8034 E.4.b.(2) shall, therefore, be read in conjunction with the terms as defined in the Act and U.S. EPA regulations.

(3) The agency shall provide for an adequate mixture of Step 1, 2, and 3 projects so as to permit funding to proceed in an orderly fashion and to fully utilize all allocated funds.

(4) Federal grant funds allocated to non-metropolitan area projects and for which there are not sufficient certifiable non-metropolitan projects by the end of the fiscal year for which those funds were allotted shall be reallocated by the agency to the metropolitan area. Any such federal grant funds which are reallocated to the metropolitan area shall be recoverable in total for allocation to non-metropolitan projects in later fiscal years in annual amounts deemed reasonable by the director. Grant funds allocated to the metropolitan area which are unused are subject to similar provisions for reallocation to and recovery from non-metropolitan projects.

c. A reserve project list shall be developed by the agency for the purpose of utilizing grant monies forfeited by any municipality pursuant to 6 MCAR § 4.8034 E.8.b. and E.8.c.

d. The municipal project list may be modified, in accordance with EPA regulations, to give higher priority to Step 2 or combined Step 2 and 3 projects utilizing innovative or alternative wastewater treatment processes and techniques to the extent necessary to comply with the set-asides required by the Act.

5. Project eligibility.

a. Projects which are not eligible for federal grants shall not be eligible for state grant funds except as provided in section E.9.b.

b. A project is not eligible for a grant if the construction has been initiated prior to the award of the grant, except as provided in 6 MCAR § 4.8034 E.9.b.

c. Items are not granted eligible unless the director determines that they are necessary to the cost effective functioning of an otherwise grant eligible disposal system.

6. Adjustments.

a. Notwithstanding any other provision in this rule including, but

not limited to, 6 MCAR § 4.8034 E.2.d., E.3.c. and E.6.a., to the contrary, the director may, as necessary to establish criteria for determining priority for applications for federal and state construction grants under the Act, and regulations and guidelines of the EPA promulgated pursuant thereto, and Minn. Stat. chs. 115 and 116, establish such criteria for determining priority upon a basis other than that provided herein, to the extent required to comply with the Act, and guidelines and regulations thereto or resulting therefrom.

7. Public participation. Prior to the adoption of the municipal needs list and the municipal project list by the agency, public participation shall be sought in the following manner:

a. Notice of the agency board meeting at which the municipal needs list and the municipal project list will be adopted shall be given to all affected municipalities at least 30 days prior to such meeting.

b. A free copy of the proposed municipal needs list and the proposed municipal project list will be mailed to any interested person upon request.

c. Prior to the agency board meeting, public informational meetings will be conducted at such locations as the director deems appropriate. Notice of such meetings shall be given to all affected municipalities.

d. All interested persons shall have the opportunity to present oral or written statements to the board in regard to the proposed municipal needs list or the proposed municipal project list if a request is submitted to the board. Such request should be submitted fourteen days prior to the meeting to facilitate agenda preparation and must be submitted at least three days prior to meeting. If such request is made during the board meeting, interested persons may be afforded the opportunity to participate within such limits of time and manner as the board may establish under the circumstances.

8. Applications.

a. Unless otherwise specified by the director, the state construction grant application form shall be the federal construction grant application form of the EPA.

b. Within 90 days for a Step 1, 150 days for a Step 2, and 150 days for a Step 3 after notification in writing from the director, a municipality shall file a completed construction grant application or submit such information as the director determines to be necessary to complete a previously submitted application. The director may extend the date of filing or submission of any information subject to the municipality providing adequate justification therefor. Failure to comply with this schedule may cause forfeiture of grant monies for the step grant involved and the municipality may be required to complete the work for that step without grant monies.

c. A specific schedule for completing the particular step of the

project will be contained in each grant offer tendered. The municipality's National Pollutant Discharge Elimination System (NPDES) permit may be modified, pursuant to agency rule, to include such schedule. Failure to comply with this schedule may cause forfeiture of grant monies for the step grant involved and the municipality may be required to complete the work for that step without grant monies. Prior to the forfeiture of grant monies or the required completion of work without grant monies pursuant to 6 MCAR § 4.8034 E.8.b. or c., the municipality shall have the right to a hearing, if it so requests.

d. The construction grant application for a Step 1 project shall include the following attachments and such other attachments as EPA may require:

(1) Resolution of governing body of the municipality authorizing the filing of the application and designating the municipal official authorized to sign the application;

(2) If more than one municipality is involved, resolutions from the governing body of all municipalities agreeing to cost sharing and agreeing to proceed to Steps 2 and 3 if cost-effective;

(3) Proposed sub-agreements, or an explanation of the intended method of awarding sub-agreements for substantial portions of the project work;

(4) Statement by the consulting engineer indicating the effluent limitations for which the disposal system is being designed;

(5) A resolution by the governing body of the municipality to the effect that the sewage collection system will, at the appropriate time, be constructed concurrently with the sewage treatment works; and

(6) A resolution by the governing body of the municipality as to the methods for financing the construction of the collection system; and

(7) Documentation by the engineer(s) that they carry adequate errors and omissions insurance.

e. The construction grant application form for a Step 2 project shall include the following attachments and such other attachments as EPA may require:

(1) Any of the items listed in 6 MCAR § 4.8034 E.8.d. which were not previously submitted or which require updating;

(2) Resolution of the governing body of the municipality authorizing the application and designating the municipal official authorized to sign the application;

(3) If more than one municipality is involved, resolutions from the governing bodies of all municipalities agreeing to cost sharing and agreeing to proceed to Step 3 when so instructed by the agency;

(4) A design summary based on the plans and specifications to be submitted when the plans and specifications are complete; and

(5) Documentation by the engineer(s) that they carry adequate errors and omissions insurance.

f. The construction grant application form for a Step 3 project shall be supported by the following attachments and such other attachments as EPA may require:

(1) Any of the items listed in 6 MCAR § 4.8034 E.8.d. or E.8.e. which were not submitted or which require updating;

(2) Resolution of the governing body of the municipality authorizing the application and designating the municipal official authorized to sign the application;

(3) If any items are deleted from project eligibility after initial submittal of the plans and specifications, the cost of such items must be set out;

(4) Signature and registration number of the consulting engineer accompanying the following certification statement:

The treatment works described in this grant application have been designed with full knowledge of the effluent limitations required by the Minnesota Pollution Control Agency as set forth in NPDES Permit No. _____ dated _____. It is my judgment and carefully considered opinion that these treatment works are capable of consistently producing the required effluent quality, provided that the facility is operated in conformance with the approved operation and maintenance manual and that the volume and characteristics of raw wastewater are within the limits of "Design Data" stated on page _____ of the plans or as follows:

(5) Executed engineering contract, including, unless otherwise approved by the director, full-time qualified resident inspection by the consulting engineer or his agent during construction. After project initiation, reports are to be submitted outlining type of construction inspected and time; and

(6) Documentation by the engineer(s) that they carry adequate errors and omissions insurance.

g. All construction grant application forms and attachments shall be submitted in triplicate to the agency at the address specified by the director. Unless adequately justified in writing, failure to submit all the necessary

documents by the date specified shall constitute grounds for rejection of the application. Substantial deficiencies in the application and/or supporting documents or failure to conform with applicable requirements such as those set forth in the current agency water pollution control program plan or the applicable basin, regional, or area water quality management plan also shall be grounds for rejection. Any application shall be rejected at the discretion of the agency if it does not include an engineering report acceptable to the director, or does not include an adequate commitment for support of operation and maintenance of the project or is not consistent with applicable statutes, or does not contribute to the overall objective of effective water quality management.

9. Administration.

a. Certification. Accepted applications of municipalities on the municipal project list shall be certified to the EPA for a grant. Such certification shall in any fiscal year be withheld or withdrawn by the director if the project is not or cannot be implemented according to an acceptable schedule or otherwise poses a substantial likelihood of causing a loss of federal funds to the State.

b. Tender of grant.

(1) After the EPA has determined the eligibility of the application and tendered a federal grant, the agency shall make a similar grant offer to the municipality in an amount not less than that required by federal law and regulator, as a condition for the grant of federal funds or in an amount not less than that allowed by state statutes where not required by federal law.

(2) In the case of a project for which the applicant has solicited and received contracts which exceed the costs estimated in the application, the director may, after consideration of available federal funds and in accordance with EPA regulations, recommend a grant increase. A reasonable amount shall be reserved by the agency from each allotment of funds for such increases.

(3) The agency may tender a grant of state funds to a municipality that would otherwise qualify for a federal grant but desires to initiate construction of a project without a federal grant.

(4) The agency may tender a grant of state funds to a municipality for what would otherwise be the local share of the cost if:

(a) The municipality is unable to finance the local share and attain a minimal point rating of 40 under the criteria of 6 MCAR § 4.8034 E.3.c.(2); and,

(b) Application is made prior to the initiation of construction; and,

(c) The prevention, control, and abatement of water pollution and the public health of the state require the construction of the project.

d. Change orders. Any proposed changes in the contract which result in cost increases greater than that of the base contract plus contingencies as stated in the project summary or other proposed changes regardless of cost which substantially alter the type of treatment process, or its efficiency, versatility or reliability, shall be submitted to the director for prior approval, except where the work is agreed by the director to be of an emergency nature. Change orders not requiring prior approval of the director shall be submitted within one month after the date on which the change is ordered by the applicant, its engineer or other authorized agent for review and approval.

d. Reimbursement grants. If a project is eligible for a federal reimbursement grant, the agency may provide a state grant or grant increase for such project.

e. Payment of grant funds.

(1) Step 1 grants. The agency shall pay 50% of the grant when an adequate facilities plan has been received by the director. The balance shall be paid upon agency and EPA approval of the facilities plan.

(2) Step 2 grants. The agency shall pay 50% of the grant when adequate plans and specifications have been received by the director. The balance shall be paid upon agency and EPA approval of the plans and specifications.

(3) Step 3 grants.

(a) Installment payments may be requested from the agency when twenty-five (25) percent, fifty (50) percent and seventy-five (75) percent of the eligible construction, as measured by its cost, has been completed, or in accordance with a schedule and conditions agreed upon between the grantee, EPA and the director. The director shall authorize such proportional installment payment upon notification from the EPA that a federal installment has been authorized in a given amount.

(b) Installment payments at the fifty (50) percent level shall not be made until the applicant has in its employ for the operation of the project treatment works, a waste-water treatment works operator having a valid state certificate or one who is capable of obtaining such a certificate for operation of the designated class of treatment works within a reasonable period of time. State installment payments at the seventy-five (75) percent level, and beyond the seventy-five (75) percent level, shall be based on an assessment of the applicant's development of and progress towards completion of an acceptable manual for operation and maintenance of the disposal system and the establishment of adequate pretreatment requirements and facilities. Final payment shall not be made until final inspection of the project by the agency.

c. The proportional installment payment to be made by the agency shall not be in excess of the overall federal-state project cost ratio as authorized by the agency and director.

f. Retained payment. The agency may withhold Step 3 grant payments in the following circumstances:

(1) If the director determines that a project does not substantially conform to approved plans and specifications and/or there has been a major breach of a condition in the grant agreement, the agency may withhold all unpaid funds and may request EPA to do likewise.

(2) If the director determines that a project does not conform to approved plans and specifications, but such nonconformity is not substantial, and/or there has been a minor breach of a condition in the grant agreement, the agency may withhold up to 10% of unpaid funds and may request EPA to do likewise.

(3) If the director determines that a project has any other deficiency, the agency may withhold up to 10% of the unpaid funds.

(4) If funds are withheld pursuant to (1), (2) or (3) above and the condition causing such action has been corrected to the satisfaction of the director, then all retained funds shall be released to the municipality, unless otherwise agreed to by the director and the municipality.

g. Funds recovery. In addition to any other remedies, the agency may seek to recover any or all funds tendered or disbursed for a project which is improperly designed, improperly constructed, or improperly operated and maintained.

h. Contract assignment. The grantee shall retain the right to assign its contract with a contractor or engineer, and any or all rights pursuant thereto, to the agency.

i. Contract beneficiary. The contract between the engineer or contractor and the grantee shall provide that the agency is a third-party beneficiary to their contract.

j. Cost of administration. The agency may use federal funds from the state's allotment, in such amount as authorized by the Act, for administration of the construction grants program.

k. Procedural rules and appeals. All requests for hearing, appeals, and other procedural matters not specifically provided for herein shall be governed by the agency rules of procedure, the rules of the Office of Hearing Examiners and other applicable law.

l. Variances. Any person may apply for a variance from any requirement of these rules. Such variance shall be applied for and acted upon by the

agency in accordance with Minn. Stat. § 116.07, subd. 5, and other applicable statutes and rules.

F. Construction loan program.

1. Application.

a. The application form shall be of the type set forth below:

MINNESOTA POLLUTION CONTROL AGENCY
Division of Water Quality

Application for Disposal System Planning and/or Construction Loan	To be filled in by the State
	Date Received
	Project Number
	Loan Request

Legal Name of Applicant

Address, Zip Code

Hereby Makes Application to the Pollution Control Agency of the State of Minnesota for a Loan of Funds for the Planning and/or Construction of:

Financial Aspects:

Estimated Project Cost	\$	_____
State Loan Funds		_____
Local Funds		_____
Other Funds		_____

Project Schedule:

Project Starting Date	_____
Time to Complete Project	_____

Name and Title of Official	Signature of Official	Date
_____	_____	_____

b. The planning loan application form shall be supported by the following attachments:

(1) Resolution of the governing body authorizing the filing of the application and designating the municipal official authorized to sign the application.

(2) Resolution of the governing body of the municipality obligating the municipality to repay the loan to the state treasurer in annual installments including both principal and interest, each in an amount sufficient to pay the amount due within five (5) years from user charges, taxes, special assessments, or other funds available to it.

(3) Resolution of the governing body of the municipality obligating the municipality to establish rates and charges for the execution of contracts sufficient to produce the revenues pledged if required by the agency.

(4) Proposed method of loan repayment.

(5) Proposed contracts for engineering, legal, planning and other consulting services.

c. The construction loan application form shall be supported by:

(1) The attachments of 6 MCAR § 4.8034 F.1.b.(1), (3) and (4) of this section and the items of 6 MCAR § 4.8034 E.8.f. The director for just cause may waive or defer the submission of any items required pursuant to 6 MCAR § 4.8034 E.8.f. if such items are EPA requirements.

(2) Resolution of the governing body of the municipality obligating the municipality to repay the loan to the state treasurer in annual installments including both principal and interest, each in an amount sufficient to pay the principal amount within twenty (20) years of lesser time interval if the amount of the annual payment will not justify the administrative expenses of processing the payment, from user charges, taxes, special assessments, or other funds available to it.

d. The loan application form and attachments shall be submitted in duplicate to the agency at the address specified by the director. Substantial deficiencies in the application and supporting documents or failure to conform with applicable requirements such as those set forth in the current agency water pollution control program plan or the applicable basin, regional or area water quality management plan shall be grounds for rejection. Any construction loan application shall be rejected at the discretion of the agency if it does not include an engineering report acceptable to the director, or does not include an adequate commitment for support of operation and maintenance of the project, or does not conform to the intent of the applicable statutes, or does not contribute to the overall objectives of effective water quality management, or is not considered to be in the best interests of the state.

e. Applications must be restricted to those projects or portions thereof for which service contracts or construction contracts can be awarded

by June 1, except in cases of advance approval by the director, of the state fiscal year in which the loan is applied for.

2. Administration.

a. The allocation of state funds shall be established in accordance with 6 MCAR § 4.8034 E.4.b.(1) and priority rating points assignable to loan applications shall be established in accordance with section F.3. Funds allocable to loans shall be determined each fiscal year by the agency on the basis of total availability and demand for grants listed in 6 MCAR § 4.8034 D.1., 2., and 3.

b. Those planning applications which receive a priority rating sufficiently high in relation to available funds shall be tendered a state planning loan. Within sixty (60) days after the acceptance of the offer and award of contracts, for engineering, legal and other consulting services the state payment shall be made.

c. Those construction loan applications which receive a priority rating sufficiently high in relation to available funds shall be tendered a state construction loan. Within thirty (30) days after acceptance of the offer and award of the construction contract for the project, the state payment shall be made.

d. Principal and interest, each in an amount sufficient to pay the principal amount within the loan period, shall be paid in equal annual installments to the state treasurer. Interest shall be calculated on the declining balance at the average annual interest rate on state bonds of issue from the proceeds of which the loan was made.

e. Priority ratings shall be established each fiscal year for those loan applications filed on or before the end of the state fiscal year. Applications postmarked or hand delivered after that day shall be rejected.

3. Criteria for determining loan priority.

a. The loan funds set aside in any fiscal year shall be allocated in the ratio of twenty-five (25) percent for planning and seventy-five (75) percent for construction.

b. The determination of the order of priority for planning loan applications shall be in accordance with:

(1) The criteria set forth in 6 MCAR § 4.8034 E.2.d., E.3.c. and F.3.b.(2).

(2) Technological feasibility. Priority points shall be assigned based on the completion of the planning studies as set forth below:

Point Rating

(a) Sewer system evaluation which shall demonstrate to the satisfaction of the director and regional administrator that each sewer system discharging into such treatment works is not subject to excessive infiltration/inflow, through an infiltration/inflow analyses and, where appropriate and authorized by the regional administrator, a sewer system evaluation survey. 50

(b) Report on wastewater disposal concepts. 40

(c) Regionalization evaluations. 30

(d) Other planning activities including assimilation studies. 20

c. The determination of the order of priority for construction loan applications shall be in accordance with 6 MCAR § 4.8034 E.2.d. and E.3.c.

State of Minnesota
Pollution Control Agency

CHAPTER THIRTY-SIX: WPC 36

**REGULATION FOR ADMINISTRATION OF THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
(NPDES) AND STATE DISPOSAL SYSTEM PERMIT PROGRAMS**

WPC 36 (a) PURPOSE. This regulation is hereby adopted and promulgated by the Agency to implement the provisions of Minnesota Statutes, Chapters 115 and 116, as amended, by instituting a permit program in accordance with the National Pollutant Discharge Elimination System (NPDES) and by providing for the processing of disposal system permits required pursuant to Minnesota Statutes, Section 115.07. The NPDES has been initiated by the Federal Congress through the enactment of the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500). This regulation applies in general to the following:

- (1) submission and evaluation of NPDES and disposal system permit applications;
- (2) establishment of terms and conditions of NPDES and disposal system permits;
- (3) establishment of monitoring, recording and reporting requirements for NPDES and disposal system permits;
- (4) issuance and denial of NPDES and disposal system permits;
- (5) modification, suspension and revocation of NPDES and disposal system permits; and
- (6) reissuance of NPDES and disposal system permits. The promulgation of this regulation, which supplements Minnesota Statutes, Chapters 115 and 116, as amended, is essential for the State of Minnesota, upon approval by the United States Environmental Protection Agency, to exercise its authority to issue permits for discharges of pollutants under the NPDES pursuant to Section 402(b) of the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500). The Minnesota Pollution Control Agency (MPCA) is the state agency designated by the State to administer this program. Except as otherwise specifically provided herein, this regulation shall apply with equal force to NPDES permits and to state disposal system permits.

(b) DEFINITIONS. The terms "person," "water pollution," "sewage," "industrial wastes," "other wastes," "pollutants," "toxic pollutant," "discharge," "treatment works," "disposal system," "point source," "waters of the state," "municipality," "standards," "schedules of compliance," "director," as well as any other pertinent terms for which definitions are given in Minnesota Statutes, Chapters 115 and 116, as amended, shall have the meanings ascribed to them. The terms specified below shall have the following meanings therein ascribed to them:

- (1) "**ACT**" means the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251, et seq.

(2) **"ADMINISTRATOR"** means the Administrator of the United States Environmental Protection Agency.

(3) **"AGENCY"** means the Minnesota Pollution Control Agency, as constituted pursuant to Minnesota Statutes, Section 116.02, subd. 1.

(4) **"DISPOSAL SYSTEM PERMIT"** or **"STATE DISPOSAL SYSTEM PERMIT"** means any permit or equivalent document, including any terms, conditions and requirements, issued by the Agency pursuant to Minnesota Statutes, Chapters 115 and 116 for disposal systems, as defined in Section 115.01, Subdivision 8.

(5) **"EPA"** means the United States Environmental Protection Agency.

(6) **"NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)"** means the national system for the issuance of permits under Section 402 of the Act and includes any state program which has been approved by the Administrator, in whole or in part, pursuant to Section 402 of the Act.

(7) **"NPDES FORM"** means any issued NPDES permit and any uniform national form developed for use in the NPDES and prescribed in regulations promulgated by the Administrator, including the Refuse Act applications, the NPDES application and the NPDES reporting forms.

(8) **"NPDES PERMIT"** means any permit or equivalent document or requirements issued by the Agency after enactment of the Federal Water Pollution Control Act Amendments of 1972, for the purpose of regulating the discharge of sewage, industrial wastes, or other wastes under the authority of Section 402 of the Act.

(9) **"PERMIT APPLICATION"** means the uniform national forms (including subsequent additions, revisions, or modifications duly promulgated by the Administrator pursuant to the Act) for application for an NPDES permit or state forms for application for a state disposal system permit, or Refuse Act application.

(10) **"REFUSE ACT"** means Section 13 of the River and Harbor Act of March 3, 1899.

(11) **"REFUSE ACT APPLICATION"** means the application for a permit under the Refuse Act prior to enactment of the Act.

(12) **"REGIONAL ADMINISTRATOR"** means the EPA Regional Administrator for the region in which Minnesota is located (now Region V).

(13) **"REPORTING FORM"** means the uniform national forms (including subsequent additions, revisions, or modifications duly promulgated by the Administrator pursuant to the Act) for reporting data and information pursuant to monitoring and other conditions of NPDES permits, or state forms for reporting data and information pursuant to monitoring and other conditions of state disposal system or NPDES permits.

Other terms and abbreviations used herein which are not specifically defined by law shall be construed in conformance with the context and commonly accepted professional usage.

(c) **SEVERABILITY.** If any provision of this regulation or the application thereof to any person or circumstance is held to be invalid, such in-

validity shall not affect other provisions of the regulation or application of any other part of this regulation which can be given effect without application of the invalid provision. To this end, the provisions of all sections, subsections, or subdivisions herein and the various applications thereof are declared to be severable.

(d) SCOPE.

(1) Applicable Procedure. This regulation shall govern the procedure for the issuance of NPDES permits and state disposal system permits. To the extent of any inconsistency between the provisions of this regulation and the Agency's Rules of Procedure, MPCA 1-13, this regulation shall control. Otherwise, the provisions of this regulation and the Rules of Procedure, MPCA 1-13, shall be construed to complement each other.

(2) Request for Agency Appearance. An applicant, any affected state or interstate agency, the Regional Administrator or any other interested person may request at any time during the period a permit application is under review and consideration by the Director that a permit application be an item on the agenda of a regular or special meeting of the Agency. The request shall be made in writing to the Director at least fourteen (14) days prior to a regular or special meeting. The Director may determine whether or not to place a permit application item on the agenda pursuant to a request. The Director shall advise the Agency of all such items he decides not to place on the agenda. The Director shall mail a copy of the regular or special meeting agenda to the person making a request. If the requested item has been placed on the agenda, the person who made the request shall be permitted to appear before the Agency pursuant to Agency Rules of Procedure, MPCA 13.

(e) APPLICATION FOR PERMITS.

(1) Application for Existing Disposal Systems.

(aa) NPDES Permit Application. Any person presently discharging sewage, industrial waste or other wastes to the waters of the state shall submit a NPDES permit application in accordance with this subsection regardless of whether or not the discharge is in compliance with regulations or standards of the Agency, an outstanding order, variance, or state disposal system permit from the Agency, or stipulation agreement with the Agency. In addition, the following shall be construed to be a NPDES permit application:

(i) The applicant has filed a complete Refuse Act application prior to the enactment of the Act; or

(ii) The applicant has filed a complete NPDES application no later than 60 days following receipt by the applicant of notice from the Director that the applicant's previously filed Refuse Act Application is deficient as not to have satisfied the NPDES filing requirements.

(bb) Application for State Disposal System Permit for Facilities. The Director may require that application be made for a state disposal system permit for an existing disposal system, and may require that any applicable information regarding said disposal system be submitted for review pursuant to Minnesota laws and regulations.

(2) Application for New Disposal Systems.

(aa) **NPDES Permit Application.** Any person proposing a disposal system from which sewage, industrial wastes, or other wastes are or may be discharged to waters of the state, where the discharge is to commence after the effective date of this regulation, shall file a complete NPDES application at least 180 days before such discharge is to commence. If the applicant has filed a complete Refuse Act application prior to the enactment of the Act, such application shall be construed to be a NPDES permit application.

(bb) **State Disposal System Permit Application for Facilities.** A preliminary engineering report on the proposed disposal system and pollutants, and, unless waived in writing by the Director, a state disposal system permit application for the facilities shall be submitted to the Director. Final construction plans and specifications for the disposal system shall be submitted to the Director for review, and a state disposal system permit for the facilities issued by the Director and approved by the Agency prior to solicitation of any construction bids or construction of any part of the disposal system, unless the Director has, in writing, waived such requirements for good cause, and if requested in writing by the applicant.

(3) **Application and Reporting Forms.** NPDES application and reporting data shall be submitted on the forms prescribed by the Administrator. State disposal system permit application forms and reporting data forms shall be submitted on forms prescribed for the NPDES by the Administrator, except as such forms are waived in writing, altered or supplemented by the Director.

(4) **Forms, Signatories.** Any form, including but not limited to NPDES forms, submitted to the Agency shall be signed as follows:

(aa) In the case of a corporation, by a principal executive officer of at least the level of vice president, or his duly authorized representative or agent, if such representative or agent is responsible for the overall operation of the disposal system or point source from which the discharge originates.

(bb) In the case of a partnership, by a general partner.

(cc) In the case of a sole proprietorship, by the proprietor.

(dd) In the case of a municipal, state or other public disposal system, by either a principal executive officer, ranking elected official, or other duly authorized employee.

(5) **NPDES Permits; Application Exemptions.** Those persons not required to apply for an NPDES permit under the Act or EPA NPDES Regulations shall not be required to apply for NPDES permits hereunder. The absence of any requirement with respect to NPDES permits shall not be construed as a waiver of the requirement to obtain a state disposal system permit pursuant to this regulation.

(6) State Disposal System Permit Applications.

(aa) No person shall construct, install or operate a disposal system, or any part thereof, until an application for a state disposal system permit and plans and specifications therefor have been submitted to the Director, and a permit for such disposal system has been issued by the Director and approved by the Agency. The Director may, in writing, waive the submission of such plans and specifications, and issue a permit subject to the approval of the Agency.

(bb) If upon application for a NPDES permit, the Director determines that a NPDES permit is not required by the Act or EPA regulations, but determines a state disposal system permit is required by Minnesota law or regulations, he may proceed to process the NPDES application as an application for a state disposal system permit in accordance with this regulation or may require additional information to complete the application.

(cc) No person shall make any change, addition to or extension of any existing disposal system or point source, or part thereof, to effect any facility expansion, production increase, or process modification which results in new or increased discharges of pollutants, or operate such system or point source, or part thereof as changed, added to, or extended until a state disposal system permit application and plans and specifications therefor shall have been submitted to and have been approved in writing by the Agency. The Agency may waive in writing the submission of plans and specifications.

(7) **Multiple Sources.** In the event that a person discharges pollutants from more than one point source, a separate application shall be filed by the person for each point source discharge. A single application may be filed for multiple outfalls discharging from a single point source if approved by the Director.

(f) REVIEW OF PERMIT APPLICATIONS.

(1) **Completeness.** All permit applications shall be reviewed for completeness by the Director. If the application is incomplete or otherwise deficient, the Director shall promptly advise the applicant of such incompleteness or deficiency. Further processing of the application may be suspended until the applicant has supplied the necessary information or otherwise corrected the deficiency. A permit shall not be issued by the Director and approved by the Agency until an application is complete.

(2) Completeness; Special Cases.

(aa) In the event that an applicant for a permit proposes to construct, install or operate a disposal system with a discharge to waters of the state which will serve residential dwelling units but will not be served by a municipally owned and operated treatment works, the Director may require the applicant to provide any or all of the following:

(i) A construction bond, assuring the Agency that the treatment works proposed to be constructed by the applicant pursuant to the requested permit shall in fact be constructed in accordance with the plans and specifications therefor, as approved by the Agency, and in accordance with applicable Agency permits, stipulation agreements, orders, standards, regulations and requirements;

(ii) A performance bond, assuring the Agency or a municipality willing to accept the responsibility for operation and maintenance of the treatment works that in the event of a violation of a NPDES or a state disposal system permit conditions or the failure by the permittee to provide adequate operation and maintenance of the disposal system, funds will be available to carry on the operation of the works for an interim period until the violation or failure is corrected;

(iii) A resolution, stipulation agreement, or other contractual commitment satisfactory to the Agency that a municipality having jurisdiction

over the applicant's premises shall assume the responsibility for operation and maintenance of the applicant's disposal system in the event of a violation of a NPDES or a state disposal system permit conditions or the permittee's failure in its obligation to provide adequate operation and maintenance of said disposal system necessary to comply with applicable Agency permits, stipulation agreements, orders, standards, regulations and requirements;

(iv) A joint application for a permit by both the person constructing, installing or operating a disposal system serving residential dwelling units and a municipality having jurisdiction over such person's premises.

(bb) Upon review of an application, the Director or the Agency may determine that the application is incomplete or deficient for failure to include any of the items described in (i), (ii), (iii), and (iv) above.

(cc) In the event that an applicant for a permit subject to the requirements of Section (f)(2)(aa) does not provide an adequate level of treatment for pollutants conveyed by such a disposal system or unsatisfactory progress is being made toward providing such level of treatment, or the treatment works to which such sewer system is connected do not otherwise conform with Minnesota laws or Agency regulations, standards, orders, permits, stipulation agreements, variances or other applicable requirements, the Director or the Agency may determine said application for permit to be deficient or incomplete.

(g) PERMITS; TENTATIVE DETERMINATIONS AND DRAFT PERMITS.

(1) **Preparation of Preliminary Determinations.** The Director shall make preliminary determinations regarding a completed NPDES or state disposal system permit application prior to the issuance of public notice, pursuant to this regulation, of the application. These preliminary determinations shall include a proposed determination to issue or deny a NPDES permit or a state disposal system permit for the discharge described in the application.

(2) **Determination to Issue Permit; Additional Determinations Required.** If the proposed determination is to issue a state disposal system permit or a NPDES permit the following additional determinations shall be made:

(aa) Proposed effluent limitations shall be delineated for the constituents proposed to be limited.

(bb) A proposed schedule of compliance, if necessary, for meeting the proposed effluent limitations including interim dates and requirements.

(cc) A description of any other proposed restrictions or other conditions determined necessary by the Director or the Agency, pursuant to Minnesota laws and regulations, the Act or EPA regulations, including but not limited to, pretreatment and toxic limitation requirements for discharges into publicly-owned treatment works.

(3) **Draft Permit.** The Director shall prepare a draft permit based upon the preliminary determinations made pursuant to this section for a NPDES or a state disposal system permit application. The draft permit shall be mailed to the applicant and in the case of a NPDES permit, to the Regional Administrator prior to public notice of the application.

(h) PUBLIC NOTICE OF PERMIT APPLICATION AND PRELIMINARY DETERMINATIONS.

(1) Circulation of the Public Notice. The Director shall prepare and issue a public notice of a completed application for a NPDES permit. The Director may issue a public notice of a completed application for a state disposal system permit. The notice shall be circulated within the geographical area of the proposed discharge. The geographical area shall at minimum include the county in which the discharge will be made. The area may be expanded by the Director or the Agency as deemed appropriate. The Director or the Agency shall circulate the notice in one or more of the following ways:

(aa) Posting of the notice in the post office or public libraries, buildings, places, etc., located within the designated geographical area.

(bb) Posting of the notice at or nearby the entrance to the applicant's premises which are located near the proposed discharge point.

(cc) Publishing the notice in one or more newspapers of general circulation in the designated geographical area of the applicant, or if appropriate, in an applicable periodical.

(2) Availability of the Public Notice.

(aa) The Director shall mail a copy of the public notice of the permit application to the permit applicant, interested persons upon request, and those on the mailing list pursuant to Section (i)(3) and to any other interested persons deemed by the Director to have a potential interest in the permit application or those who may be adversely affected.

(bb) The Director shall make available a copy of the notice at the main Agency office and at the appropriate Agency district office.

(cc) The Director shall list the permit applications in which public notice has been issued as information items on the agenda of each regular Agency meeting.

(3) Public Notice; Contents and Information. The public notice of a state disposal system permit or a NPDES permit application shall include:

(aa) The address and telephone number of the main Agency office and the Agency district office nearest to the geographical location of the applicant.

(bb) The name and address of the applicant.

(cc) A concise description of the applicant's activities and operations which result in the discharge identified in the permit application.

(dd) The name of the waterway to which the discharge is proposed to be made, including the location of the proposed or existing discharge identified in the application.

(ee) A statement of the preliminary determination to issue or deny the permit for the discharge identified in the application.

(ff) A concise description of the procedures for the formulation of final determinations, including information on the comment period pursuant to subsection (4) of this section, and petitioning for a public hearing, pursuant to Section (k)(1).

(gg) The address and telephone numbers of the Agency office or offices where more information on the application may be obtained or where

fact sheets, if prepared, or copies of the draft permit prepared pursuant to Section (f)(3), or any other applicable forms may be inspected or copied.

(hh) A statement that a copy of the fact sheet or draft permit will be mailed to any interested person upon written request.

(ii) The date of issuance of the public notice in which the 30-day comment period commences and terminates.

(jj) A statement regarding the duration of the proposed permit.

(4) Public Notice; Comment Period for Interested Persons.

(aa) Any interested person, including the applicant for the permit under consideration, may within 30-days following the date of issuance of the public notice pursuant to this Section submit in writing comments on the application or determinations, or both, to the Agency. The time for public comment may be extended by the Director if he determines that such extension of time is necessary to facilitate additional public comment.

(bb) All comments submitted in writing by interested persons or the applicant during the comment period shall be retained and considered in the formulation of final determinations concerning the permit application.

(i) FACT SHEETS ON PERMITS; APPLICATIONS.

(1) Fact Sheets; Availability; Preparation.

(aa) The Director shall prepare and make available a fact sheet for each state disposal system or NPDES permit application which identifies a proposed discharge of 500,000 gallons or more for any day of the year with respect to the application described in the public notice, which shall contain information specified in subsection (2) of this section.

(bb) The Director may prepare a fact sheet for any application for discharge of less than 500,000 gallons for any day of the year, if he deems the discharge to be of such importance as to warrant additional information for public comment.

(cc) A copy of the fact sheet shall be available at the main Agency office and at the Agency district office nearest to the geographical location of the applicant. Any person may request a copy of the fact sheet. Upon receipt of such a request, the Agency shall mail a copy thereof to such person.

(2) Fact Sheets; Contents and Information. The fact sheet shall contain, but not be limited to, the following information:

(aa) A sketch or detailed description of the location of the proposed discharge described in the permit application.

(bb) A quantitative description of the proposed discharge including, but not limited to, its rate or frequency of average daily flow; its summer and winter temperatures in degrees centigrade, if the discharge is a thermal discharge subject to limitation under the Act, its average daily discharge in pounds per day of any pollutants or other constituents subject to limitation under Minnesota Statutes, Chapters 115 and 116, or the Act, or regulations promulgated thereunder.

(cc) The preliminary determinations made by the Director on the permit application pursuant to Section (f).

(dd) A concise citation of the effluent limitations and standards to be applied to the proposed discharge, and the water quality standards and uses for which the receiving waters have been classified.

(ee) A description of the procedures used by the Director to formulate final determinations on the application and proposed discharge including the 30-day comment period on the public notice, procedures for requesting a public hearing on the application pursuant to this regulation and other procedures to facilitate public comment and preparation in the formulation of final determinations.

(ff) A concise statement regarding the environmental policy considerations and requirements prescribed in Minnesota Statutes Section 116D that are or may be applicable to the proposed discharge.

(3) Public Notices and Fact Sheets; Mailing Lists.

(aa) Any interested person who desires to receive copies of all public notices on a state disposal system or a NPDES permit application for all proposed discharges or those in specific counties of the state as identified in this Section may request that his name be placed on a mailing list of the Agency for such information. Such a request shall be made in writing to the Director and shall be renewed annually. After 30 days written notification to renew a request, failure to renew the request shall be just cause for the Director to remove a name from the mailing list.

(bb) The written request of any interested person to the Director shall clearly identify the name of the person, the person's address, and the designated county or counties of the state for which public notice of permit applications is requested.

(4) Public Notices and Fact Sheets; Notices to Other Governmental Agencies.

(aa) Upon receipt of an application for a NPDES permit which identifies a proposed discharge into interstate or international waters and upon a determination by the Director that such proposed discharge may affect the quality of the waters of any other state or country, the Director shall notify the appropriate state, interstate agency, or Canadian provincial agency, and the International Joint Commission of the proposed discharge and shall transmit a copy of the public notice and fact sheet on the application thereto. Upon request of the state, interstate agency, or Canadian provincial agency and the International Joint Commission, the Director shall also transmit a copy of the application and the draft permit prepared pursuant to Section (f).

(bb) A state, interstate agency, or Canadian provincial agency and the International Joint Commission notified by the Director pursuant to this section shall have 30 days from the date of such notification in which to comment on the proposed discharge and, if desired, may submit in writing to the Director its views and recommendations. The comments and recommendations submitted by another state, interstate agency, or Canadian provincial agency and the International Joint Commission may be incorporated into the NPDES permit if determined necessary and desirable by the Director or the Agency. If such comments and recommendations are not incorporated into the NPDES permit, notification and reasons therefor shall be given in writing to the Regional Administrator and the state or interstate agency, or Canadian provincial agency and the International

Joint Commission. The Director shall provide opportunity for public hearing if requested by the Regional Administrator, the state or interstate agency or the International Joint Commission.

(cc) When a public notice on a NPDES permit application for discharge into navigable waters is posted or published, the Director shall transmit a copy of the notice and fact sheet thereon to the appropriate District Engineer of the United States Army Corps of Engineers for the proposed discharge identified therein. If such discharge is a minor discharge and the Corps of Engineers has waived receipt of notice, the above shall not apply to such discharge.

(dd) If requested in writing thereby, the Director shall mail a copy of a public notice, draft permit or fact sheet for an application for a NPDES or a state disposal system permit, to any other federal, state or local agency or affected Canadian provincial or federal agencies. The provisions of subdivision (bb) of this subsection with regard to opportunity for comment and public hearings shall apply to such federal, state or local agencies or Canadian provincial agencies or the International Joint Commission.

(j) PUBLIC ACCESS TO PERMIT APPLICATION FORMS AND AGENCY FILES AND RECORDS; CONFIDENTIALITY.

(1) **Public Inspection and Copying.** A copy of a state disposal system or NPDES permit application, public notice, fact sheet, draft permit, final permit after issuance, and other forms relating thereto, including written public comment thereon and other reports, files and information relating to the application not classified as confidential information by the Director pursuant to Minnesota Statutes, Section 116.075 shall be available for public inspection and copying during normal business hours at the main Agency office. Documents may be inspected between 8:30 a.m. and 11:30 a.m. and between 1:00 p.m. and 4:00 p.m., each Monday through Friday, except holidays. Documents may be copied, subject to reasonable requirements of the Agency staff, at a reasonable charge per copy sheet. Copies of the public notice, fact sheet and draft permit shall be available for review and inspection in an appropriate Agency district office in the geographical area of the applicant.

(2) **Confidential Information.** The Director, upon certification of the affected person and upon the Director's written concurrence that information contained on any NPDES or state form, except effluent data, or information within the files and records of the Agency would, if available for public inspection or copying, divulge processes or methods of production entitled to protection as trade secrets of the applicant, may label such information as confidential, and shall so notify the Regional Administrator. Information labeled by the Director as confidential, unless otherwise determined by the Regional Administrator, shall not be made available to the public for inspection or copying pursuant to this section, except that such information shall be made available at any time to the Regional Administrator upon written request therefor for EPA's use under the NPDES program. Notwithstanding the foregoing, the Agency may disclose any information, whether or not otherwise considered confidential, which it is obligated to disclose in order to comply with Minnesota and federal laws and regulations, to the extent and for the purposes of such required disclosure.

(k) PUBLIC HEARINGS ON PERMIT APPLICATIONS.

(1) Petition for and Determination of Need for Public Hearing. An applicant, any affected state or interstate agency, the Regional Administrator or any other interested person may, within the 30 days comment period or other applicable comment period provided after issuance of a public notice pursuant to Section (h), file a petition with the Director for a public hearing on an application for a state disposal system or NPDES permit. Any petition for a public hearing shall indicate the reason or reasons why a hearing is requested, the interest in or relationship of the petitioner to the application or proposed discharge identified therein, and specifically indicate which portion or portions of the application or other NPDES form or information constitutes necessity for such public hearing. If the Agency determines that there is sufficient public interest in an application for a public hearing, it shall direct the scheduling of a hearing thereon. Instances of doubt shall be resolved in favor of holding a hearing.

(2) Scheduling of Hearings and Notices. A public hearing shall be scheduled in the geographical area of the proposed discharge, and shall be noticed at least 30 days prior to the hearing in the same manner as the public notice on an application pursuant to Section (h) and as otherwise provided by law or stipulation. The notice of public hearing shall be published in at least one (1) newspaper of general circulation in the geographical area of the proposed discharge identified on the permit application, and shall be mailed to any person or group upon request.

(3) Combined Hearings. The Agency, in its discretion, may hold a single public hearing on related groups of permit applications.

(4) Public Hearing Notice Contents. A notice by the Director of a public hearing on an application or applications shall contain in addition to the time and place of the hearing:

(aa) The address and telephone number of the main Agency office and the appropriate district office;

(bb) The name and address of the applicant or applicants whose application or applications will be considered at the public hearing;

(cc) The name of the waterway or waterways to which a proposed discharge, as identified on the application or applications, will be made and a concise description of the location on the waterway of such discharge;

(dd) Reference to the public notice posted and published for the application or applications, including the identification numbers and dates of issuance thereof;

(ee) A brief statement of the purpose of the public hearing;

(ff) A concise description of the issue or issues which have been identified by the petitioners requesting the public hearing;

(gg) The address or addresses of Agency offices where interested persons may inspect or obtain copies of a draft permit, fact sheet or other applicable forms or other reports, files or information relating to an application or applications subject to public hearing, which have not been labeled confidential by the Director pursuant to Section (i);

(hh) A concise description of the nature of the public hearing and the issues to be heard, with reference to rules and procedures to be followed.

(I) TERMS AND CONDITIONS OF PERMITS.

(1) Effluent Standards and Limitations. Whenever applicable, a permit issued pursuant to this regulation shall contain terms and conditions deemed necessary to insure compliance with at least the following effluent standards and limitations:

(aa) Effluent limitations for publicly-owned treatment works and other point source discharges promulgated by the Administrator pursuant to Sections 301 and 302 of the Act.

(bb) Standards of performance promulgated by the Administrator for new sources within the categories defined pursuant to Section 306 of the Act.

(cc) Pretreatment standards or effluent limitations or prohibitions promulgated by the Administrator pursuant to Section 307 of the Act.

(dd) Any other limitation or requirement to insure compliance with the Act and regulations thereunder.

(ee) Any other more stringent limitation deemed necessary by the Director or the Agency to meet applicable standards established pursuant to Minnesota Statutes, Chapters 115 or 116 or regulations or standards promulgated pursuant thereto, or other Minnesota and federal laws and regulations.

(2) Consistency with Water Quality Standards. When a permit contains additional effluent limitations related to applicable water quality standards, the Director shall prepare a waste load allocation survey insuring that the discharge authorized by the issued permit is consistent with such applicable water quality standards. When a state disposal system or NPDES permit is issued which contains any effluent standards or other limitations as set forth in accordance with subsection (1) of this section the Director shall verify that the discharge authorized by the issued permit will not violate applicable water quality standards or that a variance therefrom has been authorized consistent with the Act and Minnesota Statutes, Chapters 115 and 116.

(3) Requirements to Comply with Plans. The Director or the Agency may impose any further requirements under the terms and conditions of a state disposal system or NPDES permit to comply with an areawide waste treatment management plan, or amendments thereto, prepared pursuant to Section 208(b) of the Act.

(4) Interim Requirements. The Director or the Agency may impose any standard, limitation or conditions within a state or NPDES permit to assure compliance with Minnesota Statutes, Chapters 115 and 116, and with the Act, prior to promulgation of regulations by the Administrator relating to applicable effluent standards or limitations or standards of performance set forth in accordance with subsection (1) of this section.

(5) Discharges from Vessels.

(aa) If a NPDES permit is issued pursuant to Minnesota laws and regulations for the discharge of pollutants from a vessel other than wastes exempted by Section (e), the permit shall contain requirements in accordance with and subject to the applicable regulations promulgated by the secretary of the federal department in which the United States Coast Guard

is operating, which establish specifications for transportation, handling, carriage, storage and stowage of such pollutants.

(bb) The Director, subject to Agency approval, shall issue a NPDES permit for the discharge of wastes from a vessel only when such permit is in conformance with the provisions of all applicable provisions of state law.

(6) Other Limitations and Requirements.

(aa) The Director, when issuing a state disposal system permit or a NPDES permit pursuant to Minnesota laws and regulations, shall specify therein, where applicable, average and maximum daily quantitative limitations for the level of pollutants in terms of weight, and, where appropriate, average or maximum concentration and volume limits for the wastes in the discharge authorized by the issued permit.

(bb) All discharges authorized by a permit shall be consistent with the terms and conditions of such permit.

(cc) Any facility expansion, production increases, process modifications, changes in discharge volume, or other changes in operations or conditions by the permittee which may result in new or increased discharges of pollutants shall be reported to the Director by submission of a new application for a state disposal system or a NPDES permit pursuant to Section (e).

(dd) The permittee shall permit any authorized Agency representative to enter upon any property, public or private, at any reasonable time, to have access to and copy any applicable records, to inspect process facilities, disposal systems, treatment works, monitoring methods or equipment therefor, and to sample any effluent of a discharge authorized by a permit and otherwise to obtain necessary information relevant to the permitted discharges.

(ee) The permittee shall comply with Minnesota Regulation WWOB 1, administered by the Water Supply and Wastewater Operator Board of Certification, and other applicable laws, regulations and policies relating to the operation or maintenance of disposal systems. The Agency may impose, and the permittee shall comply with, a requirement that the permittee provide a certified wastewater operator in responsible charge of the disposal system subject to the permit in question, who possesses the qualifications required for operators of disposal systems, equivalent to those listed in Minnesota Regulation WWOB 1, given the size and class of facility and method of treatment. The permittee shall at all times maintain in good working order and operate as efficiently as possible any facilities or systems of control installed to achieve compliance with the terms and conditions of a permit.

(ff) Prior to the issuance of a state disposal system permit or a NPDES permit for a discharge from a publicly-owned disposal system, the permittee shall provide the Director with assurance satisfactory to the Agency that the Director shall be notified of:

(i) Any new introduction of pollutants into such disposal system from a new source.

(ii) Any new introduction of pollutants into such disposal systems from a person subject to limitations and conditions prescribed by Section 301 of the Act.

(iii) Any substantial change in the volume or character of wastewater constituents being introduced into such disposal system at the time of issuance of a permit.

(gg) The storage of any liquid or solid substance or other pollutant in a manner which does not reasonably assure proper retention against entry into any waters of the state that would be likely to pollute any water of the state is prohibited.

(hh) The permit may be modified, suspended, or revoked in whole or in part during its term for cause in accordance with applicable laws and regulations, including, but not limited to, the following:

(i) Violation of any terms or conditions of the permit.

(ii) Obtaining a permit by misrepresentation or failure to disclose fully all relevant facts; or

(iii) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

(ii) If the permit is for a discharge from a publicly owned treatment works, the permittee shall require any industrial user of such treatment works to comply with the requirements of Sections 204(B), 307, and 308 of the Act. As a means of insuring such compliance, the permittee shall require of each industrial user, subject to the requirements of Section 307 of the Act, to file periodic reports (over intervals not to exceed 9 months) of progress towards full compliance with Section 307 requirements. A copy of such reports shall be forwarded to the Director by the permittee.

(jj) If a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the permittee's discharge and such standard or prohibition is more stringent than any limitation upon such pollutant in the NPDES permit the Director shall revise or modify the permit in accordance with the toxic effluent standard or prohibition and in accordance with applicable laws and regulations.

(7) Schedules of Compliance.

(aa) A person issued a state disposal system permit or NPDES permit pursuant to Section (o) who is not in compliance with applicable effluent standards and limitations or other requirements specified therein at the time the permit is issued, shall be required to achieve compliance within a period of time as set forth in the permit with such effluent standards and limitations, with water quality standards, or with specified requirements or conditions, whichever is applicable. The permit shall require compliance in the shortest reasonable period of time.

(bb) If the schedule for compliance specified in a state disposal system permit or a NPDES permit exceeds nine months, such schedule shall provide for interim dates for achievement of compliance with certain applicable terms and conditions of the permit. The time interval between interim dates specified in the permit shall not exceed nine months and, to the extent practicable, shall fall on the last day of March, June, September, or December. The Director of the Agency may require periodic progress reports to assure continued compliance with applicable laws and regulations and the permit.

(8) **Compliance Reports by Dischargers.** Within 14 days after an interim date of compliance or the final date of compliance specified in a state disposal system permit or NPDES permit, a permittee shall provide the Director with a written report of his compliance or non-compliance with

the requirements or conditions specified to be completed by the discharger by that date. A report by a permittee of non-compliance shall include the reasons and the steps being taken to correct such non-compliance. Failure to submit such written report to the Director shall be deemed just cause for the Agency to revoke the permit or pursue enforcement action against the discharger pursuant to Minnesota laws and regulations.

(m) **DURATION OF PERMITS.** NPDES permits issued and renewed pursuant to Minnesota Statutes, Chapters 115 and 116 and this regulation shall have a fixed term which shall not exceed five years. State disposal system permits issued pursuant to Minnesota Statutes, Chapters 115 and 116 and this regulation may also be limited to a fixed term, but such term may exceed five years. The Director may issue, with Agency approval, state disposal system permits for an indefinite period.

(n) PERMIT MONITORING: RECORDING AND REPORTING REQUIREMENTS WITH RESPECT TO PERMITTEES AND USERS OF PUBLICLY OWNED DISPOSAL SYSTEMS.

(1) Monitoring Requirements.

(aa) The Director or the Agency shall impose necessary monitoring requirements in any state disposal system or any NPDES permit. In requiring such monitoring, the Director or the Agency may specify the type of monitoring required and the installation, use and maintenance of any monitoring equipment or methods including, where appropriate, biological monitoring methods, to be employed therefor.

(bb) A discharge authorized by a NPDES permit which is not a minor discharge in accordance with regulations promulgated under the Act, and which the Regional Administrator, by written request to the Director, requires to be monitored or which contains wastewater constituents for which an effluent standard or limitation has been established by the Administrator pursuant to Section 307(a) of the Act, shall be monitored by the permittee and users of publicly owned disposal systems at intervals sufficiently frequent to yield data which reasonably characterize the nature of the discharge of the monitored flow or effluent, including, but not limited to the following:

(i) The flow of the discharge in gallons per day or other volumes as required by the Director or the Agency.

(ii) Pollutants subject to reductions or elimination under the terms and conditions of the permit.

(iii) Specific pollutants which are determined by the Director or the Agency to have a significant effect on the quality of the water of the state.

(iv) Pollutants specified as subject to monitoring by the Administrator in regulations promulgated pursuant to the Act.

(v) Any other specific pollutants which the Regional Administrator, the Director or the Agency may, in writing request to be monitored.

(vi) The frequency that a discharge is required to be monitored pursuant to this section shall be specified in a state disposal system permit or NPDES permit when issued, except that the Director or the Agency may, at any time, when deemed necessary, require additional monitoring by notification in writing to the permittee or said user.

(2) **Monitoring Plan.** A permittee or said user shall submit a monitoring plan within 45 days after date of issuance of a permit to the Director for approval, unless such monitoring requirements are described in the permit. The monitoring plan shall include, but is not limited to the following:

- (aa) A description of the monitoring equipment;
- (bb) The monitoring methods including, where appropriate, biological monitoring methods;
- (cc) The type of samples;
- (dd) Sampling procedure or manner and analysis of samples;
- (ee) Location and interval of sampling; and
- (ff) Such other information as the Director or the Agency may reasonably require of the permittee or said user.

(3) **Recording and Reporting.**

(aa) A permittee or said user required to monitor a wastewater discharge pursuant to this section shall maintain records of all information resulting from such monitoring, including, but not limited to:

- (i) The date, exact place and time of sampling;
- (ii) The dates analyses were performed;
- (iii) The person who performed the analyses;
- (iv) The analytical techniques, procedures or methods used; and
- (v) The results of such analysis.

All records and results of monitoring activities and results, including all original strip chart recordings for continuous monitoring instrumentation, and calibration and maintenance records shall be retained for a minimum of three years by the permittee unless otherwise required or extended by the Director.

(bb) The Director may require a permittee or said user to periodically report the results of all monitoring activities undertaken by him on an appropriate reporting form of the type specified by the Director. The Director shall notify the permittee of the frequency of such reporting, but in no case shall such frequency be less than at least once in a period of one year. In addition to the NPDES reporting form, the Director may require submission of such other information as he determines to be necessary.

(cc) The Director, upon written request of the Regional Administrator, shall transmit thereto any reporting form or other monitoring information required by this regulation.

(c) PERMITS: DETERMINATIONS, ISSUANCE OR DENIAL OF PERMITS.

(1) **Prohibited Discharges.** A permit shall not be issued to a person proposing any of the following discharges:

- (aa) A discharge containing a radiological, chemical or biological warfare agent or a high-level radioactive waste.
- (bb) A discharge of a character which, as determined by the Secretary of the Army acting through the chief of engineers of the U. S. Army Corps of Engineers would substantially impair anchorage or navigation, or both.

(cc) A discharge to which the Regional Administrator objects in writing to the Director pursuant to Section (d), until the conditions and effluent limitations and standards are set for such discharge to the satisfaction of the Regional Administrator, and compliance with the Act and the federal regulations is likewise to the Regional Administrator's satisfaction.

(dd) A point source discharge in conflict with an approved areawide waste treatment management plan, or amendments thereto, prepared pursuant to Section 208(b) of the Act.

(2) Final Determinations. Following review and consideration of tentative determinations or modifications of the proposed permit made pursuant to Section (g), comments on the proposed permit received by the Director from the Regional Administrator pursuant to Section (e), comments received from the interested persons and the applicant during the 30-day comment period following public notice of the permit application as provided by Section (h), other applicable recommendations or determinations and, if applicable, review and consideration of the public hearing record on an application pursuant to Section (k), the Director shall make a final determination and recommendation regarding the issuance of a permit which then shall be subject to the approval of the Agency.

The Director may issue a permit to an applicant, prior to a final decision of the Agency, but it shall be a conditional issuance pending final approval of the Agency. The Director shall properly schedule on the agenda of an Agency meeting all permits subject to approval by the Agency. The Director shall promptly notify the permittee of the Agency's final decision regarding the issuance of the permit.

In making its final decision on a permit application, the Agency shall be satisfied that the conditions of a state disposal system permit or a NPDES permit proposed to be issued shall comply with an areawide waste treatment management plan prepared pursuant to Section 208(b) of the Act where applicable and any other requirements of the Act, Minnesota laws and all regulations and standards promulgated pursuant to the Act and such laws.

(3) NPDES Permit Equivalent to State Permit. A NPDES permit issued by the Director and approved by the Agency pursuant to Minnesota law and this regulation may constitute and be equivalent to a state disposal system permit in all cases where such permit is issued for discharges to the waters of the state.

(p) PERMITS: TRANSMITTAL TO ENVIRONMENTAL PROTECTION AGENCY. The Director shall transmit a copy of an Agency approved NPDES permit to the Regional Administrator concurrent with the transmittal thereof to the applicant. If a permit is denied, written notice thereof and the reasons therefor shall be transmitted by the Director to the Regional Administrator and to the applicant.

(q) NON-COMPLIANCE LISTS.

Transmittal to Regional Administrator; Public Availability. The Director shall prepare and submit to the Regional Administrator on or before the last day of the months of February, May, August, or November, a list of all dischargers holding NPDES permits which have submitted a report pursuant to subsection (8) of section (k) showing non-compliance with require-

ments set forth by the Agency to be met on interim dates or on the final date of compliance specified in the permit, and those which have not filed a timely report. Such non-compliance lists shall be available to the public at the main Agency office for inspection and copying and at the appropriate district office for inspection and copying and shall contain the following information:

- (1) The name and address of each non-complying permittee;
- (2) A concise description of the nature of non-compliance;
- (3) A description of proposed actions to be taken by the Agency or the permittee to correct such instance of non-compliance; and
- (4) Any other information deemed necessary by the Agency or the Director to explain or mitigate an instance of non-compliance.

(r) REVIEW AND REISSUANCE OF STATE DISPOSAL SYSTEM AND NPDES PERMITS: REQUESTS AND FILING REQUIREMENTS.

(1) **Requests for Reissuance of Permits.** At least 180 days prior to the expiration date of a state disposal system permit or NPDES permit issued to a person pursuant to Minnesota Statutes, Chapters 115 and 116 and this regulation, a person who wishes to continue discharging to waters of the state shall submit a written request to the Director for reissuance of a state disposal system permit or a NPDES permit consistent with and under the Act, and Minnesota Statutes, Chapters 115 and 116, whichever is applicable.

(2) **Conditions for Reissuance.** After receipt of a written request for reissuance of a state disposal system permit or a NPDES permit by a permittee, the Director before reissuing a permit shall review the request with particular reference to whether or not:

(aa) The permittee is in compliance with or has substantially complied with the terms, conditions, requirements, and schedules of compliance of the expiring state disposal system permit or a NPDES permit.

(bb) The Agency has up-to-date information on the permittee's production levels, waste treatment practices and the nature, content and frequency of the permittee's discharge. Such information shall be made available to the Director through the submission of new NPDES forms by the permittee or by means of monitoring records or reports submitted thereto pursuant to section (m), or other means.

(cc) That the discharge is consistent with applicable effluent standards and limitations, water quality standards, and other legally applicable requirements including any additions to, or revisions or modifications of such effluent standards and limitations, water quality standards, or other legally applicable requirements during the term of the permit.

(3) **Public Notices and Participation Procedures.** The Director shall follow the public notice and public participation procedures specified in Sections (g), (h), (j), and (k), before any state disposal system permit or NPDES permit is reissued pursuant to this regulation.

(4) **Transmittal to Regional Administrator.** A copy of a reissued NPDES permit approved by the Agency shall be transmitted to the Regional Administrator with any other appropriate NPDES forms or other applicable information relating thereto.

(s) MODIFICATION, SUSPENSION AND REVOCATION OF PERMITS.

(1) **Grounds for Modification, Suspension or Revocation.** The Agency may, after opportunity for public hearing and as otherwise required under this regulation or Minnesota law, modify, suspend or revoke any term or condition of a permit, including a schedule of compliance, or the permit in its entirety, upon its finding that:

(aa) There is a change in any condition that requires a temporary or permanent reduction or elimination of a permitted discharge or constituent thereof.

(bb) The Administrator promulgates a regulation prescribing a restriction or prohibition of a pollutant which is not covered by the terms and conditions of a permit or if the regulation is more stringent than any limitation imposed on a pollutant in a permit.

(cc) A modification of the terms and conditions of a permit for a time schedule therein is necessary because of an act of God, strike, flood, material shortage, or other conditions over which the permittee has little or no control, provided that the Regional Administrator does not object in writing within 45 days following receipt of notice thereof from the Director.

(dd) There has been a violation of Minnesota law.

(ee) There has been a violation of a regulation, standard, order, permit, variance, stipulation agreement or compliance schedule pertaining to the discharge or disposal system subject to the permit.

(ff) There has been a violation of the Act or any regulation or guidelines promulgated pursuant thereto;

(gg) There has been a violation of any federal or state law or regulation or municipal ordinance pertaining to the discharge or disposal system subject to the permit;

(hh) There has been a violation of any pretreatment requirement imposed by the Agency or the Regional Administrator;

(ii) There has been misrepresentation or omission of significant facts upon which the permit was based;

(jj) Other just cause exists for such action.

(2) **Notice to Regional Administrator.** The Regional Administrator shall be notified of any change in status or condition of a permit by the Director and shall have an opportunity to object in writing thereto within 45 days after notification. If the Regional Administrator objects, the modification shall not be included in the NPDES permit.

(3) **Notice to Permittee.** A permittee who is affected by a modification or revocation of a permit by the Agency shall be notified at least 90 days in advance of the effective date of such modification, or revocation, and, upon petition therefor, shall have a hearing thereon pursuant to Minnesota Statutes, Chapters 115 and 116, and the regulations of the Agency; provided that this section shall in no way limit the Agency's authority to institute an emergency order or such injunctive or other legal or equitable relief pursuant to Minnesota Statutes, Chapters 115 or 116, as amended.

(t) **NOTIFICATION OF VIOLATIONS.** The Agency shall notify the Regional Administrator of all violations of this regulation, other applicable

regulations, a valid permit or Minnesota Statutes, Chapter 115, or as it applies to water pollution, Chapter 116, and of the manner in which the Agency proposes to correct or require the correction of such violations.

(u) WAIVERS.

(1) **Waiver Period.** Nonwithstanding any other provision of this regulation and in accordance with either subsection (2) or subsection (3) of this section, any point source of a discharge having a thermal component and having been modified after the enactment of this regulation to meet existing effluent and water quality limitations, which limitations will assure protection and propagation of a balanced, indigenous population of fish and wildlife in and on the water into which the discharge is made, shall not be subject to any more stringent effluent limitation with respect to the thermal component of its discharge during a ten-year period beginning on the date of completion of new source construction or beginning on the date of completion of modifications, or during the period of depreciation or amortization of such facility for the purposes of Section 167 or 169, or both, of the Federal Internal Revenue Code of 1954, whichever periods ends first. Upon the termination of said period, such new sources shall comply with all provisions of this and other applicable regulations.

(2) **Standards of Performance for New Sources.** Pursuant to Section 306(d) and upon adoption by the Agency of procedures of performance for new sources, approved by the Administrator for applying and enforcing standards, the Agency may grant a waiver for the period specified in subsection (1) of this section from any more stringent standard for any point source to meet all applicable standards of performance for new sources, consistent with and pursuant to the provisions of Section 306(d) of the Act. Such standard of performance for a new source is one which takes into consideration, among other things, classes, types, sizes, and categories of sources, processes, pollution control technology, cost of achieving such effluent reduction, and any non-water quality impact and energy requirements and encompasses those standards for the control of the discharge of pollutants which reflect the greatest degree of effluent reduction which the Agency determines to be achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including where practicable, a standard permitting no discharge of pollutants. New sources shall encompass buildings, structures, facilities, or installations from which there is or may be the discharge of pollutants the construction of which is commenced after promulgation of regulations by the EPA prescribing standards of performance which apply to such sources. Construction shall encompass any placement, assemble, or installation of facilities or equipment, including contractual obligations to purchase such facilities or equipment, at the premises where such equipment will be used, including preparation work at such premises.

(3) **Effluent Limitations for Heat Components of Discharge.** Whenever the owner or operator of any point source, after opportunity for public hearing, can demonstrate to the satisfaction of the Agency that any effluent limitation proposed for the control of the heat component of any discharge from such sources will require effluent limitations more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of fish and wildlife in and on the body of water into which the discharge is to be made, the Agency may impose and, thereafter, modify or

terminate, an effluent limitation for such plant, with respect to the heat component of such discharge (taking into account the interaction of such heat component with other pollutants) that will assure the protection and propagaion of a balanced, indigenous population of fish and wildlife in and on that body of water. For any point source the construction of which is thereafter commenced, and which, as modified, meets applicable effluent and water quality limitations, which limitations will assure protection and propagation of a balanced indigenous population of fish and wildlife in or on the water into which the discharge is made, the Agency shall have adequate authority to grant and, thereafter, modify or terminate, a waiver for the period specified in subsection (1) from a more stringent limitation with respect to the thermal component of such discharge.

(4) **Best Available Technology Requirement.** The Agency may modify, in its discretion, any requirement or limitation based upon best available technology with respect to any point source for which a permit application is filed after July 1, 1977, upon a showing satisfactory to the Agency by the owner or operator of such point source that such modified requirements will represent the maximum use of technology within the economic capability of the owner or operator and will result in reasonable further progress toward the elimination of the discharge of pollutants.

(5) **Disposal System Permit Applications.** Notwithstanding any provision of this regulation to the contrary, unless the Director or the Agency determines that there is sufficient public interest in an application, an application for a state disposal system permit which is not subject to the requirements of NPDES and does not have a flow of more than 50,000 gallons per day on any day, shall not be subject to the procedural requirements of Sections (f), (g), (h), or (j) of this regulation.

(6) **Sewer System Extension Permit Applications.** Notwithstanding any provisions of this regulation to the contrary, unless the Director or the Agency determines that there is sufficient public interest in an application, an application for a state disposal system permit for a sewer system extension which does not constitute a point source shall not be subject to the procedural requirements of Sections (f), (g), (h), or (j) of this regulation.

**STATE OF MINNESOTA
POLLUTION CONTROL AGENCY**

CHAPTER THIRTY-SEVEN: WPC 37

**STANDARDS FOR THE LIMITATION OF THE
AMOUNT OF PHOSPHORUS IN VARIOUS CLEANING AGENTS
AND CHEMICAL WATER CONDITIONERS**

WPC 37: The official policy and purpose of the State of Minnesota in regard to these matters is set forth in Section 116.21 through 116.35 of Minnesota Statutes 1971 which are stated in part as follows:

Section 116.21. Nutrients in Cleaning Agents and Water Conditioners, Control; Statement of Policy.

The Legislature seeks to encourage the Minnesota Pollution Control Agency through the passage of sections 116.21 to 116.35, to set standards limiting the amount of nutrients in various cleaning agents and water conditioning agents. The Legislature realizes that the nutrients contained in many of these products serve a valuable purpose in increasing their overall effectiveness, but we are also aware that they overstimulate the growth of aquatic life and eventually lead to an acceleration of the natural eutrophication process of our state's waters. Limitations imposed under section 116.21 to 116.35 should, however, be made taking the following factors into consideration:

- (1) The availability of safe, non-polluting and effective substitutes.
- (2) The difference in the mineral content of water in various parts of the state.
- (3) The differing needs of industrial, commercial and household users of cleaning agents and chemical water conditioners.

Section 116.24. Regulations.

The Pollution Control Agency may make regulations:

- (a) Prescribing, for the purpose of section 116.23, nutrients and the maximum permissible concentration, if any, of a prescribed nutrient in any cleaning agent or chemical water conditioner;
- (b) Respecting the manner in which the concentration of any prescribed nutrient in a cleaning agent or chemical water conditioner shall be determined; and
- (c) Requiring persons who manufacture in Minnesota any cleaning agent or chemical water conditioner to maintain books and records necessary for the proper enforcement of sections 116.21 to 116.35 and regulations thereunder, and to submit samples of cleaning agents or water conditioners to the Pollution Control Agency.

(a) Introduction.

- (1) **Scope.** The following controls, prohibitions or restrictions

hereby adopted and established shall apply to all ingredients of cleaning agents and chemical water conditioners distributed, sold, offered or exposed for sale in the State of Minnesota within the scope of this regulation.

(2) **Prohibition.** No person shall sell, offer, expose for sale or distribute for use in Minnesota any cleaning agent or chemical water conditioner which contains a prescribed nutrient in a concentration that is greater than the prescribed maximum permissible concentration of that nutrient in that cleaning agent or chemical water conditioner.

(3) **Severability.** The provisions of this regulation shall be severable, and the validity of any lettered paragraph or any sub-paragraph or subdivision thereof shall not make void any other lettered paragraph, sub-paragraph, subdivision or any other part thereof.

(b) **Definitions.** For purposes of this regulation, the terms defined in this section shall have the meanings given them:

(1) "Cleaning agent" means a heavy duty laundry detergent, laundry additive, dishwashing compound, household cleaner, industrial cleaner, phosphate compound or other substance intended to be used for cleaning purposes.

(2) "Nutrient" means a substance or combination of substances which, if added to waters in sufficient quantities, provide nourishment that promotes growth of aquatic vegetation in densities which:

A. interfere with use of the waters by man or by any animal, fish or plant useful to man, or

B. contribute to degradation or alteration of the quality of the waters to an extent detrimental to their use by man or by any animal, fish or plant that is useful to man.

(3) "Chemical water conditioner" means a water softening chemical, anti-scale chemical, corrosion inhibitor or other substance intended to be used to treat water.

(4) "Dishwashing machine" means equipment manufactured for the purpose of cleaning dishes, glassware and other utensils involved in food preparation, consumption or use, using a combination of water agitation and high temperature.

Other terms and abbreviations used herein not specifically defined in the law shall be construed in conformance within the context and professional usage.

(c) **Prescribed nutrient.** Phosphorus, as elemental phosphorus, is prescribed as a nutrient for the purpose of this regulation pursuant to Minnesota Statute 116.23.

(d) **Nutrient limitation.** After January 1, 1977, the maximum permissible concentrations of the prescribed nutrient in the below listed cleaning agents or chemical water conditioners shall be as follows:

(1) Laundry detergents and built soaps for machine laundry excluding chemical water conditioners: not to exceed 0.5% phosphorus, by weight.

(2) Household and commercial detergents for machine dishwashing: not to exceed 11% phosphorus, by weight.

(3) All household cleaning agents except those listed in (d)(1) and (2) intended to be used in the home: not to exceed 0.5% phosphorus, by weight.

(4) Chemical water conditioners for machine laundry use: not to exceed 20% phosphorus, by weight.

(e) The amounts of phosphorus permissible in all cleaning agents and chemical water conditioners other than those identified in section (d) of this regulation are not limited by this regulation.

(f) The concentration by weight of prescribed nutrient in any cleaning agent or chemical water conditioner shall be determined by the current applicable method prescribed by the American Society for Testing and Materials (A.S.T.M.).

(g) **Variance.** In any case where, upon application of the responsible person or persons, the Agency finds that by reason of exceptional circumstances the strict enforcement of any provision of this regulation would cause undue hardship; that the use of cleaning or water conditioning agents containing phosphorus in excess of the permissible levels set forth herein is necessary for the public health, safety or welfare; or that strict conformities with these limits would be unreasonable, impractical or not feasible under the circumstances, the Agency in its discretion may permit a variance therefrom upon such conditions as it may prescribe for prevention, control or abatement of pollution in harmony with the general purpose of this regulation and the intent of applicable state and national laws.

Filed June 4, 1976

POLLUTION CONTROL AGENCY

Chapter Thirty-Eight: 6 MCAR § 4.8038

§ 4.8038 Requirements for Labeling of Products Containing PCB and for Issuing Certificates of Exemption for Use, Possession, Sale, Purchase or Manufacture of PCB or Products Containing PCB.

A. Introduction.

1. Purpose. This regulation is hereby adopted and promulgated by the Agency to implement the provisions of Minn. Stat. §§ 116.36 and 116.37. This regulation establishes procedures for the issuance by the Agency of certificates of exemption for the use, possession, sale, purchase or manufacture of polychlorinated biphenyls (PCB) and products or class of products containing PCB, and labeling requirements for items, products or materials sold in the State which contain PCB.

2. Scope. The provisions of this regulation shall apply to PCB and products or a class of products containing PCB used, possessed, sold, purchased or manufactured in the State of Minnesota.

3. Severability. The provisions of this regulation shall be severable and the invalidity of any lettered paragraph or any subparagraph or subdivision thereof shall not void any other lettered paragraph, subparagraph or subdivision or any other part thereof.

B. Definitions.

1. "Agency" means the Minnesota Pollution Control Agency.

2. "Certificate of Exemption" means a document issued by the Agency for the purpose of permitting the use, sale, possession, purchase or manufacture of PCB, a product containing PCB, or a class of products containing PCB.

3. "Class of products containing PCB" means a group or category of closely related items, products or materials having a similar function or making similar use of the chemical or physical properties of the PCB which they contain.

4. "Director" means the Executive Director of the Minnesota Pollution Control Agency.

5. "PCB" means the class of organic compounds known as polychlorinated biphenyls and includes any of several compounds produced by replacing one or more hydrogen atoms on the biphenyl molecule with chlorine. PCB does not include chlorinated biphenyl compounds that have functional groups attached other than chlorine.

6. "Person" means the state or any agency or institution thereof, any

municipality, governmental subdivision, public or private corporation, individual, partnership or other entity, including, but not limited to, association, commission, or any interstate body, and includes any officer or governing or managing body of any municipality, governmental subdivision, or public or private corporation.

7. "Possess" or "Possession" means the ownership or physical control of an item, product or material. "Possess" or "Possession" does not include physical control by a person other than the owner while the item, product or material is being shipped in commerce.

8. "Product containing PCB" means a product, item or material which contains a concentration of PCB equal to or greater than 500 milligrams per kilogram (mg/kg). Concentration for the purposes of this definition is calculated as follows:

a. If PCB is distributed throughout a product, item or material, the concentration of PCB is determined on the basis milligram (mg) of PCB per kilogram (kg) of the mass in which the PCB is distributed.

b. If PCB is a constituent of only a portion of a product, item or material, the concentration of PCB is determined on the basis of milligram (mg) of PCB per kilogram (kg) of only that portion of the product, item or material in which the PCB is a constituent.

9. "Subsequent Use" means a use of PCB or a product or class of products containing PCB which is identical in function to the use exempted in a certificate of exemption currently in effect.

10. "Written" includes printing, typewriting or any other intentional reduction to tangible form.

Other terms and abbreviations used herein which are not specifically defined by law shall be construed in conformance with the context and commonly accepted professional usage.

C. Certificate of exemption.

1. Application.

a. Existing facilities, equipment and products. Any person who presently uses, possesses, sells, purchases or manufactures PCB or a product containing PCB shall submit a complete application for a certificate of exemption for such PCB or products containing PCB within 90 days after the effective date of this regulation.

b. New facilities, equipment and products. Any person who intends to use, possess, sell, purchase or manufacture PCB or a product containing PCB shall submit a complete application for a certificate of exemption for such PCB or products containing PCB at least 180 days prior to the proposed

date of use, possession, sale, purchase or manufacture of PCB or a product containing PCB.

c. Forms and signatures.

(1) Applications shall be submitted on forms prescribed by the Director.

(2) Signatures. Applications shall be signed as follows:

(a) In case of a corporation, by a principal executive officer of at least the level of vice president, or his duly authorized representative.

(b) In case of a partnership, by a general partner.

(c) In case of a sole proprietorship, by the proprietor.

(d) In case of a municipal, state or other public entity by either the principal executive officer or by an official authorized by a resolution passed at an official meeting of the governing body.

d. Contents of application.

(1) The application for certificate of exemption shall include:

(a) The name and address of the applicant.

(b) The amount of PCB involved in the use, possession, sale, purchase, or manufacture or contained in a product containing PCB. In instances where the amount of PCB involved is not ascertainable by an applicant, applicant shall supply the name and mailing address of the manufacturer of such product and the serial and model number, if any, of the product involved. In all such cases wherein the amount of PCB involved cannot be reasonably ascertained by an applicant, the applicant shall make an estimate of the amount of PCB involved.

(c) The purpose for the use, possession, sale, purchase, or manufacture of PCB or a product containing PCB.

(d) A concise description of the location of the use, possession, sale, purchase or manufacture of PCB or a product containing PCB.

(e) Justification for the use, possession, sale, purchase or manufacture of the PCB or a product containing PCB. The justification shall include, but is not limited to, a detailed evaluation of the following:

(i) The impact upon the air, water and land resources of the State which may result from the applicant's use, possession, sale, purchase or manufacture of PCB or a product containing PCB, including any impacts that may result from the accidental spill of PCB or fluids containing PCB.

(ii) The risk to public health and safety which may result from the applicant's use, possession, sale, purchase or manufacture of PCB or a product containing PCB.

(iii) The toxicity, flammability and reasonable availability of PCB substitutes.

(iv) Any feasible alternatives to the continued use, possession, sale, purchase or manufacture of PCB or a product containing PCB which have been considered by the applicant.

(v) The data, information or analyses which the applicant has relied upon or developed in determining the public health, safety, and environmental impacts which may result from the applicant's use, possession, sale, purchase or manufacture of PCB or a product containing PCB.

(f) A description of the applicant's practices and procedures for handling and storing PCB or products containing PCB. The description shall include, but is not limited to, the following:

(i) The existing safeguards utilized in handling or storing PCB or products containing PCB.

(ii) The procedures utilized in the control and cleanup of spilled PCB or products containing PCB.

(iii) The procedures followed for disposing of PCB, products containing PCB, or materials and items contaminated by PCB.

(2) Any application for a certificate of exemption for the use or replacement of existing electrical transformers or capacitors shall include, in addition to the requirements of section C.1.d.(1) of this regulation.

(a) A detailed assessment of the cost of replacing the existing electrical transformers or capacitors with equipment that does not contain PCB.

(b) The cost of purchasing and installing non-PCB fluids in existing equipment.

e. Complete application. All certificate of exemption applications shall be reviewed for completeness by the Director. If an application is incomplete or otherwise deficient, the Director shall promptly advise the applicant of such incompleteness or deficiency. Further processing of the application may be suspended until the applicant has supplied the necessary information or otherwise corrected the deficiency. A certificate of exemption shall not be issued until a complete application is submitted to the Agency.

f. Any person may submit an application for a certificate of exemption for a class of products possessed by the Applicant which contain PCB.

An application for a class of products exemption shall comply with section C.1.d. of this regulation.

2. Preliminary determination and draft certificate of exemption.

a. The Director shall make preliminary determinations regarding a complete certificate of exemption application prior to issuance of public notice of the application. These preliminary determinations shall include a proposed determination to issue or deny a certificate of exemption.

b. The Director shall inform the applicant of the proposed determination to issue or deny a certificate of exemption.

c. If the proposed determination is to issue a certificate of exemption, the Director shall prepare a draft certificate.

3. Public notice of certificate of exemption application.

a. Circulation of public notice. The Director shall prepare and issue a public notice of the certificate of exemption application. The notice shall be circulated within the geographical area of the use, possession, sale, purchase or manufacture of the PCB or a product containing PCB. The Director may circulate the notice in any of the following ways:

(1) Posting the notice in public libraries or other public buildings or places located in the designated geographical area.

(2) Posting the notice at or nearby the entrance to the applicant's premises.

(3) Publishing the notice in one or more newspapers of general circulation in the designated geographical area of the applicant or, if appropriate, in an applicable periodical.

(4) Publishing the notice in the State Register.

b. Availability of public notice.

(1) The Director shall mail a copy of the public notice to the applicant. The Director shall mail a copy of the public notice to any interested persons upon written request.

(2) The Director shall make available a copy of the public notice at the main Agency office and at the appropriate Agency regional office.

c. Public notice comment period.

(1) Any interested person, including the applicant, may, within the time allowed for public comment following the issuance of the public notice, submit written comments on the certificate of exemption application

to the Agency. The time for public comment shall be 30 days unless otherwise extended by the Director. The time for public comment may be extended by the Director if he determines that such extension is necessary to facilitate public comment.

(2) All written comments submitted during the comment period shall be retained and considered in the formulation of final determinations concerning the certificate of exemption application.

d. Public notice contents. The public notice of the certificate of exemption application shall include:

(1) The name and address of the applicant.

(2) A concise description of the applicant's use, possession, sale, purchase or manufacture of PCB or a product containing PCB and location of that use, possession, sale, purchase or manufacture.

(3) A statement of the Director's preliminary determination to issue or deny the certificate of exemption.

(4) A statement regarding the proposed duration of the certificate of exemption.

(5) A statement that any interested person may submit written comments to the Agency during the public comment period after the issuance of the public notice.

(6) The date the public comment period terminates.

(7) If the proposed determination is to issue a certificate of exemption, a statement that a copy of the draft certificate of exemption will be mailed to any person upon written request.

(8) The address and telephone number of the main Agency office and the appropriate Agency regional office.

(9) A concise statement explaining the procedures for petitioning for a public hearing on the certificate of exemption application.

4. Public hearing on certificate of exemption application.

a. The applicant or any interested person may, within the public comment period, file a petition with the Director for a public hearing on a certificate of exemption application. A petition for a public hearing shall include:

(1) The basis for the hearing request.

(2) The specific portion of the draft certificate of exemption, if

one has been prepared pursuant to section C.2 of this regulation, that necessitates a public hearing.

(3) The interest in or relationship of the petitioner to the applicant.

b. All public hearings on certificate of exemption applications shall be held in accordance with the rules and regulations of the Office of the Hearing Examiners.

5. Duration of certificate of exemption. All certificates of exemption issued by the Agency shall have a fixed term which shall not exceed five years.

6. Issuance of certificate of exemption.

a. The Agency shall not issue a certificate of exemption unless:

(1) A complete application has been filed with the Agency.

(2) The applicant has provided sufficient justification, to the satisfaction of the Agency, for the use, possession, sale, purchase or manufacture of PCB or a product or class of products containing PCB in accordance with section C.1. of this regulation.

b. In determining whether to issue or deny the certificate of exemption, the Agency shall consider, but is not limited to:

(1) The effect upon the air, water and land resources of the State which may result from the applicant's use, possession, sale, purchase or manufacture of PCB or a product containing PCB.

(2) The gravity of risk to public health and safety which may result from the applicant's use, possession, sale, purchase or manufacture of PCB or a product containing PCB.

(3) The toxicity, flammability and reasonable availability of PCB substitutes.

(4) The existence of feasible alternatives to the applicant's use, possession, sale, purchase or manufacture of PCB or a product containing PCB.

(5) The potential risk for dispersion of PCB into the air, water and land resources of the State which may result from the applicant's use, possession, sale, purchase or manufacture of PCB or a product containing PCB.

(6) The applicant's practices and procedures, including compliance with applicable State and federal statutes and regulations, for the

handling, storing and disposing of PCB, products containing PCB, or materials and items contaminated by PCB.

c. If the certificate of exemption application involves the use or replacement of existing electrical transformers or capacitors, the Agency shall consider, in addition to the requirements of sections 6.a. and b. of this regulation:

- (1) The safety of proven alternatives or substitutes.
- (2) The cost of replacing existing electrical transformers or capacitors with equipment that does not contain PCB.
- (3) The cost of purchasing and installing non-PCB fluids in existing equipment.

7. Terms and conditions of a certificate of exemption. The Agency may include in a certificate of exemption such terms and conditions as are necessary in order to abate, control or prevent pollution of the air, water and land resources of the State including, but not limited to:

a. A requirement that annual reports be submitted to the Agency within 30 days following the end of each calendar year and that these reports include the following information:

- (1) Name and address of the person responsible for filing the report.
- (2) Quantity of PCB used, possessed, sold, purchased or manufactured during the preceding calendar year.
- (3) Location and nature of the use, possession, sale, purchase or manufacture of PCB or a product containing PCB.
- (4) Handling, storage or disposal practices and procedures utilized in the use, possession, sale, purchase or manufacture of PCB or a product containing PCB.
- (5) Such other information as the Executive Director deems necessary.

b. A requirement that any item, product or material containing PCB be labeled in a manner which discloses the following:

- (1) The presence of PCB in the item, product or material.
- (2) A statement regarding proper disposal of the item, product or material.
- (3) A warning regarding potential environmental and public health hazards of PCB.

c. A requirement that all records, including analytical and test analyses, be retained by the holder of the certificate of exemption for a period of three years.

d. A schedule for the replacement of existing equipment which contains PCB or PCB compounds or fluids with equipment which does not contain PCB or PCB compounds or fluids.

e. Such other terms and conditions as the Executive Director deems necessary.

8. Subsequent uses. If the Agency issues a certificate of exemption for the use of PCB or a product or class of products containing PCB, the certificate of exemption shall be valid for all subsequent uses of such PCB or product or class of products containing PCB if the subsequent uses are consistent with the terms and conditions of the original certificate of exemption.

9. Modification, suspension, and revocation of certificate of exemption.

a. Grounds for modification, suspension, or revocation. The Agency may modify, suspend, or revoke any term or condition of the certificate of exemption, or the certificate of exemption in its entirety, upon finding:

(1) There has been a change in the applicant's justification for use, possession, sale, purchase or manufacture of PCB or a product or class of products containing PCB.

(2) There has been a violation of law.

(3) There has been a misrepresentation or omission of significant facts upon which certificate of exemption was based.

(4) The terms and conditions of the certificate of exemption have not been complied with or have been violated.

(5) Other just cause exists for such action.

b. Notice of modification, suspension or revocation. No certificate of exemption may be modified, suspended or revoked by the Agency unless the exempt person is notified of the proposed action at least 30 days prior to the effective date of the modification, suspension or revocation.

c. Opportunity for public hearing. Any exempt person may request, in accordance with Minn. Reg. MPCA 9 (b) (6 MCAR § 4.3009 B.), the Agency to hold a public hearing on the proposed modification, suspension or revocation. The Agency, upon its own motion, may order that a public hearing be held. In issuing its order of modification, suspension or revocation of a certificate of exemption, the Agency shall state the reasons for such action.

d. Section C.9 of this regulation shall not limit or preclude the Agency from exercising its emergency powers pursuant to Minn. Stat. § 116.11.

D. Labels.

1. Any person after July 1, 1977, who adds PCB in the manufacture of any new item, product, or material or any person in this State who sells any new item, product, or material to which PCB has been added shall conspicuously label the PCB or product containing PCB.

a. The label shall disclose the following:

(1) The presence of PCB in the item, product or material.

(2) The item, product, or material contains a concentration of PCB equal to or greater than 500 milligrams per kilogram (mg/kg).

(3) A statement regarding proper disposal.

(4) A warning regarding potential environmental and public health hazards of PCB.

b. The label shall be written and affixed to the item, product or material so that a reasonable person ought to have noticed it.

c. The following statement may be used to satisfy the requirements of section D.1.a. of this regulation:

WARNING: Contains a concentration of polychlorinated biphenyl (PCB) equal to or greater than 500 mg/kg. Severe environmental contaminant. Care should be taken to prevent entry into the environment through spills, leakage, use, vaporization or disposal of liquid or containers. Avoid prolonged breathing of vapors or mists, contact with eyes or prolonged contact with skin. This item must be used and disposed of in accordance with State and federal statutes and regulations.

E. Exemptions.

1. The following uses of PCB or products containing PCB are exempted by the Agency:

a. Any product containing PCB which was purchased or otherwise acquired by an individual person for consumer use in the home.

b. Wastepaper, pulp or other wood fiber materials purchased for use within this State in the manufacture of recycled paper products.

c. Any electrical ballast, capacitor or transformer which contains less than one kilogram of PCB.

2. The certificate of exemption and labeling requirements shall not apply to the uses or products exempted under section E.1. of this regulation.

§ 4.8040 Individual sewage treatment systems standards.

A. Intent. The improper design, location, installation, use and maintenance of individual sewage treatment systems adversely affects the public health, safety and general welfare by discharge of inadequately treated sewage to surface and ground waters. In accordance with the authority granted in Minn. Stat. ch. 104, 105, 115, and 116 (1976), the Minnesota Pollution Control Agency, hereinafter referred to as the Agency, does hereby provide the minimum standards and criteria for the design, location, installation, use and maintenance of individual sewage treatment systems, and thus protect the surface and ground waters of the state, and promote the public health and general welfare.

Further, it is intended that the administration and enforcement of these standards be conducted by local units of government, since experience has shown that sanitary ordinances can most effectively be administered at the local level.

B. Definitions. For the purposes of these standards, certain terms or words used herein shall be interpreted as follows: the word "shall" is mandatory, the words "should" and "may" are permissive. All distances, unless otherwise specified, shall be measured horizontally.

1. **Aerobic tank.** Any sewage tank which utilizes the principle of oxidation in the decomposition of sewage by the introduction of air into the sewage.
2. **Agency.** The Minnesota Pollution Control Agency.
3. **Alternative system.** An individual sewage treatment system employing such methods and devices as presented in section I.
4. **Baffle.** A device installed in a septic tank for proper operation of the tank, and to provide maximum retention of solids. Includes vented sanitary tees and submerged pipes in addition to those devices that are normally called baffles.
5. **Bedrock.** That layer of parent material which is consolidated and unweathered.
6. **Bedroom.** Any room within a dwelling that might reasonably be used as a sleeping room.
7. **Building drain.** That part of the lowest piping of the drainage system which receives the sewage discharge inside the walls of the building and conveys it to the building sewer beginning at least one foot outside the building footings.

8. **Building sewer.** That part of the drainage system which extends from the end of the building drain and conveys its discharge to an individual sewage treatment system.

9. **Capacity.** The liquid volume of a sewage tank using inside dimensions below the outlet.

10. **Cesspool.** An underground pit into which raw household sewage or other untreated liquid waste is discharged and from which the liquid seeps into the surrounding soil. See section C. 2. d.

11. **Distribution pipes.** Perforated pipes or agricultural drain tiles that are used to distribute sewage tank effluent in a soil treatment system.

12. **DNR.** The Minnesota Department of Natural Resources.

13. **Dosing chamber (or pump pit or wet well).** A tank or separate compartment following the sewage tank which serves as a reservoir for the dosing device.

14. **Dosing device.** A pump, siphon, or other device that discharges sewage tank effluent from the dosing chamber to the soil treatment system.

15. **Dwelling.** Any building or place used or intended to be used by human occupants as a single family or two family unit.

16. **Filter material.** Clean rock, crushed igneous rock or similar insoluble, durable and decay-resistant material free from dust, sand, silt, or clay. The size shall range from three-fourths inch to two and one-half inches.

17. **Greywater.** Liquid waste from a dwelling or other establishment produced by bathing, laundry, culinary operations and from floor drains, and specifically excluding toilet waste.

18. **Holding tank.** A watertight tank for storage of sewage until it can be transported to a point of approved treatment and disposal.

19. **Impermeable.** With regard to bedrock, a bedrock having no cracks or crevices and having a vertical permeability less than one inch in 24 hours shall be considered impermeable. With regard to soils, a soil horizon or layer having a vertical permeability less than one inch in 24 hours shall be considered impermeable.

20. **Individual sewage treatment system.** A sewage treatment system, or part thereof, serving a dwelling, or other establishment, or group thereof, which utilizes subsurface soil treatment and disposal.

21. **Local unit of government.** A township, city or county organized under the laws of the State of Minnesota.

22. **Mottling.** A zone of chemical oxidation and reduction activity, appearing as splotchy patches of red, brown, orange and gray in the soil.

23. **Mound system.** A system where the soil treatment area is built above the ground to overcome limits imposed by proximity to water table or bed-rock, or by rapidly or slowly permeable soils.

24. **Other establishment.** Any public or private structure other than a dwelling which generates sewage.

25. **Percolation rate.** The time rate of drop of a water surface in a test hole as specified in section D. 3. b. of this regulation.

26. **Permitting authority.** Any State agency or local unit of government which administers the provisions of these standards.

27. **Plastic limit.** A soil moisture content below which the soil may be manipulated for purposes of installing a soil treatment system, and above which manipulation will cause compaction and puddling.

28. **Sand.** A soil texture composed by weight of at least 85 percent of soil particles ranging in size between 0.05 and 2.0 mm.

29. **Seepage pit (or leaching pit or dry well).** An underground pit into which a sewage tank discharges effluent or other liquid waste and from which the liquid seeps into the surrounding soil through the bottom and openings in the side of the pit.

30. **Septage.** Those solids and liquids removed during periodic maintenance of a septic or aerobic tank, or those solids and liquids which are removed from a holding tank.

31. **Setback.** A separation distance measured horizontally.

32. **Sewage.** Any water carried domestic waste, exclusive of footing and roof drainage, from any industrial, agricultural, or commercial establishment, or any dwelling, or any other structure. Domestic waste includes but is not limited to liquid waste produced by bathing, laundry, culinary operations and liquid wastes from toilets and floor drains, and specifically excludes animal waste and commercial process water.

33. **Sewage flow.** Flow as determined by measurement of actual water use or, if actual measurements are unavailable, as estimated by the best available data provided by the Agency.

34. **Sewage tank.** A watertight tank used in the treatment of sewage. Includes, but is not limited to septic tanks and aerobic tanks.

35. **Sewage tank effluent.** That liquid which flows from a septic or aerobic tank under normal operation.

36. **Septic tank.** Any watertight, covered receptacle designed and constructed to receive the discharge of sewage from a building sewer, separate solids from liquid, digest organic matter, and store liquids through a period of detention, and allow the clarified liquids to discharge to a soil treatment system.

37. **Shoreland.** Land located within the following distances from public waters: (1) 1,000 feet from the ordinary high water mark of a lake, pond or flowage; and (2) 300 feet from a river or stream or the landward extent of a flood plain designated by ordinance on such a river or stream, whichever is greater.

38. **Site.** The area bounded by the dimensions required for the proper location of the soil treatment system.

39. **Slope.** The ratio of vertical rise or fall to horizontal distance.

40. **Soil characteristics, limiting.** Those soil characteristics which preclude the installation of a standard system, including but not limited to evidence of water table or bedrock closer than three feet to the ground surface, and percolation rates faster than one-tenth or slower than 60 minutes per inch.

41. **Soil textural classification.** Where soil particle sizes or textures are specified in this regulation, they refer to the soil textural classification in the Soil Survey Manual, Handbook No. 18, U. S. Department of Agriculture, 1951.

42. **Soil treatment area.** That area of trench or bed bottom which is in direct contact with the filter material of the soil treatment system.

43. **Soil treatment system.** A system whereby sewage tank effluent is treated and disposed of below the ground surface by filtration and percolation through the soil. Includes those systems commonly known as seepage bed, trench, drainfield, disposal field, and includes mounds, Electroosmosis systems, and seepage pits.

44. **Standard system.** An individual sewage treatment system employing a building sewer, sewage tank and the soil treatment system commonly known as seepage bed or trenches, drainfield, or leachfield.

45. **Surface water flooding.** The 100 year flood plain along rivers and streams as defined by the DNR, or in the absence of such data, as defined by the largest flood of record. On lakes, high water levels as determined or recorded by the DNR or, in the case of no DNR record, by local records or experience. Other surface water flooding or high water areas should be determined by local information.

46. **Ten year flood.** That flood which can be expected to occur, on an average, of once in ten years; or the level to which flood waters have a ten percent chance of rising in any given year.

47. Toilet waste. Fecal matter, urine, toilet paper and any water used for flushing.

48. Valve box. Any device which can stop sewage tank effluent from flowing to a portion of the soil treatment area. Includes, but is not limited to caps or plugs on distribution or drop box outlets, divider boards, butterfly valves, gate valves, or other mechanisms.

49. Water table. The highest elevation in the soil where all voids are filled with water, as evidenced by presence of water or soil mottling or other information.

50. Ordinary high water mark. A mark delineating the highest water level which has been maintained for a sufficient period of time to leave evidence upon the landscape. The ordinary high water mark is commonly that point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial.

51. Watertight. Constructed so that no water can get in or out below the level of the outlet.

52. Wild and scenic river land use district. Those lands designated by the Commissioner of the DNR as the protected land corridor along those rivers or river segments designated as wild, scenic or recreational rivers.

C. General provisions.

1. Applicability.

a. Administration by State Agencies.

(1) Individual sewage treatment systems which serve a single facility generating greater than 15,000 gallons per day shall conform to the requirements of these standards and shall make application for and obtain a State Disposal System Permit from the Agency.

(2) Collector systems which serve 15 dwellings or 5,000 gallons per day, whichever is less, shall conform to the requirements of these standards and shall make application for and obtain a State Disposal System Permit from the Agency.

(3) Individual sewage treatment systems serving establishments or facilities licensed or otherwise regulated by the State of Minnesota shall conform to the requirements of these standards.

(4) Any individual sewage treatment system requiring approval by the State of Minnesota shall also comply with all local codes and ordinances.

b. Administration by local units of government.

(1) Shoreland and floodplain areas, and wild and scenic river land use districts. Pursuant to Minn. Stat., §§ 104.04, 104.36 and 105.485 (1976), certain counties and municipalities must enact ordinances which comply with the appropriate regulations of the Minnesota Department of Natural Resources, some of which in turn require compliance with the regulations of the Minnesota Pollution Control Agency.

(2) Other areas. Outside of the above mentioned areas, these standards provide recommended guidelines for the adoption of local ordinances and for the design, location, construction, use and maintenance of individual sewage treatment systems.

(3) Localized standards. Nothing in these standards shall prevent local units of government from enacting ordinances which provide more adequate sewage treatment under local conditions.

2. General.

a. Surface discharge. Unless specifically permitted by the Agency*, sewage, sewage tank effluent, or seepage from a soil treatment system shall not be discharged to the ground surface, abandoned wells, or bodies of surface water, or into any rock or soil formation the structure of which is not conducive to purification of water by filtration, or into any well or other excavation in the ground.

b. Treatment required. The system, or systems, shall be designed to receive all sewage from the dwelling, building, or other establishment served. Footing or roof drainage shall not enter any part of the system.

c. System components. The system shall consist of a building sewer, sewage tank and soil treatment system. All sewage shall be treated in a sewage tank or toilet waste treatment device, and the sewage tank effluent shall be discharged to the soil treatment system.

d. Prohibited installations. Cesspools shall not be installed.

e. System sizing. Where the construction of additional bedrooms, the installation of mechanical equipment or other factors likely to affect the operation of the system can be reasonably anticipated, the installation of a system for such anticipated need shall be required.

3. Advisory committee.

a. There is hereby created an Advisory Committee on Individual Sewage Treatment Systems (ISTS) hereinafter referred to as the Committee.

* All new or existing systems which discharge to surface waters or the ground surface must obtain either a National Pollutant Discharge Elimination System (NPDES) or State Disposal System Permit from the Agency and shall comply with all requirements pertaining thereto.

b. The Committee shall, subject to the approval of the Agency:

(1) Review and advise the Agency on revisions of standards and legislation relating to ISTS.

(2) Review technical data relating to ISTS.

(3) Develop and revise a technical manual on ISTS.

(4) Develop educational materials and programs for ISTS.

(5) Advise the Agency and local unit of government on the administration of standards and ordinances pertaining to ISTS.

c. The Committee shall consist of 16 voting members. Of the 16 voting members:

One shall be a citizen of Minnesota, representative of the public;

One shall be from the Agricultural Extension Service of the U.S.D.A. and the University of Minnesota;

Six shall be county administrators (such as zoning administrators, sanitarians, etc.), one from each of the five Agency regions and one from the seven-county metropolitan area;

One shall be a municipal building inspector;

Six shall be sewage treatment contractors, one from each of the five Agency regions and one from the seven-county metropolitan area; and

One shall be a water well contractor.

d. The following agencies and associations shall each have one non-voting ex officio member to assist the Advisory Committee and to be advised, in turn, on matters relating to ISTS: the Agency, the DNR, Department of Health, the U.S.D.A. Soil Conservation Service, the Metropolitan Council, the Association of Minnesota Counties, the Minnesota Association of Township Officials, the League of Minnesota Cities, and the Minnesota Society of Professional Engineers.

e. All members shall be appointed by the Agency Board from recommendations by the affected groups. All members shall serve for two years, with terms staggered so as to maintain continuity.

f. In the case of a vacancy, an appointment shall be made for the unexpired balance of the term. The administrators, inspectors, and contractors shall have been bona fide residents of this state for a period of at least three years prior to appointment, and shall have had at least three years experience in their respective businesses.

g. Robert's Rules of Order shall prevail at all meetings of the Advisory Committee.

D. Site evaluation.

1. All proposed sites for individual sewage treatment systems shall be evaluated as to:

a. Depth to the highest known or calculated ground water table or bedrock;

b. Soil conditions, properties and permeability;

c. Slope;

d. The existence of lowlands, local surface depressions, and rock outcrops;

e. All legal setback requirements from: existing and proposed buildings; property lines; sewage tanks; soil treatment systems; water supply wells; buried water pipes and utility lines; the ordinary high water mark of lakes, rivers, streams, flowages; and the location of all soil treatment systems and water supply wells on adjoining lots within 150 feet of the proposed soil treatment system, sewage tank and water supply well;

f. Surface water flooding probability.

2. A preliminary evaluation shall be made of publicly available, existing data. If this evaluation, in the opinion of the permitting authority, yields enough information that the site is suitable, approval may be given for the installation of a standard system as specified in section H. 2. If a preliminary evaluation does not produce sufficient information, a field evaluation shall be made to determine the necessary information as specified in section D. 1.

3. Procedures for soil borings and percolation tests.

a. Soil borings. Where soil borings are required, they shall be made as follows:

(1) Each boring or excavation shall be made to a depth at least three feet deeper than the bottom of the proposed system or until bedrock or a water table is encountered, whichever is less.

(2) A soil texture description shall be recorded by depth and notations made where texture changes occur.

(3) Particular effort shall be made to determine the highest known water table by recording the first occurrence of mottling observed in the hole, or if mottling is not encountered, the open holes in clay or loam soils shall be observed after standing undisturbed a minimum of 16 hours, and depth to standing water, if present, shall be measured.

b. Percolation tests. Where percolation tests are required, they shall be made as follows:

(1) Test hole dimensions and locations:

(a) Each test hole shall be six to eight inches in diameter, have vertical sides, and be bored or dug to the depth of the bottom of the proposed individual sewage treatment system.

(b) Soil texture descriptions shall be recorded noting depths where texture changes occur.

(2) Preparation of the test hole:

(a) The bottom and sides of the hole shall be carefully scratched to remove any smearing and to provide a natural soil surface into which water may penetrate.

(b) All loose material shall be removed from the bottom of the test hole and two inches of one-fourth to three-fourths inch gravel shall be added to protect the bottom from scouring.

(3) Soil saturation and swelling:

(a) The hole shall be carefully filled with clear water to a minimum depth of 12 inches over the soil at the bottom of the test hole and maintained for no less than four hours.

(b) The soil shall then be allowed to swell for at least 16, but no more than 30 hours. In sandy soils, the saturation and swelling procedure shall not be required and the test may proceed if one filling of the hole has seeped away in less than ten minutes.

(4) Percolation rate measurement:

(a) In sandy soils adjust the water depth to eight inches over the soil at the bottom of the test hole. From a fixed reference point, the drop in water level shall be measured in inches to the nearest one-eighth inch at approximately ten minute intervals. A measurement can also be made by determining the time it takes for the water level to drop one inch from an eight-inch reference point. If eight inches of water seeps away in less than ten minutes, a shorter interval between measurements shall be used, but in no case shall the water depth exceed eight inches. The test shall continue until three consecutive percolation rate measurements vary by a range of no more than ten percent.

(b) In other soils, adjust the water depth to eight inches over the soil at the bottom of the test hole. From a fixed reference point, the drop in water level shall be measured in inches to the nearest one-eighth inch at approximately 30 minute intervals, refilling between measurements to main-

tain an eight-inch starting head. The test shall continue until three consecutive percolation rate measurements vary by a range of no more than ten percent. The percolation rate can also be made by observing the time it takes the water level to drop one inch from an eight-inch reference point if a constant water depth of at least eight inches has been maintained for at least four hours prior to the measurement.

(5) Calculating the percolation rate:

(a) Divide the time interval by the drop in water level to obtain the percolation rate in minutes per inch.

(b) Percolation rates determined for each test hole shall be averaged to determine the final soil treatment system design.

(6) For reporting the percolation rate, worksheets showing all calculations and measurements shall be submitted.

(7) A percolation test shall not be run where frost exists below the depth of the proposed soil treatment system.

E. Building sewers. The design, construction, and location of, and the materials for use in building sewers are presently governed by the Minnesota Building Code which, in Minn. Reg. SBC 8701, incorporates by reference the Minnesota Plumbing Code, Minn. Reg. MHD 120-135, and by specific provisions of the Minnesota Water Well Construction Code, Minn. Reg. MHD 217 (c)(1)(dd), (ee) and (ff). Relevant portions of the Minnesota Plumbing Code, as of the date of enactment of this rule, are reproduced in Appendix C. Minn. Reg. MHD 217(c)(1)(dd), (ee) and (ff), as of the date of enactment of this rule, is reproduced in Appendix D.

F. Sewage tanks.

1. General.

a. All tanks, regardless of material or method of construction shall be:

(1) Watertight.

(2) So designed and constructed as to withstand all lateral earth pressures under saturated soil conditions with the tank empty.

(3) So designed and constructed as to withstand a minimum of seven feet of saturated earth cover above the tank top.

(4) Not subject to excessive corrosion or decay.

b. Any tank not having an integrally cast bottom shall not be installed when the water table is closer than three inches to the bottom of the excavation at the time of construction.

2. Septic tanks.

a. Design. All tanks, regardless of material or method of construction, shall conform to the following criteria:

(1) The liquid depth of any septic tank or compartment thereof shall be not less than 30 inches. A liquid depth greater than six and one-half feet shall not be considered in determining tank capacity.

(2) No tank or compartment thereof shall have an inside horizontal dimension less than 24 inches.

(3) Inlet and outlet connections of the tank shall be submerged by means of baffles.

(4) The space in the tank between the liquid surface and the top of the inlet and outlet baffles shall be not less than 20 percent of the total required liquid capacity, except that in horizontal cylindrical tanks this space shall be not less than 15 percent of the total required liquid capacity.

(5) Inlet and outlet baffles shall be constructed of acid resistant concrete, acid resistant fiberglass or plastic.

(6) Sanitary tees shall be affixed to the inlet or outlet pipes with a permanent waterproof adhesive. Baffles shall be integrally cast with the tank, affixed with a permanent waterproof adhesive or affixed with stainless steel connectors, top and bottom.

(7) The inlet baffle shall extend at least six inches but not more than 20 percent of the total liquid depth below the liquid surface and at least one inch above the crown of the inlet sewer.

(8) The outlet baffle and the baffles between compartments shall extend below the liquid surface a distance equal to 40 percent of the liquid depth except that the penetration of the indicated baffles or sanitary tees for horizontal cylindrical tanks shall be 35 percent of the total liquid depth. They also shall extend above the liquid surface as required in section F. 2. a. (4). In no case shall they extend less than six inches above the liquid surface.

(9) There shall be at least one inch between the underside of the top of the tank and the highest point of the inlet and outlet devices.

(10) The inlet invert shall be not less than three inches above the outlet invert.

(11) The inlet and outlet shall be located opposite each other along the axis of maximum dimension. The horizontal distance between the nearest points of the inlet and outlet devices shall be at least four feet.

(12) Sanitary tees shall be at least four inches in diameter. Inlet

baffles shall be no less than six inches or no more than 12 inches measured from the end of the inlet pipe to the nearest point on the baffle. Outlet baffles shall be six inches measured from beginning of the outlet pipe to the nearest point on the baffle.

(13) Access to the septic tank shall be as follows:

(a) There shall be one or more manholes, at least 20 inches least dimension, and located within six feet of all walls of the tank. The manhole shall extend through the cover to a point within 12 inches but no closer than six inches below finished grade. The manhole cover shall be covered with at least six inches of earth.

(b) There shall be an inspection pipe of at least four inches diameter or a manhole over both the inlet and outlet devices. The inspection pipe shall extend through the cover and be capped flush or above finished grade. A downward projection of the center line of the inspection pipe shall be directly in line with the center line of the inlet or outlet device.

(14) Compartmentation of single tanks.

(a) Septic tanks larger than 3,000 gallons and fabricated as a single unit shall be divided into two or more compartments.

(b) When a septic tank is divided into two compartments, not less than one-half nor more than two-thirds of the total volume shall be in the first compartment.

(c) When a septic tank is divided into three or more compartments, one-half of the total volume shall be in the first compartment and the other half equally divided in the other compartments.

(d) Connections between compartments shall be baffled so as to obtain effective retention of scum and sludge. The submergence of the inlet and outlet baffles of each compartment shall be as specified in sections F. 2. a. (7) and (8).

(e) Adequate venting shall be provided between compartments by baffles or by an opening of at least 50 square inches near the top of the compartment wall.

(f) Adequate access to each compartment shall be provided by one or more manholes, at least 20 inches least dimension, and located within six feet of all walls of the tank. The manhole shall extend through the cover to a point within 12 inches but no closer than six inches below finished grade. The manhole cover shall be covered with at least six inches of earth.

(15) Multiple tanks.

(a) Where more than one tank is used to obtain the required liquid volume, the tanks shall be connected in series.

(b) Each tank shall comply with all other provisions of section F. 1.

(c) No more than four tanks in series can be used to obtain the required liquid volume.

(d) The first tank shall be no smaller than any subsequent tanks in series.

b. Capacity.

(1) Dwellings. The liquid capacity of a septic tank serving a dwelling shall be based on the number of bedrooms contemplated in the dwelling served and shall be at least as large as the capacities given below (see sections B. 6. and C. 2. e.):

Number of Bedrooms	Tank Liquid Capacities (gallons)
2 or less	750
3 or 4	1,000
5 or 6	1,500
7, 8 or 9	2,000

For ten or more bedrooms, the septic tank shall be sized as an other establishment. See section F. 2. b. (2).

(2) Other establishments. The liquid capacity of a septic tank serving an establishment other than a dwelling shall be sufficient to provide a sewage detention period of not less than 36 hours in the tank for sewage flows less than 1,500 gallons per day, but in no instance shall the liquid capacity be less than 750 gallons. For sewage flows greater than 1,500 gallons per day the minimum liquid capacity shall equal 1,125 gallons plus 75 percent of the daily sewage flow.

c. Location.

(1) The sewage tank shall be placed so that it is accessible for the removal of liquids and accumulated solids.

(2) The sewage tank shall be placed on firm and settled soil capable of bearing the weight of the tank and its contents.

(3) Sewage tanks shall be set back as specified in Table IV following section H. 2. d. (3).

(4) Sewage tanks shall not be placed in areas subject to flooding or in flood plains delineated by local ordinances adopted in compliance with the "State-wide Standards for Management of Flood Areas of Minnesota" (Minn. Reg. NR 85-93), or in areas for which regional flood information is

available from the DNR, except that in areas where ten year flood information is available from and/or approved by the DNR, sewage tanks may be installed in accordance with all provisions of Appendix A, section C. 6. of these standards.

d. Maintenance. The owner of any septic tank or his agent shall regularly inspect and arrange for the removal and sanitary disposal of septage from the tank whenever the top of the sludge layer is less than 12 inches below the bottom of the outlet baffle or whenever the bottom of the scum layer is less than three inches above the bottom of the outlet baffle.

3. Aerobic tanks. Aerobic tank treatment systems shall comply with the general requirements for sewage tanks set forth in section F. 1., and with the following:

a. The treatment system including each individual unit or compartment shall be easily accessible for inspection and maintenance and shall be provided with secured covers.

b. The raw sewage flow from the dwelling shall be intercepted by a trash trap prior to its entering the aeration compartment. The trash trap shall have a net holding capacity of not less than 20 percent of the average daily flow. The invert level to the trap shall be above the liquid level and discharge directly into the trap. The outlet from the trap to the aeration compartment shall be deep baffled or equipped with a tee or long ell.

c. The trash trap shall be readily accessible for inspection and effective cleaning and shall be so constructed as to prevent unauthorized entry.

d. The aeration compartment shall have a minimum holding capacity of 500 gallons or 120 gallons per bedroom, whichever is greater.

e. The method of aeration shall be accomplished by mechanical aeration, diffused air, or both. The method used shall maintain aerobic conditions at all times.

f. The settling compartment shall have a minimum net holding capacity equal to 20 percent of the volume of the aeration compartment. The design shall provide for effective settling and continuous return of settled sludge to the aeration compartment.

g. A minimum one year warranty and an initial two year service contract which specifies regular inspection calls and effluent quality checks shall be provided as a part of the purchase agreement.

h. All other features of the aerobic tanks not specifically mentioned above shall comply with National Sanitation Foundation Standard No. 40 (November 1970).

G. Distribution and dosing of effluent.

1. Distribution.

a. Gravity distribution.

(1) Level ground. Where the elevation difference of the ground surface does not exceed 28 inches in any direction within the soil treatment system, the sewage tank effluent may be directed to the soil treatment system through a system of interconnected distribution pipes or trenches in a continuous system.

(2) Slightly sloping ground.

(a) Sewage tank effluent may be distributed by a distribution box provided the final ground surface elevation of the lowest trench is at least one foot higher than the outlet inverts of the distribution box.

(b) Distribution box.

(i) The box shall be watertight with a removable cover and shall be constructed of durable materials not subject to excessive corrosion or decay.

(ii) The inverts of all outlets shall be at the same elevation as measured from a liquid surface in the bottom of the box.

(iii) The inlet invert shall be at least one inch above the outlet inverts.

(iv) The outlet inverts shall be at least four inches above the distribution box floor.

(v) Each drainfield trench line shall be connected separately to the distribution box and shall not be subdivided.

(vi) When sewage tank effluent is delivered to the distribution box by pump, either a baffle wall shall be installed in the distribution box or the pump discharge shall be directed against a wall or side of the box on which there is no outlet. The baffle shall be secured to the box and shall extend at least one inch above the crown of the inlet flow line.

(3) Sloping ground.

(a) Where the elevation difference of the ground surface exceeds 28 inches in any direction within the soil treatment system and a distribution box cannot be used as specified in section G. 1. a. (2), a drop box shall be installed at the head end of each lateral line. Connections between drop boxes shall be by watertight pipes.

(b) Drop boxes.

(i) The drop box shall be watertight and constructed of durable materials not subject to excessive corrosion or decay.

(ii) The invert of the inlet pipe shall be at least one inch higher than the invert of the outlet pipe to the next trench.

(iii) The invert of the outlet pipe to the next trench shall be at least two inches higher than the invert of the outlet pipe of the trench in which the box is located.

(iv) When sewage tank effluent is delivered to the drop box by a pump, the pump discharge shall be directed against a wall or side of the box on which there is no outlet.

(v) The drop box shall have a removable cover either flush or above finished grade or covered by no more than six inches of soil.

b. Pressure distribution.

(1) Pressure distribution laterals shall be sized as shown in Table I.

(2) Laterals shall be spaced no further than 20 inches from a trench or bed wall.

(3) Laterals shall be spaced no further than 40 inches apart.

(4) Laterals shall be connected to a header pipe which is at least one and one-half inch and no more than two inches in diameter.

TABLE I
Maximum Allowable Lateral Lengths In Feet From Header Pipe

Perf. Dia.	Perforation Spacing					
	2.5 Feet Pipe Dia.			3.0 Feet Pipe Dia.		
	1"	1-1/4"	1-1/2"	1"	1-1/4"	1-1/2"
3/16"	34	52	70	36	60	75
7/32"	30	45	57	33	51	63
1/4"	25	38	50	27	42	54

2. Dosing.

a. Dosing chamber. A dosing device is not necessary in all situations but, where used, shall comply with the following requirements.

(1) The dosing chamber shall be watertight and constructed of sound and durable materials not subject to excessive corrosion or decay.

(2) There shall be one or more manholes, at least 20 inches least

dimension and preferably located directly above the dosing device. The man-hole shall extend through the dosing chamber cover to final grade and shall be so constructed as to prevent unauthorized entry.

(3) The size of the effluent dose shall be determined by design of the soil treatment unit but in no case shall the dosing chamber be sized to provide a dose of less than 75 gallons.

b. Dosing devices for gravity distribution.

(1) Where a dosing device is employed, a pump or siphon shall deliver the dose to the soil treatment unit for gravity distribution over the soil treatment area.

(2) For dwellings, the dosing device shall discharge at least 600 gallons per hour but no more than 2,700 gallons per hour.

(3) For other establishments, the dosing device should discharge at a rate at least ten percent greater than the water supply flow rate but no faster than the rate at which effluent will flow out of the distribution device.

(4) If the dosing device is a siphon, a maintenance inspection shall be made every six months by the owner or his agent. The siphon shall be maintained in proper operating condition.

(5) If the dosing device is a pump, it shall be cast iron or bronze fitted and with stainless steel screws or constructed of other sound, durable and corrosion-resistant materials.

(6) Where the soil treatment area is at a higher elevation than the pump, sufficient dynamic head shall be provided for both the elevation difference and friction loss.

(7) Where the dosing device is a pump, an alarm device shall be installed to warn of pump failure.

c. Dosing devices for pressure distribution.

(1) The dosing device shall be a pump which is cast iron or bronze fitted and with stainless steel screws or constructed of sound, durable and corrosion-resistant materials.

(2) The pump discharge capacity shall be at least seven and one-half gallons per minute for each 100 square feet of soil treatment area.

(3) The pump discharge head shall be at least five feet greater than the head required to overcome pipe friction losses and the elevation difference between the pump and the distribution device.

(4) The quantity of effluent delivered for each pump cycle shall be no greater than 25 percent of one day's sewage flow.

(5) An alarm device shall be installed to warn of pump failure.

H. Final treatment and disposal.

1. General. Final treatment and disposal of all sewage tank effluent shall be by means of soil treatment and disposal.

2. Standard system.

a. Sizing.

(1) The required soil treatment area shall be determined by the daily sewage flow and the percolation rate of the soil.

(2) Acceptable methods for estimating sewage flow for dwellings are given in Table II. The minimum daily sewage flow estimated for any dwelling shall provide for at least two bedrooms. For multiple residential units, the estimated daily sewage flow shall consist of the sum of the flows of each individual unit.

TABLE II
Sewage Flow (Gallons Per Day)

Number of Bedrooms	Classification of Dwelling*			
	I	II	III	IV
2	300	225	180	-
3	450	300	218	-
4	600	375	256	-
5	750	450	294	-
6	900	525	332	-

* Table II is based on the following formulas:

- Classification I: Sewage Flow = 150 (No. of Bedrooms)
- Classification II: Sewage Flow = 75 (No. of Bedrooms + 1)
- Classification III: Sewage Flow = 66 + 38 (No. of Bedrooms + 1)
- Classification IV: If a greywater system is employed pursuant to Appendix A, section D. 2., estimated sewage flow shall equal 60% of the amount provided in column I, II, or III of Table II.

(3) For other establishments, the daily sewage flow shall be determined as provided in section B. 33.

(4) The soil treatment area shall be at least as large as set forth in Table III.

TABLE III

Percolation Rate (Minutes per inch)	Required Soil Treatment Area in Square Feet (Per Gallon of Sewage Flow per Day)
Faster than 0.1**	-
0.1 to 5***	0.83
6 to 15	1.27
16 to 30	1.67
31 to 45	2.00
46 to 60	2.20
Slower than 60****	-

** Soil is unsuitable for standard system if percolation rate is less than 0.1 minutes per inch. See Appendix A, section C. 5.

*** Consider alternative sewage treatment systems for soils with this percolation rate range. See Appendix A, section C. 5.

**** Soil is unsuitable for standard system if percolation rate is slower than 60 minutes per inch. See Appendix A, section C. 4.

(5) Table III gives the required bottom area assuming six inches of filter material below the distribution pipe for trenches and beds. The required bottom area may be reduced, for trenches only, by the following percentages: 20 percent for 12 inches of filter material below the distribution pipe; 34 percent for 18 inches; and 40 percent for 24 inches. The filter material shall completely encase the distribution pipe to a depth of at least two inches.

b. Location.

(1) On slopes in excess of 12 percent, the soil profile shall be carefully evaluated in the location of the proposed soil treatment system and downslope to identify the presence of layers with different permeabilities that may cause sidehill seepage. In no case shall a trench be located within 15 feet of where such a layer surfaces on the downslope.

(2) Bed construction shall be limited to areas having natural slopes of less than six percent.

(3) Soil treatment systems shall be located as specified in Table IV following section H. 2. d. (3).

(4) Soil treatment areas shall not be placed in areas subject to flooding or in flood plains delineated by local ordinances adopted in compliance with the "State-wide Standards and Criteria for Management of Flood Plain Areas of Minnesota" (Minn. Reg. NR 85-93), or in areas for which regional flood information is available from the DNR, except that in areas where ten year flood information is available from and/or approved by the DNR, soil treatment systems may be installed in accordance with the provisions of Appendix A, section C. 6.

c. Design and construction.

(1) The bottom of trenches and beds shall be at least three feet above the water table or bedrock.

(2) The trenches shall be not less than 18 inches nor more than 36 inches wide. Any trench wider than 36 inches shall be considered a bed.

(3) Trenches and beds shall be not more than 100 feet in length.

(4) The bottom of the trench or bed excavation shall be level.

(5) The bottom and sides of the soil treatment system to the top of the filter material shall be excavated in such a manner as to leave the soil in a natural, unsmeared, and uncompacted condition. Excavation shall be made only when the soil moisture content is at or less than the plastic limit.

(6) When the percolation rate is slower than 15 minutes per inch, excavation shall be by back hoe or other means that allow the equipment wheels or tracks to remain on the surface soil. Excavation equipment or other vehicles shall not be driven on the soil treatment area.

(7) There shall be a layer of at least six but no more than 24 inches of filter material in the bottom of the trenches and beds.

(8) Where disposal trenches are constructed within ten feet of trees six inches or larger in diameter, or dense shrubbery, or where it can reasonably be anticipated that such vegetation will be present during the expected life of the system, at least 12 inches of filter material shall be placed beneath the distribution pipe.

(9) Distribution pipes—gravity distribution.

(a) Distribution pipe used in trenches or beds for gravity flow distribution shall be at least four inches in diameter and constructed of sound and durable material not subject to corrosion or decay or to loss of strength under continuously wet conditions.

(b) Perforated pipe used for sewage distribution pipes shall have one or more rows of holes of no less than one-half inch in diameter spaced no more than 36 inches apart. Holes shall be spaced to prevent failure due to loads. Distribution pipes shall have a load bearing capacity of not less than 1,000 pounds per lineal foot.

(c) Agricultural drain tile shall be in 12-inch lengths and laid with one-fourth inch open joints on grade boards. All open joints shall be protected on top by strips of asphalt-treated building paper at least ten inches long and three to six inches wide or by other acceptable means.

(d) Other devices may be used to distribute sewage tank effluent over the soil treatment area upon approval of the permitting authority.

(10) Pressure distribution.

(a) Distribution pipes used in trenches or beds for pressure distribution shall be at least one inch in diameter and constructed of sound and durable material not subject to corrosion or decay or to loss of strength under continuously wet conditions.

(b) Perforations shall be sized and spaced as shown in Table I set forth following section G. 1. b. (4).

(11) The distribution pipes shall be laid level or on a uniform slope away from the distribution device of no more than four inches per 100 feet.

(12) Gravity distribution pipes in beds shall be uniformly spaced no more than five feet apart and not more than 30 inches from the side walls of the bed.

(13) The filter material shall completely encase the disposal pipes to a depth of at least two inches.

(14) The filter material shall be covered with untreated building paper or a two-inch layer of hay or straw or similar, approved permeable materials.

(15) The trenches or beds shall be backfilled and crowned above finished grade to allow for settling. The top six inches of soil shall have the same texture and density as the adjacent soil.

(16) The minimum depth of cover over the distribution pipes shall be at least eight inches. The maximum depth of cover over the distribution pipes shall be no more than 36 inches and preferably no more than 24 inches.

(17) A grass cover shall be established by the owner or his agent over the soil treatment system.

d. Dual field.

(1) Dual field systems shall be used only where the percolation rate is slower than five minutes per inch.

(2) Dual field systems shall be sized, designed, and constructed as set forth above for standard systems except as follows:

(a) The soil treatment area shall be divided into two or more parts.

(b) Alternating soil treatment areas shall each be connected to a valve box outlet.

(3) A part of the soil treatment area shall be used no more than one year unless inspection of the effluent level indicates that a longer duration can be used.

TABLE IV
Minimum Setback Distances (feet)

Feature	Sewage Tank	Soil Treatment Area
Water Supply well less than 50 feet deep and not encountering at least ten feet of impervious material	*	*
Any other water supply well or buried water suction pipe	*	*
Buried pipe distributing water under pressure	*	*
Buildings	10	20
Property Lines	10	10
The Ordinary High Water Mark of:		
Natural Environment Lakes and Rivers	**	**
Recreational Development Lakes and Streams	**	**
General Development Lakes and Streams	**	**
Wild Rivers	**	**
Scenic Rivers	**	**
Recreational Rivers and Designated Tributaries of Wild, Scenic, and Recreational Rivers	**	**

* Setbacks from water supply wells and buried water pipes are presently governed by Minn. Reg. MHD 217(c)(1)(dd), (ee) and (ff). These regulations, as of the date of enactment of this rule, are reproduced in Appendix D.

** Setbacks from lakes, rivers and streams are presently governed by Minn. Reg. Cons. 72(b)(4), NR 79(d)(2) and NR 83(d)(2)(dd). These regulations, as of the date of enactment of this rule, are reproduced in Appendix E.

I. Alternative systems. Where limiting soil characteristics exist, special systems of sewage treatment and disposal, including but not limited to those in Appendix A, may be employed provided:

1. reasonable assurance of performance of such system is presented to the permitting authority;
2. the engineering design of such system is first approved by the permitting authority;
3. there is no discharge to the ground surface or to surface waters;
4. treatment and disposal of wastes is in such a manner so as to protect the public health and general welfare; and
5. such systems comply with all applicable requirements of these standards and with all local codes and ordinances.

J. Severability. If any provision of these standards or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions of these standards or application of any other part of these standards which can be given effect without application of the invalid provision. To this end the provisions of all sections, subsections or subdivisions herein and the various applications thereof are declared to be severable.

K. Variance. In any cases where a permit is required by the Agency, and upon application of the responsible person or persons, the Agency finds that by reason of exceptional circumstances the strict enforcement of any provision of these standards would cause undue hardship, that disposal of the sewage, industrial waste or other waste is necessary for the public health, safety or welfare, or that strict conformity with the standards would be unreasonable, impractical or not feasible under the circumstances, the Agency in its discretion may permit a variance therefrom upon such conditions as it may prescribe for prevention, control or abatement of pollution in harmony with the general purpose of these standards and the intent of applicable state and federal laws.

**Appendix A
Alternative Systems**

A. General. The intent of this appendix is to provide standards for the design, location, installation, use and maintenance of alternative sewage treatment systems in areas of limiting soil characteristics, or where a standard system cannot be installed or is not the most suitable treatment. Where such systems are employed, they shall comply with all local codes and ordinances, and be subject to timely inspections to assure adherence to specifications.

B. Adoption and use.

1. Where 6 MCAR § 4.8040 is administered by a local unit of government, those local units of government may adopt this appendix, in whole or in part, as part of a local code or ordinance. Nothin in 6 MCAR § 4.8040 or this appendix, however, shall require the adoption of any part of this appendix as a local ordinance or code. Further, nothing in 6 MCAR § 4.8040 or this appendix shall require local units of government to allow the installation of any system in this appendix.

2. This appendix defines the minimum requirements for alternative systems serving establishments or facilities licensed or otherwise regulated by the State of Minnesota or this Agency pursuant to section C. 1. a.

C. Class I alternatives—modified standard systems.

1. Extreme caution and careful planning shall be employed wherever limiting characteristics including, but not limited to water table or bedrock, exist within two feet of the original ground surface.

2. Fluctuating ground water.

a. Where natural drainage will not provide three feet of separation between the bottom of the soil treatment area and the highest known or calculated level of the water table, agricultural drain tile may be used to intercept or lower the seasonal high water table, except within shorelands of public waters. There shall be at least ten feet of undisturbed soil between the sidewall of the soil treatment unit and the agricultural drain tile.

b. Within shorelands of public waters, agricultural drain tile may be used to intercept the seasonal high water table provided the ground water table has a slope of at least two feet per hundred feet toward the public water and provided the drain tile are installed upslope of the soil treatment system. There shall be at least 20 feet of undisturbed soil between the sidewall of the soil treatment unit and the agricultural drain tile.

c. In all cases the greatest practicable vertical separation distance from the water table shall be provided.

3. **Bedrock proximity.** In no case shall filter material of the soil treatment system be placed closer than three feet to creviced bedrock or to consolidated permeable bedrock. When all horizons of the original soil profile have percolation rates slower than 60 minutes per inch, filter material of the soil treatment system shall be placed no closer than seven feet to consolidated impermeable bedrock. A maximum depth of 24 inches of sand may be used under the filter material. Where additional fill is required to achieve the required separation distance, a soil having a percolation rate between five and 45 minutes per inch (loamy sand to silt loam) 12 months after placement shall be used. If it is not possible to allow the soil to settle for 12 months after placement, mechanical methods may be used to settle the fill to within ten percent of its "in situ" density.

4. **Slowly permeable soils.**

a. In no case shall excavation for the purpose of constructing a soil treatment system be made in any soil layer having a percolation rate slower than 120 minutes per inch.

b. In no case shall excavation for the purpose of constructing a soil treatment system be made in a soil layer having a percolation rate slower than 60 minutes per inch unless the moisture content is lower than the plastic limit of the soil.

c. In no case shall filter material be placed in contact with original soil having a percolation rate slower than 60 minutes per inch.

d. Where the percolation rate of the original soil is slower than 60 minutes per inch, at least six inches but no more than 12 inches of fill material having a percolation rate of between five and 30 minutes per inch (loamy sands and loams) after placement shall be placed between the filter material and the original soil along the excavation bottom and sidewalls.

e. In no case shall construction equipment, wheels or tracks be placed in contact with the bottom of the excavation during the construction of a soil treatment system in soils having a percolation rate slower than 15 minutes per inch.

f. The size of soil treatment system shall be based on the required treatment area for a soil having a percolation rate of 60 minutes per inch as specified in Table III set forth in section H. 2. a. (4).

5. **Rapidly permeable soils.**

a. Filter material for a soil treatment unit shall not be placed in contact with original soil having a percolation rate faster than one-tenth minute per inch.

b. For coarse soils having a percolation rate faster than one-tenth minute per inch, at least six inches of sandy loam textured soil having a per-

colation rate between five and 15 minutes per inch after placement (loamy sand to sandy loam) shall be placed between the filter material and the coarse soil along the excavation bottom and sidewalls.

c. For soils with percolation rates between one-tenth and five minutes per inch at least one of the following treatment techniques shall be used:

(1) Provide at least six inches of sandy loam textured soil with a percolation rate between five and 15 minutes per inch after placement between the filter material and the coarse soil.

(2) Distribution of sewage tank effluent by pressure flow over the treatment area as specified in section G. 1. b.

(3) Divide the total soil treatment area into at least four equal parts connected serially.

6. Flood plain areas.

a. The soil treatment area shall be a trench system with at least 12 inches of filter material below the distribution pipe. There shall be no pipe or other installed opening between the filter material and the soil surface.

b. The trench system shall be located on the highest feasible area of the lot and shall have location preference over all other improvements except the water supply well. The bottom of the trench shall be at least as high as the elevation of the ten year flood. The sewage tank may be located so as to provide gravity flow to the soil treatment area.

c. If a pumping station is used to move effluent from the sewage tank to the drainfield, provisions shall be made to prevent the pump from operating when inundated with flood waters.

d. When fill is needed to raise the elevation of the soil treatment area, a mound system may be used with the following additional requirement: The elevation of the mound shall be such that the elevation of the bottom of the rock layer shall be at least one-half foot above the ten year flood elevation. Inspection wells shall not be installed unless the top of the mound is above the elevation of the regional flood.

e. When the top of the sewage tank is inundated, the dwelling must cease discharging sewage into it. This may be accomplished by either temporarily evacuating the structure until the system again becomes functional, or by diverting the sewage into a holding tank sized and installed according to the requirements below.

f. The building sewer shall be designed to prevent backflow of liquid into the building when the system is inundated. If a holding tank is utilized, the building sewer shall be designed to permit rapid diversion of sewage into the holding tank when the system is inundated.

g. If a holding tank is utilized for a dwelling, its liquid capacity shall be equal to 100 gallons times the number of bedrooms times the number of days between the ten year stage on the rising limb of the regional flood hydrograph and the ten year stage on the falling limb of the hydrograph, or 1,000 gallons, whichever is greater. For other establishments see Appendix A, section F.

h. Whenever the water level has reached a stage above the top of the sewage tank, the tank shall be pumped to remove all solids and liquids after the flood has receded before use of the system is resumed.

D. Class II alternatives—reduced area systems.

1. Aerobic tanks. No additional reduction in soil treatment area shall be allowed with the use of an aerobic treatment tank.

2. Separate toilet waste and greywater systems.

a. General.

(1) A toilet waste treatment device shall be used in conjunction with a greywater system.

(2) In all cases, only toilet wastes shall be discharged to toilet waste treatment devices. Greywater or garbage shall not be discharged to the device except as specifically recommended by a manufacturer.

b. Toilet waste treatment devices.

(1) Toilet waste treatment devices shall be considered as one of two types: I—privies; and II—other devices, including, but not limited to, incinerating, composting, biological, chemical, recirculating or holding toilets.

(2) Type I—privies.

(a) Pit privies shall not be installed where the bottom of the pit is less than three feet above the water table. A vault privy shall be used in areas of high ground water. The vault of a vault privy shall be constructed in the same manner as a septic tank. See section F. 1.

(b) Privies shall be set back from surface waters the same distance as required for buildings and from property lines and water supply wells the same distance as required for soil treatment areas.

(c) Pits or vaults shall be of sufficient capacity for the residence they serve, but shall have at least 50 cubic feet of capacity.

(d) The sides of the pit shall be curbed to prevent cave-in.

(e) The superstructure shall be constructed so as to be easily cleaned, and it shall be insect proof. The door and seat shall be self closing. All openings including vent openings, shall be screened.

(f) Privies shall be adequately vented.

(g) When the pit is filled to within one foot of the top the solids shall be removed or a new pit shall be constructed. The abandoned pit shall be filled with clean earth and slightly mounded to allow for settling. Removed solids shall be disposed of by land application in accordance with Agency guidelines for septage disposal and all local ordinances and codes.

(h) All liquids and solids removed from a vault privy shall be treated and disposed of by application in accordance with the Agency's septage disposal guidelines.

(3) Type II—other devices.

(a) Other devices may be used where reasonable assurance of performance is provided.

(b) All Type II devices shall be vented.

(c) All electric, gas and water connections to a Type II device shall conform to all local ordinances and codes.

(d) Operation and maintenance of all Type II devices shall follow the manufacturer's recommendations.

(4) All materials removed from a Type I or II toilet waste treatment device, including but not limited to, ashes, compost and all solids and liquids shall be disposed of in a public sewage system or by land application in accordance with the Agency's septage disposal guidelines and all local ordinances and codes.

c. Greywater system.

(1) Plumbing.

(a) The drainage system in new systems shall be based on a pipe diameter of two inches to prevent installation of a water flush toilet. There shall be no openings or connections to the drainage system, including floor drains, larger than two inches in diameter. For repair or replacement of an existing system, the existing drainage system may be used.

(b) Toilets or urinals of any kind shall not be connected to the drainage system. Toilet waste or garbage shall not be discharged to the drainage system.

(c) Garbage grinders shall not be connected to the drainage system.

(2) Building sewer. The building sewer shall meet all requirements of section E. except that the building sewer for a greywater system shall be at least two inches in diameter.

(3) Sewage tank.

(a) Greywater septic tanks shall meet all requirements of section F. 1., except that the liquid capacity of a greywater septic tank serving a dwelling shall be based on the number of bedrooms contemplated in the dwelling served and shall be at least as large as the capacities given below (see sections B. 6. and C. 2. e.):

TABLE A-1

Number of Bedrooms	Tank Liquid Capacity (gallons)
2 or less or hand pump	300
3 or 4	500
5 or 6	750
7, 8 or 9	1,000

(b) For ten or more bedrooms or other establishments, the greywater septic tank shall be sized as for an other establishment (see section F. 2. 6. (2)) except that the minimum liquid capacity shall be at least 300 gallons.

(c) Greywater aerobic tanks shall meet all requirements of section F. 3.

(4) Distribution and dosing. Distribution and dosing of greywater shall meet all requirements of section G.

(5) Final treatment and disposal.

(a) Standard system. A standard greywater system shall meet all requirements of sections H. 1. and 2.

(b) Alternative system. A greywater mound system shall meet all requirements of Appendix A, section E. 1.

3. Seasonal use.

a. Where a commercial establishment is occupied or used for less than 180 days per year and less than 120 days consecutively, the maximum daily sewage flow shall be determined and the average daily sewage flow shall be computed by dividing the total annual estimated or measured sewage flow by 365 days. The size of the soil treatment system shall be based on the average daily sewage flow and the areas specified in Table III set forth in section H. 2. a. (4). All other requirements of soil treatment system construction shall be followed.

b. The maximum daily sewage flow shall be used to determine sewage tank size for other establishments. There shall be no reduction in the size of sewage tanks for seasonal use.

c. In no case shall a seasonal use establishment be converted to full-time use until the soil treatment system meets the size requirements of Table III set forth in section H. 2. a. (4).

E. Class III—alternatives—advanced alternative system.

1. Mounds.

a. Mounds may be constructed on soils having the site or soil conditions specified in Appendix A, section C.

b. The soil percolation rate in all layers of the natural or fill soil to a depth of at least 24 inches below the sand, as specified in Appendix A, section E. 1. 1., shall be faster than 120 minutes per inch.

c. Below the sand layer there shall be at least one layer of soil, either natural or fill, at least 12 inches thick, which has a percolation rate slower than five minutes per inch (loamy sand).

d. Wherever possible, mounds shall be located on flat areas or crests of slopes. Mounds shall not be located on natural slopes of more than three percent if the percolation rate is slower than 60 minutes per inch to a depth of at least 24 inches below the sand layer.

e. Mounds shall not be located on slopes exceeding six percent if the soil percolation rate is slower than 30 minutes per inch to a depth of at least 24 inches below the sand layer.

f. Mounds shall not be located on natural slopes exceeding 12 percent under any soil percolation rate conditions.

g. The bottom area of the filter material shall be sized on the basis of 0.83 square feet per gallon of waste per day.

h. In no case shall the width of the filter material in a single bed exceed ten feet.

i. A rubber tired tractor may be used for plowing or discing but in no case shall a rubber tired tractor be used after the surface preparation is completed where the soil is slower than 15 minutes per inch. A crawler or track type tractor shall be used for mound construction where the soil is slower than 15 minutes per inch.

j. The discharge pipe from the pump to the mound area shall be installed prior to soil surface preparation. The trench shall be carefully back-filled and compacted to prevent seepage of effluent.

k. Soil surface preparation.

(1) The total area selected for the mound, including the dikes

shall be plowed to a depth of at least eight inches or the sod layer broken and roughened by backhoe teeth. Furrows shall be thrown uphill and there shall be no deadfurrow under the mound. The soil shall be plowed only when the moisture content of a fragment eight inches below the surface is below the plastic limit.

(2) In soils having percolation rates faster than 15 minutes per inch (sandy loam) in the top eight-inch depth, discing may be used for surface preparation as a substitute for plowing.

(3) Mound construction shall proceed immediately after surface preparation is completed.

l. A minimum of twelve inches of soil defined as sand shall be placed where the filter material is to be located. A crawler tractor with a blade shall be used to move the sand into place. At least six inches of sand shall be kept beneath equipment to minimize compaction of the plowed layer. The sand layer upon which the filter material is placed shall be level.

m. A depth of at least nine inches of filter material shall be placed over the bed area below the distribution pipe.

n. Distribution of effluent over the filter material shall be either by four-inch distribution pipes with gravity flow from a distribution box or by perforated pipe under pressure from a manifold.

o. Gravity distribution.

(1) The four-inch distribution pipes shall be rigid plastic with holes at least one-half inch diameter spaced no further than 36 inches. One row of holes shall be laid at the bottom of the pipe.

(2) The distribution pipe shall slope downward two inches per 100 feet away from the distribution box.

(3) The far ends of the distribution pipe shall be connected.

(4) The distribution pipes shall be spaced no further than five feet apart and no further than 30 inches from the edge of the filter material.

(5) The distribution pipes shall connect to the outlets of a distribution box.

(6) The quantity of effluent per pump dose shall be at least 25 percent of the estimated or measured daily sewage flow.

p. Pressure distribution.

(1) Perforation holes shall be as set forth in Table I set forth in

section G. 1. b. (4). Holes shall be drilled straight into the pipe and not at an angle.

(2) The perforated pipe laterals shall be connected to a two-inch diameter manifold pipe with the ends capped. The laterals shall be spaced no further than 40 inches on center and no further than 20 inches from the edge of the filter material.

(3) The perforated pipe laterals shall be installed level with the perforations downward.

(4) The manifold pipe shall be connected to the supply pipe from the pump. The manifold shall be sloped toward the supply pipe from the pump.

q. At least two inches of filter material shall be placed over the lateral or distribution pipes.

r. Straw or marsh hay to an uncompacted depth of three to four inches shall be placed over the filter material.

s. Construction vehicles shall not be allowed on the filter material until backfill is placed.

t. Sandy loam soil shall be placed on the filter material to a depth of one foot in the center of the mound and to a depth of six inches at the sides.

u. A maximum of two ten-foot wide beds may be installed side by side in a single mound if the soil percolation rate is between five and 60 minutes per inch to a depth of at least 24 inches below the sand layer. The beds shall be separated by four feet of sand.

v. When two beds are installed side by side the sandy loam fill at the center of the mound shall be 18 inches deep and six inches deep at the sides.

w. Six inches of topsoil shall be placed on the fill material over the entire area of the mound.

x. A grass cover shall be established over the entire area of the mound.

y. No shrubs shall be planted on the top of the mound. Shrubs may be placed at the foot and side slopes of the mound.

z. The side slopes on the mound shall be no steeper than three to one.

aa. Whenever mounds are located on slopes, a diversion shall be constructed immediately upslope from the mound to intercept and direct runoff.

bb. A pump shall be used as specified in section G. 2. c.

2. Collector systems.

a. General.

(1) Where site or soil conditions do not allow for final treatment and disposal on an individual lot, a system whereby a soil treatment system is located on another lot or lots may be employed, where approved by the local unit of government.

(2) Plans and specifications shall comply with local ordinances on such issues as zoning, joint ownership of land, joint maintenance responsibilities, easements, and other considerations and shall be approved by the local unit of government.

b. Design.

(1) Common soil treatment system. The size of common soil treatment systems shall be based on the sum of the areas required for each residence.

(2) Sewage tanks. The system shall be designed with each residence having a sewage tank or with a common sewage tank. In the case of a common tank, the capacity of the tank shall be sized according to section F. 2. b. (2) except that the minimum capacity shall be at least 3,000 gallons, and shall be compartmented if in a single tank.

(3) Sewers.

(a) Sewer systems shall be designed on an estimated average daily flow for dwellings based on Table II, set forth in section H. 2. a. (2), plus estimated flows from other establishments.

(b) The sewer for systems with common sewage tanks shall be so constructed to give mean velocities, when flowing full, of not less than two feet per second. The sewer for systems with individual sewage tanks shall be so constructed and designed to hydraulically conduct the flow for which they were designed. In no case shall a gravity sewer be less than four inches in diameter.

(c) Infiltration or exfiltration shall not exceed 200 gallons per inch of pipe diameter per mile per day.

(d) Cleanouts, brought flush with or above finished grade, shall be provided wherever a common sewer joins an individual building sewer or piping from an individual sewage tank, or every 100 feet, whichever is less, unless manhole access is provided.

(e) There shall be no physical connection between sewers

and water supply systems. Sewers shall be set back from water supply systems and piping as required for building sewers. See section E. 3. Where it is not possible to obtain proper separation distances, the sewer connections shall be watertight and pressure tested as in section E. 3.

(4) Pumps and pump stations.

(a) Pump stations shall be watertight.

(b) Pump stations shall have manholes flush with or above finished grade for cleaning and maintenance.

(c) Manhole covers shall be so constructed as to prevent unauthorized entry.

(d) Pumps and pump stations shall be sized to handle peak flows.

(e) An alarm system shall be provided for all pumping stations to warn of pump failure, overflow or other malfunction.

c. Maintenance. All persons using a common drainfield system shall assure, by contract with maintenance personnel or other equivalent means, that the system will be adequately maintained throughout its useful life. The system so maintained includes, but is not limited to, common drainfields, common sewage tanks, common pumps, common pump stations, common sewers and all individual tanks connected to the common system.

3. Sewage osmosis.

a. The Electroosmosis System (a proprietary installation process under U. S. and Canadian patents) may be permitted as an alternative system in clay soils having percolation rates slower than 60 minutes per inch.

b. Standards and criteria for approval.

(1) Installation shall comply with all applicable requirements for standard systems contained in these regulations as pertain to system location, water table and bedrock separation distances, septic tanks, pumping stations, distribution or drop boxes, and materials.

(2) Conditions for installation and reporting of performance shall be subject to the provisions in Appendix A, section E. 5.

4. Seepage pits.

a. Seepage pits may be used for disposal of sewage tank effluent only when it can be clearly demonstrated that a standard drainfield system or mound system is not feasible on the particular site in question and when such use is indicated by favorable conditions of soil, ground water level or topog-

raphy and where such use does not reduce the safety of surrounding ground water supplies. In areas where limestone or any geological formation characterized by similar fault patterns is covered by less than 50 feet of earth, seepage pits shall not be installed. The pit excavation shall terminate at least three feet above the highest known or calculated ground water table. The depth of the excavation shall not exceed 50 percent of the depth of any well casing in the area or ten feet, whichever is least.

b. When two or more seepage pits are used, a distribution box constructed in accordance with section G. 1. a. (2) (b) shall be used if the inlet inverts of the seepage pits have no more than one foot difference in elevation. If the difference in elevation between the inlet inverts is greater than one foot, the seepage pits shall be connected in series.

c. Seepage pits, in addition to the general provisions specified in Table IV following section H. 2. d. (3) shall be set back not less than the stated minimum distances from the following:

- (1) Wells less than 50 feet in depth and not encountering at least 10 feet of impervious material 150 ft.
- (2) Any water supply well or buried water suction pipe . . . 75 ft.
- (3) Buildings 20 ft.
- (4) Property lines and buried pipe distributing water under pressure 10 ft.
- (5) Other seepage pits three times the diameter of the largest pit (edge to edge).

d. Effective soil treatment area of a seepage pit shall be calculated as the sidewall area below the inlet, exclusive of any hardpan, rock or clay formations. The sidewall area shall be based on the outer diameter of the pit lining plus 12 inches of rock in the annular space.

(1) Required treatment area shall be determined by the percolation test described in section D. and from Tables II and III, set forth in sections H. 2. a. (2) and (4), with no reduction for increased filter material below or around the pit. In no case shall a seepage pit be installed in soils where the percolation rate of any stratum is faster than one-tenth minute per inch (coarse sand). A percolation test shall be made in each vertical stratum penetrated by the seepage pit, and the weighted average of the results, exclusive of results from soil strata in which the percolation rate is slower than 30 minutes per inch, shall be computed and applied to the seepage bed column of Table III as indicated.

(2) A minimum of four feet composite depth of porous formation for each installation shall be provided in one or more pits.

(3) All pits shall have an inside diameter of at least five feet.

e. Construction of all seepage pits shall conform to the following requirements:

(1) To prevent cave-in, the pit shall be precast concrete or lined with brick, stone or block at least four inches thick, laid in a radial arch to support the pit walls.

(2) The brick, stone or block shall be laid watertight above the inlet and with open joints below the inlet to provide adequate passage of liquids.

(3) A minimum annular space of 12 inches between the pit lining and excavation wall shall be filled with crushed rock or gravel.

(4) The seepage pit shall be so constructed at the top as to be capable of supporting the overburden of earth and any reasonable load to which it is subjected. Access to the pit shall be provided by means of a man-hole or inspection hole equipped with a watertight cover. The seepage pit may terminate in a conventional manhole top, frame and cover to a point within 12 inches, but no closer than six inches below finished grade. The manhole cover shall be covered with at least six inches of earth. The top of the seepage pit shall be not less than 12 inches below the ground surface. The top shall be provided with an inspection pipe of not less than four-inch diameter extending through the cover to a point flush with finished ground level. The top of the inspection pipe shall be provided with a readily removable watertight cap.

5. Other systems. Where unusual conditions exist, special systems of treatment and disposal other than those specifically mentioned in Appendix A, sections E. 1. to E. 4. above, may be employed provided:

a. reasonable assurance of performance of such system is presented to the permitting authority;

b. the engineering design of such system is first approved by the permitting authority;

c. there is no discharge to the ground surface or to surface waters;

d. treatment and disposal of wastes is in such a manner so as to protect the public health and general welfare;

e. such systems comply with all applicable requirements of these standards and with all local codes and ordinances.

F. Class IV alternatives—holding tanks.

1. General. Holding tanks may be allowed only as replacements for

existing non-conforming systems or on existing parcels or lots as of the date of the enactment of these standards and only where it can conclusively be shown that a standard, Class I, Class II or mound system cannot be feasibly installed.

2. Construction. A holding tank shall be constructed of the same materials and by the same procedures as those specified for watertight septic tanks.

3. Access. A cleanout pipe of at least six inches diameter shall extend to the ground surface and be provided with seals to prevent odor and to exclude insects and vermin. A manhole of at least 20 inches least dimension shall extend through the cover to a point within 12 inches, but no closer than six inches below finished grade. The manhole cover shall be covered with at least six inches of earth.

4. Depth of bury. The tank shall be protected against flotation under high water table conditions. This shall be achieved by weight of tank, earth anchors or shallow bury depths.

5. Capacity.

a. For a dwelling the size shall be 1,000 gallons, or 400 gallons times the number of bedrooms, whichever is greater.

b. For permanent structures other than dwellings, the capacity shall be based on measured flow rates or estimated flow rates. The tank capacity shall be at least five times the daily flow rate.

6. Location. Holding tanks shall be located:

a. In an area readily accessible to the pump truck under all weather conditions.

b. As specified for septic tanks in Table IV, set forth following section H. 2. d. (3).

c. Where accidental spillage during pumping will not create a nuisance.

7. Contract. A contract for disposal and treatment of the sewage wastes shall be maintained by the owner with a pumper, municipality, agency or firm established for that purpose.

8. Accidental overflow. Holding tanks shall be monitored to minimize the chance of accidental sewage overflows. Techniques such as visual observation, warning lights or bells, or regularly scheduled pumping shall be used. For other establishments, a positive warning system shall be installed which allows 25 percent reserve capacity after actuation.

FIGURE 1
VERTICAL SIDEWALL SEPTIC TANK

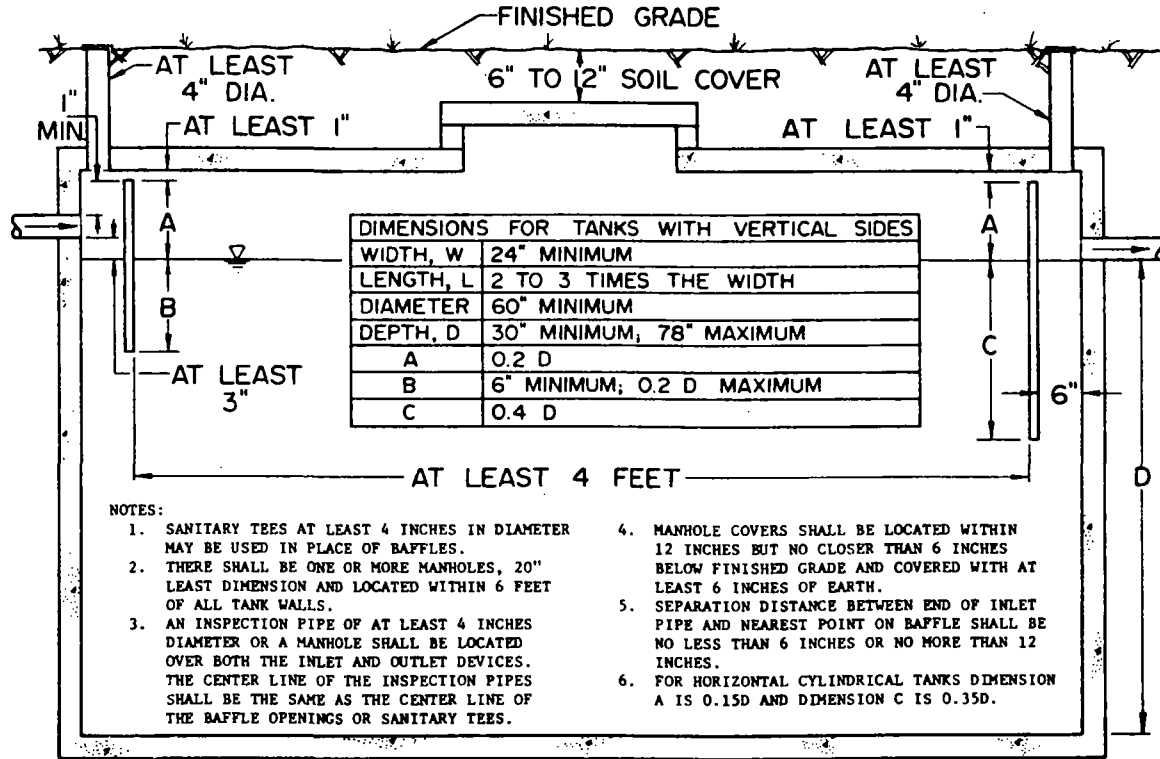
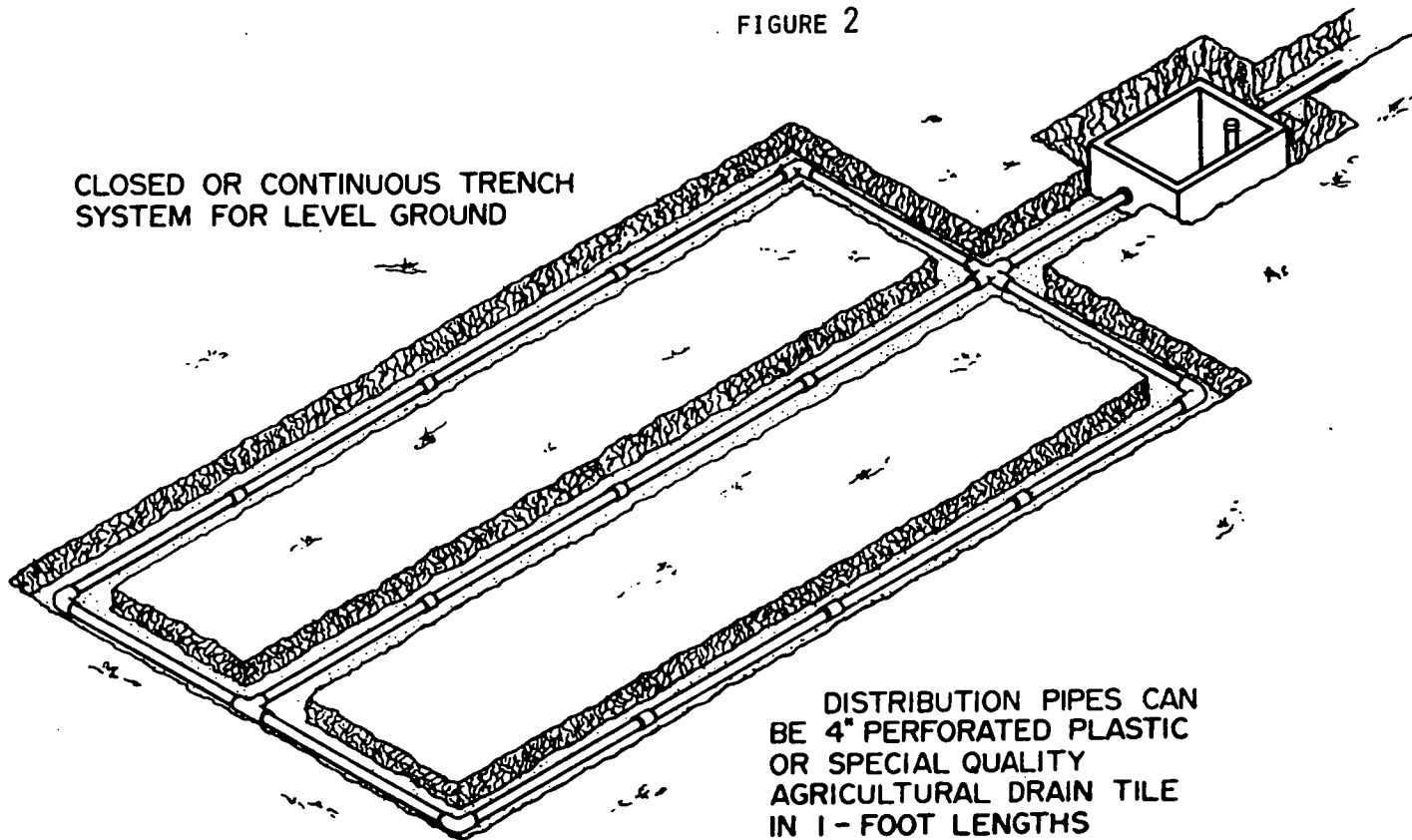


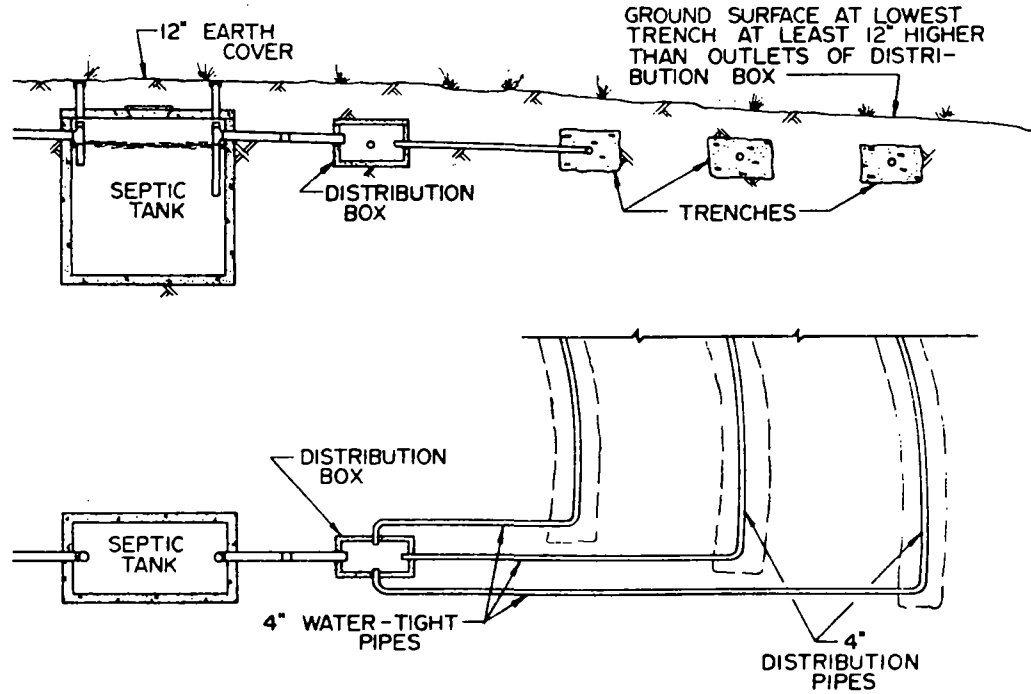
FIGURE 2

CLOSED OR CONTINUOUS TRENCH
SYSTEM FOR LEVEL GROUND



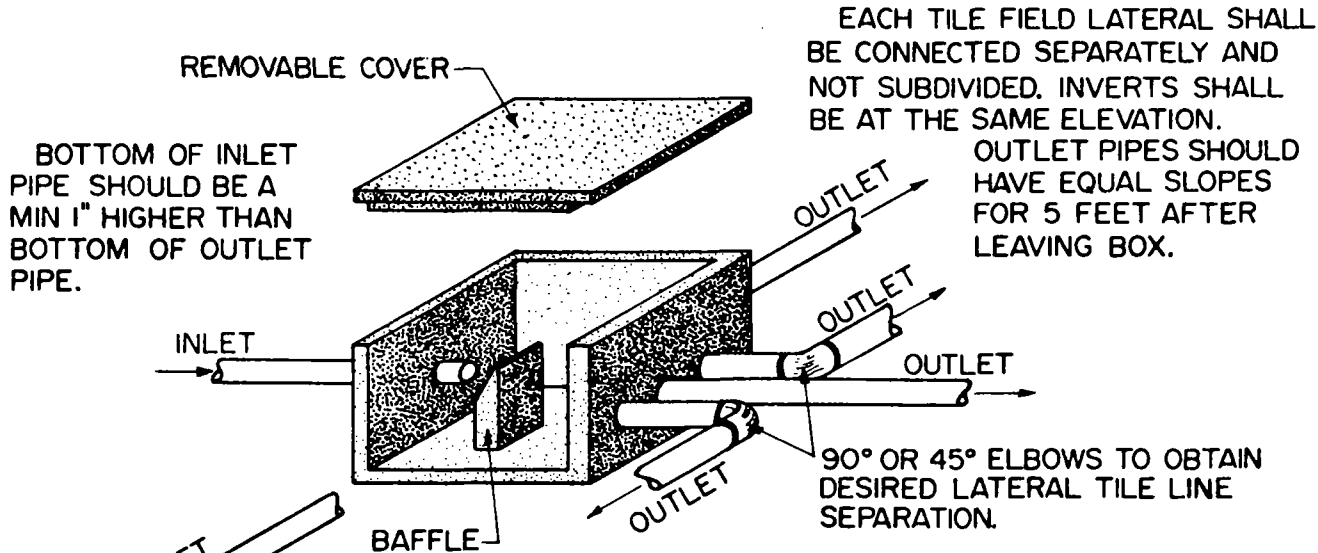
DISTRIBUTION PIPES CAN
BE 4" PERFORATED PLASTIC
OR SPECIAL QUALITY
AGRICULTURAL DRAIN TILE
IN 1- FOOT LENGTHS

FIGURE 3



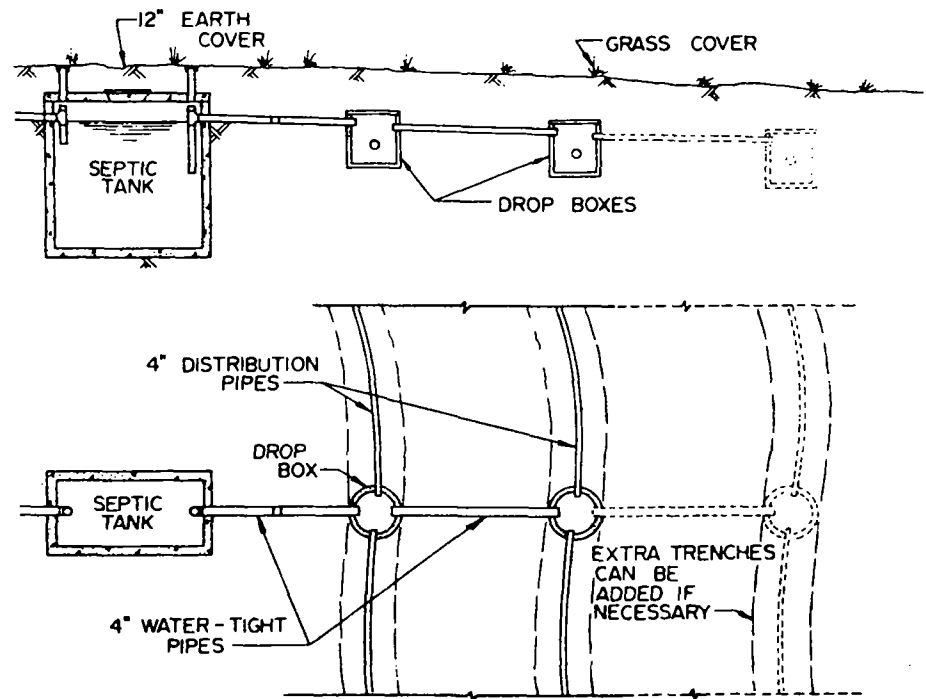
SEWAGE TREATMENT SYSTEM WITH DISTRIBUTION BOX

FIGURE 4

DISTRIBUTION BOX

BAFFLE TO BE USED WHEN EFFLUENT IS DELIVERED BY PUMP OR SIPHON, OR THE SLOPE OF THE INLET LINE IS SUCH THAT UNEVEN DISTRIBUTION COULD OCCUR. TOP OF THE BAFFLE AT LEAST LEVEL WITH THE CROWN OF THE INLET PIPE.

FIGURE 5



SEWAGE TREATMENT SYSTEM WITH DROP BOXES

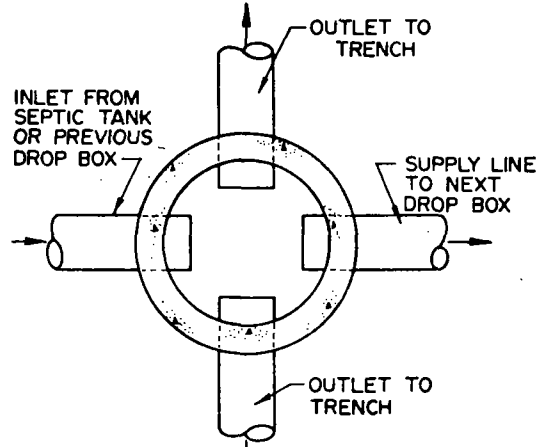
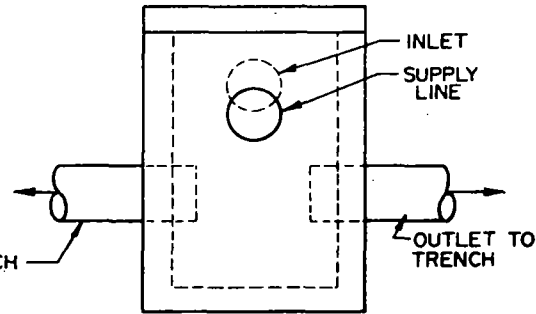
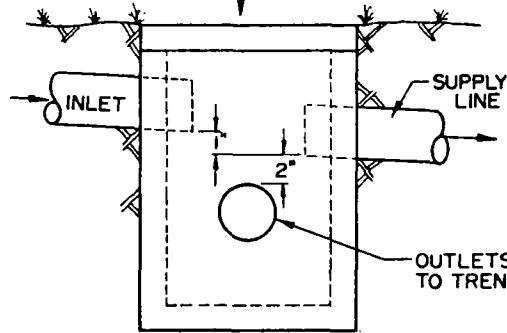


FIGURE 6

NOTES

1. ALL PIPES SHOULD BE AT LEAST 4-INCH DIAMETER
2. ELEVATION OF INLET AND SUPPLY LINE TO NEXT DROP BOX MAY BE ADJUSTED UP OR DOWN FOR DESIRED EFFLUENT LEVEL IN TRENCH
3. SUGGESTED TRENCH LIQUID LEVEL IS 2" ABOVE TOP OF OUTLET PIPE
4. INVERT OF INLET MUST BE AT LEAST ONE INCH HIGHER THAN INVERT OF SUPPLY PIPE TO NEXT DROP BOX
5. TRENCHES MAY OUTLET ONE SIDE OR BOTH SIDES OF DROP BOX



DROP BOX

FIGURE 7

LAYOUT OF PERFORATED PIPE LATERALS FOR PRESSURE DISTRIBUTION

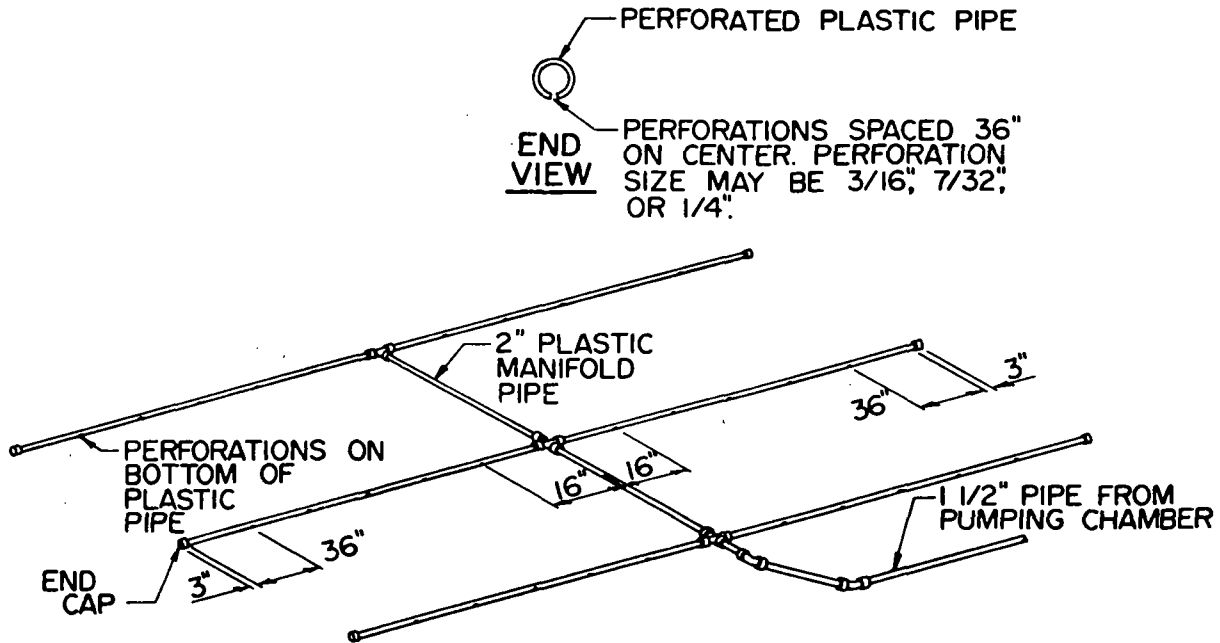
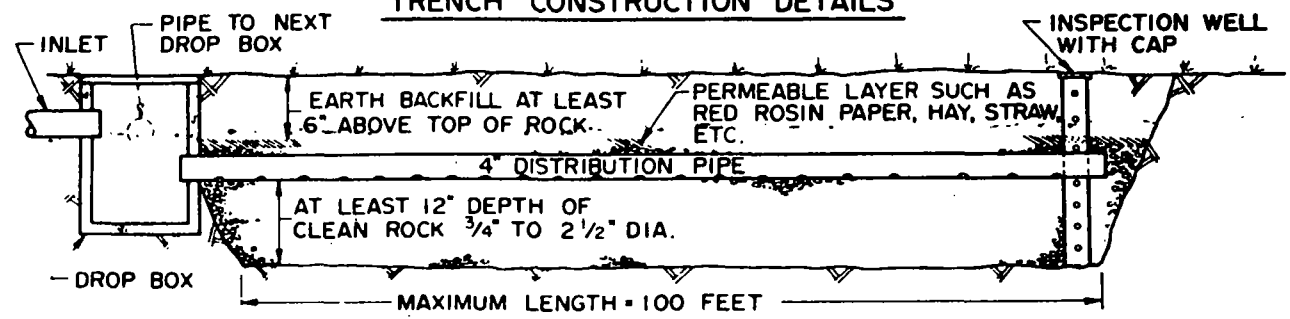


FIGURE 8

TRENCH CONSTRUCTION DETAILS



NOTE : 1. BOTTOM OF TRENCH MUST BE FLAT ALONG LENGTH

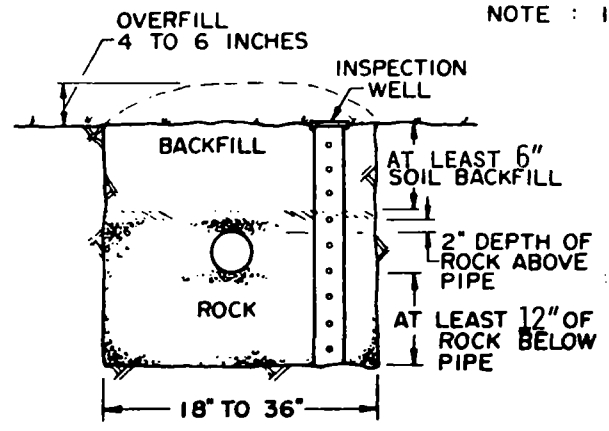
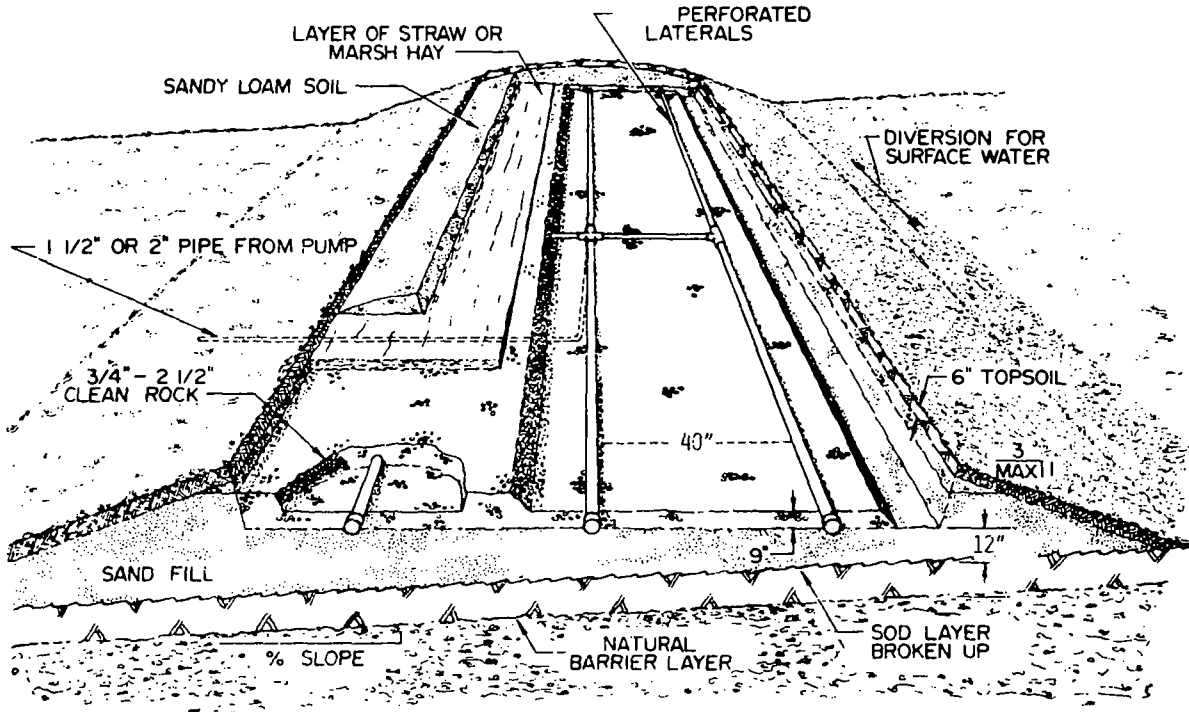


FIGURE 9



SEWAGE TREATMENT MOUND (PRESSURE DISTRIBUTION)

APPENDIX C

MHD 123 Materials.

(a) **Quality of Materials.** All materials used in any drainage or plumbing system or part thereof, shall be free from defects, and no materials which are damaged or defective, shall knowingly be installed.

(b) **Identification of Materials.** All materials must be marked, unless otherwise easily identifiable, so as to provide a visual means of identification as to types, grades, weights, and strengths. The installer shall, as far as possible, position the identification marks so as to provide ease of inspection by the Administrative Authority.

(c) **Standards for Plumbing Materials.**

(1) **Approved Materials.** A material shall be considered approved if it meets one or more of the standards cited in Table 123(c)(3) Standards for Plumbing Materials. Materials not listed in Table 123(c)(3) shall be used only as provided for in MHD 122(h)(3), or as permitted elsewhere in this Code.

(2) **Abbreviations.** Abbreviations in Table 123(c)(3) refer to the following:

- ANSI — American National Standards Institute
10 East 40th Street
New York, New York 10016
- ASTM — American Society for Testing and Materials
1916 Race Street
Philadelphia, Pennsylvania 19103
- AWWA — American Water Works Association
2 Park Avenue
New York City, New York 10016
- CS — Commercial Standards Available From:
Commodity Standards Division
Office of Industry and Commerce
U. S. Department of Commerce
Washington, D. C. 20234
- FS — Federal Specifications Available From:
Federal Supply Service
Standards Division—General Services Administration
Washington, D. C. 20406
- NSF — National Sanitation Foundation
Ann Arbor, Michigan 48106
- FHA — Federal Housing Authority
Architectural Standards Division
Washington, D. C.

TABLE 123 (C) (3)
STANDARDS FOR PLUMBING MATERIALS

	DESCRIPTION	ANSI	ASTM	FS	OTHER
1.	CAST IRON PIPE & FITTINGS	A21.2 A21.6			
1A	Cast Iron Pipe & Fittings Extra Heavy	A21.8	A-74	WW.P.401C	CS188
1B	Cast Iron Pipe Centrifugally Cast only and fittings	A21.6	A-74	WW.P.401C	CS188
	Service Weight	A21.8			
1C	Cast Iron Mechanical (Gland Type) Pipe	A21.11 A21.2		WW-P-421a	
		A21.6			
1D	Cast Iron Mechanical (Gland Type) Pipe Cement Lined	A21.8 A21.4 A21.2 A21.6 A21.8			
1E	Cast Iron Short Body Water Service Fittings (2"-12")	A21.10			AWWA C100
1F	Cast Iron Threaded Pipe	A40.5			
1G	High Silicon Pipe, Fittings Cast Iron				
1H	Cast Iron Threaded Fittings Black and galvanized 125#	B16.4		WW-P-501	
1J	Cast Iron Drainage Fittings Black and Galvanized	B16.12		WW-P-491	
1K	Hubless Cast Iron Pipe and Fit- tings (amended 8-31-72)				CISPI Standard 301-69T

V.	SILICA AND EARTH PRODUCTS PIPE AND FITTINGS, NON METALLIC				
5A	Asbestos-Cement Pressure Pipe and Fitting		C500 C296	SS-P351	
5B	Asbestos-Cement Water Pipe and Fittings		C500	SS-P-351	AWWA C400
5C	Asbestos-Cement Non Pressure Pipe and Fittings		C428	XX-P-331	
5D	Asbestos-Cement Perforated Underdrain Pipe and Fittings		C508		
5E	Vitrified Clay Pipe, Standard . . Strength and Stronger fittings . .		C13 C200		
5F	Unglazed Clay Pipe, Extra Strength and fittings		C278		
5G	Perforated Clay Pipe and Fittings		C211		
5H	Borosilicate Glass Pipe and Fittings 60 psi				
5J	Non Reinforced Concrete Drain tile		C412		AASHO M178

5K	Non Reinforced Concrete Pipe	C14	SS-P-371	AASHO M86
5L	Perforated Concrete Pipe, Underdrainage	C444		
5M	Reinforced Concrete Pipe	C76	SS-P-375	
5N	Reinforced and Prestressed Concrete Pipe, Pressure Type and Fittings			
5O	Bituminized Fiber Drain and Sewer Pipe	D1860	SS-P-1540A	(Amended 8-31-72)
5P	Perforated Bituminized Fiber Pipe for General Drainage	D2311	SS-P-1540A	(Amended 8-31-72)
VI. PLASTIC PIPE AND FITTINGS				
DRAIN, WASTE and VENT				
6A	Acrylonitrile-Butadiene- Styrene (ABS)	D2661	L-P-322a	HSF14
	Type 1, Schedule 40		FHA-MPS	CS270
6B	Polyvinyl Chloride (pvc)	D2665	L-P-320a	NSF14
	Schedule 40 Unthreaded		FHA-MPS	CS272
	Schedule 80 can be threaded			
	BUILDING SEWER		L-P-001221	
6C	(1) Styrene-Rubber	D2852	(Filed 4-5-73)	CS228
6C	(2) Polyvinyl Chloride (pvc)	D3033	FHA-UM-26	
	(Amended 4-5-73)	D3034	WW-P-00380a	

* * * * *

(d) Piping System Materials

* * * * *

(4) Building Sewers

(aa) Cast Iron 1A and 1B and fittings and Hubless Cast Iron 1K.
(Amended 6-26-72)

(bb) Cast Iron 1C and 1D with 1 E fittings.

(cc) Asbestos Cement 5A and 5C and fittings laid on a continuous granular bed and only in yard areas.

(dd) Clay pipe and fittings 5E laid on a continuous granular bed.

(ee) Concrete pipe 5K in yard areas and not under permanent streets, laid on a continuous granular bed.

(ff) Concrete 5N.

(gg) Plastic 6A, 6B, 6C(1), and 6C(2) laid on a continuous granular bed in yard areas. (Amended 4-5-73)

(hh) Bituminized-fiber drain and sewer pipe 50, laid on a continuous granular bed. (Amended 8-31-72)

* * * * *

MHD 124 Joints and Connections.**(a) Types of Joints for Piping Materials.**

(1) **Tightness.** Joints and connections in the plumbing system shall be gastight and watertight for the pressure required by test, with the exception of those portions of perforated or open joint piping which are installed for the purpose of collecting and conveying ground or seepage water.

(2) Types of Joints.

(aa) **Caulked Joints.** Caulked joints for cast-iron bell and spigot soil pipe shall be firmly packed with oakum or hemp and filled with molten lead not less than 1 inch deep and shall extend not more than 1/8 inch below rim of hub. No paint, varnish, or any other coatings shall be permitted on the jointing material until after the joint has been tested and approved. Lead shall be caulked tight.

(bb) **Threaded Joints—Screwed Joints.** Threaded joints shall conform to American National taper pipe thread, ASA - B2.1 - 1945 or FS GGG - P - 351a. All burrs shall be removed. Pipe ends shall be reamed out to size of bore and chips removed. Pipe joint compound shall be used on male threads only.

(cc) **Wiped Joints.** Joints in lead pipe or fittings, or between lead pipe or fittings and brass or copper pipe, ferrules, solder nipples, or traps, shall be full wiped joints. Wiped joints shall have an exposed surface on each side of the joint not less than 3/4 inch, and a minimum thickness at the thickest part of the joint of not less than 3/8 inch. Joints between lead pipe and cast iron, steel, or wrought iron shall be made by means of a caulking ferrule, soldering nipple, or bushing.

(dd) **Soldered or Brazed Joints.** Joints with copper tube with solder joint fittings shall be soldered or brazed. Surfaces to be soldered or brazed shall be thoroughly cleaned. Joints to be soldered shall be properly fluxed with non-corrosive paste type flux. Solder used for joints shall have a nominal composition of 50% tin and 50% lead, or 95% tin and 5% antimony, conforming to ASTM Standard Specification for soft solder metal B32-60T. Joints to be brazed shall be properly fluxed with a flux suitable for brazing material which is used. Brazing material shall conform to ASTM Standard Specification for Brazing Filler Metal B260-52T.

(ee) **Flared Joints.** Flared joints for soft copper water tubing shall be made with fittings meeting approved standards. (See Table 123(c)(3)). The tubing shall be reamed and expanded with proper flaring tools.

(ff) **Hot-poured Joints.** Hot-poured compound for clay or concrete sewer pipe, or other materials, shall not be water absorbent, and when poured against a dry surface shall have a bond of not less than 100 pounds per square inch. All surfaces of the joint shall be clean and dried before pouring. If wet surfaces are unavoidable, a suitable primer shall be applied.

The compound shall not soften sufficiently to destroy the effectiveness of the joint when subjected to a temperature of 160° Fahrenheit nor soluble in any of the waste carried by the drainage system. Approximately 25% of the joint space at the base of the socket shall be filled with jute or hemp. A pouring collar, rope, or other device shall be used to hold the hot compound when pouring. Each joint shall be poured in one operation until the joint is filled. Joints shall not be tested until one hour after pouring.

(gg) **Cold Joint Compound (Tar Base).** Cold joint compound (tar base) for clay and concrete pipe shall not be water absorbent, and shall bond itself to vitrified clay and concrete pipe. Half of the joint must be packed with oakum, and the remainder with cold tar compound.

(hh) **Gasket Type Joints.** Resilient Rubber Joints for Clay or Concrete. Flexible joints between lengths of clay or concrete pipe may be made by using approved resilient on rubber materials, both on the spigot end and in the bell end of the pipe.

(ii) **Cement Mortar Joints.** Except for repairs and connections of existing lines constructed with such joints, cement mortar joints are prohibited. Where permitted, cement mortar joints shall be made in the following manner: A layer of jute or hemp shall be inserted into the base of the annular joint space and packed tightly to prevent mortar from entering the interior of the pipe or fitting. Not more than 25% of the annular space shall be used for jute or hemp. The remaining space shall be filled in one continuous operation with a thoroughly mixed mortar composed of one part cement and two parts sand, with only sufficient water to make the mixture workable by hand. Additional mortar of the same composition shall then be applied to form a one to one slope with the barrel of the pipe. The bell or hub of the pipe shall be left exposed and when necessary the interior of the pipe shall be swabbed to remove any mortar or other material which may have found its way into such pipe.

(ij) **Burned Lead Joints.** Burned (welded) lead joints shall be fused together to form a uniform weld at least as thick as the lead being joined.

(kk) **Asbestos Cement Sewer Pipe Joints.** Joints in asbestos cement pipe shall be made with sleeve couplings of the same composition as the pipe, sealed with rubber rings. Joints between asbestos cement pipe and metal pipe shall be made by means of an adapter coupling caulked as required in MHD 124(a)(2)(aa). No adapted coupling shall be used that does not have a center ridge. Pipe must not be able to pass through the coupling.

(ll) Mechanical Joints.

(ll-1) **Mechanical Joints for Cast-Iron Water Pipe.** Mechanical joints in cast-iron water pipe shall be made by means of a flanged collar and rubber ring gasket, secured by the use of an adequate number of

steel bolts. The rubber sealing ring shall conform to A.S.A. A21-Point 11 Requirements.

(11-2) **Mechanical Joints in Cast-Iron Soil Pipe.** Mechanical joints in cast-iron soil pipe shall be made by means of a preformed molded rubber ring, secured by pulling the pipe and fittings together in such a way as to compress the molded rubber ring in a manner that will assure a gas and water tight joint. The rubber sealing ring shall conform to A.S.T.M. 564-65 requirements.

(11-3) **Mechanical Joints to Chemical Waste Pipe.** Mechanical joints in chemical waste pipe, of prestressed, low-expansion borosilicate glass pipe and high silicon content cast-iron pipe, shall be jointed by means of a stainless steel corrosion resistant clamp assembly, or a clamp assembly utilizing a fiberglass reinforced nylon shell surrounding a sealing sleeve of an elastomeric material containing an approved acid and corrosion resistant seal ring or gasket in such a manner that the sleeve and ring seal or gasket are firmly compressed by the tightening device in order that a gas and water tight joint is provided. The sleeves or bands for this type joint shall be marked with the words "All Stainless", or the recognized abbreviation therefore, and marked with the pipe size for which its use is intended. Fiberglass reinforced shells must bear the manufacturer name. The sleeve must be used as factory assembled. During installation assembly, the pipe or fittings must be inserted into the sleeve so as to be firmly seated against the center rib or shoulder of the gasket, and on all field cut lengths the ends must be as square and smooth as possible. *(Amended 6-26-72)*

(11-4) **Mechanical Joints in Hubless Cast Iron Soil Pipe.** Mechanical joints for hubless cast iron soil pipe and fittings shall be made by using a neoprene sleeve and stainless steel retaining band as specified in CISPI standard 301. *(Amended 6-26-72)*

(11-5) **Mechanical Pipe Couplings and Fittings.** Couplings shall be made with the housing fabricated in two or more parts of malleable iron castings in accordance with Federal Specification QQ-I-666c, Grand 11, or with ASTM A47 or ASTM A339. The coupling gasket shall be molded synthetic rubber, per ASTM D-735-61, Grade No. R615BZ. Coupling bolts shall be oval neck track head type with hexagonal heavy nuts, per ASTM-A-183-60, or ASTM A325.

Pipe fittings used with these pipe couplings shall be fabricated or malleable iron castings in accordance with Federal Specifications QQ-I-666c, Grade 11, or with ASTM A47; ductile iron ASTM A339; segweld steel ASTM53 or A106.

These couplings and fittings may be used above ground, for storm drains and leaders and for water distribution pipe provided exposed parts in contact with water are galvanized. *(Amended 6-26-72)*

(mm) **Plastic Joints.** Every joint in plastic piping shall be made with approved fittings by either solvent welded or fusion welded connections or with approved insert fittings and metal clamps and screws of corrosion re-

sistant material or threaded joints according to accepted standards. All solvent materials must meet approved recognized standards.

(nn) Bituminized Fiber Drain Pipe Joints. Pipe and bends shall be provided with accurately machined or molded tapered joints, and a taper-sleeve coupling shall be provided for each length of pipe and for each bend. The slope of the taper in both pipe and coupling shall be 2°. (*Amended 6-26-72*)

(3) Use of Joints.

(aa) Clay Sewer Pipe. Joints in clay sewer pipe, or between such pipe and metal pipe shall be made as provided in MHD 124(a)(2)(ff), (gg), (hh), and (ii).

(bb) Concrete Sewer Pipe. Joints in concrete sewer pipe, or between pipe and metal pipe, shall be made by means as provided in MHD 124(a)(2)(ff), (gg), (hh) and (ii).

(cc) Cast-Iron Pipe. Joints in cast-iron shall be either caulked or screwed, as provided in MHD 124(a)(2)(aa), (bb), and (cc).

(dd) Cast-Iron Soil Pipe. Joints in cast-iron soil pipe may be made by means as provided in MHD 124(a)(2)(aa) or (II-2).

(ee) Threaded Pipe to Cast-Iron. Every joint between wrought iron, steel, brass, copper and cast-iron pipe shall be either caulked or threaded joints as provided in MHD 124(a)(2)(aa), (bb) and (cc) and shall be made with approved adapter fittings.

(ff) Lead to Cast-Iron, Wrought Iron and Steel. Joints between lead and cast-iron, wrought iron, or steel shall be made by means of wiped joints to a caulking ferrule, soldering nipple or bushing as provided in MHD 124(a)(2)(cc).

(gg) Copper Water Tube. Joints in copper water tubing shall be made either by the appropriate use of approved brass or wrought copper water fittings properly soldered or brazed, or by means of approved flared fittings as provided in MHD 124(a)(2)(ee).

(hh) Plastic Pipe Joints. Joints in plastic pipe or between plastic and cast-iron, steel, brass or copper pipe shall be made as provided in MHD 124(a)(2)(mm).

(ii) Bituminized Fiber Pipe Joints. Joints in bituminized fiber pipe shall be made as provided for in MHD 124(a)(2)(nn). (*Amended 6-26-72*)

(4) Special Joints.

(aa) Copper Tubing to Threaded Pipe Joints. Joints from copper tubing to threaded pipe shall be made by the use of brass or copper adapter fittings. The joint between the copper pipe and fitting shall be properly soldered, brazed or flared.

(bb) Cast-Iron to Copper Tube. Caulked joints between copper tubing and cast-iron soil pipe shall be made by means of brass or copper ferrules or other approved adapter fittings.

(cc) Slip Joints. In drainage piping, slip joints shall be used only on the inlet side of the trap or in the trap seal. Every slip joint shall be made using approved packings of gasket material or approved ground joint brass compression rings. Ground faced connections which allow adjustments of tubing but provide a durable rigid joint when made up shall not be considered as a slip joint.

(dd) Expansion Joints. Every expansion joint shall be of an approved type and the material used in its manufacture shall be compatible with the type of piping in which it is installed. Every expansion joint, other than an expansion loop, shall be accessible. (Also see MHD 133(i))

(ee) Bituminized Fiber to Other Types of Pipe. When connecting bituminized fiber pipe to other types of materials, only approved types of fittings and adaptors designed for the specific transition intended shall be used. (*Amended 6-26-72*)

(5) Flanged Fixture Connections. Fixture connections between drainage pipes and water closets, pedestal urinals, and earthenware trap standards shall be made by means of brass, plastic, or iron flanges, caulked, soldered, solvent welded, or screwed to the drainage pipe. The connection shall be bolted, with an approved gasket, washer or setting compound between the earthenware and the connection. Floor flanges of other equivalent materials may be used when approved by the Administrative Authority.

The bottom of the floor flange shall be set on the top of the finished floor or on a structurally firm base. Closet bends or stubs must be cut off so as to present a smooth surface, even with the top of the closet flange. Use of commercial putty or plastic as fixture setting compound is prohibited.

(6) Prohibited Joints and Connections. See MHD 131(b)(3).

(7) Increasesers and Reducers. Brass or cast-iron body cleanouts shall not be used as a reducer or adapter from cast-iron soil pipe to steel or wrought iron pipe. Where different sizes of pipe or pipes and fittings are to be connected, the proper size increasesers, reducers, or reducing fittings shall be used between the two sizes. Hexagon screwed bushings shall not be used in drainage piping.

MHD 125 Traps and Clean Outs.

* * * * *

(b) Drainage Pipe Cleanouts.

(1) Location. There shall be at least 2 cleanouts in the building drain, one at or near the base of the stack and one near the connection between the building drain and the building sewer. The cleanout at the outside wall may be inside or outside the building, and shall be made with a full "Y" branch fitting and shall extend at least 2 inches above grade or finished floor, except that the Administrative Authority may grant permission to use a flush cover in traffic areas.

A cleanout which is easily accessible shall be provided at or near the foot of each vertical soil or waste stack.

Each horizontal branch drain pipe shall be provided with a cleanout at its upper terminal, except that a fixture trap or a fixture with an integral trap, readily removable without disturbing concealed piping, may be accepted as a cleanout equivalent for this purpose.

(2) Size of Cleanouts. The cleanout shall be of the same nominal size as the pipes they serve up to 4 inches in diameter and not less than 4 inches for larger piping.

The distance between cleanouts in horizontal piping shall not exceed 50 feet for 3 inch or less in size and not over 100 feet for 4 inch and over in size.

(3) Cleanout Materials. The bodies of cleanout ferrules shall be made to standard pipe sizes, conform in thickness to that required for pipe and fittings of the same material and extend not less than ¼ inch above the hub. The cleanout cover or plug shall be of brass, cast-iron or approved plastic and be provided with a raised nut or recessed socket for removal.

Cleanouts for cast-iron soil pipe shall have cleanout covers made of brass and conform to specifications and details as shown in Figure 125(b)(3), Appendix B.

(4) Cleanouts to be Accessible. Each cleanout, unless installed under an approved cover plate or left flush with the finished floor, shall be at least 2 inches above grade, readily accessible and shall not be covered with cement, plaster, or other permanent finish material. Where a soil stack cleanout is located within 10 feet of where the building drain leaves the building, the cleanout at the outside wall may be eliminated.

MHD 131 Drainage Systems.

(a) Determining Size of Drainage System.

(1) Load on Drainage Piping. The load on drainage system piping shall be computed in terms of drainage fixture units in accordance with Table 131 (a)(1) and MHD 131(a)(1)(aa), except the Administrative Authority may allow variations where it is shown by a hydraulic analysis of the piping system, submitted to the Administrative Authority, that such variation would result in a more desirable flow rate in the piping system.

**TABLE 131 (a) (1)
FIXTURE UNIT VALUES FOR VARIOUS PLUMBING FIXTURES**

Type of Fixture	Fixture Unit Value	Minimum Fixture Trap and drain size
Clothes Washer (Domestic Use)	2	1½
Clothes Washer (Public Use in Groups of 8 or more)	6 each	
Bath tub with or without shower	2	1½
Bidet.	2	1½
Dental unit or cuspidor.	1	1½
Drinking Fountain.	1	1½
Dishwasher, Domestic	2	1½
Dishwasher, Domestic	2	1½
Dishwasher, Commercial.	4	2
Floor Drain with 2 inch waste	2	2
Floor drain with 3 inch waste	3	3
Floor Drain with 4 inch waste	4	4
Lavatory	1	1½
Laundry Tray (1 or 2 Compartment).	2	1½
Shower Stall, Domestic.	2	1½
Shower (Gang) per head	1	
SINKS:		
Combination, Sink and Tray (with disposal unit)	3	1½
Combination, Sink and Tray (with one trap).	2	1½
Domestic.	2	1½
Domestic, with disposal unit	2	1½
Surgeons	3	1½
Laboratory.	1	1½
Flushrim or Bedpan washer	6	3
Service	3	2
Pot or Scullery	4	2
Soda Fountain	2	1½
Commercial, Flat Rim, Bar or Counter	3	1½
Wash, Circular or Multiple (per set of faucets).	2	1½
URINAL		
Pedestal, Wall Hung, with 3 inch trap (Blowout and Syphon Jet)	6	3
Wall Hung with 2 inch trap	3	2
Wall Hung with 1½ inch trap	2	1½
Trough (per 6 foot section).	2	1½
Stall	3	2
WATER CLOSET		
Unlisted Fixture or Trap Size	6	3
1¼ inch	1	
1½ inch	2	
2 inch	3	
2½ inch	4	
3 inch	5	
4 inch	6	

(aa) Values for Continuous Flow. Fixture unit values for continuous or semi-continuous flow into the drainage system, such as from a pump, sump ejector, air conditioning equipment, or similar device shall be computed on the basis of one fixture unit for each gallon per minute flow.

(2) Selecting Size of Drainage Piping. Pipe sizes shall be determined from Table 131(a)(2)A and Table 131(a)(2)B on the basis of drainage load computed from Table 131(a)(1) and MHD 131(a)(1)(aa).

TABLE 131 (a) (2) A
MAXIMUM LOADS FOR HORIZONTAL DRAINS IN FIXTURE UNITS

Diameter of Drain (inches)	Horizontal Fixture Branch* 1/4 in/ft. (f. u.)	Building Sewer, Building Drain and Building Drain Branches-from Stacks****			
		Slope			
		1/16 in/ft. (f. u.)	1/8 in/ft. (f. u.)	1/4 in/ft. (f. u.)	1/2 in/ft. (f. u.)
1 1/4	1				
1 1/2	3				
2	6			21	26
2 1/2	12			24	31
3**	32***		36***	42***	50***
4	160		180	216	250
5	360		390	480	575
6	620		700	840	1,000
8	—	1,400	1,600	1,920	2,300
10	—	2,500	2,900	3,500	4,200
12	—	3,900	4,600	5,600	6,700
15	—	7,000	8,300	10,000	12,000

* Includes Horizontal Branches of the Building Drain.

** No water closet shall discharge into a drain less than 3 inch.

*** Not over 2 Water Closets.

**** Every building drain that receives the discharge of (3) or more water closets, shall not be less than 4 inch in diameter. (Amended 7-26-73)

(3) Minimum Size of Soil and Waste Stacks. No soil or waste stack shall be smaller than the largest horizontal branch connected thereto except that a 4x3 water closet connection shall not be considered as a reduction in pipe size.

(4) Minimum Size of Stack Vent or Vent Stack. Any structure in which a building drain is installed shall have at least one stack vent or vent stack carried full size through the roof not less than 3 inches in diameter. Where one or more soil stacks are required to extend through the roof undiminished in size they should be the stack or stacks most remote from the location where the building drain leaves the building. When a soil or waste stack receives the discharge of fixtures located on 2 or more floors, and the uppermost fixture is located 3 or more floors above the building drain, such stack and stack vent shall continue undiminished in size through the roof. (Amended 4-5-73)

(5) Provisions for Future Fixtures. When provision is made for future installation of fixtures, those provided for shall be considered in determining the required sizes of drain and vent pipes. Construction to provide for such future installations shall be terminated with a plugged fitting or fittings.

**TABLE 131 (a) (2) B
MAXIMUM LOADS FOR SOIL AND WASTE STACKS IN
FIXTURE UNITS**

Diameter of Stack	Stacks of not more than 3 stories or Branch Intervals	Stacks of more than 3 stories or Branch Intervals	Total at One Story or Branch Interval
1¼*	2	2	1
1½*	4	4	2
2*	9	18	6
2½*	20	42	9
3	36***	72***	24**
4	240	500	90
5	540	1,100	200
6	960	1,900	350
8	—	3,600	600
10	—	5,600	1,000
12	—	8,400	1,500

* No water closets permitted.

** Not over 2 water closets permitted.

*** Not over 6 water closets permitted, and not over 6 branch intervals on a 3 inch soil stack. (Amended 12-26-72)

(6) Minimum Size of Underground Drainage Piping. No portion of the drainage system installed underground shall be less than 2 inches in diameter.

(7) Sizing of Offsets on Drainage Piping.

(aa) Offsets of 45 Degrees or Less. An offset in a vertical stack with a change of direction of 45° or less from the vertical, may be sized as a straight vertical stack.

(bb) Offsets of more than 45 Degrees. A stack with an offset of more than 45 degrees from the vertical shall be sized as follows:

The portion of the stack above the offset shall be sized as for a regular stack based on the total number of fixture units above the offset.

The offset shall be sized as for a building drain branch. Table 131 (a) (2) A Maximum Loads for Horizontal Drains.

The portion of the stack below the offset shall be sized at least as large as the offset. (Amended 4-5-73)

(cc) Above Highest Branch. An offset above the highest branch connection is an offset in the stack vent and shall be considered only as it affects the developed length of the vent.

(dd) Below Lowest Branch. In the case of an offset in a soil or waste stack below the lowest branch connection, there shall be no change in diameter required if the offset is made at an angle of not greater than 45 degrees from the vertical.

If such offset is made at an angle of greater than 45 degrees from the vertical, the required diameter of the offset and the stack below it shall be sized as for a building drain. (Table 131 (a) (2) A)

(8) Fixture Connections to an Offset of More than 45' or at Base of Stack. When stacks in buildings of 5 or more stories in height receive the discharge of fixtures 4 or more stories above the offset, no fixtures on the floor at which the offset occurs shall be connected to the stack within 8 feet of the base of the offset measured vertically or horizontally. Said fixtures may also be connected into vertical section of the stack more than 2 feet below the offset. Fixture connections to horizontal piping at the bases of such stacks shall be made in the same manner, or at a point acceptable to the Administrative authority.

(b) Drainage Piping Installation.

(1) Pitch or Horizontal Drainage Piping. Horizontal drainage piping shall be installed in uniform alignment at uniform slopes in accordance with the following requirements and in no case at a slope which will produce a computed velocity of less than 2 feet per second, unless otherwise permitted by the Administrative Authority, based on hydraulic analysis of the piping system.

Size of Piping	Minimum Slope
Less than 3 inches	1/4 inch per foot
3 inches to 6 inches	1/8 inch per foot
8 inches and over	1/16 inch per foot

(2) Change in Direction. Changes in direction in drainage piping shall be made by the appropriate use of 45 degree wyes, long or short sweep quarter bends, sixth, eighth, or sixteenth bends, or by combination of these or equivalent fittings. Single and double sanitary tees, quarter bends, and long turn ells may be used in drainage lines only where the direction of the flow is from the horizontal to the vertical.

(aa) Short Sweeps Permitted. Short sweep bends or long turn ells 3 inch or larger in diameter may be used in soil or waste lines where the change in direction of flow is from either the horizontal to the vertical or from the vertical to the horizontal.

(3) Prohibited Fittings and Connections. No fittings having a hub in the direction opposite to flow, or straight tee branch shall be used as a drainage fitting. No fitting or connection which has an enlargement chamber or recess with a ledge or shoulder, or reduction in pipe area shall be used. No drainage or vent piping shall be drilled, tapped, or welded unless otherwise permitted by the Administrative Authority. Fittings used for back-to-back, wall outlet, blowout type water closet bowls shall have a baffle plate or other device to prevent the waste water from one water closet from entering the opposite water closet. No fixture connection shall be made to a closet bend. No running threads, bands, or saddles shall be used. The short pattern fitting in a horizontal position is prohibited in underground work.

(aa) Heel or Side-Inlet Bends. A heel or side-inlet quarter bend shall not be used as a vent when the inlet is placed in a horizontal position or any similar arrangement of pipe or fittings producing a similar effect.

(bb) Obstruction to Flow. No fitting, connection, device or method of installation which obstructs or retards the flow of water, wastes, sewage, or air in the drainage or venting system in an amount greater than the normal frictional resistance to flow, shall be used unless it is indicated as acceptable to this Code by having a desirable and acceptable function and as of ultimate benefit to the proper and continuing functioning of the plumb-

ing system. The enlargement of a 3 inch closet bend or stub to 4 inches shall not be considered an obstruction, provided the horizontal flow line or insert is continuous without forming a ledge.

(4) **Dead Ends.** In the installation of a drainage system, dead ends shall be avoided except where necessary to extend piping for a cleanout so as to be accessible.

(5) **Building Drains Below Building Sewer.** Building drains which cannot be discharged to the sewer by gravity flow shall discharge into an approved watertight, gas tight vented sump or receiving tank, so located as to receive the sewage or wastes by gravity. From such sump or receiving tank the sewage or other liquid wastes shall be lifted and discharged into the building gravity drain by approved automatic pumping equipment. The system or drainage piping entering such sump shall be installed and vented as required in this section for a gravity system.

(aa) **Design of Sumps.**

(aa-1) Sumps and receiving tanks shall be constructed of poured concrete, metal, or other approved materials. If constructed of poured concrete, the walls and bottom shall be adequately reinforced and designed to acceptable standards. Metal sumps or tanks shall be of such thickness as to serve their intended purpose and shall be treated internally and externally to resist corrosion.

(aa-2) The discharge line from such pumping equipment shall be provided with an accessible back-water valve and gate valve, and if the gravity drainage line to which such discharge line connects is horizontal, the method of connection shall be from the top through a wye branch fitting. The minimum size of any pump or discharge pipe from a sump having a water closet connected thereto shall not be less than 2 inches.

(aa-3) Building drains or building sewers receiving discharge from any pumping equipment shall be adequately sized to prevent over-loading. In all buildings, other than single and 2 family dwellings, should 3 or more water closets discharge into the sump, duplicate pumping equipment shall be installed.

(aa-4) Sumps and receiving tanks shall be provided with gastight metal covers, except that float control or switch rods shall operate without binding. Such cover shall be of a bolt and gasket type or equivalent manhole opening to permit access for inspection, repairs, and cleaning.

(bb) **Sump Vent.** The top of the sump tank shall be provided with a vent pipe which shall extend separately through the roof, or may be combined with other vent pipes. Such vent shall be large enough to maintain atmospheric pressure within the sump under all normal operating conditions and in no case less than in accordance with the number of fixture units discharging into the sump. When the foregoing requirements are met and the vent after leaving the sump, is combined with vents from fixtures discharging into the sump, the size of the combined vent need not exceed that required for the total number of fixtures discharging into the sump. No vent from an air operated sewage ejector shall combine with other vents.

(cc) **Clear Water Sumps.** Sumps and receiving tanks which receive only clear water drainage, and from which sewage is excluded, need not be air tight or vented.

MHD 134 Inspection, Tests and Maintenance.

(a) **Inspections.** New plumbing systems and parts of existing systems which have been altered, extended or repaired shall be inspected and tested by the proper Administrative Authority to insure compliance with all the requirements of this Code and the installation and construction of the system in accordance with the approved plan and the permit, except that testing may be waived for work which does not include addition to, replacement, alteration, or relocation of any water supply, drainage or vent piping.

All the piping shall be tested and after the plumbing fixtures have been set, and before the system is put into use, the system shall be given a final inspection and test by the proper Administrative Authority.

(b) **Notifications.**

(1) It shall be the duty of the plumbing contractor to notify the proper Administrative Authority and the Owner, or his authorized agent orally, by telephone, or in writing, not less than eight working hours between the hours of 8 a.m. and 4 p.m. before the work is to be inspected or tested.

(2) It shall be the duty of the plumbing contractor to make sure that the work will stand the test prescribed before giving the above notification.

(3) If the proper Administrative Authority finds that the work will not stand the test, the plumbing contractor shall be required to renotify as above.

(4) If the proper Administrative Authority does not appear for an inspection within 24 hours of the time set, excluding Saturdays, Sundays and Holidays, the inspection or test shall be deemed to have been made, and the plumbing contractor is required to file an affidavit with the proper Administrative Authority that the work was installed in accordance with the Code, the approved plans and permit, and that it was free from defects and that the required tests had been made and the system found free from leaks; also whether the owner or his authorized agent was present when such inspection or test was made.

(c) **Material and Labor for Tests.** The equipment, material, power, and labor necessary for the inspection and test shall be furnished by the plumbing contractor.

(d) **Method of Testing.** The air tests shall be applied to the plumbing drainage system in its entirety or in sections. Sections which are found satisfactory need not be retested after completion of the entire system unless considered necessary by the proper Administrative Authority.

(1) **Rough Plumbing.** Except for outside leaders and perforated or open drain tile, the piping of plumbing drainage and venting systems shall be air tested upon completion of the rough piping.

(aa) The air test shall be made by attaching the air compressor or testing apparatus to any suitable opening and closing all other inlets and outlets to the system by means of proper testing plugs. Plaster paris shall not be used in roof terminals.

(bb) Air shall be forced into the system until there is a uniform pressure of 5 pounds per square inch on the portion of the system being tested. The pressure shall remain constant for 15 minutes without the addition of air.

(2) **Finished Plumbing.** After the plumbing fixtures have been set and their traps filled with water, their connections shall be tested and proven gas and water tight by plugging the stack openings on the roof and the building drain where it leaves the building, and air introduced into the system equal to the pressure of a one inch water column. Such pressure shall remain constant for the period of inspection without the introduction of additional air.

(e) **Covering of Work.** No building drainage or plumbing system or part thereof shall be covered until it has been inspected, tested, and approved as herein prescribed.

(f) **Uncovering of Work.** If any building drainage or plumbing system or part thereof is covered before being regularly inspected, tested, and approved, as herein prescribed, it shall be uncovered upon the direction of the proper Administrative Authority.

(g) **Defective Work.** If the inspection or test shows defects, such defective work or material shall be replaced and the inspection and test repeated.

(h) **Building Sewer.** The building sewer shall be inspected by the proper Administrative Authority to insure compliance with the provisions of the Code.

* * * * *

(k) **Certificate of Approval.** Upon the satisfactory completion and final inspection of the plumbing system, a certificate of approval shall be issued by the proper Administrative Authority.

(l) **Air Test of Defective Plumbing.** The air test shall be used in testing the sanitary condition of the drainage or plumbing system of all buildings where there is reason to believe that it has become defective. In buildings condemned by the proper Administrative Authority because of insanitary conditions of the plumbing system, the alterations in such system shall not be considered as repairs, but as new plumbing.

Where buildings are moved from one location to another, or raised for foundations, or where part of the plumbing system has been damaged by fire, storm, or other means, a final air test shall be applied and shall hold tight, if in the opinion of the Administrative Authority it is warranted in order to assure a sanitary plumbing system.

* * * * *

(n) **Defective Fixtures.** All installed fixtures found defective or in an insanitary condition shall be repaired, replaced, or removed upon written notice from the proper Administrative Authorities.

(o) **Maintenance.** The plumbing system of every building shall be maintained in a sanitary and safe operating condition.

APPENDIX D
WATER WELL CONSTRUCTION CODE

MHD 217 Location of Wells.

* * * * *

(c) Distance from Pollution or Contamination Sources.

(1) A well shall be at least:

* * * * *

(dd) Fifty feet (50 ft.) from a buried sewer, septic tank, subsurface disposal field, grave, animal or poultry yard or building, privy, petroleum storage tank, or any other sewage or liquid wastes that may drain into the soil.

(ee) Twenty feet (20 ft.) from a buried sewer constructed of cast iron pipe with tested watertight joints or other material acceptable to the Board; or a pit or unfilled space below ground surface, except an approved basement.

(ff) Wells less than 50 feet in depth and not encountering at least 10 feet of impervious material shall be located at least 150 feet from cesspools, leaching pits, or dry wells and at least 100 feet from a subsurface disposal field, manure storage pile or other sources of contamination.²

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APPENDIX E

Cons 72 Sanitary Provisions.

* * * * *

(b) SEWAGE AND WASTE DISPOSAL.

* * * * *

(4) Septic tank and soil absorption systems shall be set back from the normal high water mark in accordance with class of public waters:

- (aa) On Natural Environment Lakes and Streams, at least 150 feet;
- (bb) On Recreational Development Lakes, at least 75 feet;
- (cc) On General Development Lakes and Streams, at least 50 feet.

* * * * *

NR 79 Land Use Provisions

* * * * *

(d) SANITARY PROVISIONS

(1) The sanitary provision standards set forth in Minn. Regs. Cons. 72 of the Statewide Standards and Criteria for Management of Shoreland Areas of Minnesota shall apply to Wild, Scenic and Recreational river land use districts.

(2) However, the provisions of Cons. 72 (b)(4) are superseded by the following setback provisions for septic tank and soil absorption systems.

	Setback from the normal high water mark
Wild River	150 feet
Scenic River	100 feet
Recreational River	75 feet
Tributaries	75 feet

NR 83 LAND USE CONTROL PROVISIONS.

*** * * * ***

(d) Sanitary Provisions.

*** * * * ***

(2) Sewage and Waste Disposal.

*** * * * ***

(dd) Septic tank and soil absorption systems shall be set back from the ordinary high water mark in accordance with the class of public waters:

- (i) On Natural Environment Waters, at least 150 feet ;**
- (ii) On Recreational Development Waters, at least 75 feet; and**
- (iii) On General Development Waters, at least 50 feet.**

*** * * * ***

CHAPTER FORTY-ONE: WPC 41

WPC 41. The following standard of effluent quality and purity is hereby adopted and established for all of the intrastate waters of the Vermillion River in Town 113, 114 and 115 North, Range 15, 16, 17, 18, 19, 20 and 21 West, Goodhue, Dakota and Scott Counties.

(a) **Scope.** These effluent standard requirements shall be in addition to the effluent standards imposed in WPC 14 or any other standards by other regulations applying to these waters, and shall supersede any less stringent effluent standards conflicting with provisions of this regulation.

(b) **Severability.** All provisions of this regulation shall be severable and the invalidity of any lettered paragraph or any subparagraph or subdivision thereof shall not void any other lettered paragraph or subparagraph, subdivision or any part thereof.

(c) **Definitions.** The terms "sewage," "industrial wastes," "other wastes," "treatment works," "disposal systems," and "waters of the state," as well as any other terms for which definitions are given in the Water Pollution Control Statutes, as used herein have the meanings ascribed to them in Minnesota Statutes, Sections 115.01 and 115.41 with the exception that disposal systems or treatment works operated under permit of the Agency shall not be construed to be "waters of the state" as the term is used herein. Other terms and abbreviations used herein which are not specifically defined in applicable federal or state law shall be construed in conformance with the context, and in relation to the applicable section of the statutes pertaining to the matter at hand, and current professional usage.

(d) **Standards of Effluent Quality and Purity.** It is herein established that the Agency shall require the treatment of all discharges of sewage, industrial waste or other waste effluent to meet the following effluent standards: (see Section (c)(6) WPC 14 for additional effluent requirements):

<u>Substance or Characteristic**</u>	<u>Limiting Concentration or Range</u>
5-day Biochemical Oxygen Demand*	10 milligrams per liter
Ammonia as Nitrogen	1 milligram per liter
Total Suspended Solids*	10 milligrams per liter
Dissolved Oxygen	4 milligrams per liter

*The concentration specified in Regulation WPC 14 section (c)(6) may be used in lieu thereof if the discharge of effluent is restricted to the spring flush or other high runoff periods when the stream flow rate above the discharge point is sufficiently greater than the effluent flow rate to insure that the applicable water quality standards are met during such discharge periods.

**If treatment works are designed and constructed to meet the specified limits given above for a continuous discharge, at the discretion of the Agency the operation of such works may allow for the effluent quality to vary between the limits specified above and in WPC 14 (c) (6), provided the water quality standards of WPC 14 and all other requirements of the Agency and any permit

issued by the Agency in conjunction with the U.S. Environmental Protection Agency are being met. Such variability of operation must be based on adequate monitoring of the treatment works and the effluent and receiving waters as specified by the Agency.

(e) Determination of Compliance. Compliance will be based on effluent samples which are representative of the discharge. In making tests or analyses of the sewage, industrial wastes or other wastes to determine compliance with the standards, samples shall be collected in such manner and place, and of such type, number and frequency as may be considered satisfactory by the Agency from the viewpoint of adequately reflecting the condition of the composition of the effluents. Reasonable allowance will be made for dilution of the effluents, which are in compliance with Section (d), to meet established water quality standards following discharge into waters of the State. The Agency by allowing dilution may consider the effect on all uses of the waters into which the effluents are discharged. The samples shall be preserved in accordance with procedures given in the 1971 edition of Standard Methods for the Examination of Water and Waste-Water, by the American Public Health Association, American Water Works Association, and the Water Pollution Control Federation, and any revisions or amendments thereto. Test procedures for the analysis of pollutants shall conform to regulations promulgated pursuant to 33 Section 1314 of FWPCA and Minnesota Statutes Section 115.03, Subdivision 1(e)(7), as amended. The Agency may accept or may develop other methods, procedures, guidelines or criteria for measuring, analyzing and collecting samples. The arithmetic mean for concentrations of 5-day biochemical oxygen demand, ammonia, dissolved oxygen, and total suspended solids shall not exceed the stated values in Section (d) of this regulation in a period of 30 consecutive days.

(f) Variance from Standards. In any case where, upon application of the responsible person or persons, the Agency finds that by reason of exceptional circumstances the strict enforcement of any provision of these standards would cause undue hardship, that disposal of the sewage, industrial waste or other waste is necessary for the public health, safety or welfare; and that strict conformity with the standards would be unreasonable, impractical or not feasible under the circumstances; the Agency in its discretion may grant a variance therefrom upon such conditions as it may prescribe for prevention, control or abatement of pollution in harmony with the general purposes of these classifications and standards and the intent of the applicable state and federal laws. The U.S. Environmental Protection Agency will be advised of any permits which may be issued under this clause together with information as to the need therefor.

Filed May 13, 1976

POLLUTION CONTROL AGENCY

6 MCAR § 4.8043 Effluent standards for disposal systems discharging to the South Fork of the Zumbro river. The following standards of effluent quality and purity are hereby adopted and established for all of the intrastate waters of the South Fork of the Zumbro River from the dam at Silver Lake in Section 26, Township 107 North, Range 14 West in the city of Rochester to the beginning of Lake Zumbro in Section 23, Township 108 North, Range 14 West, Olmsted County.

A. Scope. These effluent standard requirements shall be in addition to the effluent standards imposed by WPC 14 and any other standards imposed by other rules applying to these waters, and shall supersede any less stringent effluent standards conflicting with provisions of this rule.

B. Severability. All provisions of this rule shall be severable and the invalidity of any lettered paragraph or any subparagraph or subdivision thereof shall not void any other lettered paragraph or subparagraph, subdivision or any part thereof.

C. Definitions. The terms "seepage," "industrial wastes," "other wastes," "treatment works," "disposal systems," and "waters of the state," as well as any other terms for which definitions are given in the Water Pollution Control Statutes, as used herein have the meanings ascribed to them in Minn. Stat., §§ 115.01 and 115.41 (1976) with the exception that disposal systems or treatment works operated under permit of the Agency shall not be construed to be "waters of the state" as the term is used herein. Other terms and abbreviations used herein which are not specifically defined in applicable federal or state law shall be construed in conformance with the context, and in relation to the applicable section of the statutes pertaining to the matter at hand and current professional usage.

D. Standards of effluent quality and purity. It is herein established that the Agency shall require the treatment of all discharges of sewage, industrial waste or other waste effluent to meet the following effluent standards (see Section (c) (6), WPC 14 for additional effluent requirements):

Substance or Characteristic**	Limiting Concentration or Range
5-Day Biochemical Oxygen Demand*	14 milligrams per liter
Total Suspended Solids*	20 milligrams per liter
Minimum Dissolved Oxygen*	5 milligrams per liter
Ammonia (N)*	1.6 milligrams per liter

*The concentration specified in Rule WPC 14 Section (c) (6) may be used in lieu of the concentrations specified herein if the discharge of effluent is restricted to the spring flush or other high runoff periods when the stream flow rate above the discharge point is sufficiently greater than the effluent flow rate to insure that the applicable water quality standards are met during such

discharge periods. The ammonia (N) and dissolved oxygen effluent standards are not applicable if a controlled form of discharge is utilized and the applicable water quality standards for ammonia (N) and dissolved oxygen, respectively, are not violated during the discharge period.

****If treatment works are designed and constructed to meet the specified limits given above for a continuous discharge, at the discretion of the Agency the operation of such works may allow for the effluent quality to vary between the limits specified above and in Rule WPC 14 Section (c) (6), provided the water quality standards and all other requirements of the Agency and the U.S. Environmental Protection Agency are being met. Under this variability of treatment option the ammonia (N) effluent concentration could vary up to levels normally obtained by operation of secondary treatment facilities provided the applicable water quality standard for ammonia (N) is met. Such variability of operation must be based on adequate monitoring of the treatment works and the effluent and receiving waters as specified by the Agency.**

E. Determination of compliance. Compliance will be based on effluent samples which are representative of the discharge. In making tests or analyses of the sewage, industrial wastes or other wastes to determine compliance with the standards, samples shall be collected in such manner and place, and shall be of such type, number and frequency as may be considered satisfactory by the Agency from the viewpoint of adequately reflecting the condition of the composition of the effluents. Reasonable allowance will be made for dilution of the effluents, which are in compliance with Section D., to meet established water quality standards following discharge into waters of the state. The Agency by allowing dilution may consider the effect on all uses of the waters into which the effluents are discharged. The samples shall be preserved in accordance with procedures given in the fourteenth edition of Standard Methods for the Examination of Water and Waste-Water, by the American Public Health Association, American Water Works Association, and the Water Pollution Control Federation, dated 1976. Test procedures for the analysis of pollutants shall conform to rules and regulations promulgated pursuant to Section 304 of the Federal Water Pollution Control Act of 1972, 33 U.S.C. Section 1314 (1972) and Minn. Stat., § 115.03, subd. 1 (e) (7) (1976). The arithmetic mean for concentrations of 5-day biochemical oxygen demand, total suspended solids, and ammonia (N) shall not exceed the stated values in Section D. of this rule in a period of 30 consecutive days. The value of dissolved oxygen shall never be less than 5 milligrams per liter.

F. Variance from standards. Any person may apply for a variance from any requirements of this rule. Such variance shall be applied for and acted upon by the Agency in accordance with Minn. Stat., ch. 116.07, subd. 5 (1976) and other applicable statutes and rules.

Rules for the Control of Pollution from Animal Feedlots

Preamble

[An adequate supply of healthy livestock, poultry, and other animals is essential to the well-being of Minnesota citizens and the nation. These domesticated animals provide our daily source of meat, milk, eggs, and fiber. Their efficient, economic production must be the concern of all consumers if we are to have a continued abundance of high-quality, wholesome food and fiber at reasonable prices.

However, livestock, poultry, and other animals produce manure which may, when improperly stored, transported, or disposed, negatively affect Minnesota's environment. When animal manure adds to air, water, or land pollution in the State of Minnesota, it must be controlled.

The following rules for the control of livestock, poultry, and other animal manures have been promulgated to provide protection against pollution caused by manure from domesticated animals. However, these rules recognize that animal manure often provides beneficial qualities to the soil and to the production of agricultural crops.

These rules provide for a cooperative program between counties and the Minnesota Pollution Control Agency (hereinafter Agency). County programs, in many instances, represent considerable experience and sensitivity to local agricultural practices and to successful soil and water conservation. Pollution control measures, where deemed necessary by the Agency, should be individually designed and developed to provide the site specific controls needed for the operation in question. Therefore, a joint county-state program is desirable because it will insure local involvement, minimal disruption to agricultural operations and protect the environment from further degradation.

These rules comply with the policy and purpose of the State of Minnesota in regard to the control of pollution as set forth in Minn. Stat. chs. 115 and 116 (1978). Specifically, these rules are promulgated in accordance with Minn. Stat. § 116.07 (1978) and Minn. Stat. § 115.03 (1978). Finally, these rules shall have the force and effect of law and shall supersede and replace Minn. Rules SW 51-55 (1971) and Minn. Rules SW 56-61 (1974) twenty days after its publication in the State Register.

In repealing the old rules controlling pollution from animal feedlots, specifically Minn. Rule 54 containing certain location requirements, the Agency will look to local units of government to provide adequate land use planning for residential and agricultural areas. It has been the Agency's experience that residential and agricultural uses of land are often incompatible and that the best forum for resolving the conflicting use of land is at the local level. However, in promulgating these rules the Agency does not seek to abdicate its mandate to protect the purity of the natural resources of the State of Minnesota.]

6 MCAR § 4.8051 Rules for the control of pollution from animal feedlots.

A. **General applicability.** The provisions of these rules govern the storage, transportation, disposal, and utilization of animal manure and the application for and issuance of permits and certificates of compliance for construction and operation of animal manure management and disposal or utilization systems for the protection of the environment.

B. **Definitions.** All terms employed in these animal feedlot rules for which definitions are given in Minn. Stat. §§ 115.07 and 116.06 (1978), shall have the meaning ascribed to them therein. The terms specified below shall have the meanings ascribed to them:

1. "Agency." The Minnesota Pollution Control Agency as established in Minn. Stat. ch. 116 (1978).

2. "Animal feedlot." A lot or building or combination of lots and buildings intended for the confined feeding, breeding, raising or holding of animals and specifically designed as a confinement area in which manure may accumulate, or where the concentration of animals is such that a vegetative cover cannot be maintained within the enclosure. For purposes of these rules, open lots used for the feeding and rearing of poultry (poultry ranges) shall be considered to be animal feedlots. Pastures shall not be considered animal feedlots under these rules.

3. "Animal manure." Poultry, livestock or other animal excreta or a mixture of excreta with feed, bedding or other materials.

4. "Animal unit." A unit of measure used to compare differences in the production of animal manures that employs as a standard the amount of manure produced on a regular basis by a slaughter steer or heifer. For purposes of this rule, the following equivalents shall apply:

Animal	Unit
one mature dairy cow	1.4 animal unit
one slaughter steer or heifer	1.0 animal unit
one horse	1.0 animal unit
one swine over 55 pounds	.4 animal unit
one duck	.2 animal unit
one sheep	.1 animal unit
one swine under 55 pounds	.05 animal unit
one turkey	.018 animal unit
one chicken	.01 animal unit

For animals not listed above, the number of animal units shall be defined as the average weight of the animal divided by 1,000 lbs.

5. "Certificate of compliance." A letter from the Director or the county feedlot pollution control officer to the owner of an animal feedlot stating that the feedlot meets Agency requirements.

6. "Change in operation." An increase beyond the permitted maximum number of animal units, an increase in the number of animal units which are confined at an unpermitted animal feedlot requiring a construction investment, or a change in the construction operation of an animal feedlot that would affect the storage, handling, utilization, or disposal of animal manure.

7. "Corrective or protective measure." A practice, structure, condition, or combination thereof which prevents or reduces the discharge of pollutants from an animal feedlot to a level in conformity with Agency rules.

8. "County feedlot pollution control officer." A county employee or officer who is knowledgeable in agriculture and who is designated by the county board to receive and process animal feedlot permit applications.

9. "Director." The Executive Director of the Minnesota Pollution Control Agency whose duties are defined in Minn. Stat. § 116.03 (1978).

10. "Domestic fertilizer."

a. Animal manure that is put on or injected into the soil to improve the quality or quantity of plant growth, or

b. Animal manure that is used as compost, soil conditioners, or specialized plant beds.

11. "Floodplain." The areas adjoining a watercourse which have been or hereafter may be covered by a large flood known to have occurred generally in Minnesota and reasonably characteristic of what can be expected to occur on an average frequency in the magnitude of the 100 year recurrence interval.

12. "Interim permit." A permit issued by the Director or the county feedlot pollution control officer which expires no longer than ten months from the date of issue.

13. "Manure storage area." An area associated with an animal feedlot where animal manure or runoff containing animal manure is stored until it can be utilized as domestic fertilizer or removed to a permitted animal manure disposal site. Animal manure packs or mounding within the animal feedlot shall not be considered to be manure storage for these regulations.

14. "New animal feedlot." An animal feedlot constructed and operated at a site where no animal feedlot existed previously or where a pre-existing animal feedlot has been abandoned or unused for a period of five years or more.

15. "National Pollutant Discharge Elimination System (NPDES) permit." A permit issued by the Agency for the purpose of regulating the discharge of pollutants from point sources including concentrated animal feeding operations.

16. "Owner." All persons having possession, control, or title to an animal feedlot.

17. "Pastures." Areas where grass or other growing plants are used for grazing and where the concentration of animals is such that a vegetation cover is maintained during the growing season except in the immediate vicinity of temporary supplemental feeding or watering devices.

18. "Permit." A document issued by the Agency, at no charge to the applicant, which contains requirements, conditions and compliance schedules relating to the discharge of animal manure pollutants.

19. "Potential pollution hazard." A condition which indicates a potential for pollution of the land or waters of the state including:

a. An animal feedlot or manure storage area whose boundaries are located within shoreland or floodplain, or are located in an area draining directly to a sinkhole or draining to an area with shallow soils overlying a fractured or cavernous rock, or are located within 100 feet of a water well, or

b. An animal feedlot or manure storage area whose construction or operation will allow a discharge of pollutants to surface waters of the state in excess of applicable standards (including, but not limited, to Minnesota Rules WPC 14, 15, 24, and 25) during a rainstorm event of less magnitude than the 25 year-24 hour event, or will allow uncontrolled seepage of pollutants into the ground water, or will violate any applicable state rules.

20. "Shoreland." Land located within the following distances from the ordinary high water elevation of public waters:

a. Land within 1,000 feet from the normal high watermark of a lake, pond or flowage, and

b. Land within 300 feet of a river or stream or the landward side of floodplain delineated by ordinance on such a river or stream, whichever is greater.

21. "Sinkhole." A surface depression which is connected to a cavernous bedrock (generally limestone) by a channel or collapse of the overlying formation.

C. Animal feedlot pollution control requirements.

1. No animal feedlot or manure storage area shall be constructed, located or operated so as to create or maintain a potential pollution hazard unless a certificate of compliance or an Agency permit has been issued.

2. All vehicles used to transport animal manure on county, state and interstate highways or through municipalities shall be leakproof. Manure spreaders with endgates shall be in compliance with this provision provided

the endgate works effectively to restrict leakage and the manure spreader is leakproof. This shall not apply to animal manure being hauled to fields adjacent to feedlot operations or fields divided by roadways provided the animal manure is for use as domestic fertilizer.

3. Animal manure, when utilized as domestic fertilizer, shall not be stored for longer than one year and shall be applied at rates not exceeding local agricultural crop nutrient requirements except where allowed by permit. Local agricultural crop nutrient requirements can be obtained at local Soil Conservation Service Offices or local Agricultural Extension Service Offices.

4. Any animal manure not utilized as domestic fertilizer shall be treated or disposed of in accordance with applicable state rules and regulations.

5. The owner of any animal feedlot shall be responsible for the storage, transportation and disposal of all animal manure generated in a manner consistent with the provisions herein.

D. Animal feedlot permitting procedure.

1. Animal feedlot permit application requirements.

a. The owner of a proposed or existing animal feedlot for greater than 10 animal units shall make application to the Director for a permit when any of the following conditions exist:

- (1) A new animal feedlot is proposed; or
- (2) A change in operation of an existing animal feedlot is proposed; or
- (3) Ownership of an existing animal feedlot is changed; or
- (4) A National Pollutant Discharge Elimination System (NPDES) permit application is required under state or federal rules and regulations.

b. The owner of any animal feedlot shall be required to make an application for a permit when an inspection by the Agency staff or a county feedlot pollution control officer determines that the animal feedlot creates or maintains a potential pollution hazard.

c. The permit application shall include the following items:

(1) A completed permit application form listing all owners and signed by at least one of the owners, including animal types, the maximum number of animals of each type which can be confined at the animal feedlot, the location of the animal feedlot, soil conditions, and hydrogeological conditions.

(2) A map or aerial photograph showing the location of all wells, buildings, lakes, and watercourses within 1,000 feet of the proposed feedlot.

(3) A manure management plan including manure handling and application techniques, acreage available for manure application and plans for any proposed manure storage structure. Any plans for manure storage structures of 500,000 gallons capacity or larger shall have been prepared or approved by a registered professional engineer or a soil conservation service employee.

(4) Such additional information relating to the specific site or the specific feedlot operation as may be requested by the Director to evaluate compliance with federal and state rules and regulations.

d. When more than one person is in possession, control or has title to a single animal feedlot, only one person needs to apply for an animal feedlot permit, however, the permit application must list all owners in accordance with 6 MCAR § 4.8051 D.1.c.(1). All owners are responsible for compliance with these rules and permits or certificates of compliance issued pursuant to these rules.

2. The animal feedlot permit application shall be reviewed by the county feedlot pollution control officer or by the Director if a county permit processing program has not been implemented in the county where the animal feedlot will be located.

a. No permit shall be required when the review of the application indicates that all animal manures are being used as domestic fertilizer and that a potential pollution hazard does not exist or that potential pollution hazards have been satisfactorily addressed by corrective or protective measures. However, a certificate of compliance shall be obtained by the owner of such an animal feedlot prior to commencing operation of the new feedlot, changing the operation of an existing feedlot or changing ownership of an existing feedlot.

b. The Agency shall consider the issuance of a permit when the review indicates that a potential pollution hazard exists and has not been addressed by corrective or protective measures or when manure is not being used as a domestic fertilizer.

(1) An interim permit shall be issued by the Director when the potential pollution hazard will be corrected within ten months of the date of permit issuance. When all necessary corrective and protective measures have been installed on a permitted animal feedlot, the permit shall terminate and a certificate of compliance shall be issued.

(2) An animal feedlot permit may be issued by the Agency when the potential pollution hazard will not be corrected within ten months of the date of permit issuance or when manure is not used as a domestic fertilizer. This permit shall contain such conditions and requirements as the Agency deems necessary in order to insure compliance with applicable state rules and regulations.

(3) If it is determined during the review process that an animal feedlot must obtain a National Pollutant Discharge Elimination System (NPDES) permit, the applicant shall be notified and a permit shall be processed and issued as prescribed in Minn. Rule WPC 36 (1974).

E. Existing permits for the construction and operation of livestock feedlots, poultry feedlots and other animal lots. The conditions and provisions of all Agency animal feedlot permits issued under Minn. Rules SW 51-61 before the effective date of these rules shall continue to be in effect. Upon application for a change in operation or change of ownership of an existing, permitted animal feedlot, the permit shall be reconsidered pursuant to these rules.

F. Procedural rules and appeals. All requests for hearings, appeals and other procedural matters not specifically provided for herein shall be governed by the Agency Rules of Procedure, the Rules of the Office of Hearing Examiners and other applicable statutes and rules.

G. Severability. If any provision of this rule or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions of this rule or application of any other part of this rule which can be given effect without application of the invalid provision. To this end the provisions of all sections, subsections and subdivisions herein and the various applications thereof are declared to be severable.

H. Variance from rules. Any person may apply for a variance from any requirements of this rule. Such variances shall be applied for and acted upon by the Agency in accordance with Minn. Stat. § 116.07 subd. 5 (1978) and other applicable statutes and rules.

6 MCAR § 4.8052 Rules for the processing of animal feedlot permit applications by counties.

A. General applicability. Any Minnesota county board may, by resolution, assume responsibility for processing applications for animal feedlot permits as authorized by Minn. Stat. § 116.07 subd. 7 (1978). The provisions of these rules shall govern the exercise of approval and supervising authority by the Agency with respect to the processing of animal feedlot permit applications by a county.

B. County processing procedure for animal feedlot permit applications.

1. Any Minnesota county board desiring to assume responsibility for processing animal feedlot permit applications shall:

a. Submit to the Director a resolution duly adopted by the county board requesting permission to process animal feedlot permit applications in the county. Such resolution shall be accompanied by a statement describing the permit application processing procedure to be used by the county..

b. Receive written approval from the Agency authorizing the processing of animal feedlot permit applications within the county.

c. Designate a county feedlot pollution control officer as having the primary responsibility for the animal feedlot permit program and charge him with the following duties:

(1) Distribute permit application forms made available by the Director to those required to make application for the permit.

(2) Provide, where requested, assistance to applicants to insure that application forms are properly completed.

(3) Receive and review completed application forms and conduct such inspections as necessary to determine if the proposed animal feedlot will comply with applicable state rules and regulations and applicable local ordinances.

(4) Maintain a record of all correspondence and material relating to animal feedlot applications, certificates of compliance, and interim permits issued by the county.

2. The processing of applications for animal feedlot permits by a county board, as defined in Minnesota Statutes § 116.07 subd. 7(a), (b), and (c) (1978), shall be accomplished according to the following procedure:

a. For animal feedlots with less than 1,000 animal units where manure is used as a domestic fertilizer and with no potential pollution hazard, the county feedlot pollution control officer shall provide a certificate of compliance to the Agency and the applicant stating that the animal feedlots comply with all aspects of 6 MCAR § 4.8051 and that no animal feedlot permit is required.

b. For animal feedlots of less than 300 animal units where manure is used as a domestic fertilizer and where all potential pollution hazards have been mitigated by protective or corrective measures the county feedlot pollution control officer shall provide a certificate of compliance to the Agency and to the applicant stating that the animal feedlots comply with 6 MCAR § 4.8051 and that no animal feedlot permit is required.

c. The county feedlot pollution control officer shall forward to the Director, with recommendations and comments, all animal feedlot permit applications which fall within the following categories:

(1) Animal feedlots of 1,000 animal units or more; or

(2) Animal feedlots of more than 300 animal units where a potential pollution hazard has been mitigated through corrective or protective measures; or

(3) Animal feedlots with a potential pollution hazard which has not been mitigated by corrective or protective measures; or

(4) Animal feedlots where manure is not used as domestic fertilizer; or

(5) Animal feedlots for which further technical review is desired by the county feedlot pollution control officer.

3. Any county board which has assumed responsibility for processing feedlot permit applications in accordance with 6 MCAR § 4.8052 B.1., may issue, deny, modify, impose conditions upon or revoke interim permits for animal feedlots smaller than 300 animal units where animal manure is used as a domestic fertilizer and with a potential pollution hazard which will be mitigated by corrective or protective measures within ten months of the date of the issuance of the interim animal feedlot permit. These permits shall be issued, denied, modified, have conditions imposed upon them or revoked in conformance with the following requirements:

a. In order for the county to issue an interim permit:

(1) The Director must receive written notification of the intention of the county to issue an interim permit. Such notification must include the completed permit application, a copy of the draft interim permit proposed for issuance by the county and documentation concerning the potential pollution hazard and the corrective or protective measures to be taken by the owner;

(2) The Director shall, after receipt of written notification of intent to issue an interim permit, review the draft interim permit within 15 days to determine compliance with applicable Agency rules and shall approve, suspend, modify, or reverse the issuance of the interim permit. If the Director approves issuance of the interim permit, the interim permit and a certificate for display shall be returned to the county for issuance to the operator. If the Director suspends, modifies or reverses the issuance of the interim permit, the applicant retains all rights of appeal set out in 6 MCAR § 4.8052 C. If the Director fails to act within 15 days after receipt of the draft interim permit from the county, the county may proceed to issue the interim permit.

b. In order for a county to modify or impose conditions upon a interim permit the county shall notify the Director in writing of its intention to modify or impose conditions upon an interim animal feedlot permit. Such notification must include a copy of the interim permit together with the intended modifications and conditions. The Director shall determine compliance with the provisions of applicable Agency rules and shall either approve, suspend, further modify or reverse the recommended modification or conditions within 15 days of receipt of the aforementioned notice of intent. The county shall be notified of said Agency action. The applicant retains all rights of appeal set out in 6 MCAR § 4.8052 C.

c. In order for a county to revoke an interim permit a copy of the

interim permit together with a written justification for revocation must be submitted to the Director for review. The Director shall, after receipt of the justification for revocation by the county, review the matter within 15 days to determine compliance with the provisions of applicable Agency rules. The county must receive written approval of the interim permit revocation from the Agency prior to taking action. Where a revocation has been approved by the Agency, the applicant must be informed in writing by the county of the reasons for revocation and the applicant shall retain all rights of appeal set out in 6 MCAR § 4.8052 C.

d. In the case of a denial of an interim permit application by the county board, the applicant shall be informed by the county in writing of the reasons for denial and shall be informed of applicable appeal procedures. The applicant shall retain all rights of fundamental fairness afforded by law and the applicant may make an appeal to the Agency to review the county's action. Such a denial by a county shall be without prejudice to the applicant's right to an appearance before the Agency to request a public hearing or to file a further application after revisions are made to meet objections specified as reasons for denial. The Agency shall approve, suspend, modify or reverse the denial of an interim permit if the matter has been appealed to the Agency.

4. If the county has issued an interim permit, the county feedlot pollution control officer shall terminate the permit and issue a certificate of compliance when all necessary corrective and protective measures have been installed.

5. The Director shall review within 15 days all animal feedlot permit applications forwarded by the county and shall notify the county of the status of the review and of any intended action with respect to all properly completed animal feedlot permit applications.

6. A county no longer wishing to continue in the application review process shall submit a resolution stating its reasons for withdrawal and the effective date of withdrawal to the Director.

7. If the Agency finds that a county program is not meeting the requirements of these rules, the Agency may, after giving the county written notice and an opportunity to respond, revoke its approval of the county's application review authority.

C. Procedural rules and appeals. All requests for hearings, appeals and other procedural matters not specifically provided for herein shall be governed by the Agency Rules of Procedure, the Rules of the Office of Hearing Examiners and other applicable statutes and rules.

D. Severability. If any provision of this rule or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions of this rule or application of any other part of this rule which can be given effect without application of the invalid provision. To

this end the provisions of all sections, subsections and subdivisions herein and the various applications thereof are declared to be severable.

E. Variance from rules. Any person may apply for a variance from any requirements of this rule. Such variances shall be applied for and acted upon by the Agency in accordance with Minn. Stat. § 116.07 subd. 5 (1978) and other applicable statutes and rules.

6 MCAR S 4.9001 General applicability, definitions, abbreviations, incorporations, severability, and variances.

A. General applicability. The provisions of these rules govern the identification, classification, storage, labeling, transportation, treatment, processing and disposal of hazardous waste by any person and the issuance of permits for the construction, operation and closure of a hazardous waste facility for the protection of the environment.

B. Definitions. As used in these hazardous waste rules the following words shall have the meanings defined herein:

1. Agency: the Minnesota Pollution Control Agency.
2. Chemical composition: any of the following:

- a. A standard chemical nomenclature such as those adopted by the International Union of Pure and Applied Chemistry or the Chemical Abstracts' Service.

- b. Common chemical name when it is documented to the director that the number of isomers, related compounds of similar chemical structure and property, etc., make chemical analysis or delineation impractical.

- c. Common chemical name of a mixture of components with similar properties, but not including a trade name.

3. Components of the waste: chemical elements, chemical compounds and ions that constitute the waste and those that may form during the management of the waste from chemical reactions among the components or as biological products of microbial action.

4. Container: any packaging or containment unit, excluding portable tanks and storage tanks.

5. Corrosive material: a material that has any one of the following properties:

- a. a pH that is greater than 12 or less than three for an aqueous material;

- b. the ability to cause a visible destruction or irreversible alteration of skin tissues at the site of contact following an exposure period of four hours or less when tested by the technique described in 16 Code of Federal Regulations, section 1500.41 (1977);

- c. a corrosion rate of 0.250 inch per year or more on Society of Automotive Engineers' 1020 Steel when tested in accordance with the minimum requirements described in the National Association of Corrosive Engineers' Standard TM-01-69, at a test temperature of 130 degrees Fahrenheit (54.4 degrees

Celsius).

6. Demolition debris: concrete, blacktop, bricks, stone facing, concrete block, stucco, glass, structural metal and wood from demolished structures.

7. Director: the executive director of the Minnesota Pollution Control Agency.

8. Explosive material: a material that has the property either to evolve large volumes of gas that are dissipated in a shock wave or to heat the surrounding air so as to cause a high pressure gas that is dissipated in a shock wave. Explosive materials include, but are not limited to, explosives as defined in 49 Code of Federal Regulations, section 173.50 (1976) and compressed gases as defined in 49 Code of Federal Regulations, section 173.300 (1976).

9. Facility operator: any person who owns, leases, operates, controls, supervises, closes, or abandons a hazardous waste facility.

10. Flammable material: any material that:

a. has a flash point below 200 degrees Fahrenheit (93.3 degrees Celsius), except the following:

(1) a material comprised of miscible components having one or more components with a flash point of 200 degrees Fahrenheit (93.3 degrees Celsius), or higher, that make up at least 99 percent of the total volume of the mixture;

(2) a material that has a flash point greater than 100 degrees Fahrenheit (37.8 degrees Celsius) and that when heated to 200 degrees Fahrenheit (93.3 degrees Celsius) will not support combustion beyond the flash;

(3) an explosive material; or

b. may ignite without application of a flame or spark including, but not limited to, nitro cellulose, certain metal hydrides, alkali metals, some oily fabrics, some processed meals and acidic anhydrides.

c. is capable of spontaneously producing temperatures in excess of 200 degrees Fahrenheit (93.3 degrees Celsius).

11. Flash point: the minimum temperature at which a material gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the material.

12. Floodplain: as defined in Minnesota Statutes, section 104.02, subdivision 3.

13. Garbage: discarded material resulting from the

handling, processing, storage, preparation, serving and consumption of food.

14. Generator: a person who produces a hazardous waste within the state of Minnesota or a person who produces a hazardous waste outside the state of Minnesota that is transported to a hazardous waste facility within the state of Minnesota.

15. Ground water: the water contained below the surface of the earth in the saturated zone including, without limitation, all waters whether under confined, unconfined or perched conditions, in near surface unconsolidated sediment or regolith, or in rock formations deeper underground. The term ground water shall be synonymous with underground water.

16. Hazardous property: any property of a waste that requires the waste to be classified as a hazardous waste.

17. Hazardous waste: as defined in Minnesota Statutes, section 116.06, subdivision 13.

18. Hazardous waste facility: real or personal property that is used or is constructed to be used for the management of hazardous waste including, but not limited to the following:

a. Hazardous waste containerized storage facility: a hazardous waste facility that is designed or operated for the onsite storage of hazardous waste that is in containers, portable tanks or storage tanks.

b. Hazardous waste noncontainerized storage facility: a hazardous waste facility that is designed or operated for the storage of hazardous waste in lagoons, basins, ponds, vaults or similar bulk storage other than containers or tanks.

c. Hazardous waste transfer station: a hazardous waste facility that receives wastes from one or more generators and is designed or operated for the purpose of intermediate storage of wastes prior to transportation of the waste to another hazardous waste facility.

d. Hazardous waste processing facility: a hazardous waste facility that is designed and operated to modify the chemical composition or chemical, physical, or biological properties of a hazardous waste by means such as incineration, reclamation, distillation, precipitation or other similar processes.

e. Hazardous waste land disposal facility: a hazardous waste facility that is designed or operated for the purpose of disposing of, or storing for a period greater than one year, hazardous waste in the subsurface of the land.

f. Hazardous waste land treatment facility: a hazardous waste facility that is designed or operated for the

purpose of utilizing the surface of the land as the medium by which biological, physical or chemical processes can provide treatment of hazardous waste.

19. Hazardous waste management: the total system for the identification, storage, collection and removal of hazardous waste from public or private property, the transportation of the waste to a hazardous waste facility, and the ultimate processing or disposal of the waste by approved methods in accordance with these regulations. Any reference to hazardous waste being managed shall refer to the foregoing.

20. Incompatible wastes: wastes that when in contact with each other pose a threat to human health and safety that does not exist when they are separate, including, but not limited to, wastes that pursuant to 49 Code of Federal Regulations, section 177.848 (1976) cannot be stored or transported together.

21. Irritative material: a noncorrosive material which has the property to cause a local reversible injury to a biological membrane at the site of contact as determined by either of the following:

a. Practical experience with the waste where short term exposures have caused first degree burns and where long term exposure may cause second degree burns;

b. Skin irritation of an empirical score of five or more as determined pursuant to 16 Code of Federal Regulations, section 1500.41 (1977).

22. Leachate: a liquid that is released from, or percolated through, a waste as a result of conditions that arise during storage, land disposal, or land treatment.

23. Manifest: The shipping papers used in transporting hazardous waste.

24. Median lethal concentration (LC_{50}): the calculated concentration at which a material kills 50 percent of a group of test animals within a specified time.

a. Aquatic LC_{50} : the LC_{50} determined by a test in which the specified time is 96 hours, the test animals are at least ten fathead minnows, and the route of administration follows accepted static or flow through bio-assay techniques.

b. Inhalation LC_{50} : the LC_{50} determined by a test in which the specified time is 14 days, the group of the test animals is at least ten white laboratory rats of 200 to 300 grams each, half of which are male and half of which are female, and the route of administration is continuous respiratory exposure for a period of one hour.

25. Median lethal dose (LD_{50}): the calculated dose at

which a material kills 50 percent of a group of test animals within a specified time.

a. Oral LD₅₀: the LD₅₀ determined by a test in which the specified time is 14 days, the group of test animals is at least ten white laboratory rats of 200 to 300 grams each, half of which are male and half of which are female, and the route of administration is a single oral dose.

b. Dermal LD₅₀: the LD₅₀ determined by a test in which the specified time is 14 days, the group of test animals is ten or more white rabbits, half of which are male and half of which are female, and the route of administration is a 24 hour exposure with continuous contact on bare skin.

26. Onsite management: the handling of a hazardous waste after generation without transporting such hazardous waste by public thoroughfare.

27. Open burning: the burning of any matter whereby the resultant combustion products are emitted directly to the atmosphere without passing through an adequate stack, duct or chimney.

28. Oxidative material: any material with the property to readily supply oxygen to a reaction in the absence of air. Oxidative materials include, but are not limited to, oxides, organic and inorganic peroxides, permanganates, perrhenates, chlorates, perchlorates, persulfates, nitric acid, organic and inorganic nitrates, iodates, periodates, bromates, perselenates, perbromates, chromates, dichromates, ozone and perborates. Bromine, chlorine, fluorine and iodine react similarly to oxygen under some conditions and are therefore also oxidative materials.

29. Person: as defined in Minnesota Statutes, section 116.06, subdivision 8.

30. Pesticide: any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest, and any substance or mixture of substances intended for use as a plant regulator, defoliant or desiccant.

31. Petroleum waste: an oily waste generated by petroleum storage, petroleum refining and petroleum refinery products storage.

32. Resource recovery: as defined in Minnesota Statutes, section 473.121, subdivision 31c.

33. Routine waste management: the total system for the handling of a waste by one of the following methods:

a. Storage, collection, and removal of waste from public or private property, its transportation to intermediate or final disposal facilities, and its ultimate disposal at a sanitary landfill permitted by the agency.

b. Discharge into a sewer system and subsequent treatment at a wastewater treatment works operated pursuant to a National Pollutant Discharge Elimination System Permit or State Disposal Permit.

c. Discharge into the atmosphere as an air contaminant or emission emitted pursuant to an Emission Facility Operating Permit.

d. A wastewater discharge pursuant to a National Pollutant Discharge Elimination System Permit or a State Disposal System Permit.

34. Rubbish: discarded paper, cardboard, scrap metal, yard clippings, crop residues, brush, wood, glass, bedding, crockery or litter.

35. Sanitary landfill: a land disposal site employing an engineered method of disposing of solid waste on land in a manner that minimizes environmental hazards by spreading the solid waste in thin layers, compacting the solid waste to the smallest practical volume, and applying cover material at the end of each operating day, or at intervals as may be required by the agency.

36. Saturated zone: that part of the earth's crust in which all the voids, large and small, are ideally filled with water under pressure greater than atmospheric.

37. Sewage: as defined in Minnesota Statutes, section 115.01, subdivision 2.

38. Sewer system: as defined in Minnesota Statutes, section 115.01, subdivision 6.

39. Shoreland: as defined in Minnesota Statutes, section 105.485, subdivision 2.

40. Tank: any packaging or containment unit having a capacity of 100 gallons or greater that is used to confine and hold a material. Tanks that are anchored, fixed or attached to one location are storage tanks, and those that are not are portable tanks.

41. Toxic material: a material with any one of the following properties:

a. An oral LD_{50} less than 500 milligrams of material per kilogram of body weight of test animal.

b. A dermal LD_{50} less than 1,000 milligrams of material per kilogram of body weight of test animal.

c. An inhalation LC_{50} (when the material or a component is in a form that may be inhaled) less than:

(1) 2,000 milligrams of material as dust or mist per cubic meter of air, or

(2) 1,000 parts per million of material as gas or vapor.

d. An aquatic LC₅₀ less than 100 milligrams of material per liter of water.

42. Waste: any discarded material including, but not limited to, solids, semisolids, sludges, liquids, gases, and their vapors, mists, or dusts.

43. Waters of the state: as defined in Minnesota Statutes, section 115.01, subdivision 9.

44. Water table: the surface of the ground water at which the pressure is atmospheric. Generally this is the top of the saturated zone.

45. Wetland: a natural marsh where water stands near, at or above the soil surface during a significant portion of most years, and which is eligible for classification as an inland fresh water wetland type 3, 4 or 5 under U. S. Department of Interior classifications.

C. Abbreviations. The abbreviations used in these hazardous waste rules have the following meanings:

1. A.S.T.M.: American Society for Testing and Materials.
2. C.F.R.: Code of Federal Regulations.
3. EPA: U.S. Environmental Protection Agency.
4. LC₅₀: median lethal concentration.
5. LD₅₀: median lethal dose.
6. NPDES: National Pollutant Discharge Elimination System.

D. Incorporations. The following are contained in the indicated appendices at the end of this rule and are hereby incorporated and made a part of these rules and shall apply as indicated within these rules:

1. ASTM D3243-76 (Appendix A).
2. ASTM D56-70 (Appendix B).
3. ASTM D3278-73 (Appendix C).
4. ASTM D93-73 (Appendix D).
5. ASTM D2487-69 (Appendix E).

6. ASTM D2488-69 (Appendix E).

7. National Association of Corrosion Engineers' Standard TM-01-69 (Appendix G).

8. 10 Code of Federal Regulations, section 20.301 (1977) (Appendix H).

9. 16 Code of Federal Regulations, section 1500.41 (1977) (Appendix I).

10. 49 Code of Federal Regulations, sections 173.50, 173.300, 177.824 and 177.848 (1976) (Appendix J).

11. United States Department of Interior inland fresh water wetland types 3, 4, and 5 (Appendix K).

12. EP Toxicity Text (Appendix L).

13. 49 Code of Federal Regulations, sections 172.202 and 172.203 (1979) (Appendix M).

E. Severability. If any provision of these rules or the application thereof to any person or circumstance is held to be invalid, such invalidity shall not affect other provisions of these rules that can be given effect without the invalid provision or application. To this end, the provision of all rules and the various applications thereof are declared to be severable.

F. Variances. Any person may apply for a variance from any requirement of these hazardous waste rules. Such variance shall be applied for and acted upon by the agency in accordance with Minnesota Statutes, section 116.07, subdivision 5 and other applicable statutes and rules.

G. Other standards. Nothing in these hazardous waste rules shall relieve any person from any obligations or duties imposed by any other laws, statutes, rules, standards or ordinances of the federal, state or local governments or any agency thereof now in effect or which become effective in the future. In the event these hazardous waste rules conflict with any such laws, statutes, rules, standards, or ordinances, the more stringent shall apply. Nothing in these rules shall be construed to require any person to comply with any portion of these rules if that portion should at any time be preempted by federal law.

6 MCAR § 4.9002 Classification, evaluation and certification of waste.

A. Applicability. This rule establishes the criteria for determining whether a waste is a hazardous waste.

B. Hazardous wastes. The following wastes are hazardous wastes:

1. A waste that contains a component specified in List 1 is a hazardous waste if the concentration of that component in the waste exceeds the concentration listed.

List 1

Component	Concentration (ppm)
2-Acetylaminofluorene (2-AAF)	1000
4-Aminodiphenyl (4-ADP)	100
Arsenic and its Compounds	500
Benzene	100
Benzidine	100
Beryllium and its Compounds	20
Cadmium and its Compounds	500
Carbon Tetrachloride	100
Chloroform	100
bis-(Chloromethyl) ether (BCME)	100
Chloromethyl methyl ether (CMME)	100
Chromium and its Compounds (VI)	1000
3,3-Dichlorobenzidine (DCB)	1000
4-Dimethylaminoazobenzene (DAB)	1000
Ethyleneimine (EI)	1000
Lead and its Compounds	600
4,4-Methylene-bis-2-Chloroaniline (MOCA)	100
α -Naphthylamine (1-NA)	1000
β -Naphthylamine (2-NA)	100
Nickel and its Compounds	10,000
4-Nitrobiphenyl (4-NBP)	100
n-Nitrosodimethylamine (DMN)	1000
Polychlorinated biphenyl (PCB)	500
β -Propiolactone (BPL)	1000
Vinyl Chloride (VCM)	100

2. A waste which contains a component specified in List 2 is a hazardous waste unless leachate from that waste does not contain that component at a concentration in excess of that specified in List 2.

List 2

Component	Concentration (ppm)
Aldrin	0.03
Arsenic and its Compounds	5.0

Cadmium and its Compounds	1.0
Chlordane	0.1
Chromium and its Compounds	5.0
DDT	0.01
Endrin	0.02
Heptachlor	0.01
Lead and its Compounds	3.0
Mercury and its Compounds	0.2
Methoxychlor	0.3
Mirex	0.01
Polychlorinated biphenyl (PCB)	0.01
Toxaphene	0.05

3. Any of the following wastes:

- a. An explosive material.
- b. A flammable material.
- c. An irritative material.
- d. A corrosive material.
- e. An oxidative material.
- f. A toxic material.
- g. Used crankcase oil.
- h. Petroleum waste.

4. A waste that is a mixture of small amounts of unrelated chemicals such that the description of any sample or set of samples is not representative of the total waste. Examples are discarded chemicals from a chemistry laboratory, wastes from pilot plant chemical reactions and discarded prescription drugs.

5. Any other waste that is not a hazardous waste under any provision in 6 MCAR § 4.9002 B. 1.-4., but that the agency determines pursuant to 6 MCAR § 4.9002 H. 2. cannot be handled by routine waste management techniques because it poses a substantial present or potential hazard to human health or other living organisms.

C. Exempt wastes. The following wastes may be stored, labeled, transported, treated, processed and disposed of without complying with the requirements of these rules:

1. Normal refuse from households.
2. Sewage.

3. Garbage, rubbish and demolition debris from nonhousehold sources.
4. Asbestos in taconite wastes.
5. Septic tank sludge from households.
6. An air contaminant or emission emitted pursuant to an Emission Facility Operating Permit.
7. Any composite wastewater that is formed in a sewer system by the combination of two or more individual wastes that have been discharged into the sewer system. This exemption does not include any of the individual wastes which form the composite wastewater.
8. Wastes discharged pursuant to an NPDES Permit or a State Disposal System Permit.
9. Municipal sewage sludge.
10. Radioactive waste that is produced pursuant to a permit issued under 10 C.F.R. Parts 30, 40 and 70 (1976) and that is disposed of in compliance with 10 C.F.R. § 20.301 (1976).
11. A waste pesticide that is not in List 1 or List 2 or an unrinsed pesticide container that contained a pesticide that is not in List 1 or List 2.
12. The director shall exempt wastes resulting from spills from all or any provision of these rules if the exemption is necessary to expedite the proper management of the spilled material and to prevent, abate or control pollution.

D. Evaluation of wastes.

1. Any person who produces any waste within the State of Minnesota or any person who produces a waste outside the State of Minnesota that is managed within the State of Minnesota, and which waste is not an exempt waste under subsection C, shall evaluate the waste to determine if it is hazardous. The person evaluating the waste shall compare the properties of the waste with the criteria for a hazardous waste in subsection B and determine whether the waste is hazardous, in accordance with the procedures set forth in this rule.
2. The person shall reevaluate the waste whenever the person has reason to believe that the composition of the waste is altered so that the results of the previous evaluation are no longer representative of the waste.
3. This evaluation shall be of the individual waste prior to any mingling or combining with other wastes. If wastes are subsequently mingled or combined, except for wastes that are mingled or combined in a sewer system, the generator shall also evaluate the waste resulting from the mingling or combining.

4. A person who produces two or more wastes that are similar or are from similar processes such that one waste is representative of the other wastes may use one evaluation for all such wastes.

E. Comparison of properties.

1. General. Any person evaluating a waste shall obtain such data as are necessary to determine whether the waste has any hazardous properties at any time during its management. The data may be obtained from the literature, from experience with the waste or from other sources, but if data are not available, then actual tests of a sample of the waste shall be conducted.

2. List 1 and List 2 components. Whenever the person evaluating a waste knows or suspects that any of the components in List 1 or List 2 is in the waste, the person shall conduct a quantitative analysis to determine the concentration of each component in List 1 that is known or suspected to be in the waste and the EP Toxicity Test for each component in List 2 that is known or suspected to be in the waste with the following exceptions:

a. A waste known to contain a component of List 1 in excess of the concentration listed in List 1 need not be analyzed for that component.

b. A waste which is a hazardous waste because it contains a component of List 1 in excess of the concentration listed in List 1 need not be tested for that component in a List 2 test.

3. Other hazardous properties.

a. A person evaluating a waste shall determine whether the waste has any of the properties of an explosive material, a flammable material, an irritative material, a corrosive material, an oxidative material, and a toxic material. However, once the person determines that a waste has one of the properties of one of the classes of hazardous wastes described above, the person need not determine whether it has any of the other properties of the same class. For example, if a waste is a hazardous waste because of its oral LD₅₀, the dermal LD₅₀ need not be determined, but the waste must be evaluated to determine whether it is also explosive, flammable, irritative, corrosive or oxidative.

b. Generators of wastes comprised of small amounts of unrelated chemicals such that a description of any sample or set of samples is not representative of the total waste, generators of petroleum waste and generators of used crankcase oil need not evaluate such wastes to determine whether they have any of the properties of an explosive material, a flammable material, an irritative material, a corrosive material, an oxidative material and a toxic material. Such generators are also not required for such wastes to conduct a quantitative analysis to determine the concentration of each component in List 1 that is known or suspected to be in the waste nor a leachate test for each component in List 2 that is known or suspected to be in the waste.

4. Testing for flammable properties. Whenever the flash point of a waste is to be determined, one of the following test procedures shall be used. The test chosen shall be appropriate for the characteristics of the waste that is tested.

a. Standard Method of Test for Flash Point by Tag Closed Tester (ASTM D56-70).

b. Standard Method of Test for Flash Point of Aviation Turbine Fuels by Setaflash Closed Tester (ASTM D3243-76).

c. Standard Methods of Test for Flash Point of Liquids by Setaflash Closed Tester (ASTM D3278-73).

d. Standard Method of Test for Flash Point by Pensky-Martens Closed Tester (ASTM D93-73) or alternate tests authorized in this standard.

For any waste containing components with different volatilities and flash points and having a flash point higher than 200°F (93.3°C) according to the test procedure employed, a second test shall be conducted on a sample of the liquid portion of the material that remains after evaporation in an open beaker (or similar container), under ambient pressure and temperature (20 to 25°C) conditions, to 90 percent of original volume or for a period of four hours, whichever occurs first, with the lower flash point of the two tests being the flash point of the material.

5. Testing for toxic properties. Any person who is determining whether a waste is a toxic material may elect to use the following modification to the LC₅₀ and LD₅₀ test procedures if the actual LC₅₀ or LD₅₀ is unknown:

a. A single dosage or exposure level equivalent to the maximum dosage or exposure level in 6 MCAR § 4.9001 B.40. which establishes that a material is a toxic material shall be administered to a test population of ten animals. The animals shall be the kind specified in the LC₅₀ and LD₅₀ test procedures. The animals are then observed for a period of 14 days or 96 hours whichever is applicable. If five or more of the test animals die, the waste shall be classified as a toxic material. If three or four of the test animals die, then either the waste shall be classified as a toxic material or additional dosage or exposure levels shall be tested and the actual LC₅₀ or LD₅₀ determined. If less than three of the ten test animals die, then the waste shall not be classified as a toxic material.

6. Testing for corrosive properties. Any person testing for corrosive properties may elect to use the following procedure for a nonaqueous waste: the person may prepare an aqueous solution that contains equal parts of the waste and water and test it for pH. If the pH of the solution is greater than 12 or less than 3, the person may classify the waste as a corrosive waste in lieu of evaluating the waste for the criteria indicated by 6 MCAR § 4.9001 B. 5. If the person elects not to classify the nonaqueous waste as a corrosive waste or if the pH of the solution is not greater than 12 or less than 3, additional evaluation to determine corrosivity must be performed.

7. Sample collection. In the event the person evaluating the waste must conduct tests to determine the properties of the waste, the person shall collect a representative sample of the waste. In an attempt to collect a sample at the time when the properties being measured pose the greatest hazard, the person shall consider the following variations in the waste composition and their causes in collecting a sample for evaluation:

- a. Variations in the process by which the waste is produced.
- b. Variations in chemical composition and physical state.
- c. Any other variations indicated by past experience with the waste or similar wastes.

F. Results of evaluation. If the person evaluating the waste determines that the waste has any properties of a hazardous waste, the person shall file a disclosure with the agency and manage the waste in accordance with the requirements of these rules.

G. Submission of evaluation results.

1. The director may request at any time that a person producing a waste submit the results of the evaluation of the waste to the agency. Upon such request by the director, setting forth the reasons therefore, the person shall submit the following information:

- a. The type of waste and the source or process from which it was produced.

- b. The chemical composition of the waste and the anticipated fluctuations in its chemical composition.

- c. The concentration of each component in List 1 that is known or suspected to be in the waste and the concentration in the leachate of each component in List 2 that is known or suspected to be in the waste. If the component is not detected in the waste or in the leachate, the level of detectability of the testing method used shall be reported.

- d. The results of the evaluation to determine whether the waste has any of the properties of an explosive material, a flammable material, an irritative material, a corrosive material, an oxidative material, and a toxic material and the source of the data or information relied upon.

- e. In the event any tests were conducted to evaluate the waste, the person shall submit the following:

- (1) The sampling procedure and the reasons for determining that the sample is representative of the waste.

- (2) The results of all tests conducted.

- (3) A discussion of the accuracy and precision of any tests conducted.

2. If the person who is requested by the director to submit the results of an evaluation of a waste fails to submit the required information within thirty (30) days after the request, the waste shall be managed as a hazardous

waste and the person who produces the waste shall be considered a generator until the agency has determined whether the waste is hazardous or not.

3. If the director determines that the results of the evaluation are not adequate to determine whether or not the waste is hazardous, the director may require the person to conduct an additional evaluation. The director shall notify the person in writing of such determination, the reasons therefor, and the additional tests that must be run or additional data that must be obtained. If the results of the additional evaluation are not reported to the agency within thirty (30) days of the request, the waste shall be managed as a hazardous waste and the person who produces the waste shall be considered a generator until the agency has determined whether the waste is hazardous or not. The director may grant up to an additional ninety (90) days where the person demonstrates such extension to be necessary.

H. Agency determination that a waste is hazardous.

1. The agency or any member, employee, or agent thereof, when authorized by it, may enter upon the property of the person who produces any waste to take samples of the waste and may conduct tests, analyses and evaluations to determine whether the waste is a hazardous waste. The results of the tests, analyses, and evaluations shall be made available, upon request, to the person.

2. The director may recommend to the agency that a waste be classified as a hazardous waste because it has one or more of the properties of a hazardous waste or because the waste cannot be handled by routine waste management techniques because it poses a substantial or potential hazard to human health or other living organisms. The director shall notify the person producing the waste in writing of the recommendation and the person shall have at least thirty (30) days to submit any additional material or written comments to the agency before the agency makes a determination. The agency shall notify the person in writing of its decision. The agency shall hold a contested case hearing pursuant to Minn. Stat. § § 15.0418 et seq. upon request of the person producing the waste.

3. In the event the director recommends that a waste be classified as a hazardous waste, the waste shall be managed as a hazardous waste and the person who produces the waste shall be considered a generator until the agency has determined whether the waste is hazardous or until six months after the date of the director's recommendation, whichever occurs first; provided, however, that the person shall not be required to obtain a Hazardous Waste Facility Permit for storage of the waste on-site during this time. Any such recommendation by the director shall be considered by the agency on an expeditious basis.

6 MCAR § 4.9003 Generation of hazardous waste.

A. Applicability. This rule prescribes the duties of a generator.

B. Production of a hazardous waste. No person shall produce a hazardous waste within the State of Minnesota or produce a hazardous waste outside the State of Minnesota that is transported to a hazardous waste facility within the State of Minnesota unless that person has adequate financial resources to insure that the hazardous waste is disposed of, treated or processed at a hazardous waste facility permitted to manage such waste. Nothing in this provision is intended to restrict or enlarge or affect in any way, any liability the generator may have to correct the mismanagement of the hazardous waste or pay for damages or alleviate any pollution caused by the mismanagement of the hazardous waste.

C. Preparation of a disclosure. Each generator shall prepare a disclosure for each hazardous waste that he produces or transports, except used crank-case oil that is collected by a transporter registered pursuant to 6 MCAR § 4.9005 G.

D. Contents of a disclosure.

1. Each generator in his disclosure shall include the following information:

a. The type of waste and the source or process from which it is generated.

b. The chemical composition of the waste and the anticipated fluctuations in the chemical composition that will occur during normal operations.

c. The concentration of each component in List 1 that is known or suspected to be in the waste and the concentration in the leachate of each component in List 2 that is known or suspected to be in the waste. If the component is not detected in the waste or in the leachate, the level of detectability of the testing method used shall be reported.

d. The hazardous properties of the waste and the source of the data or information used to identify the hazardous properties.

e. In the event any tests were conducted to evaluate the waste, the following information shall be included in the disclosure:

(1) The sampling procedure and the reasons for determining that the sample is representative of the waste.

(2) The results of all tests conducted.

(3) A discussion of the accuracy and precision of any tests conducted.

f. A list of special handling procedures, labels and safety equipment necessary for safe handling and storage of the hazardous waste.

g. The name, address, telephone numbers and title of the individual at the generator's facility responsible for arranging for the management of the hazardous waste.

h. A copy of procedures for personnel to follow in the case of spills of the hazardous waste.

i. A summary of the following relating to the management of the hazardous waste for the year preceding the filing of the disclosure or for the period since the last disclosure was filed if that filing was more than one year ago:

(1) The amount of the hazardous waste produced.

(2) The names and identification numbers of the transporters utilized.

(3) The names of the hazardous waste facilities utilized, and, as applicable:

(a) The numbers of the Hazardous Waste Facility Permits issued by the agency for those facilities located in the State of Minnesota.

(b) The addresses of those facilities located outside the State of Minnesota.

(c) The name of the waste water treatment works to which a sewered hazardous waste was discharged.

(d) The NPDES or State Disposal Permit number for discharges to sewers other than a municipal sewer system.

(4) A summary taken from the shipping papers and other records of the generator of the amounts spilled, amounts recovered and any resultant environmental or health damages from spills of the hazardous waste.

j. A prediction of the following relating to the management of the hazardous waste for the year immediately following the filing of the disclosure:

(1) The estimated amounts to be produced.

(2) The names and identification numbers of the transporters to be used.

(3) The frequency with which the hazardous waste is expected to be transported or discharged.

(4) The names of the hazardous waste facilities to be involved in the management of the hazardous waste and, as applicable:

(a) The numbers of the Hazardous Waste Facility Permits issued by the agency for those facilities located in the State of Minnesota.

(b) The addresses of those facilities located outside the State of Minnesota.

k. A list of all nonexempt wastes of the generator that have been determined by the generator to be nonhazardous wastes. The list shall include the type of waste and the sources or process from which the waste was produced. Examples of the information required are (1) salt solution from water softening, and (2) wash water from potato processing.

1. Any other information that the generator deems important.

2. Generators of wastes that are comprised of small amounts of unrelated chemicals such that a description of any sample or set of samples is not representative of the total waste, generators of petroleum waste and generators of used crankcase oil are not required to include in the disclosures for those wastes the items listed in subparts b, c, d and e above, but these generators shall identify those components in List 1 or List 2 in 6 MCAR § 9.002 B. that the generator knows or suspects are in the waste.

3. No person shall make a false statement in a disclosure. The disclosure shall be submitted under oath.

E. Submission of a disclosure to the agency.

1. Existing hazardous waste. Each generator who is producing a hazardous waste in the State of Minnesota or who is producing a hazardous waste outside the State of Minnesota that is being transported to a hazardous waste facility within the State of Minnesota on the day these hazardous waste regulations take effect shall submit a disclosure to the agency within one year after the effective date of these regulations. A generator who has produced a hazardous waste in the past and who anticipates producing that hazardous waste in the future may elect to file a disclosure on that hazardous waste under this provision. In such event, the generator shall not be required to file a disclosure under 6 MCAR § 4.9003 E. 2. for that waste.

2. New hazardous wastes.

a. Any generator who produces a hazardous waste in the State of Minnesota that is not being produced on the day these hazardous waste regulations take effect shall submit a disclosure to the agency within ninety (90) days after first producing the hazardous waste. The hazardous waste shall not be disposed of or change possession until at least thirty (30) days after the disclosure is filed with the agency.

b. Any generator who produces a hazardous waste outside the State of Minnesota that is not being transported to a hazardous waste facility within the State of Minnesota on the day these regulations take effect shall file a disclosure with the agency before the hazardous waste is transported to a hazardous waste facility within the State of Minnesota. The hazardous waste shall not be transported to a hazardous waste facility within the State of Minnesota until at least thirty (30) days after the disclosure is filed with the agency.

3. Annual resubmission of a disclosure.

a. After submitting its first disclosure, each generator who is required to submit a disclosure pursuant to subparagraph 1 shall submit a subsequent disclosure according to the following schedule if any hazardous waste has been produced or managed since the first disclosure:

FIRST LETTER IN NAME OF GENERATOR	MONTH OF SUBMISSION (The disclosure shall be made the first time the indicated month occurs after the regulations have been in effect for a period of two years.)
L-N	January
A-C	March
D-G	May
T-Z	July
O-S	September
H-K	November

Each such generator shall submit a new disclosure within ten (10) days of the anniversary date of the second disclosure if any hazardous waste has been produced or managed in the preceding year.

b. Any generator who is required to file a disclosure pursuant to subparagraph 2, shall submit a new disclosure within ten (10) days of the anniversary date of the first disclosure.

c. In submitting a new disclosure for a hazardous waste, the generator need not repeat any information required in a disclosure that has not changed from the previous disclosure, but may merely indicate that the information is the same.

d. Any generator who does not submit a disclosure because the hazardous waste was not produced or transported during the preceding period or year shall inform the agency of such fact and shall comply with the requirements for submitting a disclosure for a new hazardous waste in the event a hazardous waste is again produced or transported.

41922B-21

F. Identification number. Prior to transportation or disposal of any hazardous waste a generator shall obtain a generator identification number from EPA.

G. Preparation of hazardous waste shipping papers. Each generator shall prepare hazardous waste shipping papers for each hazardous waste in accordance with 6 MCAR S 4.9008.

H. Preparation of hazardous waste labels.

1. Each generator shall attach a hazardous waste label to each container and portable tank containing hazardous waste in accordance with the applicable U. S. Department of Transportation regulations on hazardous materials under 49 Code of Federal Regulations, part 172 (1979). In addition, the following words and information shall be displayed:

a. HAZARDOUS WASTE - Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U. S. Environmental Protection Agency.

b. Generator name and address _____

c. Manifest document number _____

d. EPA identification number _____

e. Accumulation start date _____

2. The container or portable tank shall be labeled and marked in a manner that is suitable for interstate commerce.

3. Any generator or other person who maintains a storage tank containing hazardous waste shall display the words "Hazardous Waste" on the storage tank in a legible and conspicuous manner. The words "Hazardous Waste" shall be plainly visible and legible to any person who may operate any outlet valve.

I. Containers and tanks. Each generator shall put hazardous waste only into containers or tanks that comply with the requirements of 6 MCAR S 4.9004 for storage of hazardous waste in containers and tanks at hazardous waste facilities.

J. Proper hazardous waste management. No generator shall relinquish control of a hazardous waste when the generator has reason to believe that the hazardous waste is not being properly managed. Nothing in this rule is intended to restrict or enlarge or affect in any way, any liability the generator may have to correct the mismanagement of the hazardous waste or pay for damages or alleviate any pollution caused by the mismanagement of the hazardous waste.

418220-21

6 MCAR S 4.9004 Location, operation and closure of a hazardous waste facility.

A. Applicability. This rule establishes criteria for the location, operation, and closure of a hazardous waste facility. This rule, however, does not apply to a waste water treatment works that is operated pursuant to an NPDES Permit or State Disposal Permit.

B. Hazardous waste facility location.

1. No person shall establish, construct or operate a hazardous waste facility in a wetland, in a floodplain or within shoreland.

2. No person shall establish, construct or operate a hazardous waste facility in a location where the topography, geology, hydrology, or soil is unsuitable for the protection of the ground water and the surface water.

3. No person shall establish, construct or operate a hazardous waste facility in a location where such activity would result in emissions of air contaminants causing the violation of the ambient air quality standards established in Minn. Reg. APC 1 (6 MCAR S 4.0001).

C. Hazardous waste facility operation.

1. General. No person shall operate a hazardous waste facility except in conformance with the following requirements:

a. The facility operator shall prepare procedures for personnel to follow in the case of spills of hazardous waste and in the case of fire and other emergencies. The facility operator shall post these procedures in a conspicuous place at the facility site.

b. The facility operator shall have safety equipment available at the facility site for use during spills, fires and other emergencies.

c. The facility operator shall have available at all times written procedures for handling spills, fires and other emergencies. The facility operator shall train and instruct all personnel at the facility site in these procedures. The facility operator shall maintain records of the training and instruction programs that are held.

d. The facility operator shall construct and begin operating a site monitoring system that is approved by the agency as adequate to determine the effect of the facility on the soil, ground water and air before accepting or storing any hazardous waste at the facility.

e. The facility operator shall control access to the

facility by the use of fences, gates, locks and other similar methods and allow access only to persons who are knowledgeable in the safety and emergency procedures needed for handling the hazardous waste. The facility operator shall provide security against unauthorized entry onto the site.

f. The facility operator shall have communication equipment available at the site for summoning aid in an emergency.

g. The facility operator shall maintain lighting at the facility in a manner sufficient to ensure safety and proper operation if the facility is operated during hours of darkness.

h. The facility operator shall not allow scavenging at the facility.

i. The facility operator shall prevent the discharge of hazardous waste from the facility to the surface waters or groundwaters of the state. The facility operator shall prevent hazardous waste from entering drains, sewer inlets, storm sewers, sanitary sewers, doorways, vents, tunnels, pipes, windows or areas with permeable earth or soil floors.

j. The facility operator shall handle shipping papers as provided in 6 MCAR S 4.9008.

2. Acceptance of hazardous waste.

a. The facility operator shall notify the agency by telephone immediately upon delivery and prior to acceptance of a shipment of hazardous waste if any of the following discrepancies exist.

(1) Incomplete shipping papers.

(2) A container or portable tank containing hazardous waste is not properly labeled.

(3) The shipping papers and the labels are inconsistent.

(4) The shipping papers and the hazardous waste shipment are inconsistent with regard to quantity, type or number of containers.

Within ten (10) working days, a follow-up report which fully describes any discrepancy, its resolution and the management of the hazardous waste shall be mailed to the agency.

b. In the event a shipment of hazardous waste without any shipping papers is delivered to a hazardous waste facility, the facility operator shall immediately notify the agency by telephone of:

(1) the transporter's name and vehicle license plate;

(2) the transporter's address and EPA identification number, if available;

(3) the generator's name, address and EPA identification number, if available;

(4) a description of the unmanifested waste;

(5) a brief explanation of why the waste was unmanifested, if known.

Within ten (10) working days, a follow-up report which fully describes any discrepancy, its resolution and the management of the hazardous waste shall be mailed to the agency.

c. No facility operator shall accept a shipment of hazardous waste that the facility operator is not allowed to manage under the Hazardous Waste Facility Permit unless written approval is obtained from the director. The director shall approve the acceptance of the waste if the director determines that:

(1) The hazardous waste is a waste that can be properly managed at the facility; and

(2) The generator has filed a disclosure with the agency.

The director shall act on the request as expeditiously as possible.

3. Storage of hazardous waste in containers and tanks.

a. The facility operator shall segregate incompatible wastes stored in containers and tanks to minimize the potential problem of incompatible wastes coming in contact during storage.

b. The facility operator shall regularly inspect all containers and tanks to determine if any leaks have occurred and in the event a leak has occurred, take necessary action pursuant to subparagraph 1.c.

c. The facility operator shall store hazardous waste in containers and tanks in a manner such that the facility operator can locate any shipment of hazardous waste and any hazardous waste from any particular generator stored on the site.

d. The facility operator shall store hazardous waste in containers and tanks that are located out-of-doors only within a liner and dike system which meets the following requirements:

(1) The liner and dike system shall have a permeability rate no greater than 10^{-7} centimeters per second when being subjected to a head of one foot of water and shall be of a composition that will not increase in permeability as a

result of contact with the hazardous waste.

(2) The liner and dike system shall be constructed so as to hold a volume equal to the volume of the largest storage tank plus the total capacity of all containers and portable tanks plus one foot of freeboard.

(3) The interface between the dike and underlying liner shall be constructed so as to provide a seal against movement of hazardous waste or solutions thereof.

(4) The dike shall be constructed in a manner that provides necessary ramps for vehicles needing access to the storage areas.

e. The facility operator shall store hazardous waste in containers that are located out-of-doors in a manner that complies with the following requirements:

(1) The facility operator shall stack containers with a capacity of less than 45 gallons in rows no more than 30 feet in length, five feet in width, and six feet in height, unless otherwise stated in the Hazardous Waste Facility Permit.

(2) The facility operator shall store containers with a capacity of 45 gallons or more in rows no more than 30 feet in length and two containers in width and shall not stack the containers, unless otherwise stated in the Hazardous Waste Facility Permit.

(3) The facility operator shall maintain a minimum of five feet between rows of containers of hazardous waste.

(4) If exposure of the containers to moisture or direct sunlight will create a hazardous condition or adversely affect the containers' ability to contain the hazardous waste, the facility operator shall store containers in an area with overhead roofing or other covering that does not obstruct the visibility of the labels.

f. No facility operator shall store hazardous waste in containers and tanks unless the containers and tanks meet the following requirements:

(1) Containers and tanks shall be of sturdy, leak-proof construction. Containers shall be of adequate wall thickness, of adequate weld, hinge, and seam strength and of sufficient material strength to withstand side and bottom shock, while filled, without impairment of the ability of the container or tank to fully contain the hazardous waste.

(2) Except during filling or emptying, the container or tank shall be securely closed. In the event that state or federal law requires a tank to be vented, the tank shall be equipped with a vapor recovery system; provided that persons who store used crankcase oil in tanks with a capacity of less than

5,000 gallons (18,927 liters) shall not be required to equip such tanks with a vapor recovery system.

(3) Lids, caps, hinges or other closure devices shall be of sufficient strength and construction so that when closed they will withstand dropping, overturning or other shock without impairment of the container's or tank's ability to fully contain the hazardous waste. Gasketed closures shall be fitted with gaskets of material that is sufficient to prevent leakage and that will not be deteriorated by the contents.

(4) Containers, tanks and their closures shall be constructed of materials or protected by a liner that will not undergo chemical reaction with the contained waste or with other substances that the container may foreseeably contact if such a reaction may impair the container's or tank's ability to contain the waste.

(5) Corroded or damaged containers or tanks shall not be used to contain hazardous wastes.

(6) Containers and portable tanks of hazardous waste shall be suitable for interstate transportation.

g. Hazardous waste shall not be stored in containers or tanks for more than one year.

4. Reuse of hazardous waste containers. The facility operator shall handle containers and tanks that have contained hazardous waste in one of the following manners:

a. Rinse, clean and drain all hazardous waste from the containers and tanks prior to leaving the hazardous waste facility.

b. Manage the containers and tanks as a hazardous waste.

c. Reuse the containers or tanks without rinsing, cleaning, and draining if all of the following conditions are met:

(1) The containers and tanks be used to store or transport one type of hazardous waste exclusively.

(2) The containers and tanks are closed until reuse.

(3) The containers and tanks be suitable for use in accordance with 6 MCAR S 4.9004.

5. Disposal of hazardous waste.

a. The facility operator shall not discharge hazardous waste directly into the saturated zone by such means as injection wells or other devices used for the purposes of injecting materials.

b. The facility operator shall not dispose of hazardous waste by open burning.

c. The facility operator shall not engage in activities that would result in emissions of air contaminants causing the violation of the ambient air quality standards established in APC 1 (6 MCAR S 4.0001).

d. The facility operator shall not dispose of hazardous waste in a manner that contaminates the soil unless such disposal is authorized in a Hazardous Waste Facility Permit.

6. Records and reports.

a. The facility operator shall submit the site monitoring results to the agency on a quarterly basis.

b. The facility operator shall file a monthly summary with the director that identifies the amount of hazardous waste managed, the names of the generators of the hazardous waste and the identity of the types of hazardous waste managed; provided, however, that a facility operator who is also a generator and manages only its own waste at an onsite facility shall file this summary on a quarterly basis.

c. The facility operator shall maintain a log at the facility site that indicates the date that each shipment arrived, the shipment number, the name of the generator of the shipment, the name of the transporter who delivered the shipment, the location of the shipment at the facility, and the date that the hazardous waste was processed, disposed of or transported from the facility. The facility operator shall submit the log to the agency upon the request of the director.

d. The facility operator shall submit to the agency the records of personnel training and instruction in the procedures to follow in handling spills, fires, and other emergencies upon the request of the director.

e. For hazardous waste land disposal facilities, the facility operator shall maintain a ledger for each cell containing the names of the generators of the hazardous wastes, the dates of acceptance of each shipment of hazardous waste, the amount in gallons or tons of each shipment, the shipment numbers, and the chemical composition of each shipment of hazardous waste. The facility operator shall submit the ledger to the agency at the closure of each cell or upon the request of the director.

D. Hazardous waste facility closure other than hazardous waste land disposal facilities.

1. The facility operator shall give the agency a minimum of ninety (90) days written notice prior to the closing of the facility. The written notice shall include:

- a. Anticipated last day of operation;
 - b. The existing inventory count and the inventory reduction schedule; and
 - c. A discussion of how conditions of the Hazardous Waste Facility Permit will be met.
2. The facility operator shall remove, before the facility is closed, all hazardous waste from the facility unless otherwise authorized by the Hazardous Waste Facility Permit.
 3. The facility operator shall meet the conditions of the facility's Hazardous Waste Facility Permit for closing the facility. This provision shall apply even if the permit has expired or has been suspended or revoked.
 4. The facility operator shall submit certification to the agency by a registered professional engineer that the facility has been closed in accordance with the requirements of this regulation and the Hazardous Waste Facility Permit.
- E. Hazardous waste land disposal facility closure.
1. The facility operator shall give the agency a minimum of one hundred and eighty (180) days written notice prior to closing a hazardous waste land disposal facility. The written notice shall include:
 - a. Anticipated last day of operation;
 - b. A discussion of how the requirements of this regulation shall be met; and
 - c. A discussion of how conditions of the Hazardous Waste Facility Permit shall be met.
 2. The facility operator shall close the hazardous waste land disposal facility in accordance with the following requirements:
 - a. The facility operator shall close access to the facility and prevent additional waste disposal.
 - b. The facility operator shall provide, construct and maintain measures to protect ground water and surface water and to control air emissions from the facility.
 - c. The facility operator shall cover the hazardous waste with an adequate amount of cover material to eliminate blowing of the hazardous waste and to minimize leachate production by the hazardous waste.
 - d. On all areas that have been covered with soil, the facility operator shall cover the area with adequate topsoil and provide vegetation that is sufficient to prevent erosion.

e. The facility operator shall establish and maintain a final grade that promotes surface water runoff without excessive erosion and shall divert surface water drainage around and away from the disposal area.

f. The facility operator shall construct a ground water monitoring system, a surface water monitoring system and, if necessary, a gas monitoring system if such systems are not already installed.

g. The facility operator shall record a detailed description, including a plat, with the county recorder. The description shall include a statement that the site has been used for the disposal of hazardous wastes, the general types and location of wastes, depth of fill and other information of interest to potential land owners.

h. The facility operator shall file with the agency and with the appropriate county office a final plot plan and cross sections that delineate the location of each major type of waste disposed of at the facility.

3. The facility operator to whom a Hazardous Waste Facility Permit has been issued shall close the facility as required by the permit. Such a facility operator shall submit certification to the agency by a registered professional engineer that the hazardous waste land disposal facility has been closed in accordance with the requirements of this rule and the Hazardous Waste Facility Permit. This provision shall apply even if the permit has expired or been suspended or revoked.

4. A facility operator who closes a hazardous waste land disposal facility shall establish and continue in effect financial arrangements that are adequate to finance the long-term maintenance, monitoring and surveillance required by this rule.

F. Long-term maintenance, monitoring and surveillance of hazardous waste facilities other than hazardous waste land disposal facilities.

1. A facility operator who closes a hazardous waste facility other than a hazardous waste land disposal facility shall conduct such long-term maintenance, monitoring, and surveillance of the facility as is necessary to prevent pollution of the air, land and water resources of the state.

2. The requirements of this regulation shall continue for as long as the hazardous waste poses a threat to the environment, unless the state of Minnesota or the United States agrees to assume responsibility for the long-term maintenance, monitoring, and surveillance requirements described herein.

G. Hazardous waste land disposal facility long-term maintenance after closure.

1. A facility operator who closes a hazardous waste land disposal facility shall perform the following long-term maintenance, monitoring and surveillance of the facility:

- a. Maintain the impervious liner and final cover.
- b. Maintain surface water drainage in a manner that minimizes erosion.
- c. Treat contaminated surface water runoff.
- d. Collect and treat leachate.
- e. Maintain a ground water monitoring system and a surface water monitoring system and, if necessary, a gas monitoring system.
- f. Remove hazardous waste from the facility or otherwise alleviate the threat in the event the hazardous waste is a threat to air, land, or water resources of the state, or public health or safety. The facility operator shall remove the waste or otherwise alleviate the threat regardless of the cause of the threat.

2. The requirements of this rule shall continue for as long as the hazardous waste poses a threat to the environment, unless the state of Minnesota or the United States agrees to assume responsibility for the long-term maintenance, monitoring and surveillance requirements described herein.

H. Closure of unpermitted hazardous waste facilities.

1. The facility operator of a hazardous waste facility that is in operation on the effective date of these rules who does not apply for a Hazardous Waste Facility Permit pursuant to 6 MCAR S 4.9006 shall close the facility in accordance with the requirements of this rule.

2. A facility operator who closed or abandoned a hazardous waste land disposal facility prior to the effective date of these regulations shall comply with the requirements of this rule.

I. Small hazardous waste containerized storage facilities. The facility operator of a hazardous waste containerized storage facility with a capacity of less than 5,000 gallons (18,927 liters) of hazardous waste in containers and tanks shall not be required to comply with the requirements of subparagraph 1. of paragraph B.; or subparagraphs 1.d., 1.f., 2.c., 6.a., 6.b., 6.c., and 6.d. of paragraph C.; and subparagraphs 1., 3. and 4. of paragraph D.; provided no other hazardous waste facility is located at the same site.

6 MCAR § 4.9005 Transportation of hazardous waste.

A. Applicability. This rule establishes criteria for the loading and transportation of hazardous waste by any person to insure that hazardous wastes are loaded and transported in a manner which minimizes risks to human health and the environment.

B. Loading of hazardous wastes. No person shall load or unload hazardous waste onto or from any motor vehicle, railroad car, barge, airplane or other vehicle except in accordance with the following requirements:

1. All containers of hazardous waste shall be loaded so that they are reasonably secured against movement within the vehicle by which the hazardous waste is being transported.

2. Tank vehicles shall not be left unattended during the loading or unloading of a hazardous waste.

3. No tools or equipment likely to damage the effectiveness of the closure of any container or adversely affect the ability of a container to contain a hazardous waste shall be used for loading or unloading hazardous waste.

4. Hazardous waste and food or fiber intended for human or animal consumption or use shall not be loaded in the same vehicle.

5. Hazardous waste shall not be loaded in the same vehicle with incompatible wastes or other materials with which it is incompatible.

6. Broken or leaking containers of hazardous waste or containers with an outside surface that is contaminated with hazardous waste shall not be loaded or offered for transportation.

7. No container or tank containing hazardous waste shall be loaded on a vehicle unless the container or tank is properly labeled as required by 6 MCAR § 4.9003.

8. No cargo tank or cargo tank compartment shall be loaded with hazardous waste unless it has been tested, inspected and maintained to insure that there is no unintentional release or leakage of waste during transportation and unless it fulfills the applicable requirements set forth in 49 C.F.R. § 177.824 (1976). The person loading the tank or compartment shall be considered to have complied with this provision if the person owning or leasing the cargo tank certifies that all requirements of this provision have been met.

9. No hazardous waste of a type or volume that is beyond the capability of the cargo tank shall be loaded in the cargo tank.

10. No cargo tank shall be loaded unless it is properly labeled as required by 6 MCAR § 4.9003.

11. The hazardous wastes of two or more generators shall not be commingled unless such commingling is indicated on the shipping papers of all of the generators.

12. The hazardous waste shall be given to a transporter as soon as possible after loading.

C. Transportation of hazardous waste.

1. The operator of a vehicle transporting hazardous waste shall maintain possession of the hazardous waste shipping papers during transportation as follows:

a. When the vehicle is a motor vehicle and the driver is at the vehicle's controls the shipping papers shall be either:

(1) Within his immediate reach while he is restrained by the lap belt, or

(2) Readily visible to a person entering the driver's compartment or in a folder that is mounted to the inside of the door on the driver's side of the vehicle.

b. When the vehicle is a motor vehicle and the driver is not at the vehicle's controls, the shipping papers shall be displayed as follows:

(1) In a holder that is mounted to the inside of the door on the driver's side of the vehicle, or

(2) On the driver's seat in the vehicle.

c. When the vehicle is a train, a member of the crew shall maintain the shipping papers in the caboose.

d. When the vehicle is other than a motor vehicle or train, the operator of the vehicle shall maintain the shipping papers in an accessible location determined by the operator.

e. If, pursuant to the provisions of 6 MCAR § 4.9008 G., a vehicle operator does not have a copy of the shipping papers in his possession, as required by this section, then the transporter shall maintain the spill information given to him by the generator pursuant to 6 MCAR § 4.9008 G. in such a manner that the information will be available to the vehicle operator as soon as he requests it, or in such other manner that is approved in writing by the agency.

2. The transporter shall comply with all applicable requirements of 6 MCAR § 4.9008 relating to shipping papers.

3. The transporter shall replace any labels required by 6 MCAR § 4.9003 if they are destroyed, lost or detached.

D. Time in transit.

1. Any person who transports hazardous waste shall deliver the hazardous waste to its final destination as soon as possible after loading of the hazardous waste.

2. In the event that a shipment of hazardous waste is not accepted by the facility operator within 48 hours after arrival at the destination or in the event the facility operator does not sign the hazardous waste shipping papers, the transporter shall immediately return the shipment of hazardous waste to the generator and the generator shall accept it and pay for the return transportation. If the wastes of two or more generators have been commingled as provided in 6 MCAR § 4.9005 B. 11., each generator shall accept a portion of the hazardous waste equal to the generator's contribution to the total volume of waste.

E. Spills in transit. These provisions shall apply to all spills of hazardous wastes while in transit within the State of Minnesota.

1. Any transporter who has a spill or leak of hazardous waste during transit shall comply with the provisions of 6 MCAR § 4.9010.

2. In the case of a spill or leakage of hazardous waste during transit, the amount spilled, the amount recovered, the location of the spill site and the disposition of the spilled wastes and any contaminated material shall be noted on or attached to the hazardous waste shipping papers by the transporter.

3. The transporter shall notify the generator as soon as possible of any spill or leak during transit.

4. The generator shall maintain a written summary of all spills and leaks that occur during transit for a period of five years.

5. If during the course of transportation, a container is discovered to be broken or leaking, the transporter shall remove the container to the nearest safe location and isolate it pending proper disposition in the safest and most expeditious manner possible. The generator shall render all reasonable assistance to the transporter in repackaging, packing and cleaning up the waste so that the trip may be resumed. "All reasonable assistance" means providing the transporter with all necessary information about the waste and about procedures for repackaging, packing and cleaning up the waste and in addition providing any physical assistance that the generator is uniquely suited to provide and that the transporter is willing to bear the costs of. Nothing in this provision is, however, intended to restrict or enlarge or affect in any way any liability the generator may have to repackage, pack and clean up the waste.

41822B-21

F. Delivery of hazardous waste. No person shall deliver hazardous waste to a hazardous waste facility or give hazardous waste to a transporter for shipment to a hazardous waste facility located in the state of Minnesota, if the facility operator has not obtained a Hazardous Waste Facility Permit from the agency. Nothing in this provision is intended to require the transporter to undertake any evaluation of a waste to determine whether it is hazardous.

G. Registration of hazardous waste transporters. Any person who transports hazardous waste that originates or terminates in Minnesota shall obtain an identification number from EPA prior to transporting the hazardous waste.

H. Transportation of used crankcase oil. A transporter of used crankcase oil shall maintain a log that shows the source and disposition of all used crankcase oil. Upon the written request of the director, the transporter shall submit any information from the log that the director requests. The transporter shall retain all information for a period of two years.

6 MCAR § 4.9006 Hazardous waste facility permit program.

A. **Applicability.** This rule governs the application procedures, the issuance, and the conditions of a Hazardous Waste Facility Permit. The provisions in this rule and the agency's Rules of Procedure, MPCA 1-13 (6 MCAR §§ 4.3001-4.3013), shall be construed to complement each other.

B. **Other permits.** Obtaining a Hazardous Waste Facility Permit pursuant to this rule shall not exempt a person from any requirement to obtain any other applicable federal, state, and local permits.

C. **Permit required.** No person shall do any of the following without obtaining a Hazardous Waste Facility Permit from the agency:

1. Establish, construct, operate, close or abandon a hazardous waste facility;
2. Make any change in, addition to or extension of a permitted hazardous waste facility or part thereof;
3. Make any expansion, production increase, or process modification that results in new or increased capabilities of a permitted hazardous waste facility; or
4. Operate such a permitted hazardous waste facility, or part thereof, that has been changed, added to or extended or that has new or increased capabilities.

D. Submission of Hazardous Waste Facility Permit application.

1. Any person who is operating a hazardous waste facility on the day these rules take effect shall submit to the agency a preliminary application for a Hazardous Waste Facility Permit within 180 days of the effective date of these rules; except any person who, on the effective date of these rules, is operating a Hazardous Waste Containerized Storage Facility that is not in the same location as any other type of hazardous waste facility shall submit a preliminary application for a Hazardous Waste Facility Permit for such facility according to the following schedule:

The First Letter in the Name of Applicant	Application Due Date
L-N	10 months after effective date
A-C	12 months after effective date
D-G	14 months after effective date
T-Z	16 months after effective date
O-S	18 months after effective date
H-K	20 months after effective date

2. Any person who has submitted a preliminary application for a Haz-

ardous Waste Facility Permit shall submit a final application after the person has received the director's comments on the preliminary application.

3. In the event that a person operates hazardous waste facilities at more than one location, a separate application shall be filed by the person for each facility.

4. In the event that a person operates more than one type of hazardous waste facility at one location, then the person shall file a single application containing all the required information for each type of hazardous waste facility that will be at that location.

5. When the application is for a change, addition to or extension of a permitted hazardous waste facility or part thereof or when the application is for new or increased capabilities at a permitted hazardous waste facility, the agency may waive in writing the submission of plans and specifications or any parts thereof.

6. The agency need not accept a permit application unless the application contains all the information required by these rules. If a permit application is incomplete or deficient, the director shall advise the applicant of such incompleteness or deficiency. Further processing of the application may be suspended until the applicant has supplied the necessary information or otherwise corrected the deficiency.

E. Granting and reissuance of permits.

1. The agency shall not grant or reissue a Hazardous Waste Facility Permit unless the agency determines that the hazardous waste facility and its operation will comply with the requirements of applicable pollution control statutes and rules.

2. The agency shall not grant or reissue a Hazardous Waste Facility Permit unless the applicant has established financial arrangements that are adequate to provide for:

a. The proper removal, transportation and disposal of the total amount of hazardous waste that the facility operator will be permitted to store; and

b. The closure of the facility in accordance with these rules and the conditions of the permit.

c. The long term maintenance, monitoring and surveillance requirements provided for in these rules and the conditions of the permit for a Hazardous Waste Land Disposal Facility for a period of thirty (30) years after closure, unless the agency determines that a shorter period of time is adequate to determine the long term effect of the facility on the soil, groundwater and air. Nothing in this rule, however, shall limit the responsibility of the facility

operator to provide maintenance, monitoring and surveillance for a longer period of time in accordance with 6 MCAR § 4.9004 F.

F. Review of permits.

1. Any person who wishes to continue to operate a hazardous waste facility shall, at least 180 days before his Hazardous Waste Facility Permit expires, submit a written request to the agency for reissuance of the permit.

2. The agency shall review the request for reissuance. In reviewing the request, the agency shall consider:

a. Whether the permittee is in compliance with or has complied with terms, conditions, requirements, and schedules of compliance of the expiring permit, and with applicable pollution control statutes and rules, including any additions, revisions or modifications thereto.

b. Whether there have been changes in the state of the art during the term of the permit.

c. Whether the agency has up-to-date information on the nature of the facility, production levels, the operational practices and monitoring data.

d. Whether any modifications to the permit are necessary. In conducting the review, the agency may require additional information to be submitted to aid the review.

G. Hazardous Waste Facility Permit general conditions.

1. All Hazardous Waste Facility Permits shall have the following general conditions:

a. The permittee shall establish, construct, operate and close the facility in accordance with:

(1) The plans, specifications and reports identified in the permit;

(2) The agency's hazardous waste regulations; and

(3) The conditions of the permit issued by the agency.

b. The permittee shall allow any authorized agency employee or agent to enter upon any property—public or private—to have access to and copy any applicable records, to inspect the hazardous waste facility and its operations, to sample any waste, and otherwise to obtain necessary information pertaining to the construction, operation, and closure of the hazardous waste facility and the hazardous waste managed there.

c. The permittee shall, upon the request of any authorized agency employee or agent, disclose the times at which any operation occurs.

d. The permittee shall not store volumes of hazardous wastes in excess of the volumes approved by the agency in the permit.

e. The permittee shall manage only those types of hazardous waste that are approved by the permit.

f. The permit shall have a term not to exceed five years.

2. Hazardous Waste Facility Permits for facilities that existed prior to the effective date of these rules may in addition provide interim dates for achievement of compliance with applicable rules, other relevant laws and conditions of the permit.

3. Hazardous Waste Facility Permits for new facilities shall, in addition, have the following general conditions:

a. The permittee shall not begin operation of the hazardous waste facility until the permittee has submitted a certification by a registered professional engineer that the hazardous waste facility has been constructed according to the engineering plans and specifications as approved, with any modifications, by the permit.

b. The permittee shall construct and commence operation of the facility within the time schedule specified in the permit.

H. Hazardous Waste Facility Permit special conditions. The agency shall include special permit conditions to restrict the establishment, construction, operation, or closure of a hazardous waste facility whenever the agency deems such special conditions necessary in order to perform its responsibilities and duties under its rules and other relevant laws.

I. Exceptions.

1. A generator who establishes, constructs, operates, or closes an on-site hazardous waste resource recovery facility that is owned by the generator and is operated solely for the purpose of recycling hazardous waste produced by that generator shall not be required to obtain a Hazardous Waste Facility Permit for that facility.

2. The facility operator of a Hazardous Waste Containerized Storage Facility with a capacity of less than 5,000 gallons (18,927 liters) that is not in the same location as any other types of hazardous waste facility shall not be required to obtain a Hazardous Waste Facility Permit for that facility.

3. The facility operator of a waste water treatment works operated pursuant to a National Pollutant Discharge Elimination System Permit or State Disposal Permit shall not be required to obtain a Hazardous Waste Facility Permit for that facility.

4. No person shall be required to obtain a Hazardous Waste Facility Permit for receiving used crankcase oil from other persons for the purpose of supplying that oil to a recycler if the capacity of the facility is less than 5,000 gallons (18,927 liters) and if the used crankcase oil is not mixed with other wastes.

6 MCAR § 4.9007 Contents of hazardous waste facility permit applications.

A. Applicability. This rule establishes the information that must be submitted in an application for a Hazardous Waste Facility Permit.

B. Preliminary application.

1. All hazardous waste facilities. Any person who submits a preliminary application to the agency for a Hazardous Waste Facility Permit, regardless of the kind of facility, shall provide the following information in the preliminary application:

a. All information required by Minn. Reg. MPCA 5 (6 MCAR § 4.3005).

b. An area plan having a scale and vertical contour intervals sufficient to show existing surrounding features to within one mile radius, and delineating the following:

- (1) County, township and municipal boundaries.
- (2) A north arrow, town, range and section number.
- (3) Surface waters, floodplains and wetlands.
- (4) Boundaries of parks and wildlife refuges.
- (5) Highways, roads and rights of way for railroads, including a designation of the main access to the facility.
- (6) Approximate daily utilization of each access route by vehicles transporting hazardous waste.
- (7) Surface water drainage patterns and drainage divides with the direction of the drainage denoted by arrows.
- (8) Land use patterns and zoning.
- (9) Buildings within 1/4 mile of the proposed facility and their apparent uses.
- (10) Quarries and gravel pits (active and abandoned).
- (11) Major rock outcroppings and fault zones.
- (12) Sanitary landfills or dumps (active and abandoned).
- (13) The location and surface elevations of all active and abandoned wells within 1/4 mile of the facility.

(14) Any other applicable area features necessary to determine the suitability of the area for the hazardous waste facility.

c. A site plot plan of existing conditions at the location of the proposed facility, with the site plot plan having a scale and vertical contour interval acceptable to the director, including all land within 1,000 feet of the property lines of the proposed facility and the following:

(1) County, township and municipal boundaries.

(2) A north arrow, town, range and section number.

(3) Zoning and land use patterns.

(4) Surface waters, floodplains and wetlands.

(5) Highways, roads and railroads (including rights of way of railroads), including a designation of those that will be utilized as main accesses to the facility.

(6) A conceptual layout of the facility.

(7) Existing and proposed drainage patterns of surface water runoff denoted by arrows.

(8) Sanitary and storm sewers, sewer connections, electric power lines and underground gas lines serving the facility.

(9) The location and surface elevations of surrounding wells (active and abandoned), on-site soil borings, well installations and piezometers, all of which shall be tied into a bench mark.

(10) All buildings and their uses.

(11) Existing ground cover vegetation.

(12) Rock outcroppings, sink holes and faults.

(13) The boundary lines and ownership of all property bordering the proposed site of the facility.

(14) Any other site features necessary to determine the suitability of the site for the hazardous waste facility.

d. An estimate of the cost for:

(1) The proper removal, transportation and disposal of the total amount of hazardous waste that the applicant has requested to store.

(2) The closure of the facility in accordance with these rules.

2. Hazardous waste containerized storage facilities, hazardous waste transfer station facilities, and hazardous waste processing facilities. In addition to the information required by subparagraph 1 of this section, any person who submits a preliminary application for a Hazardous Waste Facility Permit for a hazardous waste containerized storage facility, a hazardous waste transfer station or a hazardous waste processing facility shall submit the following additional information:

a. A report that summarizes the available information on the subsurface conditions at the proposed site for the facility and reviews dominant soil types, underlying bedrock, groundwater quality and the location and depths of all wells within one thousand feet.

b. When required by the director, a report that summarizes the subsurface field investigations conducted by the applicant to determine the feasibility of the proposed location.

c. An engineering report that conceptually assesses the construction of the facility and any existing construction proposed to be used at the facility.

d. A report that conceptually addresses the operation of the facility including when applicable:

(1) A general description of the waste types proposed to be brought to the facility describing the approximate chemical composition, the hazardous properties, and the estimated quantities that will be handled on a yearly basis.

(2) A discussion of the inventory control procedures to be utilized in managing each waste type at the facility.

(3) A description of any processing including, but not limited to, chemical precipitation, incineration, chemical fixation, blending, or repackaging that is proposed to occur at the facility.

(4) A delineation of the actual or proposed management of the hazardous waste that is brought to the facility and that is subsequently removed from the facility for management elsewhere.

(5) A description of the anticipated air emissions, wastewater effluents, hazardous wastes and solid wastes that will be produced by the facility.

3. Hazardous waste noncontainerized storage facilities, hazardous waste land treatment facilities and hazardous waste land disposal facilities. In addition to the information required by subparagraph 1 of this section, any person who submits a preliminary application for a Hazardous Waste Facility Permit for a hazardous waste noncontainerized storage facility, hazardous waste land treatment facility or hazardous waste land disposal facility shall submit the following additional information:

a. A report on the subsurface conditions at the proposed facility based on a field investigation that includes a sufficient number of soil borings, groundwater monitoring wells, and piezometers to accurately investigate subsurface conditions. The location, placement and construction of the soil borings, monitoring wells, and piezometers shall be done in a manner that facilitates the preparation of plot plans and cross sections. The report shall include, unless otherwise specified by the director:

(1) Logs of borings classified according to ASTM D 2487-69 and ASTM D 2488-69.

(2) A plot plan that delineates the surface of the underlying groundwater, the direction of groundwater flow, perched water tables, recharge and discharge areas and the location of soil borings, groundwater monitoring wells and piezometers, and the dates of inspection and water levels recorded in establishing the groundwater information listed by each well and piezometer.

(3) The placement and construction of monitoring wells and piezometers.

(4) Cross sections prepared from the field investigation that illustrate soil profile, groundwater aquifers, vertical and horizontal direction of groundwater flow and other significant geological features, and, should the field investigation indicate the need for an investigation of the underlying bedrock, core samples or cuttings taken from borings and rock types adequately defined as to petrology and stratigraphy.

(5) A comparison of the findings of the field investigations with previous research and literature on the subsurface conditions at the site and an explanation of any discrepancies in the findings of the field investigation and previous research.

(6) An estimated water balance for the location of the proposed facility that considers precipitation, drainage, infiltration, exfiltration, percolation, evaporation and runoff.

(7) A section that addresses the porosity and permeability of major soil types that were encountered in the field investigation, including a description of the procedures used in the testing of the major soil types. The section shall discuss:

(a) The ability of the soil to attenuate the hazardous waste and the leachate thereof through ion exchange, absorption, adsorption, precipitation and other such mechanisms.

(b) A review of the anticipated products from such mechanisms including both final and intermediate biochemical metabolites and chemical degradation products.

(c) An assessment of how effective the soil attenuation processes will be in providing treatment to the hazardous waste and leachate thereof.

(8) A section that addresses the seasonal fluctuation in groundwater levels, an approximation of the historic high groundwater levels expected based on field investigations, and influences on the groundwater levels by local wells, irrigation or drainage ditches.

(9) A section on groundwater quality that delineates the natural quality, assesses the potential impact of the hazardous waste to be accepted at the facility and the leachate thereof on groundwater quality, and appraises whether this facility would preclude beneficial present and future uses of the groundwater.

b. An engineering report that conceptually addresses the design of the facility including:

(1) A description of the wastes to be managed at the facility, including the amount, general chemical composition and properties of the waste.

(2) Any treatment processes that will be utilized to prepare the waste before land disposal, land treatment or storage.

(3) A site plot plan that delineates the conceptual engineering plans for the facility.

(4) A section that describes and assesses as applicable:

(a) The preliminary specifications for the liners, the liners currently under consideration and the individual liners' ability to meet those specifications.

(b) The preliminary specifications for the leachate collection system, the materials currently under consideration and the ability of those materials to meet the specifications.

(c) The preliminary design criteria for any leachate treatment system being proposed.

(5) A conceptual discussion of the operation of the proposed facility.

c. A report that:

(1) Evaluates the expected effect of the vapors, gases and dusts from the wastes on the air quality at the actual site and in the immediate vicinity of the site.

(2) Appraises the expected subsurface migration of the vapors and gases from the wastes relative to conditions found in the subsurface investigations.

4. Hazardous waste land disposal facilities. In addition to the information required by subparagraphs 1 and 3 of this section, any person who submits a preliminary application for a Hazardous Waste Facility Permit for a hazardous waste land disposal facility shall submit an estimate of the cost of maintenance, monitoring, and surveillance of the facility for a thirty (30) year period after closure of the facility, unless the agency determines that a shorter period of time is adequate.

C. Final application.

1. All hazardous waste facilities. Any person who submits a final application to the agency for a Hazardous Waste Facility Permit, regardless of the kind of facility, shall provide the following information:

a. Any information required to respond to the comments made by the director on the preliminary application.

b. An engineering report that details the plans and specifications for the construction of the facility, which shall be referenced into the plot plans, including when applicable:

(1) A site plot plan that delineates the final engineering plans for the facility. If the facility involves progressive development of different parts of the area designated for the facility, the applicant shall submit a series of plot plans to illustrate the progressive development of the facility. All site plot plans shall be of sufficient detail, scale and vertical contour interval to allow for actual construction from the plot plan. The site plot plan shall include:

(a) All information contained on the site plot plan submitted with the preliminary plans and specifications.

(b) A detailed layout of the facility as it is to be built, indicating buildings, fencing, utilities, storage areas, earthworks and other applicable details.

(c) The location of any air quality, water quality or ground-water monitoring devices located or proposed to be located at the facility.

(d) Arrows delineating surface water drainage patterns after construction of the proposed facility, including the relationship of the drainage patterns to the runoff containment lagoons.

(2) Specifications for the construction of all storage areas and storage tanks, clearly delineating thickness of liners, liner material, grades, drains, sewer inlets, vehicle ramps, foundation construction and storage tank construction.

(3) A section of the equipment that will be installed at the facility. The section shall include a discussion of underlying physical principles or chemical reactions, detailed drawings and specifications of all equipment, expected performance data, air emissions data and the water quality of the wastewater discharge.

(4) A section that delineates the design and specifications for the treatment of contaminated runoff or snow that would arise from the operation of the facility.

c. An operations manual that includes:

(1) A section that delineates procedures, methods, and maintenance that must be done at the facility on a daily or periodic basis to insure proper management of the waste at the facility.

(2) Inventory control procedures to be utilized at the facility to properly manage the waste in inventory, including:

(a) Locations for storage of each waste type, together with a clear delineation of which waste types are not compatible, the recommended maximum times of storage and the methods for logging shipments into and out of inventory.

(b) Maintenance and inspection schedules for insuring that containers in storage are properly labeled and not leaking.

(3) A thorough description of the type and frequency of inspection or maintenance that shall be done on storage areas, dikes, storage tanks, liners, cover materials, leachate collection systems and other construction and equipment at the proposed facility.

(4) A monitoring section that describes the procedures to be used and the parameters to be analyzed by the permittee to:

(a) Inventory and identify incoming hazardous waste.

(b) Conduct air and groundwater monitoring programs.

(c) Monitor the management of waste produced by the operation of the facility.

(5) A section on how to operate and manage holding basins for runoff or contaminated snow that arises from the operation of the facility.

(6) A description of the procedures that shall be employed by the facility personnel in responding to spills or other emergency situations that could arise during facility operation. Specific references shall be made to (a) the training or instruction that the facility personnel shall receive, (b) the on-site emergency and safety equipment and (c) the arrangements for emergency services.

(7) A section outlining the specific management plan for all residuals and hazardous wastes that arise from the operation of the facility.

d. A closure manual describing the procedures and construction that will be used to close the facility, and the monitoring and maintenance required to be conducted at the facility after closure.

e. A description of the financial arrangements the applicant has made to pay for the following:

(1) The proper removal, transportation and disposal of the total amount of hazardous waste that the applicant has requested to store.

(2) The closure of the facility in accordance with these rules.

2. Hazardous waste noncontainerized storage facilities, hazardous waste land treatment facilities, and hazardous waste land disposal facilities. In addition to the information required by subparagraph 1 of this section, any person who submits a final application for a Hazardous Waste Facility Permit for a hazardous waste noncontainerized storage facility, hazardous waste land treatment facility or a hazardous waste land disposal facility, shall submit the following additional information:

a. A report on the subsurface conditions at the proposed facility. The report shall review the results of continued monitoring of groundwater conditions and supplement the information developed in the preliminary application. The report shall review the subsurface facility construction, including the following:

(1) Cross sections that illustrate the design of the facility in relationship to soil profiles, bedrock profiles, groundwater contours and other geological features and that delineate the proposed location of lysimeters and groundwater monitoring wells relative to vertical and horizontal groundwater flows.

(2) A section that describes the water balance of the facility and its impact on the existing water balance and quality in the site area, and that contains, when deemed necessary by the director, a plot plan that delineates how the groundwater contours will be affected by development of the facility.

(3) A section that reviews the effect of contaminants should a failure in the engineering design or construction occur. The section shall include an assessment of the ability of contaminants to pass through underlying soils, a description of the potential effect on the groundwater quality, and recommendations for remedial action should it be necessary.

b. A report that provides a detailed assessment of the specifications and design for liners, leachate collection systems and leachate treatment systems.

c. A report on air and groundwater monitoring systems and other equipment that will be installed at the proposed facility and on the proposed monitoring procedures. The report shall include the location of monitoring wells and air monitoring stations, plans and specifications for the construction of the monitoring wells in accordance with requirements of the Minnesota Department of Health, plans and specifications for the construction of air monitoring stations, the procedures for sampling, the frequency of sampling, and the kind of analyses to be performed.

d. A closure report and plot plan that delineates the finished construction of the facility after closure. The report and plan shall include the following:

(1) A site plot plan of the proposed final conditions at the facility. The plot plan shall have a scale and vertical contour interval acceptable to the director and shall include:

- (a) Original contours.
- (b) Proposed final contours.
- (c) Original surface water drainage patterns.
- (d) Proposed final surface water drainage patterns.
- (e) Layout of the leachate collection system.
- (f) Layout of gas vents, gas migration barriers and other such gas controls.
- (g) Access roads.
- (h) Finished landscaping.

(2) Cross sections that delineate each finished cell and cross sections that delineate the disposal or storage of each major waste type. The cross sections shall depict liners, leachate collection systems, the waste, cover materials and other applicable details.

(3) A section that provides specifications for any construction or materials to be used in closing the facility.

e. A report on the long term maintenance, monitoring and surveillance to be performed at the facility. For a hazardous waste land disposal facility, the report shall include all of the following information. For a hazardous waste noncontainerized storage facility and a hazardous waste land treatment facility, the report shall include any of the following information that is applicable:

- (1) A discussion of the long term maintenance of liners, cover

material, leachate collection systems, gas controls and other applicable construction after closure.

(2) A discussion of the operation of the leachate collection and treatment systems, gas controls and runoff retention basins after closure.

(3) A discussion of the continued sampling and analysis of monitoring wells, leachate collection systems, emitted gases and surface water runoff after closure.

(4) A discussion of the techniques for removal of chemical wastes from cells in case the waste poses a threat or has created a threat to air, land or water resources of the state, or to public health or safety, after closure, regardless of the cause of that threat.

(5) A financial plan that indicates how the applicant will provide funds for maintenance, monitoring and surveillance of the facility for thirty (30) years after closure, unless the agency determines that a shorter period of time is adequate.

D. Waiver. Any person who submits a preliminary application or final application to the agency for a Hazardous Waste Facility Permit shall not be required to submit that information which the director informs the person in writing is not pertinent to a particular application.

41822B-21

6 MCAR S 4.9008 Hazardous waste shipping papers.

A. Applicability. This rule establishes requirements for the preparation of hazardous waste shipping papers by generators. This rule also establishes requirements for the handling, signing and submission of hazardous waste shipping papers by generators, transporters and facility operators.

B. Hazardous waste shipping papers required. No person shall release, transport or accept a hazardous waste that is not accompanied by hazardous waste shipping papers.

C. Preparation of hazardous waste shipping papers.

1. Each generator shall prepare hazardous waste shipping papers for each shipment of hazardous waste.

2. The generator shall prepare an original and a sufficient number of copies of the hazardous waste shipping papers so that all persons who are going to participate in the management of the hazardous waste will be able to comply with the provisions of this rule.

3. The hazardous waste shipping papers shall include the following information.

a. The names, addresses, telephone numbers, and EPA identification numbers of the generator and hazardous waste facility to which the waste is to be transported.

b. The name and EPA identification number of each transporter.

c. An identifying shipment number assigned by the generator in sequential order for each waste shipment.

d. The total quantity of each hazardous waste by units of weight or volume and the type and number of containers as loaded into or onto the transport vehicle.

e. The description of the waste(s) (e.g., proper shipping name, etc.) required by regulations of the U. S. Department of Transportation in 49 Code of Federal Regulations, sections 172.101, 172.202 and 172.203 (1979) if applicable; otherwise the description of the waste(s) as listed on the Minnesota hazardous waste disclosure.

f. Signature and date blocks for the generator, the transporter, and the facility operator.

g. The following certification shall appear on the shipping papers:

"This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled

and are in proper condition for transportation according to the applicable regulations of the U. S. Department of Transportation and the EPA."

D. Preparation of supplemental cover sheet. Each transporter or facility operator who commingles or consolidates more than one shipment of hazardous waste shall prepare a supplemental cover sheet. The supplemental cover sheet shall provide procedures for handling spills, fires, and other emergencies and shall accompany the hazardous waste shipping papers for each individual shipment of hazardous waste until ultimate disposition.

E. Signing and submission of hazardous waste shipping papers.

1. Prior to relinquishing possession of a shipment of hazardous waste each generator, transporter, and facility operator shall obtain the dated signature of the transporter or facility operator who accepts the shipment of hazardous waste on the original and each copy of the hazardous waste shipping papers. The generator shall retain one copy of the hazardous waste shipping papers, give the original and at least three copies to the transporter and shall send one copy to the following address:

Hazardous Waste, MIS
322 Washington Avenue South
Hopkins, Minnesota 55343

The transporter shall retain one copy of the hazardous waste shipping papers after relinquishing possession of the hazardous waste and give the original and two copies to the hazardous waste facility operator. The facility operator shall sign the original and the remaining copies of the hazardous waste shipping papers upon gaining possession of the hazardous waste, retaining one copy, sending one copy to the above address and returning the original to the generator within five (5) working days of gaining possession. Generators, transporters, and facility operators shall retain their copies of the shipping papers in accordance with 6 MCAR S 4.9008 E.4.

2. Each transporter or facility operator who accepts a shipment of hazardous waste shall sign and date the hazardous waste shipping papers.

3. When a shipment of hazardous waste is to be delivered to a hazardous waste facility located outside the state of Minnesota, the generator shall ensure that the copy of the hazardous waste shipping papers signed by the facility operator is sent to the address listed in subparagraph 1. of this paragraph within thirty-five (35) days of the acceptance of the hazardous waste by the hazardous waste facility. If the generator is unable to comply with this deadline, a letter of explanation must be sent to the address listed in subparagraph 1. of this paragraph within five (5) working days after the expiration of the thirty-five (35) day period.

4. The generator of a shipment of hazardous waste shall maintain the original of the hazardous waste shipping papers for a period of five years after it is returned. Each transporter and facility operator who accepted the shipment of hazardous waste shall maintain a copy of the hazardous waste shipping papers for a period of five years after accepting the hazardous waste.

5. Upon the request of the director any generator, transporter, or facility operator shall submit the original or a copy of hazardous waste shipping papers to the agency at the time and in the manner specified by the director. If the request requires the generator to inform all transporters and facility operators managing the hazardous waste of the request, the generator shall so inform the transporters and facility operators, and the generator, transporters and facility operators shall comply with the director's request.

6. In the event that a county ordinance is approved pursuant to 6 MCAR S 4.9009, the generator, transporter and facility operator of a waste generated within that county or transported to a hazardous waste facility within that county shall sign and submit hazardous waste shipping papers as required by that ordinance.

F. Exemptions.

1. A generator who manages the hazardous waste at an onsite hazardous waste processing facility, hazardous waste land disposal facility, or hazardous waste land treatment facility is not required to comply with the requirements of this rule with respect to those wastes onsite.

2. Generators and transporters of used crankcase oil are not required to have hazardous waste shipping papers accompany the used crankcase oil that they generate or transport unless the used crankcase oil has been mixed with other wastes.

3. Persons who release or accept hazardous waste that is discharged directly to a sewer system operated pursuant to an NPDES permit or State Disposal System Permit are exempted from the requirements of this rule with respect to such a discharge.

G. Mailing shipping papers. Any generator in Minnesota who ships his hazardous waste to a hazardous waste facility outside the state of Minnesota or any generator outside the state of Minnesota who ships his hazardous waste to a hazardous waste facility in Minnesota shall mail the required copies of the shipping papers to the hazardous waste facility if both of the following conditions are present:

1. A transporter that neither originates nor terminates a shipment in the state of Minnesota refuses to sign and carry the shipping papers, and

2. There is neither a federal law nor a state law of the

state in which the shipping papers were proffered that requires the transporter to sign and carry similar shipping papers.

When the facility operator receives the shipment of hazardous waste, he shall then treat the shipping papers in the same manner as if they had physically arrived with the shipment of hazardous waste. In addition, the generator shall provide all persons who will be transporting the waste within the state of Minnesota with appropriate written information on the procedures for handling spills, fires and other emergencies.

H. Hazardous waste shipping paper format. Nothing in this rule shall be construed to require the shipping paper to be a document that is separate from and in addition to other documents already being utilized for the transportation of hazardous waste. A generator may use a bill of lading or any other such document to fulfill the requirements of this rule so long as it contains all the required information and is handled as required by this rule. The information shall, however, be in a format that will make it amenable to computerized data processing and that has been approved by the agency.

I. Certified bill of lading. Any generator that gives a bill of lading to a transporter shall, prior to the execution of the bill of lading, determine whether the facility operator can and will accept the shipment of hazardous waste and whether the facility, if within Minnesota, has a Hazardous Waste Facility Permit. The generator shall certify on the bill of lading that the facility operator can and will accept the shipment of hazardous waste and that the facility has a Hazardous Waste Facility Permit.

6 MCAR § 4.9009 County regulation of hazardous waste management.

A. Applicability. This rule establishes procedures for submission of documents in the event the county ordinance is approved by the agency. Issuing, denying, modifying, imposing conditions upon, or revoking hazardous waste generator licenses or permits, and county hazardous waste rules, shall be subject to review, denial, suspension and reversal by the agency.

B. Review of county ordinances.

1. A county that seeks agency approval of a hazardous waste ordinance shall submit a copy of the ordinance to the agency. The agency shall advise the county in writing whether the ordinance is approved. The agency shall approve a county ordinance that embodies the standards and requirements set forth in these hazardous waste rules.

2. If a metropolitan county submits a county hazardous waste ordinance to the agency for approval pursuant to Minn. Stat. § 473.811, subd. 5, the procedure established in subparagraph 1 of paragraph D for agency review of county hazardous waste licenses and permits shall be followed. Any action by the agency pursuant to such submission for agency review of the county ordinance shall not be deemed to be agency approval of such ordinance unless such approval is explicit and is in writing.

3. For the purposes of this rule a metropolitan county is any one of the following counties: Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington.

C. Effect of agency approval of county ordinance. In the event that a county has adopted a hazardous waste ordinance that is approved in writing by the agency:

1. Each generator who produces a hazardous waste within the county shall not be required to submit a disclosure to the agency for that waste unless specifically requested in writing by the director to do so.

2. Each generator shall submit the required copies of the hazardous waste shipping papers to the county as required by the county ordinance for each shipment of hazardous waste that is transported.

3. All persons shall comply with all other requirements of these regulations and all requirements of the county ordinance.

D. Duties of counties.

1. A county shall submit to the agency written notification of all hazardous waste generator licenses or permits approved or reviewed by the county during the previous month. The notification shall be submitted to the agency on the fifteenth day of each month. Upon the request of the director, the county shall provide the agency with a copy of all the information

that it considered in reaching its decision. The agency shall place the matter on the agenda of the next regularly scheduled meeting of the agency, which will be on the fourth Tuesday of the month. The agency may amend, modify, suspend, or reverse the action of the county. The action of the agency in reviewing the county decision to grant the license or permit shall not affect the agency's consideration of a Hazardous Waste Facility Permit for the same facility under these rules.

2. A county shall submit to the director, upon request, a copy of any disclosure that has been submitted to the county.

3. A county shall submit to the agency a yearly summary of hazardous waste management in the county. The yearly summary shall be submitted by March 1 for the year that ended on the previous December 31. The summary shall contain:

- a. The name and identification numbers assigned by the county to each generator in the county.
- b. The total number of hazardous waste shipments.
- c. The total quantities shipped for each type of hazardous waste.
- d. The identification numbers pursuant to 6 MCAR § 9.4005 G. and names of the transporters used.
- e. Facilities at which the waste was stored, processed or disposed.
- f. Number of spills and accidents.
- g. Any other information requested by the director.

6 MCAR § 4.9010 Spillages and leakages of hazardous waste.

A. Duty to report. Any person who owns, has possession of, or otherwise has control of a hazardous waste that spills, leaks, or otherwise escapes from a container, vehicle tank, storage tank, portable tank or other containment system, including its associated piping, shall immediately notify the agency if the hazardous waste may cause pollution of the air, land, or waters of the State. The person shall use, when applicable, the agency's 24 hour telephone notification service.

B. Duty to recover. Any person who owns, has possession of, or otherwise has control of a hazardous waste that spills, leaks, or otherwise escapes from a container, vehicle tank, storage tank, portable tank or other containment system, including its associated piping, shall recover the hazardous waste as rapidly and as thoroughly as possible and shall immediately take such other action as may be reasonably possible to protect human life and health and minimize or abate pollution of the water, air or land resources of the state caused thereby.

C. Open burning. No person shall undertake open burning of such hazardous waste unless the open burning has been approved in writing by the director. The director may approve open burning of the following substances:

1. Distilled petroleum products.

2. Crude oil, if it is not possible to recover the crude oil. The director shall consider the location of such hazardous waste and the wind conditions and may approve such open burning only if there will be no adverse effect on residential areas or on traffic conditions.

*See new 6 MCAR 55
4.9701 - 4.9706
(CARO4405T) →*

Appendix A


 AMERICAN NATIONAL
 STANDARD

ANSI/ASTM D 3243 - 76

Standard Test Method for FLASH POINT OF AVIATION TURBINE FUELS BY SETAFLASH CLOSED TESTER¹

This Standard is issued under the fixed designation D 3243; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval.

1. Scope

1.1 This method describes a procedure for the determination of the flash point, by a Setaflash[®] Tester, of aviation turbine fuels. The procedure may be used to determine whether a fuel will or will not flash at a specified temperature (go-no-go flash) or the actual flash point temperature.

1.2 Results by using the Setaflash Tester have been shown to be comparable in magnitude to those obtained by using the Tag Closed-Cup procedure as described in Method D 56.

1.3 *This standard should be used solely to measure and describe the properties of materials, products, or systems in response to heat and flame under controlled laboratory conditions and should not be considered or used for the description, appraisal, or regulation of the fire hazard of materials, products, or systems under actual fire conditions.*

2. Applicable Documents

2.1 ASTM Standards:

D 56 Test for Flash Point by Tag Closed Tester²

E 1 Specification for ASTM Thermometers³

3. Summary of Method

3.1 By means of a syringe, 2 ml of sample is introduced through a leakproof entry port into the tightly closed Setaflash Tester that has been brought to within about 5°F (3°C) below the expected flashpoint. After 1 min, to allow the sample to come to the same temperature as the aluminum alloy body of the tester, in which the thermometer is inserted, the temperature of the apparatus is raised to the "expected" flash point temperature. A test flame is applied inside the cup and note is taken as to whether the test sample flashes or not.

3.2 As a go-no-go test, the "expected" flash point temperature is a specification or other operating target value. For a finite flash measurement, the temperature is moved through the anticipated temperature range, the test flame being applied at 2°F (1.0°C) intervals until a flash is observed; a second trial is made using the first value as the "expected" flash point temperature, this time making tests at 1°F (0.5°C) intervals.

4. Apparatus

4.1 *Flash cup and operating mechanism*, illustrated in Fig. 1 and dimensioned in detail in Annex A1. Fasten electrical heaters to the cup in such a way so as to provide for efficient transfer of heat. Provide a variable heater control device with a scaled dial and a visible signal indicating when energy is or is not being applied. Energy may be supplied from a 115 or 230-V a-c main service (for stationary use) or by a 12-V d-c battery service (for field use).

4.2 *Test Flame and Pilot Flame*—Regulatable test flame, for dipping into the test cup to try for flash, and a pilot flame to maintain the test flame, are required. These flames may be fueled by piped gas service (fixed location) or by a self-contained tank (4.2.1) of L.P. gas lighter fluid (for portability). Provide a gage ring, 1/4 in. (4 mm) in diameter, mounted on a post near the test flame against which the size of the flame may be judged.

4.2.1 Never recharge the gas tank with the pilot or test flames alight, nor in the vicinity of other naked flames.

¹ This method is under the jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants.

Current edition approved Aug. 27, 1976. Published November 1976. Originally published as D 3243 - 73 T. Last previous edition D 3243 - 73 T.

² Annual Book of ASTM Standards, Part 23.

³ Annual Book of ASTM Standards, Parts 25 and 44.

for a flash at the cup opening.

7.3.5 The sample is deemed to have flashed only if a comparatively large blue flame appears and propagates itself over the surface of the sample. Occasionally, particularly near the temperature of the actual flash point, the application of the test flame will cause a halo, which should be ignored.

7.3.6 Record the test result as flash (or no flash) at the temperature and the barometric pressure. Make a barometric pressure correction, if necessary (9.1).

7.4 Test Procedure for Actual Flash Point:

7.4.1 When a finite flash point is to be determined, make a trial test beginning at about 10°F (6°C) below the expected value. If no flash is observed, continue heating and test for flash at each 2°F (1°C); the rate of temperature rise may be as rapid as can be conveniently followed when watching both the thermometer and the test flame. When a flash is observed, use it as the expected flash point value in setting the test cup temperature for the finite flash point.

7.4.2 After cleaning the test cup, adjust the temperature so that it is stable at about 5°F (3°C) below the expected flash point (7.3); charge the syringe with a fresh test sample and transfer the sample to the fitting orifice (Fig. 1) taking care not to lose any sample. Then discharge the sample into the test cup by depressing the syringe plunger to its lowest position.

NOTE 3—The test cup temperature is stable when the signal light slowly cycles ON/OFF.

7.4.3 Move the 1-min timing device by rotating its knob clockwise to the required setting. In the meantime, open the gas control valve, and light the pilot and test flames. Adjust the test flame size with the pinch valve so as to match the size of the $\frac{1}{8}$ in. (4 mm) diameter of the gage.

7.4.4 After 1 min has elapsed, turn the heater control toward FULL ON. Apply the test flame at each 1°F (0.5°C) interval by slowly and uniformly opening the slide fully and closing completely over a period of approximately 2½ s. Watch for a flash at each application of the test flame.

7.4.5 When the flash point (7.3.5) is observed, record the flash point temperature and barometric pressure. If the barometric pressure differs from 760 mm (101.3 kPa), make neces-

sary corrections according to 9.1.

7.4.6 Turn off pilot and test flames and clean the testing apparatus.

7.4.7 Never make a repeat flash point determination using the same sample; always use a fresh portion of sample for each new test.

8. Clean-Up of Apparatus

8.1 To prepare for the next test, unlock the lid assembly of the tester and raise to the hinge stop. Soak up sample with an absorbent paper tissue. Clean the underside of the lid and the filling orifice; a pipe cleaner may be of assistance in cleaning the latter.

8.1.1 Any further cleaning necessary may be carried out by complete removal of the lid and shutter assembly. Disconnect the silicone rubber gas tube and slide the lid assembly to the right to remove. If warm, handle gingerly.

8.2 After the cup has been cleaned, its temperature may be rapidly reduced to some stand-by value by turning the temperature control dial to an appropriate point.

8.2.1 It is convenient to hold the test cup at some stand-by temperature (depending on planned usage) to conserve time in bringing the cup within the test temperature range. The cup temperature may be quickly lowered by placing an ice cube in the cup, sopping up the water before it spills over the edge. A neater operation is possible by inserting the aluminum cooling block (4.6) which has been kept in an ice-water bath.

8.3 The syringe is easily cleaned by filling with acetone twice, discharging each time, and allowing to air dry with the plunger removed. Replace the plunger, and pump several times to replace any acetone vapor with air.

9. Correction for Barometric Pressure

9.1 When the barometric pressure differs from 760 mm Hg (101.3 kPa), calculate the flash temperature by means of the following equation:

$$\begin{aligned} \text{Calculated flash point} &= T_o + 0.06(760 - P) \\ &= T_o + 0.03(760 - P) \end{aligned}$$

where:

T_o, T_c = observed flash point, °F or °C, and
 P = barometric pressure, mm Hg

10. Precision

10.1 The following criteria should be used


D 3243

4.3 *1-min Audible Signal*, a desirable accessory.

4.4 *Thermometer*, conforming to specifications given in Annex A2; test to determine that the scale error does not exceed 0.5°F (1.25°C). The use of a magnifying lens significantly assists in making temperature observations.

4.5 *Syringe*, a 2 ± 0.05-ml capacity at 77°F (25°C), is needed for selecting a uniform size sample. Check the capacity by discharging water into a beaker and weighing. Adjust plunger stop if necessary.

NOTE 1—A unit meeting all of the requirements described above is shown in Fig. 2.

4.6 *Aluminum Alloy Cooling Block (with knob handle)*, that fits snugly within the test cup and is about 2½ times the volume of the cup, is a useful accessory for rapid cooling of the sample cup between tests.

5. Sample

5.1 The size of sample required for each test is 2 ml. Obtain at least a 25-ml sample at the bulk test site and store in a tight screw cap clean glass container.

5.2 Erroneously high flash points may be obtained if precautions are not taken to avoid the loss of volatile material. Do not open sample containers unnecessarily and do not transfer sample unless its temperature is at least 20°F (11°C) below the expected flash point. Discard samples in leaky containers.

6. Preparation of Apparatus

6.1 After thermometer removal or replacement, fix in place in its pocket (Fig. 1) with a good heat transfer paste.

6.2 Before initial use, determine the relationship between the temperature control dial and thermometer readings at intervals not exceeding 10°F (6°C) throughout the scale range of the heater. This calibration is useful in making the desired settings to establish a desired test temperature during a test.

6.3 As nearly as possible, place the tester in a position where it is not exposed to disturbing drafts. Provide a shield if necessary.

6.4 Read the manufacturers operating and maintenance instructions on the care and servicing of the tester, and for specific suggestions on the operation of its various controls.

7. Procedure

7.1 Inspect the inside of the test cup, lid and

shutter mechanism for cleanliness and freedom from contamination. Use an absorbent paper tissue to wipe clean, if necessary. Put cover in place and lock securely.

7.2 To use the tester, switch the instrument on and turn the heater dial to a position corresponding to the desired test temperature.

NOTE 2—A calibration curve of Temperature Control Dial setting versus Sample Well Temperature is furnished with each instrument. If such a calibration is not available, one should be prepared from observations of test cup temperature for each dial setting as this will be useful in making desired temperature settings.

7.3 Procedure for Go-No-Go Flash Point:

7.3.1 Switch the instrument ON and turn the heater dial fully clockwise (FULL ON) causing the heater signal light to glow. When the thermometer reaches a temperature of about 5°F (3°C) below the expected or target flash point temperature (7.3.1.1) reduce the heat input to the test cup by turning the heater control dial, counterclockwise to the point at which the signal light is just extinguished.

7.3.1.1 When the tester is used in the go-no-go configuration, the specification or target value is the expected flash point.

7.3.1.2 When the correct temperature can be dialed on the temperature controller (6.2), the elapsed time to reach it may be greater than when turned to FULL ON, but less attention will be required in the intervening period.

7.3.2 When the test temperature is reached and the signal light is just extinguished, charge the syringe with a sample of the fuel to be tested and transfer the charge to the filler orifice. Discharge the test sample into the test cup by fully depressing the plunger of the syringe and then removing the syringe.

7.3.3 Move the 1-min timing device by rotating the knob clockwise to its stop. Open the gas control valve and light the test and pilot control flames. Adjust the pilot flame with the pinch valve to conform to the size of the ¼-in. (4-mm) gage.

7.3.4 After 1 min has elapsed, apply the test flame by slowly and uniformly opening the slide valve and then closing it completely over a period of approximately 2½ s. Watch closely

¹A Setflash Low Temperature Tester, Model SFA 1374, as shown in Fig. 2 is manufactured by Stanhope-Seta, Ltd., Igham, Surrey, England, and available in the U. S. from Erdco Engineering Corp., 136 Official Rd., Addison, Ill., 60101.

ASTM D 3243

for judging the acceptability of results (95% confidence):

10.1.1 *Repeatability*³—Duplicate results by the same operator should be considered suspect if they differ by more than the following amounts:

Range	Repeatability
70 to 200°F (21 to 94°C)	2°F (1.1°C)

10.1.2 *Reproducibility*⁴—The results sub-

mitted by each of two laboratories should not be considered suspect unless they differ by more than the following amounts:

Range	Reproducibility
70 to 200°F (21 to 94°C)	7°F (3.9°C)

³ The results of the cooperative test program, from which these values have been derived, are listed at ASTM Headquarters as Research Report No. RR-1008, D-2.

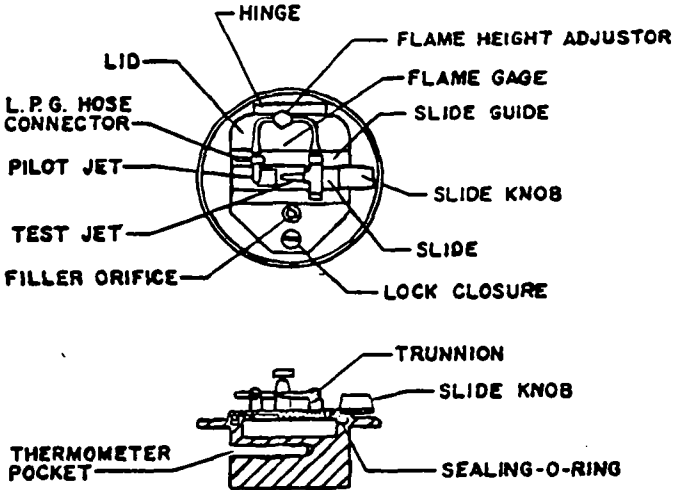


FIG. 1 Setflash Cup Unit.

Appendix B



Designation: D 56 - 70 (Reapproved 1975)

American National Standard Z11.24-1971

Approved Aug. 17, 1971

By American National Standards Institute

AMERICAN SOCIETY FOR TESTING AND MATERIALS

Method 1101—Federal Test

1916 Race St., Philadelphia, Pa., 19103

Method Standard No. 791b

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Replaces Method 4291 of Federal Test

Method Standard No. 141A

If not listed in the current combined Index, will appear in the next edition.

Standard Method of Test for FLASH POINT BY TAG CLOSED TESTER¹

This Standard is issued under the fixed designation D 56; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval.

1. Scope

1.1 This method covers the determination of the flash point, by Tag closed tester, of liquids with a viscosity of below 45 SUS at 100 F (37.8 C) and a flash point below 200 F (93 C) except cut-back asphalts and those liquids which tend to form a surface film under test conditions.

NOTE 1—For the closed cup flash point of liquids with a viscosity of 45 SUS or more at 100 F (37.8 C) or a flash point of 200 F or higher, and those liquids which tend to form a surface film under test conditions use ASTM Method D 93, Test for Flash Point by Pensky-Martens Closed Tester.² For cut-back asphalts refer to ASTM Method D 1310, Test for Flash Point of Liquids by Tag Open-Cup Apparatus.³

NOTE 2—The U. S. Department of Transportation (OHA)⁴ and U. S. Department of Labor (OSHA) have established that liquids with a flash point under 100 F (37.8 C) are flammable as determined by this method for those liquids which have a viscosity less than 45 SUS at 100 F (37.8 C) or do not contain suspended solids or do not have a tendency to form a surface film while under test. Other classification flash points have been established by these Departments for liquids using this test.

Liquids having viscosities more than 45 SUS at 100 F (37.8 C) and contain suspended solids or have a tendency to form a surface film while under test are regulated in accordance with Method D 93.

Coast Guard and Consumer Product Safety Commission Regulations are required by law to define flammable liquids as those having a flash point under 80 F (26.7 C) by an Open Cup Method (Method D 1310).

1.2 *This standard should be used solely to measure and describe the properties of materials, products, or systems in response to heat and flame under controlled laboratory conditions and should not be considered or used for the description, appraisal, or regulation of the fire hazard of materials, products, or systems*

under actual fire conditions.

2. Summary of Method

2.1 The sample is placed in the cup of the tester and, with the lid closed, heated at a specified constant rate. A small flame of specified size is directed into the cup at regular intervals. The flash point is taken as the lowest temperature at which application of the test flame causes the vapor above the sample to ignite.

3. Apparatus

3.1 *Tag Closed Tester*—The apparatus is shown in Fig. 1 and described in detail in Appendix A1; Refer to Appendix A2 for directions for checking the condition and operation of the tester.

3.2 *Shield*—A shield 18 in. (460 mm) square and 24 in. (610 mm) high, open in front, is recommended.

3.3 *Thermometers*—For the test cup thermometer, use one as prescribed in Table 1. For the bath thermometer, any convenient type which has an adequately open scale covering the required range may be used; it is often convenient to use the same type of thermometer as used in the test cup.

¹ This method is under the joint jurisdiction of ASTM Committee D-1 on Paint, Varnish, Lacquer, and Related Products, and Committee D-2 on Petroleum Products and Lubricants.

Current edition effective Sept. 11, 1970. Originally issued 1918. Replaces D 56 - 64.

² *Annual Book of ASTM Standards*, Part 29.

³ For information on U.S. Department of Transportation's regulations, see Codes of U.S. Regulations 49 CFR Chapter I and for information on U.S. Department of Labor's regulations see Code of U.S. Regulations 29 CFR Chapter XVII. Each of these items are revised annually and may be procured from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.



NOTE 3—Whenever thermometers complying with ASTM requirements are not available, thermometers complying with the requirements for The Institute of Petroleum thermometer IP 15F PM-Low may be used.

NOTE 4—There are automatic flash point testers available and in use which may be advantageous in the saving of testing time, permit the use of smaller samples, and other factors which may merit their use. If automatic testers are used, the user must be sure that all of the manufacturer's instructions for calibrating, adjusting, and operating the instrument are followed. In any cases of dispute, the flash point as determined manually shall be considered the referee test.

4. Sample

4.1 Erroneously high flash points may be obtained if precautions are not taken to avoid the loss of volatile material. Containers shall not be opened unnecessarily and transfers shall not be made unless the sample temperature is at least 20 F (11 C) below the expected flash point. Samples in leaky containers shall be discarded.

5. Preparation of Apparatus

5.1 Support the tester on a level steady-table. Unless tests are made in a draft-free room or compartment, surround the tester on three sides by the shield for protection from drafts. Tests made in a laboratory draft hood or near ventilators are not to be relied upon.

5.2 Gas is recommended for the test flame. If gas is not available, insert a wick of cotton in the burner tip, place small quantity of cotton waste in the chamber to which the burner tip is attached, and fill the chamber with signal, sperm, or lard oil.

6. Procedure

6.1 For flash points below 55 F (13 C) or above 140 F (60 C), use as bath liquid a 1 + 1 mixture of water and ethylene glycol. For flash points between 55 F (13 C) and 140 F (60 C), either water or water-glycol mixture may be used as bath liquid (Note 4). The temperature of the liquid in the bath shall be at least 20 F (11 C) below the expected flash point at the time of introduction of the sample into the test cup. Do not cool the bath liquid by direct contact with carbon dioxide or "dry ice." Place the test cup in position in the bath.

NOTE 5—Due to possible difficulty in maintaining the prescribed rate of temperature rise and due to the formation of ice on the lid, results by this method for samples having flash points below 32 F (0 C) may be somewhat unreliable. Trouble due to

ice formation on the slide may be minimized by carefully lubricating the slide shutter with high-vacuum silicone lubricant.

6.2 Using a graduate and taking care to avoid wetting the cup above the final liquid level, measure 50 ± 0.5 ml of the sample into the cup, both the sample and graduate being precooled, if necessary, so that the sample temperature at the time of measurement will be 80 ± 10 F (27 ± 5.6 C) or at least 20 F (11 C) below the expected flash point, whichever is lower. It is essential that the sample temperature be maintained at least 20 F (11 C) below the expected flash point during the transfers from the sample container to the graduate and from the graduate to the test cup. Destroy air bubbles on the surface of the sample. Wipe the inside of the cover with a clean cloth or absorbent tissue paper; then attach the lid, with the thermometer in place, to the bath collar.

6.3 Light the test flame, adjusting it to the size of the small bead on the cover. Operate the mechanism on the cover in such a manner as to introduce the test flame into the vapor space of the cup, and immediately bring it up again. The time consumed for the full operation shall be about 1 s, or the time required to pronounce distinctly the words "thousand and one." Avoid any jerkiness in the operation of depressing and raising the test flame.

6.4 *Flash Points Below 140 F (60 C)*—If the flash point of the sample is known to be below 140 F (60 C), apply and adjust the heat so that the temperature of the sample will rise at a rate of 2 F (1 C)/min \pm 6 s. When the temperature of the sample in the test cup is 10 F (5.6 C) below its expected flash point, apply the test flame in the manner just described in 6.3, and repeat the application of the test flame after each 1 F (0.6 C) rise in temperature of the sample.

6.5 *Flash Points at or above 140 F (60 C)*—If the flash point of the sample is known to be 140 F or higher, apply and adjust the heat so that the temperature of the sample will rise at a rate of 5 F (3 C)/min \pm 6 s. When the temperature of the sample in the test cup is 10 F (5.6 C) below its expected flash point, apply the test flame in the manner described in 6.3, and repeat the application of the test flame after each 2 F (1 C) rise in temperature of the sample, at each temperature reading



D 56

that is a multiple of 2 F (1 C).

6.6 When the test flame application causes a distinct flash in the interior of the cup, observe and record the temperature of the sample as the flash point. Do not confuse the true flash with the bluish halo which sometimes surrounds the test flame at applications immediately preceding the actual flash.

6.7 Discontinue the test and remove the source of heat. Lift the lid and wipe off the thermometer bulb. Remove the sample cup, empty, and wipe dry.

6.8 If, at any time between the first introduction of the test flame and the observation of the flash point, the rise in temperature of the sample is not within the specified rate or if the actual flash point differs from the expected flash point by an amount greater than 4 F (2 C), discard the result and repeat the test, adjusting the source of heat to secure the proper rate of temperature rise and/or using a modified "expected flash point," as required.

NOTE 6—Never make a repeat test on the same portion of sample once used; always take a fresh portion of sample for each test.

7. Correction for Barometric Pressure

7.1 Observe and record the barometric pressure at the time of the test. Make a correction on the following basis: for each 25 mm

(1 in.) below 760 mm (29.92 in.) barometric reading, add 0.9 C (1.6 F) to the observed flash point; for each 25 mm (1 in.) above 760 mm (29.92 in.) barometric reading, subtract 0.9 C (1.6 F) from the observed flash point. After applying the correction, round the value obtained to the nearest whole number.

8. Precision

8.1 The following criteria should be used for judging the acceptability of results (95 percent probability).⁴

8.1.1 *Repeatability*—Duplicate results by the same operator should not be considered suspect unless they differ by more than the following amounts:

Flash Point	Repeatability
Below 140 F (60 C)	2 F (1.1 C)
140 F (60 C) to 199 F (93 C)	3 F (1.7 C)

8.1.2 *Reproducibility*—The results submitted by each of two laboratories should not be considered suspect unless the two results differ by more than the following amounts:

Flash Point	Reproducibility
Below 55 F (13 C)	6 F (3.3 C)
55 F (13 C) to 139 F (59 C)	4 F (2.2 C)
140 F (60 C) to 199 F (93 C)	6 F (3.3 C)

⁴Supporting data for this method have been filed at ASTM Headquarters as RR: D-2-1003.

⁵Annual Book of ASTM Standards, Part 25.

TABLE 1 Thermometers

For Tests	Below 40 F (4 C)	At 40 to 120 F (4 to 49 C)	Above 120 F (49 C)
Use ASTM Ther- mometer ^a	57F or 57C	9F or 9C 57F or 57C	9F or 9C

^aComplete specifications for these thermometers are given in ASTM Specification E 1, for ASTM Thermometers.⁴

ASTM D 56

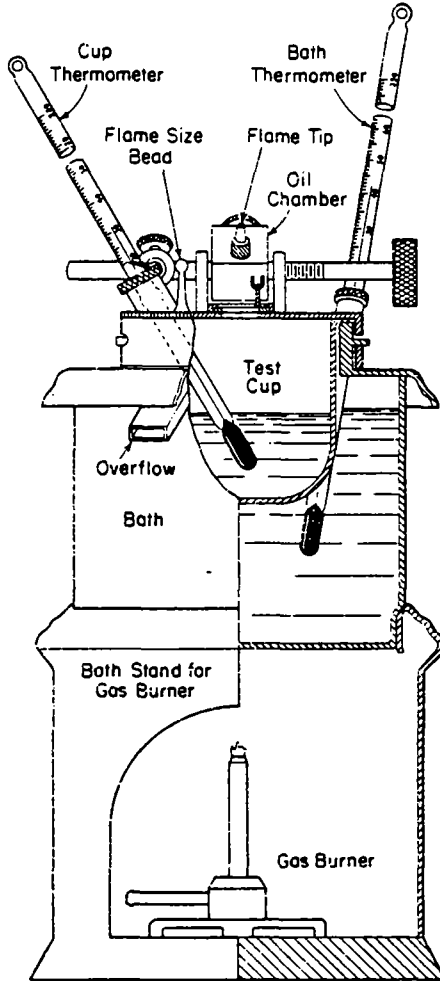


FIG. 1 Tag Closed Flash Tester.

APPENDIXES

A1. APPARATUS

A1.1 The Tag closed tester shall consist of the test cup, lid with test flame, and liquid bath conforming to the following requirements:

A1.1.1 *Test Cup*, of brass or other nonrusting metal of equivalent heat conductivity, conforming to dimensional requirements prescribed in Table A1. It shall weigh 68 ± 1 g.

A1.1.2 *Lid*:

A1.1.2.1 The lid comprises a circle of nonrusting metal with a rim projecting downward about $\frac{3}{8}$ in. (15.9 mm), a slide shutter, a device which simultaneously opens the shutter and depresses the tip of the tube which carries fuel through to the test flame, and a slanting collar in which the cup-thermometer ferrule is inserted. Figure A1 gives a diagram of the upper surface of the lid, showing di-



mensions and positions of the three holes opened and closed by the shutter, and the size and position of the opening for the cup thermometer.

A1.1.2.2 The rim shall fit the collar of the liquid bath with a clearance not exceeding 0.002 in. (0.05 mm) and shall be slotted in such a manner as to press the lid firmly down on the top of the cup when the latter is in place in the bath. When this requirement is not met, the vertical position of the cup in the bath shall be suitably adjusted, as by placing a thin ring of metal under the flange of the cup.

A1.1.2.3 The shutter shall be of such size and shape that it covers the three openings in the lid when in the closed position and uncovers them completely when in the open position. The nozzle of the flame-exposure device shall conform to the dimensions given in Table A1. The device shall be designed and constructed so that opening the shutter depresses the tip to a point approximately 0.08 in. (2 mm) to the right of the horizontal center of the middle opening of the lid. (Refer to lower part of Fig. A2.) This will bring the test flame to the approximate center of the opening. The plane of the underside of the lid shall be between the top and

bottom of the opening in the tip of the flame-exposure device when the latter is fully depressed.

A1.1.2.4 The collar for the cup-thermometer ferrule shall be set at an angle which permits placement of the thermometer with its bulb approximately in the horizontal center of the cup, at a depth prescribed in Table A1.

A1.1.3 *Liquid Bath*, conforming to the limiting or minimum dimensions shown in Fig. A2. It shall be of brass, copper, or other noncorroding metal of substantial construction. Sheet metal of about No. 20 B & S gage (0.812 mm) is satisfactory. It may, if desired, be lagged with heat-insulating material to facilitate control of temperature.

A1.1.4 *Heater*, of any type (electric, gas, alcohol, etc.) capable of controlling temperature as required in Section 6. An external electric heater, controlled by a variable voltage transformer, is recommended.

A1.1.5 *Bath Stand*—For electric heating, any type of stand may be used. For alcohol lamp or gas burner, a stand, as illustrated in Fig. 1, to protect the flame from air currents (unless tests can be made in a draft-free room) is required.

A2. CHECKING CONDITION AND OPERATION OF TAG CLOSED TESTERS

A2.1 Material

A2.1.1 *p-Xylene*,⁶ conforming to the following requirements:

Specific gravity (60/60 F) (15.6/15.6 C), 0.860 min, 0.866 max.

Boiling range. . . . 2 C max from start to dry point, when tested by ASTM Method D 850, Test for Distillation of Industrial Aromatic Hydrocarbons and Related Materials,⁷ or Method D 1078, Test for Distillation Range of Volatile Organic Liquids.⁸ The range shall include the boiling point of pure *p*-xylene, which is 138.35 C (281.03 F).

Freezing point. . . . 11.23 C, min (95 percent molal purity) as determined by ASTM Method D 1015, Test for Freezing Points of High-Purity Hydrocarbons.⁹

A2.2 Procedure

A2.2.1 Determine the flash point of the *p*-xylene, following the directions in Sections 4 to 7. When the tester is operating properly, a value of 81 ± 1 F (27.2 ± 0.6 C) will be obtained.

A2.2.2 If the flash point obtained on *p*-xylene is not within the limits stated in A2.2.1, check the condition and operation of the apparatus to ensure conformity with the details listed in Appendix A1, especially with regard to tightness of the lid (A1.1.2.2), the action of the shutter and the position of the test flame (A1.1.2.3), and the angle and position of the thermometer (A1.1.2.4). After adjustment, if necessary, repeat the test, with special attention to procedural details prescribed in Section 6.

A3. MANUFACTURING STANDARDIZATION

A3.1 The cup thermometer, which conforms also to the specifications for the low-range thermometer used in the Pensky-Martens flash tester, Method D 93, is frequently supplied by the thermometer manufacturer with a metal ferrule intended to fit the collar on the lid of the flash tester. This ferrule is frequently supplemented by an adapter which is used in the larger-diameter collar of the Pensky-Martens apparatus. Differences in dimensions of these collars, which are immaterial in their effect on the results of tests, are a source of considerable unnecessary trouble to manufacturers and suppliers of instruments, as well as to users.

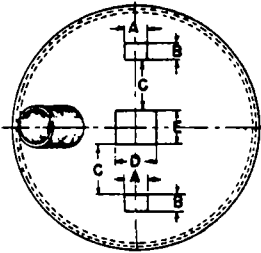
A3.2 Subcommittee 21 on Metalware Laboratory Apparatus, of ASTM Committee E-1 on Methods of Testing, has studied this problem and has established some dimensional requirements which are shown, suitably identified, in Figs. A1, A3, and A4. Conformity to these requirements is not mandatory but is desirable to users as well as suppliers of Tag closed testers.

⁶ Available as Flash Point Check Fluid (*p*-xylene) from Special Products Div., Phillips Petroleum Co., Bartlesville, Okla.

⁷ Annual Book of ASTM Standards, Part 23.

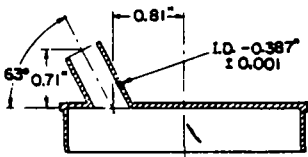
TABLE A1 Dimensional Requirements

Depth of bath liquid surface below top of test cup	1.094 ± 0.016 (27.8 ± 0.4 mm)
Depth of sample surface below top of test cup	1.156 ± 0.031 in. (29.4 ± 0.8 mm)
Depth of bottom of bulb of test thermometer below top of cup when in place	1.77 ± 0.03 in. (45.0 ± 0.8 mm)
Inside diameter of test cup at top	2.125 ± 0.005 in. (54.0 ± 0.1 mm)
Diameter of bead on top of cover	0.156 ± 0.031 in. (4.0 ± 0.8 mm)
Diameter of opening in tip of test flame nozzle	0.049 ± 0.010 in. (1.2 ± 0.3 mm)
Outside diameter of tip of test flame nozzle	0.079 in. max (2.0 mm max)



- A - 0.281"
- B - 0.188"
- C - 0.594"
- D - 0.469"
- E - 0.406"

Note: All dimensions ± 0.005" unless otherwise shown.



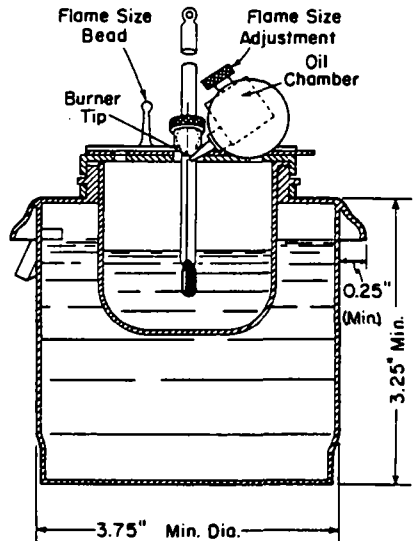
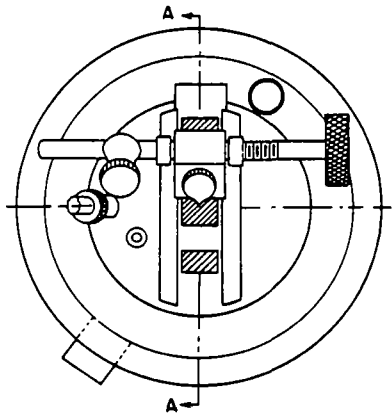
TOP OF LID SHOWING POSITION AND DIMENSIONS OF OPENINGS

Metric Equivalents

in.	mm	in.	mm
0.001	0.03	0.406	10.32
0.005	0.13	0.469	11.92
0.188	4.78	0.594	15.10
0.281	7.15	0.71	18.0
0.387	9.84	0.81	20.6

NOTE—Dimensions relating to the size and position of the thermometer collar are recommended but not mandatory.

FIG. A1 Top of Lid Showing Position and Dimensions of Openings



Metric Equivalents

in.	0.25	3.25	3.75
mm	6.4	82.6	95.3

FIG. A2 Section of Liquid Bath and Cup. Metric Equivalents

Appendix C



Designation: D 3278 - 73

AMERICAN SOCIETY FOR TESTING AND MATERIALS

1916 Race St., Philadelphia, Pa., 19103

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Standard Methods of Test for FLASH POINT OF LIQUIDS BY SETAFLASH CLOSED TESTER¹

This Standard is issued under the fixed designation D 3278; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval.

1. Scope

1.1 This method covers the determination of the flash point, by Setaflash® Closed Tester, of paints, enamels, lacquers, varnishes, and related products and their components having flash points, between 32 and 230°F (0 to 110°C) having a viscosity lower than 150 stokes at 77°F (25°C).²

NOTE 1—Tests at higher or lower temperatures are possible.

1.2 The procedure may be used to determine whether a material will or will not flash at a specified temperature or to determine the finite temperature at which a material will flash.

1.3 The results from this method are comparable to those obtained by the Tag Closed Tester procedure described in Method D 563 and the Pensky-Martens Tester method described in Method D 93.

2. Applicable Documents

2.1 ASTM Standards:

D 56 Test for Flash Point by Tag Closed Tester³

D 93 Test for Flash Point by Pensky-Martens Closed Tester³

D 850 Test for Distillation of Industrial Aromatic Hydrocarbons and Related Materials³

D 1015 Test for Freezing Points of High-Purity Hydrocarbons³

D 1078 Test for Distillation Range of Volatile Organic Liquids³

3. Summary of Method

3.1 By means of a syringe, 2 ml of sample is introduced through a leakproof entry port into

the tightly closed Setaflash Tester or directly into the cut that has been brought to within 5°F (3°C) below the expected flash point. As a flash/no flash test, the *expected* flash point temperature may be a specification or other operating requirements. The temperature of the apparatus is raised to the precise temperature of the expected flash point by slight adjustment of the temperature dial. After 1 min, a test flame is applied inside the cup and note is taken as to whether the test sample flashes or not. If a repeat test is necessary, a fresh sample should be used.

3.2 For a finite flash measurement, the temperature is sequentially increased through the anticipated range, the test flame being applied at 9°F (5°C) intervals until a flash is observed. A repeat determination is then made using a fresh sample, starting the test at the temperature of the last interval before the flash point of the material and making tests at increasing 1°F (0.5°C) intervals.

4. Apparatus

4.1 *Setaflash Tester*⁴, shown in Fig. X1, and described in Appendix X1.

4.2 *Thermometers*⁵ conforming to specifica-

¹ These methods are under the jurisdiction of ASTM Committee D-1 on Paint, Varnish, Lacquer, and Related Products.

Current edition approved Oct. 29, 1973. Published December 1973.

² 1974 Annual Book of ASTM Standards, Part 29.

³ 1973 Annual Book of ASTM Standards, Part 18.

⁴ Unit shown in Fig. X1 is manufactured by Stanhope-Seta Ltd., Park Close, Egham, Surrey, England. It is available in the USA from Erdco Engineering Corp., 136 Official Road, Addison, Ill. 60101, or from Paul N. Gardner Co., Station 9, P. O. Box 6633, Fort Lauderdale, Fla. 33316.

⁵ Thermometers may be obtained from the suppliers of the Setaflash.

tions given in Table X1. Test to determine that the scale error does not exceed 0.5°F (0.25°C). The use of a magnifying lens significantly assists in making temperature observations.

4.3 *Glass Syringe*, 2 ± 0.1 -ml capacity at 77°F (25°C), to provide a means of taking a uniform sample. Check the capacity by discharging water into a weighing bottle and weighing. Adjust plunger if necessary. A disposable syringe of equal precision may be used.

4.4 *Cooling Block*, aluminum (described in Appendix X2) which fits snugly within the test cup for rapid cooling of the sample cup.

4.5 *Barometer*.

5. Reagents and Materials

5.1 *p-Xylene*⁶—Reference standard for checking the Setaflash Tester.

5.2 *Cooling Mixture* of ice water or dry ice (solid CO_2) and acetone.

5.3 *Liquefied Petroleum Gas*.

5.4 *Heat Transfer Paste*⁷

6. Sampling

6.1 The sample size for each test is 2 ml. Obtain at least a 25-ml sample from the bulk source and store in a nearly full tightly closed clean glass container or in other container suitable for the type of liquid being sampled.

6.2 Erroneously high flash points may be obtained if precautions are not taken to avoid loss of volatile material. Do not open sample containers unnecessarily and do not transfer the sample to the cup unless its temperature is at least 20°F (10°C) below the expected flash point. Discard samples in leaky containers.

7. Preparation of Apparatus

7.1 Prior to initial use or after removal of the thermometer, insert the thermometer into its pocket, Fig. X2, with a good heat transfer paste.

7.2 To help in making the necessary settings during a test, determine the relationship between the temperature control dial and thermometer readings at intervals not over 10°F (5°C) throughout the scale range of heater before the initial use.

7.3 Place the tester in a subdued light and in a position where it is not exposed to disturbing drafts. Provide a black-coated shield, if necessary.

7.4 Read the manufacturer's operating and maintenance instructions on the care and servicing of the tester. Observe the specific suggestions regarding the operation of its various controls.

7.5 Check the accuracy of the tester by determining the flash point of the *p*-xylene reference standard in duplicate (Appendix X3). The average of the results should be $81 \pm 1.5^{\circ}\text{F}$ ($27.2 \pm 0.8^{\circ}\text{C}$). If not, remove the thermometer and observe whether sufficient heat transfer paste surrounds the thermometer to provide good heat transfer from the cup to the thermometer.

METHOD A—FLASH/NO FLASH

8. Procedure—Ambient to 230°F (110°C)

8.1 Inspect the inside of the test cup, lid, and shutter mechanism for cleanliness and freedom from contamination. Use an absorbent tissue to wipe clean, if necessary. Lock the cover lid tightly in place.

8.2 Switch the tester on, if not already at stand-by. To rapidly approach the specification flash temperature of the charged sample, turn the heater dial fully clockwise (Note 2) causing the heater signal (red) light to glow. When the thermometer indicates a temperature of about 5°F (3°C) below the specification or target flash point temperature, reduce the heat input to the test cup by slowly turning the heater control dial counter clockwise until the signal light goes out (Note 3).

NOTE 2—When the correct temperature is dialed on the temperature controller, the elapsed time to reach it may be greater than when turned Full On, but less attention will be required in the intervening period.

NOTE 3—The test cup temperature is stable when the signal light slowly cycles on and off.

8.3 Determine the barometric pressure to determine the corrected specification temperature at that barometric pressure (see 13.2).

8.4 After the test cup temperature has stabilized at the specification or target flash point, charge the syringe with the sample to be tested and transfer the syringe to the filling orifice

⁶ *p*-Xylene is available as "Flash Point Check Fluid" from Special Products Div., Phillips Petroleum Co., Bartlesville, Okla.

⁷ Heat transfer paste is available from the supplies of the Setaflash Tester. Dan Corning also can supply a similar paste as their no 340 silicone.


D 3278

(Fig. X2) taking care not to lose any sample. Discharge the sample into the test cup by depressing the syringe plunger to its lowest position, then remove the syringe. If the sample has a viscosity greater than 45 SUS at 100°F (37.8°C) or equivalent of 9.5 cSt at 77°F (25.0°C), discharge the contents of the syringe directly into the cup. Immediately close tightly the lid and shutter assembly.

8.5 Set the 1-min timing device by rotating its knob clockwise to the required setting. In the meantime, open the gas control valve and light the pilot and the test flames. Adjust the test flame size with the pinch valve so as to match the size of the $\frac{1}{2}$ in. (4-mm) diameter flame gage.

8.6 After 1 min has elapsed, observe the temperature. If at the specification temperature (accounting for the differences of the barometer reading from 760 mm), apply the test flame by slowly and uniformly opening the slide fully and closing completely over a period of approximately $2\frac{1}{2}$ s. Watch for a flash.

NOTE 4—The sample is considered to have flashed only if a comparatively large blue flame appears and propagates itself over the surface of the liquid. Occasionally, particularly near the actual flash point temperature, application of the test flame may give rise to a halo; this should be ignored.

8.7 Turn off the test and the pilot flame. Clean the apparatus in preparation for the next test.

9. Procedure—32°F (0°C) to Ambient

9.1 If the specification or target flash point is at or below ambient temperature, cool the sample to 10 to 20°F (5 to 10°C) below that point by some convenient means.

9.2 Cool the tester to approximately the temperature of the sample by inserting the cooling block (Appendix X1.2) filled with a cooling mixture (Notes 5 and 6) into the sample well. Dry the cup with a paper tissue to remove any collected moisture prior to adding the sample.

NOTE 5: Caution—Be careful in handling the cooling mixture and cooling block; wear gloves and goggles. Mixtures such as dry ice and acetone can produce severe frost bite.

NOTE 6: Caution—Be careful in inserting the cooling block into the tester cup to prevent damage to the cup.

9.3 Introduce the sample as in 8.4. Allow the

temperature to rise under ambient conditions or increase the temperature of the cup by rotating the heater controller clockwise slowly until the specification temperature adjusted for barometric pressure is reached. Determine whether the sample flashes as in 8.5 and 8.6.

9.4 Turn off the test and pilot flames. Clean up the apparatus.

METHOD B—FINITE FLASH POINT

10. Procedure—Ambient to 230°F (110°C)

10.1 *Preliminary or Trial Test*—Follow steps 8.1 to 8.5 omitting the barometric reading and using an estimated finite flash point instead of a specification flash point temperature.

10.2 After 1 min has elapsed, observe the temperature, apply the test flame by slowly and uniformly opening the slide fully and closing completely over a period of $2\frac{1}{2}$ s. Watch for a flash (Note 3).

10.3 *Finite Flash Point*—If a flash is observed proceed as below.

10.3.1 Using a temperature of 9°F (5°C) lower than the temperature observed in 10.2, repeat 10.1 and 10.2 (Note 6). If a flash is still observed, repeat at 9°F (5°C) lower intervals until no flash is observed.

NOTE 7—Never make a repeat test on the same sample. Always take a fresh portion for each test.

10.3.2 Repeat 10.1 and 10.2 with a new sample, stabilizing the test cup temperature at the temperature at which no flash occurred previously. Observe if a flash occurs at this temperature. If no flash occurs, increase the temperature at 1°F (0.5°C) intervals by making small incremental adjustment to the temperature controller and allowing 1-min intervals between each increment and the flash point test. Record the temperature at which the flash actually occurs. Record the barometric pressure. Turn off pilot and test flames and clean up tester.

10.4 *Finite Flash Point*—If no flash point is observed in 10.2, proceed as follows:

10.4.1 Using a test temperature of 9°F (5°C) higher than the temperature observed in 10.2, repeat steps 10.1 and 10.2 (Note 7). If no flash is observed, repeat at 9°F (5°C) higher intervals until a flash is observed.

10.4.2 Repeat step 10.3.2 with a new sample.



11. Procedure—32°F (0°C) to Ambient Temperature

11.1 *Preliminary or Trial Test*—Cool the sample to 5 to 10°F (3 to 5°C) below the expected flash point.

11.2 Cool the tester to approximately the temperature of the sample by inserting the cooling block filled with a cooling medium, into the sample well (Notes 4 and 5).

11.3 Insert the sample as in 8.4. Set the 1-min timing device. After 1 min, apply the test flame by slowly and uniformly opening the slide fully and closing completely over a period of approximately 2½ s. Observe for a flash (Note 3). Record the temperature.

11.4 *Finite Flash Point*—If a flash is observed, proceed as follows:

11.4.1 Cool a new sample and the sample cup to 9°F (5°C) below the previous temperature (11.3). After 1 min, check for a flash as in 11.3. If the sample flashes, repeat test at 9°F (5°C) lower intervals until no flash is observed.

11.4.2 Repeat with a new sample, cooling both sample and tester to the temperature at which the sample did not flash. After 1 min, observe if a flash occurs at this temperature, if not, increase the temperature at 1°F (0.5°C) intervals by making small incremental adjustments to the temperature controller, allowing 1 min between each increment and the test for the flash point. Record the temperature at which the flash actually occurs. Record the barometric pressure.

11.5 *Finite Flash Point*—If no flash point is observed proceed as follows:

11.5.1 Using a test temperature of 9°F (5°C) higher than the temperature observed in 11.3, repeat step 11.3 (Note 6). If no flash is observed, repeat at 9°F (5°C) higher intervals until flash is observed.

11.5.2 Using a new sample, repeat 11.4.2 until a flash occurs. Record the temperature at which the flash occurs and the barometric pressure.

12. Clean Up Of Apparatus and Preparation for Next Test

12.1 To prepare for the next test, unlock the lid assembly of the tester and raise to the hinge stop. Soak up liquid samples with an absorbent paper tissue and wipe dry. Clean the underside

of the lid and filling orifice. A pipe cleaner may be of assistance in cleaning the orifice.

12.2 If the sample is a viscous liquid or contains dispersed solids, after soaking up most of the sample, add a small amount of a suitable solvent for the sample to the cup and then soak up the solvent and wipe clean the interior surfaces of the cup with an absorbent tissue paper.

NOTE 8—If necessary to remove residual high boiling solvent residues, moisten tissue with acetone and wipe clean.

NOTE 9—If any further cleaning is necessary, remove the lid and shutter assembly. Disconnect the silicone rubber hose and slide the lid assembly to the right to remove. If warm, handle carefully.

12.3 After the cup has been cleaned, its temperature may be rapidly increased to some stand-by value by turning the temperature control dial to an appropriate point.

NOTE 10—It is convenient to hold the test cup at some stand-by temperature (depending on planned usage) to conserve time in bringing the cup within the test temperature range. The cup temperature may be quickly lowered by inserting the aluminum cooling block filled with an appropriate cooling mixture into the cup.

12.4 The syringe is easily cleaned by filling it several times with acetone or any compatible solvent, discharging the solvent each time, and allowing the syringe to air dry with the plunger removed. Replace the plunger, and pump several times to replace any solvent vapor with air.

13. Correction for Barometric Pressure

13.1 When the barometric pressure differs from 760 mm Hg (101.3 kPa), calculate the flash point temperature by means of the following equations:

$$\begin{aligned} \text{Calculated flash point} &= F + 0.06(760 - P) \\ &= C + 0.03(760 - P) \end{aligned}$$

where:

F, C = observed flash point, °F (or °C), and
 P = barometric pressure, mm Hg.

13.2 Likewise determine the corrected specification flash point by the following equation:

$$\begin{aligned} F &= S - 0.06(760 - P) \\ C &= S - 0.03(760 - P) \end{aligned}$$

where:

F, C = flash point to be observed to obtain the specification flash point at standard pressure (S),
 S = specification flash point.



14. Report

14.1 When using the flash/no flash method, report whether the sample flashed at the required flash point and that the flash/no flash method was used.

14.2 If an actual flash point was determined, report the average of duplicate runs to nearest 1°F (0.5°C) provided the difference between the two values does not exceed 2°F (1°C).

15. Precision*

15.1 The following criteria should be used for judging the acceptability of results (95 % confidence):

15.1.1 Liquids at or below 45 SUS at 100°F or equivalent viscosity measurements.

15.1.1.1 *Repeatability*—The average of duplicate results obtained by the same operator on

different days should be considered suspect if they differ by more than 3°F (1.7°C).

15.1.1.2 *Reproducibility*—The average of duplicate results, obtained by each of two laboratories should not be considered suspect unless they differ by more than 6°F (3.3°C).

15.1.2 Viscous liquids above 45 SUS at 100°F or liquids with dispersed solids.

15.1.2.1 *Repeatability*—Duplicate results obtained by the same operator on different days should be considered suspect if they differ by more than 6°F (3.3°C).

15.1.2.2 *Reproducibility*—The average of duplicate results obtained by each of two laboratories should not be considered suspect unless they differ by more than 9°F (5°C).

* Supporting data for this method has been filed at ASTM Headquarters RR 0-1-1000 and reported in Journal of Paint Technology, Vol 45, No. 581 Page 44.

APPENDICES

X1. APPARATUS SPECIFICATIONS

X1.1 A typical apparatus is shown in Fig. X1 and X2. Electrical heaters are fastened to the cup in such a way so as to provide for efficient transfer of heat. The tester includes a variable heater control device with a scaled dial and a visible signal to indicate when energy is or is not being applied. Energy may be supplied from a 115 or 230-V a-c main service (for stationary use) or by a 12-V d-c battery service (for field use). A regulatable test flame and a pilot flame

to maintain the test flame, are provided. These flames may be fueled by piped gas service (fixed location) or by a self-contained tank of liquefied petroleum gas (5.3) (for portability). A test flame, 1/2 in. (4 mm) in diameter, is provided against which the size of the flame may be judged. Never recharge the gas tank with the pilot or test flames lighted, nor in the vicinity of other naked flames. A 1-min audible signal is a desirable accessory.

X2. COOLING BLOCK

X2.1 The cooling block with dimensions as shown in Fig. X3, is made of aluminum and covered with

pipe insulation.

X3. SPECIFICATIONS FOR *p*-XYLENE REFERENCE STANDARD

X3.1 *Specific Gravity (60/60°F) (15.6/15.6°C)*—0.860 min, 0.866 max.

X3.2 *Boiling Range*—2°C max from start to dry point, when tested by Method D 850 or Method

D 1078. The range shall include the boiling point of pure *p*-xylene, which is 138.35°C (281.03°F).

X3.3 *Freezing Point*—11.23°C min (95 % molal purity) as determined by Method D 1015.

ASTM D 3278

TABLE XI Setaflash[®] Thermometers

ASTM No., Name	XXF-XXC, Setaflash Medium	XXF (XXC) Setaflash Low
Range	32 to 230°F (0 to 110°C)	-10°C - 160° (-23 to 70°C)
Immersion	44.5 ± 1 mm	44.5 ± 1 mm
Graduations:		
Subdivisions	1 ± F (1°C)	1°F (1°C)
Long lines at each	10°F (10°C)	10°F (10°C)
Number at each*	10°F (10°C)	10°F (10°C)
Scale error, max	0.5°F (0.25°C)	0.5°F (0.25°C)
Expansion chamber, for heat to ^b	248°F (120°C)	176°F (80°C)
Total length	204 ± 3 mm	204 ± 3 mm
Stem, OD	6 to 7 mm	6 to 7 mm
Bulb:		
Length	11.7 to 13.7 mm	11.7 to 13.7 mm
OD	4.7 to 5.7 mm	4.7 to 5.7 mm
Scale location:		
Bottom of bulb to 32°F (0°C)	49 to 51 mm	
Bottom of bulb to -10°F (-23°C)	59 mm to 61 mm
Bottom of bulb to 230°F (110°C)	163 to 176 mm
Bottom of bulb to 160°F (71°C)	183 to 185 mm

* Number so that figures are read from right to left in a horizontal plane.
 * Expansion bulb to be nitrogen filled for horizontal operation.

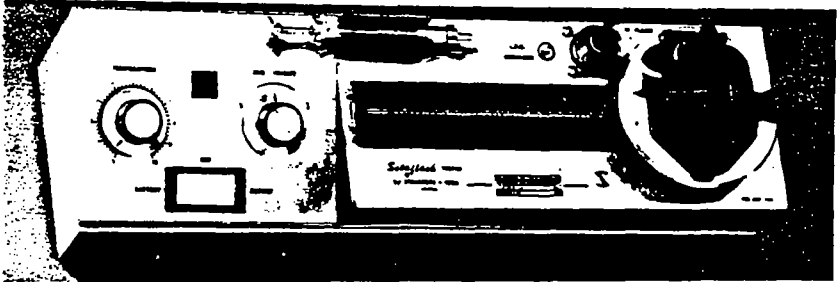
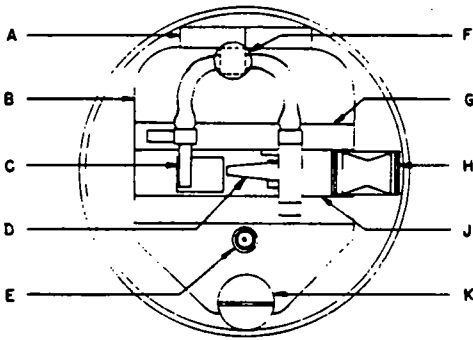
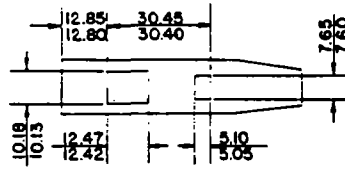
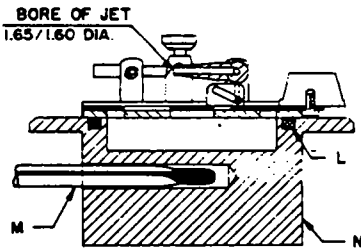


FIG. X1 Setaflash Tester.

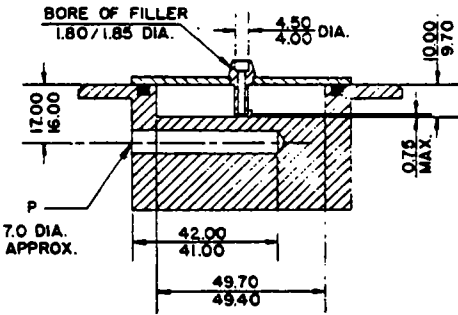
ASME D 3278



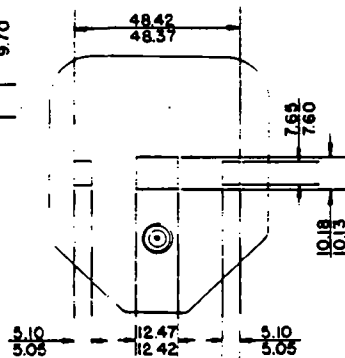
- A - HINGE
- B - LID
- C - PILOT JET
- D - TEST JET
- E - FILLER ORIFICE
- F - GAS CONTROL SCREW
- G - SLIDE GUIDE
- H - SLIDE KNOB
- J - SLIDE
- K - LOCK CLOSURE
- L - SEALING O-RING
- M - THERMOMETER
- N - SAMPLE BLOCK
- P - THERMOMETER POCKET



SLIDE (1.22 THICK APPROX.)



SAMPLE BLOCK



LID (2.00 THICK APPROX.)

FIG. X2 Setaflash Unit.

ASME D 3278

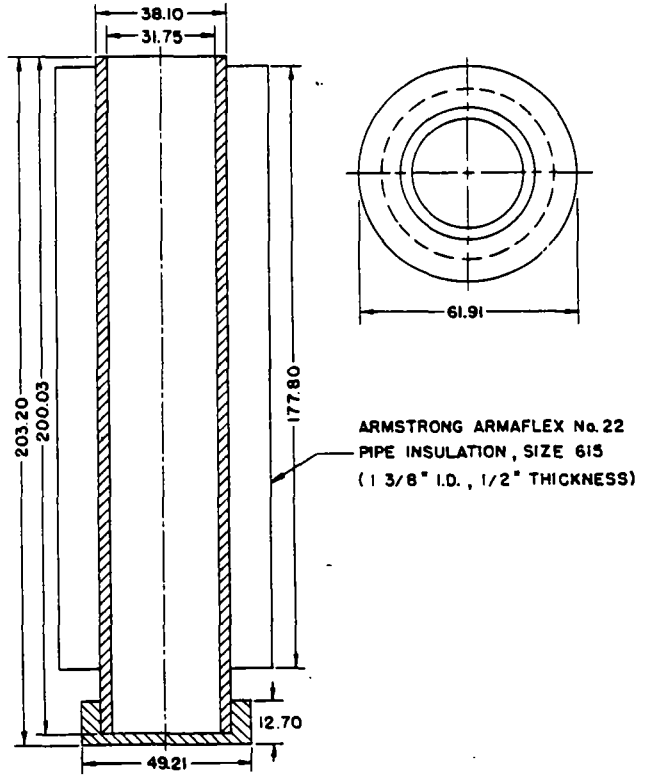


FIG. 3 Cooling Block

Appendix D



Designation: D 93 - 73



IP Designation: 34/71

AMERICAN SOCIETY FOR TESTING AND MATERIALS

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American National Standard Z11.7
American National Standards Institute
Method 1102—Federal Test
Method Standard No. 791b
Federation of Societies for
Paint Technology Standard No. Dt-5-66
British Standard 2839

Standard Method of Test for FLASH POINT BY PENSKY-MARTENS CLOSED TESTER¹

ADOPTED (as method GO-7), 1924; LAST REVISED, 1971

This Standard of the American Society for Testing and Materials is issued under the fixed designation D 93; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reappraisal. This is also a standard of the Institute of Petroleum issued under the fixed designation IP 34. The final number indicates the year of last revision.

This method was adopted as a joint ASTM-IP Standard in 1967.

1. Scope

1.1 This method covers the determination of the flash point by Pensky-Martens Closed Cup Tester of fuel oils, lube oils, suspensions of solids, liquids that tend to form a surface film under test conditions, and other liquids. For the determination of the flash point of drying oils and solvent-type waxes refer to Note 1.

NOTE 1—The flash point of drying oils may be determined using Method D 1393 and the flash point of solvent-type liquid waxes may be determined using Method D 1437.

NOTE 2—This method may be employed for the detection of contamination of lubricating oils by minor amounts of volatile materials.

2. Applicable Documents

2.1 ASTM Standards:

- D 56 Test for Flash Point by Tag Closed Tester²
- D 1310 Test for Flash Point of Liquids by Tag Open-Cup Apparatus³
- D 1393 Test for Flash Point of Drying Oils²
- D 1437 Test for Flash Point of Solvent-Type Liquid Waxes⁴
- E 1 Specification for ASTM Thermometers⁵

3. Summary of Method

3.1 The sample is heated at a slow, constant rate with continual stirring. A small flame is directed into the cup at regular intervals with simultaneous interruption of stirring. The flash point is the lowest temperature at which application of the test flame causes the vapor above the sample to ignite.

4. Apparatus

4.1 *Pensky-Martens Closed Flash Tester*, as described in Appendix A1.

NOTE 3—There are automatic flash point testers available and in use which may be advantageous in the saving of testing time, permit the use of smaller samples, and have other factors which may merit their use. If automatic testers are used, the user must be sure that all of the manufacturer's instructions for calibrating, adjusting, and operating the instrument are followed. In any cases of dispute, the flash point as determined manually shall be considered the referee test.

4.2 *Thermometers*—Two standard thermometers shall be used with the ASTM Pensky-Martens tester, as follows:

4.2.1 For tests in which the indicated reading falls within the limits 20 to 200 F (−7 to +93 C), inclusive, an ASTM Pensky-Martens Low Range or Tag Closed Tester Thermometer having a range from 20 to 230 F (−5 to +110 C) and conforming to the requirements for Thermometers 9F (9C) and as prescribed in ASTM Specification E 1 or IP Thermometer 15F (15C) conforming to specifications given in Appendix A3, shall be used.

4.2.2 For tests in which the indicated reading falls within the limits 230 to 700 F (110 to 371 C), an ASTM Pensky-Martens High

¹ This method is under the jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants. Current edition approved Aug. 27, 1973. Published October 1973. Originally published as D 93 - 21 T. Last previous edition D 93 - 72.



In the IP, this method is under the jurisdiction of the Standardization Committee. In 1971 the scope was revised.

² Annual Book of ASTM Standards, Part 20.

³ Annual Book of ASTM Standards, Part 11.

⁴ Annual Book of ASTM Standards, Part 22.

⁵ Annual Book of ASTM Standards, Parts 18 and 30.


D 93 —

34

Range Thermometer having a range from 200 to 700 F (90 to 370 C) and conforming to the requirements for Thermometers 10F (10C) as prescribed in Specification E 1 or IP Thermometer 16F (16C) conforming to specifications given in Appendix A3, shall be used.

4.2.3 For the range 200 to 230 F (93 to 110 C) either thermometer may be used.

5. Preparation of Apparatus

5.1 Support the tester on a level, steady table. Unless tests are made in a draft-free room or compartment, it is good practice, but not required, to surround the tester on three sides with a shield, each section of which is about 18 in. (46 cm) wide and 24 in. (61 cm) high.

6. Preparation of Sample

6.1 Samples of very viscous materials may be warmed until they are reasonably fluid before they are tested. However, no sample should be heated more than is absolutely necessary. It shall never be heated above a temperature of 30 F (16 C) below its expected flash point.

6.2 Samples containing dissolved or free water may be dehydrated with calcium chloride or by filtering through a qualitative filter paper or a loose plug of dry absorbent cotton. Warming the sample is permitted, but it shall not be heated for prolonged periods or above a temperature of 30 F (16 C) below its expected flash point.

NOTE 4—If the sample is suspected of containing volatile contaminants, the treatment described in 6.1 and 6.2 should be omitted.

7. Procedure

7.1 Thoroughly clean and dry all parts of the cup and its accessories before starting the test, being sure to remove any solvent which had been used to clean the apparatus. Fill the cup with the sample to be tested to the level indicated by the filling mark. Place the lid on the cup and set the latter in the stove. Be sure to have the locating or locking device properly engaged. Insert the thermometer. Light the test flame and adjust it to $\frac{9}{32}$ in. (4 mm) in diameter. Supply the heat at such a rate that the temperature as indicated by the thermometer increases 9 to 11 F (5 to stirring in a downward direction.

7.2 If the sample is known to have a flash point of 220 (104 C) or below, apply the test flame when the temperature of the sample is from 30 F (17 C) to 50 F (28 C) below the expected flash point and thereafter at a temperature reading that is a multiple of 2 F (1 C). Apply the test flame by operating the mechanism on the cover which controls the shutter and test flame burner so that the flame is lowered into the vapor space of the cup in 0.5 s, left in its lowered position for 1 s, and quickly raised to its high position. Do not stir the sample while applying the test flame.

7.3 If the sample is known to have a flash point above 220 F (104 C) apply the test flame in the manner just described at each temperature that is a multiple of 5 F (3 C), beginning at a temperature of 30 F (17 C) to 50 F (28 C) below the expected flash point.

NOTE 5—When testing materials to determine if volatile contaminants are present, it is not necessary to adhere to the temperature limits for initial flame application as stated in 7.2 and 7.3.



7.4 Record as the flash point the temperature read on the thermometer at the time the test flame application causes a distinct flash in the interior of the cup. Do not confuse the true flash point with the bluish halo that sometimes surrounds the test flame at applications preceding the one that causes the actual flash.

DETERMINATION OF FLASH POINT OF SUSPENSIONS OF SOLIDS

8. Procedure

8.1 Bring the material to be tested and the tester to a temperature of 60 ± 10 F (15 ± 5 C) or 20 F (11 C) lower than the estimated flash point, whichever is lower. Completely fill the air space between the cup and the interior of the air bath with water at the temperature of the tester and sample. Turn the stirrer 250 ± 10 rpm, stirring in a downward direction. Raise the temperature throughout the duration of the test at a rate of not less than 2 nor more than 3 F (1 to 1.5 C)/min. With the exception of these requirements for rates of stirring and heating, proceed as prescribed in Section 7.

NOTE 6—Solid carbon dioxide (CO₂) (dry ice) shall in no case be used to obtain the proper rate of temperature rise, since CO₂ has a blanketing effect which leads to a false flash point.


D 93 —

34

9. Calculation and Report

9.1 Observe and record the barometric pressure at the time of the test. When the pressure differs from 760 mm Hg, correct the flash point by means of the following equations:

$$\text{Corrected flash point} = F + 0.06(760 - P)$$

or

$$\text{Corrected flash point} = C + 0.03(760 - P)$$

where:

F = observe flash point, deg F.

C = observe flash point, deg C.

P = barometric pressure, mm Hg.

9.2 Record the corrected flash point to the nearest 1 F or 0.5 C.

9.3 Report the recorded flash point as the Pensky-Martens Closed Cup Flash Point, ASTM D 93 - IP 34, of the sample tested.

10. Precision

10.1 The following criteria should be used for judging the acceptability of results (95 percent probability):

10.1.1 *Repeatability*—Duplicate results by the same operator should be considered suspect if they differ by more than the following amounts:

Material	Flash Point Range	Repeatability
Suspensions of solids	95 to 110 F (35 to 43.3 C)	4 F (2.0 C)
All others	220 F (104.4 C) and under Above 220 F (104.4 C)	4 F (2.0 C) 10 F (5.5 C)

10.1.2 *Reproducibility*—The results sub-

mitted by each of two laboratories should be considered suspect if the two results differ by more than the following amounts:

Material	Flash Point Range	Reproducibility
Suspensions of solids	95 to 110 F (35 to 43.3 C)	6 F (3.5 C)
All others	220 F (104.4 C) and under Above 220 F (104.4 C)	6 F (3.5 C) 15 F (8.5 C)

10.2 The following criteria should be used for judging the acceptability of results (95 percent confidence) obtained on viscous and/or heavily pigmented (paint or varnish) materials which tend to form a surface film:

10.2.1 *Repeatability*—The average of two tests by the same operator on the same day compared to two tests on another day should be considered suspect if they differ by more than 9 F (5 C).

10.2.2 *Reproducibility*—The average of two tests by an operator on the same day compared to the average of two tests by another operator (or another laboratory) on any one day should be considered suspect if they differ by more than 18 F (10.0 C).

10.2.3 The definition of Repeatability and Reproducibility given here represents different parameters of the variance of the method; those given in 10.1 are derived from standards of ASTM Committee D-2 and the Institute of Petroleum, while those in 10.2 are from ASTM Committee D-1.

APPENDICES

A1. APPARATUS SPECIFICATIONS

A1.1 A typical assembly of the apparatus, gas heated, is shown in Fig. A1. The apparatus shall consist of a test cup, cover, and stove conforming to the following requirements:

A1.1.1 *Cup*—The cup shall be of brass, or other nonrusting metal of equivalent heat conductivity, and shall conform to the dimensional requirements in Fig. A2. The flange shall be equipped with devices for locating the position of the cup in the stove. A handle attached to the flange of the cup is a desirable accessory. The handle shall not be so heavy as to tip over the empty cup.

A1.1.2 *Cover*:

A1.1.2.1 *Cover Proper*—The cover shown in Fig. A3 shall be of brass (A1.1.1.1), and shall have

a rim projecting downward almost to the flange of the cup. The rim shall fit the outside of the cup with a clearance not exceeding 0.014 in. on the diameter. There shall be a locating or locking device, or both engaging with a corresponding device on the cup. The four openings in the cover, A, B, C, and D, are shown in Fig. A3. The upper edge of the cup shall be in close contact with the inner face of the cover throughout its circumference.

A1.1.2.2 *Shutter*—The cover shall be equipped with a brass (Section 3) shutter (Fig. A4), approximately $\frac{3}{32}$ in. thick, operating on the plane of the upper surface of the cover. The shutter shall be so shaped and mounted that it rotates on the axis of the horizontal center of the cover

between two stops, so placed, that when in one extreme position, the openings *A*, *B*, and *C* in the cover are completely closed, and when in the other extreme position, these openings are completely opened. The mechanism operating the shutter should be of the spring type and constructed so that when at rest the shutter shall exactly close the three openings. When operated to the other extreme, the three cover openings shall be exactly open and the tip of the exposure tube shall be fully depressed.

A1.1.2.3 Flame-Exposure Device—The flame-exposure device (Fig. A4) shall have a tip with an opening 0.027 to 0.031 in. in diameter. This tip shall be made preferably of stainless steel, although it may be fabricated of other suitable metals. The flame-exposure device shall be equipped with an operating mechanism which, when the shutter is in the "open" position, depresses the tip so that the center of the orifice is between the planes of the under and upper surfaces of the cover proper at a point on a radius passing through the center of the larger opening *A* (Fig. A3).

A1.1.2.4 Pilot Flame—A pilot flame shall be provided for automatic relighting of the exposure flame. A bead $\frac{1}{32}$ in. in diameter may be mounted on the cover so that the size of the test flame can be regulated by comparison. The tip of the pilot flame shall have an opening the same size as the tip of the flame exposure device (0.027 to 0.031 in. in diameter).

A1.1.2.5 Stirring Device—The cover shall be equipped with a stirring device (Fig. A4) mounted in the center of the cover and carrying two 2-bladed metal propellers. A stirrer shaft may be coupled to the motor by a flexible shaft or a suitable

arrangement of pulleys.

A1.1.3 Stove—Heat shall be supplied to the cup by means of a properly designed stove which is equivalent to an air bath. The stove shall consist of an air bath and a top plate on which the flange of the cup rests.

A1.1.3.1 Air Bath—The air bath shall have a cylindrical interior and shall conform to the dimensional requirements in Fig. A1. The air bath may be either a flame or electrically heated metal casting (Note A1), or an electric-resistance element (Note A2). In either case, the air bath must be suitable for use at the temperatures to which it will be subjected without deformation.

NOTE A1—If the heating element is a flame or electrically heated metal casting, it shall be so designed and used that the temperatures of the bottom and the walls are approximately the same. On this account it should be not less than $\frac{1}{4}$ in. in thickness. The casting shall be designed so that products of combustion of the flame cannot pass up and come into contact with the cup.

NOTE A2—If the air bath is of the electric-resistance heated type, it shall be constructed so that all parts of the interior surface are heated uniformly. The wall and bottom of the air bath shall be not less than $\frac{1}{4}$ in. in thickness.

A1.1.3.2 Top Plate—The top plate shall be of metal, and shall be mounted with an air gap between it and the air bath. It may be attached to the air bath by means of three screws and spacing bushings. The bushings should be of proper thickness to define an air gap of $\frac{1}{16}$ in., and they shall be not more than $\frac{1}{4}$ in. in diameter.

A2. MANUFACTURING STANDARDIZATION OF THERMOMETER AND FERRULE

A2.1 The low-range thermometer, which conforms also to the specification for the cup thermometer in the Tag closed tester (Method D 56) and which frequently is fitted with a metal ferrule intended to fit the collar on the cover of the Tag flash tester, can be supplemented by an adapter (Fig. A5) to be used in the larger diameter collar of the Pensky-Martens apparatus. Differences in dimensions of these collars, which do not affect test results, are a source of unnecessary trouble

to manufacturers and suppliers of instruments, as well as to users.

A2.2 Subcommittee 21 on Metalware Laboratory Apparatus, of ASTM Committee E-1 on Methods of Testing, has studied this problem and has established some dimensional requirements which are shown in Fig. A5. Conformity to these requirements is not mandatory, but is desirable to users as well as suppliers of Pensky-Martens Testers.



A3. THERMOMETER SPECIFICATIONS

TABLE A1 IP Thermometer Specifications

NOTE—The stem shall be made with an enlargement having a diameter of 1.5 to 2.0 mm greater than the stem and a length of 3 to 5 mm, the bottom of the enlargement being 64 to 66 mm from the bottom of the bulb. These dimensions shall be measured with the test gage shown in Fig. 1 of Specification E 1.¹

Name	IP 15F	IP 15C	IP 16F	IP 16C
	Pensky-Martens Low		Pensky-Martens High	
Range	20 to 230 F	-7 to +110 C	200 to 700 F	90 to 370 C
Graduation	1 F	0.5 C	5 F	2 C
Immersion, mm	57	57	57	57
Over-all length \pm 10 mm	280	280	280	280
Stem diameter, mm	5.5 to 8.0	5.5 to 8.0	5.5 to 8.0	5.5 to 8.0
Bulb shape	cylindrical	cylindrical	cylindrical	cylindrical
Bulb length, mm	9 to 13	9 to 13	10 max	10 max
Bulb diameter, mm	not less than 5.5 and not greater than stem	not less than 5.5 and not greater than stem	not less than 5.5 and not greater than stem	not less than 5.5 and not greater than stem
Length of graduated portion, mm	143 to 177	143 to 177	143 to 177	143 to 177
Distance bottom of bulb to, mm	20 F 75 to 90	-7 C 75 to 90	200 F 75 to 90	90 C 75 to 90
Longer lines at each	5 F	1 C and 5 C	25 F	10 and 20 C
Figured at each	10 F	5 C	50 F	20 C
Expansion chamber	Required	Required	Required	Required
Top finish	Ring	Ring	Ring	Ring
Scale error not to exceed \pm	1 F	0.5 C	2.5 to 500 C 3.5 F above 500 F	1 to 260 C 2 C above 260 C
See notes	1 and see table for emergent stem temperatures	1 and see table for emergent stem temperatures	1 and see table for emergent stem temperatures	1 and see table for emergent stem temperatures

TABLE A3 Standardization Temperatures

NOTE—The emergent column temperatures are those attained when using the thermometers in the test equipment for which the thermometers were originally designed. In some cases these temperatures are markedly different from those realized during standardization.

Temperature	Average Temperature of Emergent Column	Temperature	Average Temperature of Emergent Column	Temperature	Average Temperature of Emergent Column	Temperature	Average Temperature of Emergent Column
Thermometer 9F (20 to 230 F)		Thermometer 9C (-5 to +100 C)		Thermometer 10F (200 to 700 F)		Thermometer 10C (90 to 370 C)	
32 F	66 F	0 C	19 C	212 F	141 F	100 C	61 C
100 F	86 F	35 C	28 C	390 F	159 F	200 C	71 C
160 F	106 F	70 C	40 C	570 F	180 F	300 C	87 C
220 F	123 F	105 C	50 C	700 F	220 F	370 C	104 C
IP 15F (20 to 230 F)		IP 15C (-7 to 110 C)		IP 16F (20 to 700 F)		IP 16C (90 to 370 C)	
32 F	66 F	0 C	19 C	200 F	140 F	100 C	61 C
70 F	70 F	20 C	20 C	300 F	149 F	150 C	65 C
100 F	86 F	40 C	31 C	400 F	160 F	200 C	71 C
150 F	104 F	70 C	40 C	500 F	175 F	250 C	78 C
212 F	118 F	100 C	48 C	600 F	195 F	300 C	87 C
				700 F	220 F	350 C	99 C

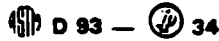


TABLE A2 Specifications for ASTM Thermometers
 All dimensions are in millimeters.
 See Table A3 for Standardization Temperatures.

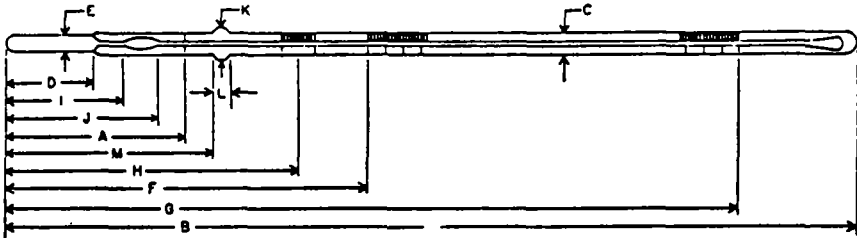
ASTM No. and Name	Range	For Test at	Immer- sion	Graduations			Scale Error max	Special Inscription	Expan- sion Chamber
				Subdi- visions	Long Lines at Each	Number at Each			
9C - 62 Pensky- Martens, Low Range Tag Closed Tester	-5 to +110 C		57	0.5 C	1 C	5 C	0.5 C	ASTM 9C or 9F 57 MM IMM	160 C
9F - 62	20 to 230 F			1 F	5 F	10 F	1 F		320 F
10C - 62 Pensky- Martens, High Range	90 to 370 C		57	2 C	10 C	20 C	*	ASTM 10C or 10F 57 MM IMM	
10F - 62	200 to 700 F			5 F	25 F	50 F	†		

* Scale error: 1 C up to 260 C; 2 C over 260 C.

† Scale error: 2.5 F up to 500 F; 3.5 F over 500 F.

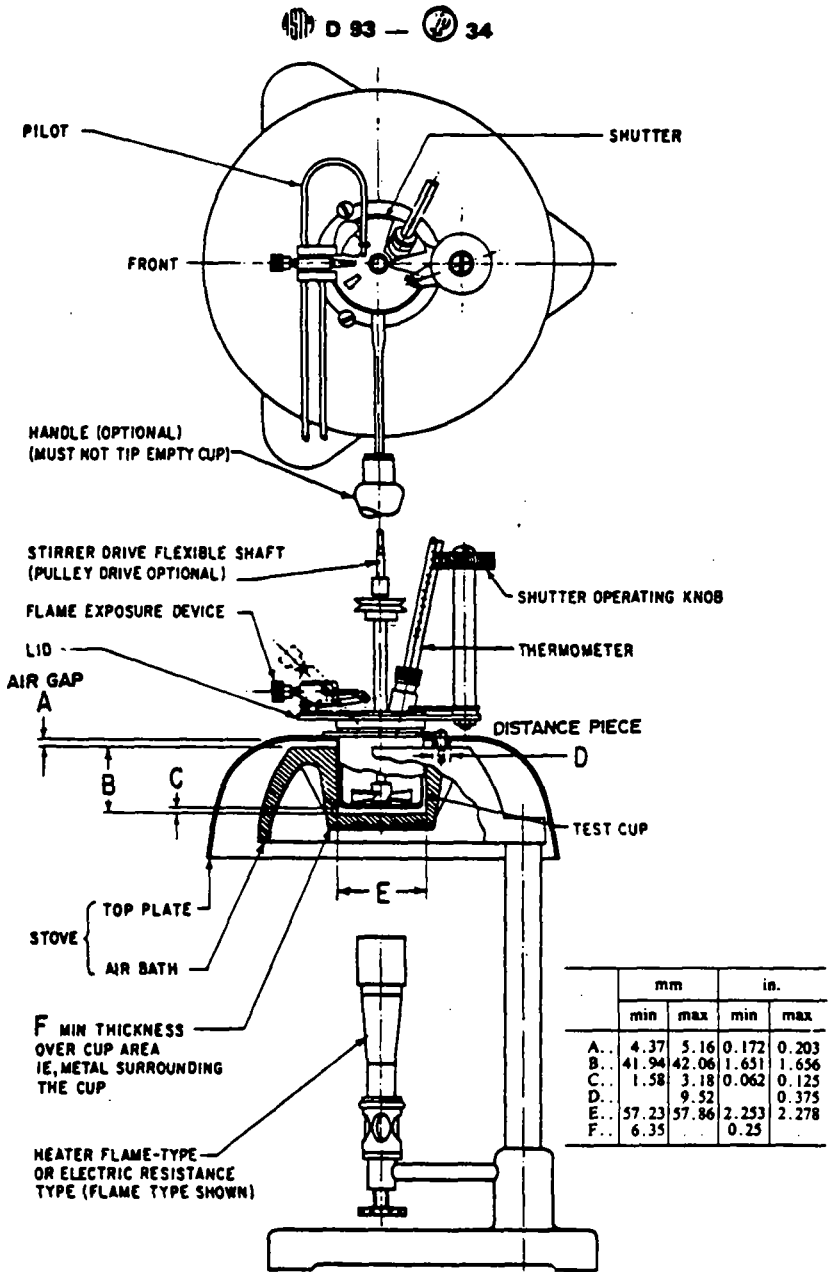
‡ An expansion chamber is provided for relief of gas pressure to avoid distortion of the bulb at higher temperatures. It is not for the purpose of joining mercury separations; and under no circumstances should the thermometer be heated above the highest temperature reading.

D 93 — 34



Total Length, ± 5	Bulb		Scale Location		Ice Point Scale		Contraction Chamber		Stem Enlargement					
	Stem OD	Length	OD	Bottom of Bulb to Line at	Distance	Bottom of Bulb to Line at	Distance	Range	Bottom of Bulb to Ice Point	Distance to Bottom, min	Distance to Top, max	OD	Length	Distance to Bottom
B	C	D	E	F	G	H	I	J	K	L	M			
287	6.0	9.0	>	0 C	85	100 C	221			7.5	2.5			64
	to 7.0	to 13	stem		to 98		to 237			to 8.5	to 5.0 ^a			to 66
				32 F		212 F								
287	6.0	8.0	4.5	110 C	86	360 C	227			7.5	2.5			64
	to 7.0	to 10	to 6.0		to 99		to 245			to 8.5	to 5.0 ^a			to 66
				230 F		680 F								

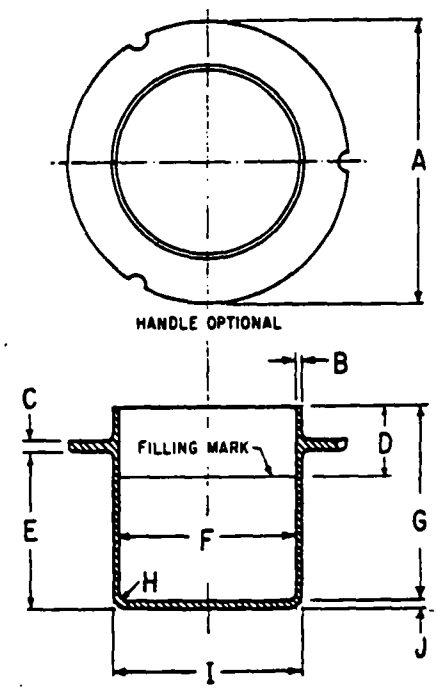
^a The length of the enlargement, and the distance from the bottom of the enlargement to the bottom of the bulb shall be measured with the test gage shown in Fig. A6.



NOTE—Lid assembly may be positioned either right or left-handed.

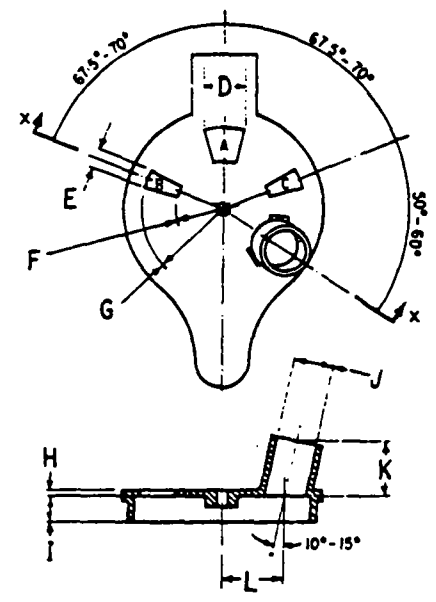
FIG. A1 Pensky-Martens Closed Flash Tester.

ASME D 93 — 34



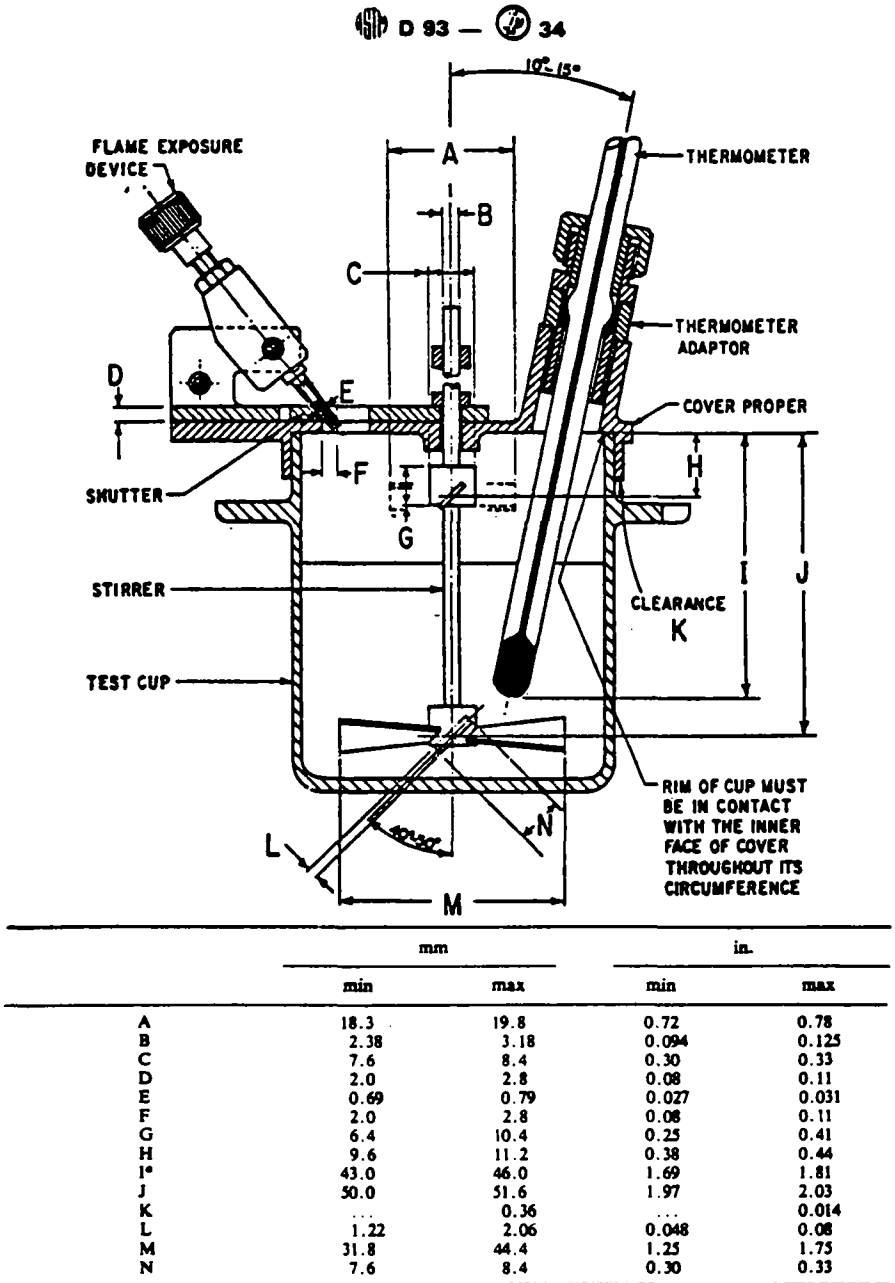
	mm		in.	
	min	max	min	max
A	79.0	79.8	3.11	3.14
B	1.0	...	0.04	...
C	2.8	3.6	0.11	0.14
D	21.72	21.84	0.853	0.860
E	45.47	45.72	1.790	1.800
F	50.72	50.85	1.997	2.002
G	55.75	56.00	2.195	2.205
H	3.8	4.0	0.15	0.16
I	53.90	54.02	2.122	2.127
J	2.29	2.54	0.090	0.100

FIG. A2 Test Cap.



	mm		in.	
	min	max	min	max
D	12.7	13.5	0.50	0.53
E	4.8	5.6	0.19	0.22
F	13.5	14.3	0.53	0.56
G	23.8	24.6	0.94	0.97
H	1.2	2.0	0.05	0.08
I	7.9	...	0.31	...
J	12.27	12.32	0.483	0.485
K	16.38	16.64	0.645	0.655
L	18.65	19.45	0.734	0.766

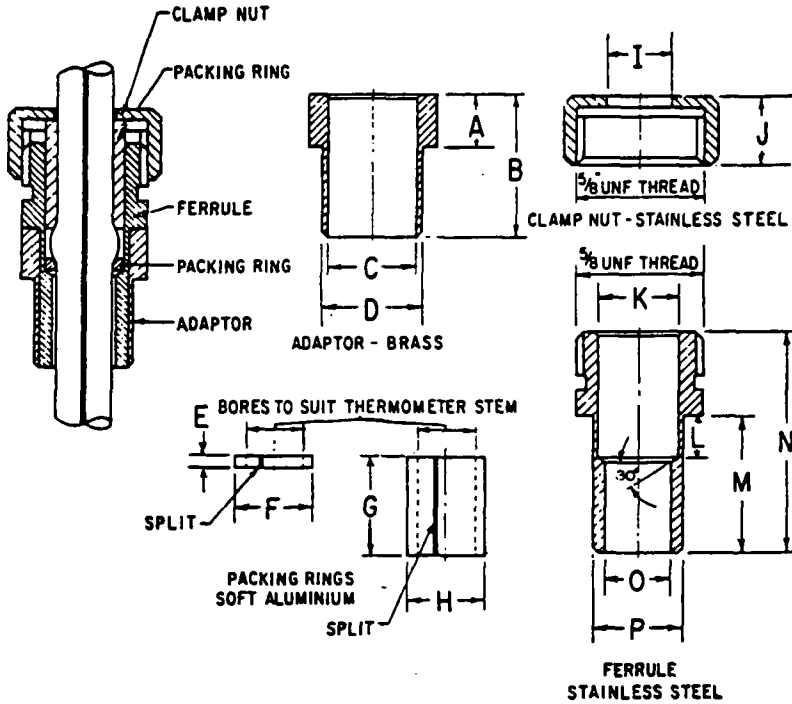
FIG. A3 Cover Proper.



* Includes tolerance for length of thermometer given in ASTM Specification E 1,† ASTM Thermometers.

FIG. A4 Test Cup and Cover Assembly.

D 93 — 34



	mm		in.	
	min	max	in.	max
A	6.20	6.50	0.244	0.256
B	17.0	18.0	0.67	0.71
C	9.80	9.85	0.386	0.388
D	12.19	12.24	0.480	0.482
E	1.40	1.65	0.055	0.065
F	8.56	8.61	0.337	0.339
G	12.4	13.0	0.49	0.57
H	8.56	8.61	0.337	0.339
I	8.1	8.6	0.32	0.34
J	9.9	10.7	0.39	0.42
K	8.64	8.69	0.340	0.342
L	5.1	5.6	0.20	0.22
M	17.0	17.5	0.67	0.69
N	27.4	28.2	1.08	1.11
O	7.11	7.16	0.280	0.282
P	9.73	9.78	0.383	0.385

FIG. A5 Dimensions for Thermometer Adaptor, Ferrule, and Packing Ring.

D 93 — 34

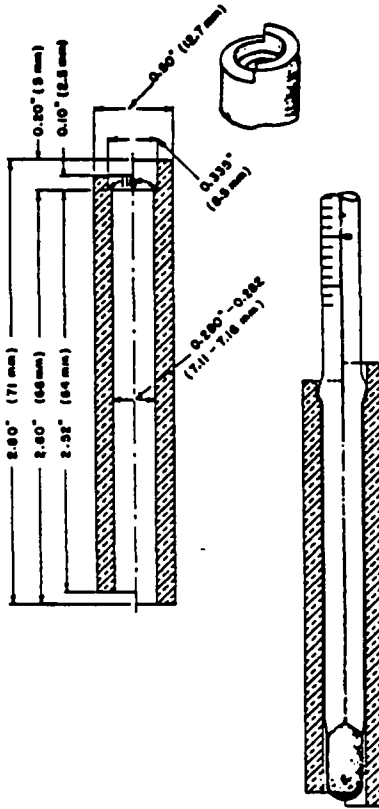


FIG. A6 Test Gage for Checking Enlargements on Thermometers.

By publication of this standard no position is taken with respect to the validity of any patent rights in connection therewith, and the American Society for Testing and Materials does not undertake to insure anyone utilizing the standard against liability for infringement of any Letters Patent nor assume any such liability.

Appendix E

AMERICAN SOCIETY FOR TESTING AND MATERIALS

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THIS

*Standard Method for*CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES¹

ASTM Designation: D 2487 - 69

This Standard of the American Society for Testing and Materials is issued under the fixed designation D 2487; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval.

1. Scope

1.1 This method describes a system for classifying mineral and organo-mineral soils for engineering purposes based on laboratory determination of particle-size characteristics, liquid limit, and plasticity index, and shall be used when precise classification is required.

NOTE 1—This method provides qualitative data only. When quantitative information is required for detailed designs of important structures, this method must be supplemented by laboratory tests or other quantitative data to determine performance characteristics of the soil under expected field conditions.

NOTE 2—This method may also be used as an aid in training personnel in the use of ASTM Recommended Practice D 2488, for Description of Soils (Visual-Manual Procedure).¹

2. Apparatus

2.1 *Apparatus for Preparation of Samples*—See Method D 421, for Dry Preparation of Soil Samples for Grain-Size Analysis and Determination of Soil

¹ Under the standardization procedure of the Society, this method is under the jurisdiction of the ASTM Committee D-18 on Soil and Rock for Engineering Purposes. A list of members may be found in the ASTM Yearbook.

Current edition effective Nov. 14, 1969. Originally issued 1966. Replaces D 2487 - 66 T.

² Annual Book of ASTM Standards, Part 11.

Constants² or ASTM Method D 2217, for Wet Preparation of Soil Samples for Grain Size Analysis and Determination of Soil Constants.²

2.2 *Apparatus for Liquid Limit Test*—See ASTM Method D 423, Test for Liquid Limit of Soils.²

2.3 *Apparatus for Plastic Limit Test*—See ASTM Method D 424, Test for Plastic Limit and Plasticity Index of Soils.²

2.4 *Apparatus for Particle Size Analysis*—See 2. Apparatus, of ASTM Method D 422, for Grain-Size Analysis of Soils,² ASTM Method D 1140, Test for Amount of Materials in Soils Finer than the No. 200 Sieve,² and the classification chart (Fig. 1).

3. Sampling

3.1 Sampling shall be conducted in accordance with ASTM Method D 1452, for Soil Investigation and Sampling by Auger Borings,² ASTM Method D 1586, for Penetration Test and Split-Barrel Sampling of Soils,² ASTM Method D 1587, for Thin-Walled Tube Sampling of Soils,² or another standard accepted procedure.

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES (D 2487)

3.2 The sample shall be carefully identified as to origin by a boring number and sample number in conjunction with a job number, a geologic stratum, a pedologic horizon or a location description with respect to a permanent monument, a grid system or a station number and offset with respect to a stated centerline.

3.3 The sample should also be described in accordance with ASTM Recommended Practice D 2488.

NOTE 3—A soil which is composed primarily of undecayed or partially decayed organic matter and has a fibrous texture, dark brown to black color, and organic odor should be designated as a *highly organic soil*, PT, and not subjected to the classification procedures described hereafter.

4. Test Sample

4.1 Test samples shall represent that portion of the field sample finer than the 3-in. (76-mm) sieve and shall be obtained as follows:

4.1.1 Air dry the field sample,

4.1.2 Weigh the field sample,

4.1.3 Separate the field sample into two fractions on a 3-in. (76-mm) sieve, and

4.1.4 Weigh the fraction retained on the 3-in. (76-mm) sieve. Compute the percentage of plus 3-in. (76-mm) material in the field sample, and note this percentage as auxiliary information.

4.1.5 Thoroughly mix the fraction passing the 3-in. (76-mm) sieve and select test samples.

5. Preliminary Classification Procedure

5.1 Procedure for the determination of percentage finer than the No. 200 sieve.

5.1.1 From the material passing the 3-in. (76-mm) sieve select a test sample and determine the percentage of the test sample finer than the No. 200 sieve in accordance with Method D 1140.

NOTE 4—Step 5.1.1 may be omitted if the soil can obviously be classified as *fine-grained* by visual inspection (see 5.3).

5.2 Classify the soil as *coarse-grained* if more than 50 per cent of the test sample is retained on the No. 200 sieve and follow 6, Procedure for Classification of Coarse-Grained Soils.

5.3 Classify the soil as *fine-grained* if 50 per cent or more of the test sample passes the No. 200 sieve and follow 7, Procedure for Classification of Fine-Grained Soils.

6. Procedure for Classification of Coarse-Grained Soils (More than 50 per cent retained on No. 200 Sieve).

6.1 Select test samples from the material passing the 3-in. (76-mm) sieve for the determination of particle-size characteristics, liquid limit, and plasticity index in accordance with ASTM Method D 421 or ASTM Method D 2217.

6.2 Determine the cumulative particle-size distribution of the fraction coarser than the No. 200 sieve in accordance with ASTM Method D 422.

6.3 Classify the sample as *gravel*, G, if 50 per cent or more of the coarse fraction (plus No. 200 sieve) is retained on the No. 4 sieve.

6.4 Classify the sample as *sand*, S, if more than 50 per cent of the coarse fraction (plus No. 200 sieve) passes the No. 4 sieve.

6.5 If less than 5 per cent of the test sample passed the No. 200 sieve as determined in 5.1.1, compute the coefficient of uniformity, C_u , and coefficient of curvature, C_c , as given in Equations 1 and 2.

$$C_u = \frac{D_{60}}{D_{10}} \quad (1)$$

$$C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} \quad (2)$$

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES	
COARSE-GRAINED SOILS More than 50% retained on No. 200 sieve*	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	
		GRAVELS WITH FINES	GP	Poorly graded gravels and gravel-sand mixtures, little or no fines	
		SANDS More than 50% of coarse fraction passes No. 4 sieve	CLEAN SANDS	SW	Well-graded sands and gravelly sands, little or no fines
			SANDS WITH FINES	SP	Poorly graded sands and gravelly sands, little or no fines
	FINE-GRAINED SOILS 50% or more passes No. 200 sieve*	SANDS AND CLAYS Liquid limit 50% or less	GRAVELS WITH FINES	SM	Silty sands, sand-silt mixtures
				SC	Clayey sands, sand-clay mixtures
		SILTS AND CLAYS Liquid limit greater than 50%	CLEAN GRAVELS	SH	Silty sands, sand-silt mixtures
				SL	Silty sands, sand-silt mixtures
				SM	Silty sands, sand-silt mixtures
				SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS 50% or more passes No. 200 sieve*	SANDS AND CLAYS Liquid limit 50% or less	CLEAN SANDS	SH	Silty sands, sand-silt mixtures	
			SM	Silty sands, sand-silt mixtures	
			SC	Clayey sands, sand-clay mixtures	
	SILTS AND CLAYS Liquid limit greater than 50%	CLEAN SANDS	SH	Silty sands, sand-silt mixtures	
			SM	Silty sands, sand-silt mixtures	
			SL	Silty sands, sand-silt mixtures	
			SC	Clayey sands, sand-clay mixtures	
FINE-GRAINED SOILS 50% or more passes No. 200 sieve*	SILTS AND CLAYS Liquid limit greater than 50%	CLEAN SANDS	SH	Silty sands, sand-silt mixtures	
			SM	Silty sands, sand-silt mixtures	
			SL	Silty sands, sand-silt mixtures	
			SC	Clayey sands, sand-clay mixtures	
			ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
FINE-GRAINED SOILS 50% or more passes No. 200 sieve*	SILTS AND CLAYS Liquid limit greater than 50%	CLEAN SANDS	OL	Organic silts and organic silty clays of low plasticity	
			MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts	
			CH	Inorganic clays of high plasticity, fat clays	
			OH	Organic clays of medium to high plasticity	
Highly Organic Soils			PT	Peat, muck and other highly organic soils	

* Based on the material passing the 3-in. (76-mm) sieve.

FIG. 1—Soil Classification Chart.

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES (D 2487)

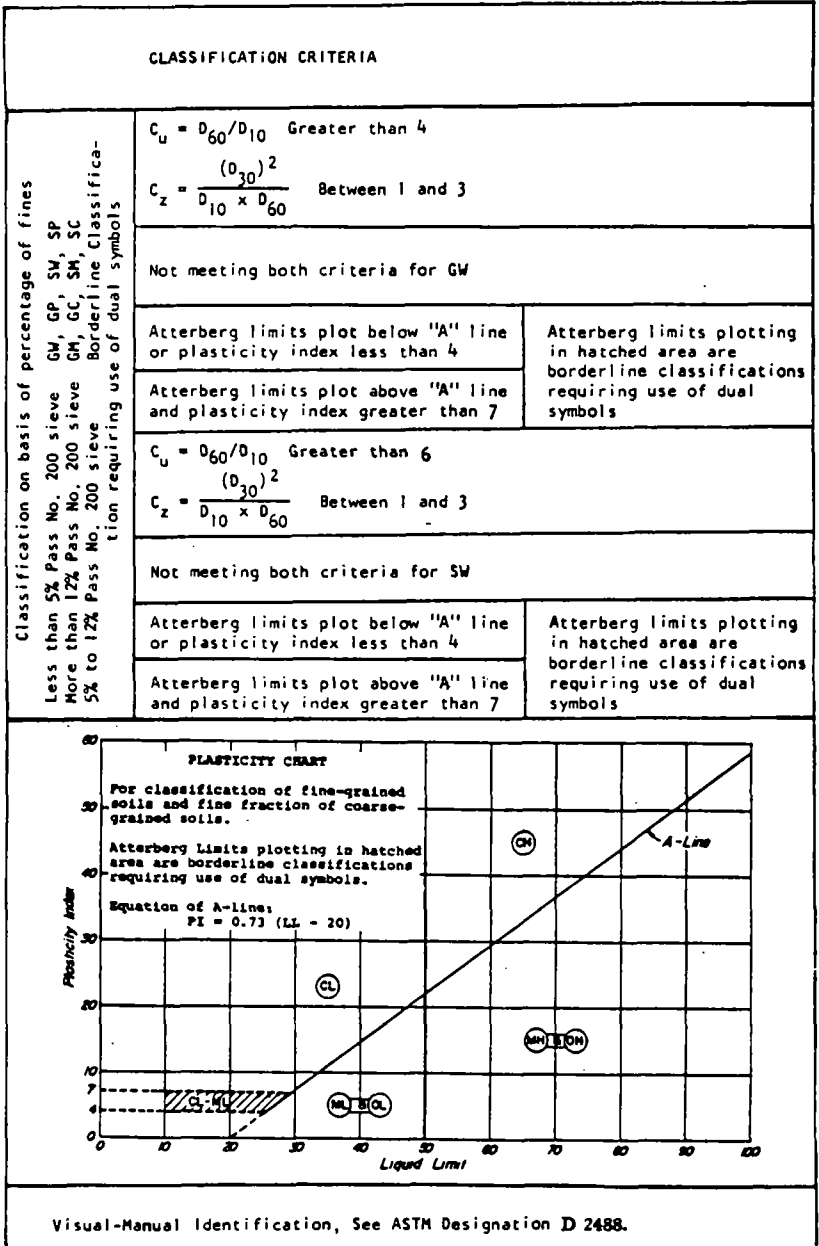


FIG. 1—Continued.

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES (D 2487)

in which D_{10} , D_{30} , and D_{60} are the particle-size diameters corresponding respectively to 10, 30, and 60 per cent passing on the cumulative particle-size distribution curve.

6.5.1 Classify the sample as *well-graded gravel*, GW or *well-graded sand*, SW, if C_u is greater than 4 for gravel and 6 for sand, and C_c is between 1 and 3.

6.5.2 Classify the sample as *poorly graded gravel*, GP, or *poorly graded sand*, SP, if either the C_u or the C_c criteria for well-graded soils are not satisfied.

6.6 If more than 12 per cent of the test sample passed the No. 200 sieve as determined in 5.1.1 determine the liquid limit and the plasticity index of a portion of the test sample passing the No. 40 sieve in accordance with ASTM Method D 423 and ASTM Method D 424.

6.6.1 Classify the sample as *silty gravel*, GM, or *silty sand*, SM if the results of the limits tests show that the fines are silty, that is, the plot of the liquid limit versus plasticity index falls below the "A" line (see Plasticity Chart, Fig. 1) or the plasticity index is less than 4.

6.6.2 Classify the sample as *clayey gravel*, GC, or *clayey sand*, SC, if the fines are clayey, that is, the plot of liquid limit versus plasticity index falls above the "A" line and the plasticity index is greater than 7.

6.6.3 If the fines are intermediate between silt and clay, that is, the plot of liquid limit versus plasticity index falls on or practically on the "A" line or falls above the "A" line but the plasticity index is in the range of 4 to 7, the soil should be given a borderline classification, such as GM-GC or SM-SC.

6.7 If 5 to 12 per cent of the test sample passed the No. 200 sieve, the soil should be given a borderline classification based on both its gradation and limit test characteristics, (see 6.6) such as GW-GC or SP-SM.

NOTE 5—In doubtful cases, the rule is to favor the less plastic classification. Example: a gravel with 10 per cent fines, a C_u of 20, a C_c of 2.0, and a plasticity index of 6 would be classified as GW-GM rather than GW-GC.

7. Procedure for Classification of Fine-Grained Soils (50 per cent or more passing No. 200 sieve)

7.1 From the material passing the 3-in. (76-mm) sieve, select a test sample for the determination of the liquid limit and plasticity index in accordance with ASTM Method D 421 or ASTM Method D 2217.

NOTE 6—It is recommended that the method for wet preparation be used for soils containing organic matter or irreversible mineral colloids.

7.2 Determine the liquid limit and the plasticity index of a portion of the test sample passing the No. 40 sieve in accordance with ASTM Method D 423, and ASTM Method D424.

7.3 Classify the soil as *inorganic clay*, C, if the plot of liquid limit versus plasticity index falls above the "A" line and the plasticity index is greater than 7.

7.3.1 Classify the soil as *inorganic clay of low to medium plasticity*, CL, if the liquid limit is less than 50 and the plot of liquid limit versus plasticity index falls above the "A"-line and the plasticity index is greater than 7. See area identified as CL on the Plasticity Chart, Fig. 1.

7.3.2 Classify the soil as *inorganic clay of high plasticity*, CH, if the liquid limit is greater than 50 and the plot of liquid limit versus plasticity index falls above the "A"-line. See area identified as CH on the Plasticity Chart, Fig. 1.

NOTE 7—In cases where the liquid limit exceeds 100 or the plasticity index exceeds 60, the plasticity chart may be expanded by maintaining the same scales on both axes and extending the A-line at the indicated slope.

7.4 Classify the soil as *inorganic silt*, M, if the plot of liquid limit versus plas-

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES (D 2487)

ticity index falls below the "A" line or if the plasticity index is less than 4, unless it is suspected that organic matter is present in sufficient amounts to influence the soil properties, then tentatively classify the soil as *organic silt or clay*, O.

7.4.1 If the soil has a dark color and an organic odor when moist and warm, a second liquid limit test should be performed on a test sample which has been oven-dried at 110 ± 5 deg C for 24 hr.

7.4.2 Classify the soil as *organic silt or clay*, O, if the liquid limit after oven drying is less than three-fourths of the liquid limit of the original sample determined before drying. (See ASTM Designation D 2217, Procedure B).

7.4.3 Classify the soil as *inorganic silt of low plasticity*, ML, or as *organic silt or silt-clay of low plasticity*, OL, if the liquid limit is less than 50 and the plot of liquid limit versus plasticity index falls below the "A"-line or the plasticity index is less than 4. See area identified as ML and OL on the Plasticity Chart, Fig. 1.

7.4.4 Classify the soil as *inorganic silt of medium to high plasticity*, MH, or as

organic clay or silt-clay of medium to high plasticity, OH, if the liquid limit is more than 50 and the plot of liquid limit versus plasticity index falls below the "A"-line. See area identified as MH and OH on the Plasticity Chart, Fig. 1.

7.5 In order to indicate their borderline characteristics, some fine-grained soils should be classified by dual symbols.

7.5.1 If the plot of liquid limit versus plasticity index falls on or practically on the "A" line or above the "A" line where the plasticity index is in the range of 4 to 7, the soil should be given an appropriate borderline classification such as CL-ML or CH-OH.

7.5.2 If the plot of liquid limit versus plasticity index falls on or practically on the line liquid limit = 50, the soil should be given an appropriate borderline classification such as CL-CH or ML-MH.

NOTE 8—In doubtful cases, the rule for classification is to favor the more plastic classification. Example: a fine-grained soil with a liquid limit of 50 and a plasticity index of 22 would be classified as CH-MH rather than CL-ML.

Appendix F

AMERICAN SOCIETY FOR TESTING AND MATERIALS

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Recommended Practice for

THIS

DESCRIPTION OF SOILS¹
(VISUAL-MANUAL PROCEDURE)

ASTM Designation: D 2488 - 69

This Recommended Practice of the American Society for Testing and Materials is issued under the fixed designation D 2488; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval.

1. Scope

1.1 This recommended practice describes a procedure for the identification and description of soils for engineering purposes based on visual examination and simple manual tests.

NOTE 1—It does not conflict with other methods of soil identification or classification and in fact the user is encouraged to supplement the descriptions recommended herein with geologic, pedologic or local terms of description. On the other hand, when precise classification of soils for engineering purposes are required ASTM Method D 2487, for Classification of Soils for Engineering Purposes,² should be employed.

1.2 This recommended practice is intended to be used not only for identification of soils in the field but also in the office or in the laboratory or wherever soil samples are inspected and described.

1.2.1 The practice has particular value in grouping similar soil samples so that

¹ Under the standardization procedure of the Society, this recommended practice is under the jurisdiction of the ASTM Committee D-18 on Soil and Rock for Engineering Purposes. A list of members may be found in the ASTM Year Book.

Current edition effective Dec. 19, 1969. Originally issued 1966. Replaces D 2488 - 66 T.

² Annual Book of ASTM Standards, Part 11.

only a minimum number of laboratory tests need be run for positive soil classification.

NOTE 2—The ability to identify soils correctly is learned more readily under the guidance of experienced personnel, but it may also be acquired systematically by comparing numerical laboratory test results for typical soils of each type with their visual and manual characteristics while performing the identification procedures.

2. Definitions and Description of Terms

2.1 The definitions of the soil components, boulders, cobbles, gravel, sand fines (silt and clay), organic soil, and peat are in accordance with ASTM Definitions D 653, Terms and Symbols Relating to Soil Mechanics.³

3. Equipment**3.1 Required Equipment:**

- 3.1.1 Small supply of water and
- 3.1.2 Pocket knife or small spatula.

3.2 Useful Auxiliary Equipment:

- 3.2.1 Small bottle of dilute hydrochloric acid,
- 3.2.2 Small test tube and stopper,
- 3.2.3 Munsell Soil Color Chart or Rock Color Chart,

DESCRIPTION OF SOILS (VISUAL-MANUAL PROCEDURE) (D 2488)

- 3.2.4 Small hand lens, and
- 3.2.5 Pocket penetrometer or shear gauge.

4. Sampling

4.1 The sample shall be considered to be representative of the stratum from which it was obtained by an appropriate accepted or standard procedure.

NOTE 3—Preferably the sampling procedure should be identified as having been conducted in accordance with ASTM Method D 1452, for Soil Investigation and Sampling by Auger Borings,² ASTM Method D 1586, for Penetration Test and Split-Barrel Sampling of Soils,² ASTM Method D 1587 for Thin-Walled Tube Sampling of Soils,² etc.

4.2 The sample shall be carefully identified as to origin.

NOTE 4—The sample identification may take the form of a boring number and sample number in conjunction with a job number, a geologic stratum, a pedologic horizon or a location description with respect to a permanent monument, a grid system or a station number and offset with respect to a stated centerline.

5. General Procedure for Identification

5.1 On the basis of an examination of the characteristics of the particles which make up a soil sample it is possible to assign it to one of three primary groups. Although most soils have components representative of two or more groups it is usually possible to discern the most important component and assign the sample to that group. A most important distinction is made on the basis of size. Individual particles visible to the naked eye make up the *coarse* fraction and those too small to be seen individually make up the *fine* fraction or the *finer*. The *organic* component of soils may consist of undecayed or partially decayed twigs, leaves, needles, stems, roots, etc. which impart a woody or fibrous texture to the soil or it may also be so finely divided that it can only be identified by its dark brown, dark gray or black color and distinctive organic odor.

5.1.1 *Coarse-grained soils* are those in which more than half (by weight) of the particles are visible to the naked eye. In making this estimate, particles coarser than 3 in. (76 mm) in diameter should be excluded. However, where such very coarse particles can be observed in surface soils or in exposure in the walls of test pits an estimate of the percentage of a large volume of soil which is occupied by cobbles and boulders should be made. This percentage should be recorded independently of the description of the material smaller than 3 in. (76 mm) in diameter.

5.1.2 *Fine-grained soils* are those in which more than half (by weight) of the particles are so fine that they cannot be seen by the naked eye. They are partly subdivided on the basis of simple manual tests. They are also subdivided as *inorganic* or *organic* on the basis of the presence or absence of a significant quantity of organic matter. Inorganic soils are usually characterized by their bright or light colors.

5.1.3 *Organic soils* are those which contain significant quantities of organic matter. *Highly organic soils* can readily be recognized by the presence of decayed roots, leaves, grasses and other fibrous vegetable matter in various stages of decay. When moist, they have a dark brown, very dark gray or black color and a soft spongy feel. If the samples are fresh, a distinctive odor of rotting organic matter can usually be noted. Many soils are only *partly organic* and are in fact composed predominantly of inorganic material. Such soils, however, behave differently from typical inorganic soils and the presence of relatively small amounts of organic matter should be noted wherever possible. Any soil which has a dark brown, dark gray or black color probably contains some finely divided organic material. The identification as an organic soil can usually be

DESCRIPTION OF SOILS (VISUAL-MANUAL PROCEDURE) (D 2488)

completed by carefully noting the organic odor of fresh samples. If the sample is dry it should be moistened and warmed in the hand which may help to bring out the distinctive odor.

5.1.4 *Mixed-grained soils* are those inorganic or partly organic soils which contain materials representative of both the coarse and fine soil fractions. A high percentage of natural soils are mixed-grained. In many of these, however, one fraction predominates to such an extent that for practical purposes the soil may be identified as that fraction and the presence of the other noted as an appropriate fraction. As nearly as possible,

Munsell color notation in terms of hue, value and chroma. Example: *Pink* (Moderate orange pink), 5 YR 8/4.

5.3 Soils containing a significant amount of organic material usually have a distinctive odor of decaying vegetation. This is especially apparent in fresh samples, but if the samples are dried the odor may often be revived by heating a moistened sample. If the soil is dark colored, the odor should be described as *organic, earthy, or none*.

5.4 Whenever intact samples are described an estimate of the *moisture condition* should be noted. *Dry* materials require the addition of considerable

TABLE 1—IDENTIFICATION OF CONSISTENCY OF FINE-GRAINED SOILS FROM MANUAL TESTS.

Consistency	Identification Procedure	Shear Strength, tons/ ft ² or kg/cm ²
Soft	Easily penetrated several inches by thumb	Less than 0.25
Firm (medium)	Penetrated several inches by thumb with moderate effort	0.25 to 0.50
Stiff	Readily indented by thumb, but penetrated only with great effort	0.50 to 1.00
Very stiff	Readily indented by thumb nail	1.00 to 2.00
Hard	Indented with difficulty by thumbnail	over 2.00

the relative proportion of coarse and fine fraction should be estimated for all mixed-grained soils.

5.2 *Color* is an important property in identifying organic soils and within a given locality it may also be useful in identifying materials of similar geologic origin. Although qualitative color names are somewhat helpful, positive color identifications obtained by comparison with a standard color chart are even more useful. If the sample contains layers or patches of varying colors, this should be noted and all representative colors should be described. If possible, color should be described for moist samples.

NOTE 5—Charts especially prepared for describing the colors of soil and rock are available respectively. Such charts give typical descriptive names for the color chips and the correct

moisture to attain optimum for compaction. *Moist* materials are near the optimum moisture content. *Wet* soils require drying to attain optimum moisture content and *saturated* (very wet) soils come from below the water table.

5.5 The *structural* characteristics of intact soil samples provide important clues to their performance as foundation materials. Whenever such samples are available or when the soil profile may be inspected during sampling from a pit, the structural characteristics should be described. *Stratified* materials consist of alternating layers of varying types (or color). If the layers are less than about $\frac{1}{4}$ in. (6 mm) thick, it may be described as *laminated* (or *varved*, if mostly fine-grained). *Fissured* materials break along definite planes of fracture with little

DESCRIPTION OF SOILS (VISUAL-MANUAL PROCEDURE) (D 2488)

resistance to fracturing. If the fracture planes appear polished or glossy, they should be described as *stickensided*. If a cohesive soil can be easily broken into small angular lumps which resist further breakdown, the structure may be described as *blocky*. A *lensed* structure is indicated by the inclusion of small pockets of different texture, such as

hydrochloric acid is important. The intensity of the HCl reaction should be described as *none*, *weak*, or *strong*.

5.7 The degree of compactness or natural density of cohesionless soils and the consistency of cohesive soils are also important in foundation problems. Whenever undisturbed materials are examined either in field pits or from

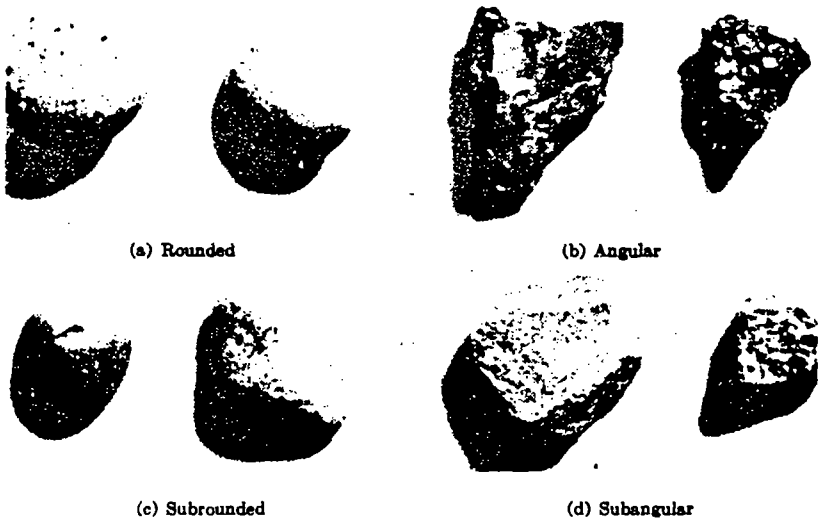


FIG. 1—Typical Shapes of Bulky Grains.

small lenses of sand scattered through a mass of clay. The presence of special structural characteristics such as *root holes*, or *porous* openings should also be noted. If no structural characteristics are apparent, the soil may be described as *nonstratified* or *homogeneous*.

5.6 Some soils show definite evidence of *cementation* in the intact state. Where this is noted, the degree of cementation may be described as *weak* or *strong*. Since calcium carbonate is the most common cementing agent a report of its presence on the basis of the reaction with dilute

sealed samples, estimates of these properties should be noted. Usually the process of sampling disturbs cohesionless soils to such an extent that the natural density may only be determined in place. In *dense* cohesionless soil it is difficult to drive a 2 by 2 in. (5 by 5 cm) wooden stake more than a few inches; however, such a stake can easily be driven into *loose* material. Obviously, this simple method cannot be used to determine the relative density of *cemented* soils.

5.7.1 The consistency of cohesive soils may be determined in place or on

DESCRIPTION OF SOILS (VISUAL-MANUAL PROCEDURE) (D 2488)

undisturbed samples in accordance with the identification procedure given in Table 1. The quantitative measure of the shear strength is given as a basis for correlation with values obtained from pocket penetrometers or shear gauges, which are often used to estimate consistency.

5.8 It is often desirable to add an estimate of the classification of the soil in accordance with the groups used for engineering classification (Fig. 1 of

Nominal Maximum Diameter	Minimum Sample Size
2-2½ in. (50-65 mm)	8 lb (3.6 kg)
1-1½ in. (25-38 mm)	4 lb (1.8 kg)
¾-½ in. (6-12 mm)	1 lb (0.45 kg)
less than ¾ in. (3 mm)	¼ lb (0.11 kg)

6.2 Estimate the percentage of the coarse fraction larger than the No. 4 sieve (about ¼ in. or 5 mm).

6.2.1 Identify the soil as *gravel* if 50 per cent or more is larger.

6.2.2 Identify the soil as *sand* if less than 50 per cent is larger.

6.3 Estimate the percentage of fines.

TABLE 2—CHECK LIST FOR DESCRIPTION OF COARSE-GRAINED SOILS.

1. <i>Typical Name</i>	Boulders	Cobbles	Gravel	Sand
	Add descriptive adjectives for minor constituents.			
2. <i>Gradation</i>	Well graded	Poorly graded	(Uniformly graded or Gap-graded)	
	Describe range of particle sizes or predominant size or sizes as coarse, medium, or fine sand or gravel.			
3. <i>Maximum Particle Size</i>	Note per cent boulders and cobbles			
4. <i>Size Distribution</i>	Approximate per cent gravel, sand and fines in fraction finer than 3 in. (76 mm). Indicate plasticity of fines (See 7.5).			
5. <i>Grain Shape</i>	Angular	Subangular	Subrounded	Rounded
6. <i>Mineralogy</i>	Rock type for gravel, predominant minerals in sand. Note especially presence of mica flakes, shaly particles and organic material.			
7. <i>Color</i>	Use Munsell notation, if possible			
8. <i>Odor</i>	None	Earthy	Organic	
	May be neglected except for dark colored soils.			
9. <i>Moisture content</i>	Dry	Moist	Wet	Saturated
10. <i>Natural Density</i>	Loose	Dense		
11. <i>Structure</i>	Stratified	Lensed	Nonstratified	
12. <i>Cementation</i>	Weak	Strong		
	Note reaction with HCl as none, weak or strong.			
13. <i>Local or Geologic Name</i>				
14. <i>Group Symbol</i>	Estimate if desired. See Classification Chart, Fig. 1, ASTM Designation D 2487.			

ASTM Method D 2487²). The group symbol should be placed in parentheses at the end of the description in order to indicate that the classification has been estimated.

6. Procedure for Coarse-Grained Soils

6.1 Select a representative sample of the soil material finer than 3 in. (76 mm) sieve, spread it out for examination and follow identification procedures.

6.1.1 For accurate identification, the minimum amounts of sample should be in accordance with the following schedule:

6.3.1 Identify the soil as *clean gravel* or *clean sand* if the fines content is about 5 per cent or less.

6.3.1.1 Identify the soil as *well graded* if it has a wide range in grain size and substantial amounts of most intermediate particle sizes.

6.3.1.2 Identify the soil as *poorly graded* if it consists predominantly of one size (*uniformly graded*) or has a wide range of sizes with some intermediate sizes obviously missing (*gap-graded*).

6.3.2 Identify the soil as *gravel with fines* or *sand with fines* if the fines content is more than about 12 per cent.

DESCRIPTION OF SOILS (VISUAL-MANUAL PROCEDURE) (D 2488)

6.3.2.1 Identify the soil as borderline *clean* to *with fines* if the fines content is between about 5 and 12 per cent.

6.3.2.2 Describe the fines as *silty* or *clayey* in accordance with identification procedures given under fine-grained soils.

6.4 Describe the grain shape of the sand and gravel portions of the coarse fraction as *angular*, *subangular*, *subrounded*, or *rounded*, (see Fig. 1).

6.4.1 *Angular* particles have sharp edges and relatively plane sides with unpolished surfaces.

6.4.2 *Subangular* particles are similar

8 in. (203 mm), about 5 per cent cobbles. About 20 per cent subrounded igneous gravel, 65 per cent subrounded to subangular quartz sand, and 15 per cent low plasticity fines. Light brown (7.5 YR 6/4). Moist. Dense. Stratified. No reaction to HCl. Alluvial sand (SM).

7. Procedure for Fine-Grained and Organic Soils

7.1 Select a representative sample of the material for examination. See 6.1.1.

7.2 Describe the color of the moist soil.

7.3 Describe the odor of the moist soil (warming if necessary to intensify the odor).

7.4 Identify the soil as *organic* if it

TABLE 3—IDENTIFICATION OF FINE-GRAINED SOIL FRACTIONS FROM MANUAL TESTS.

Typical Name	Dry Strength	Dilatancy Reaction	Toughness of Plastic Thread	Plasticity ^a Description
Sandy Silt.....	None—Very Low	Rapid	Weak—Soft	None—Slight
Silt.....	Very Low—Low	Rapid	Weak—Soft	None—Slight
Clayey Silt.....	Low—Medium	Rapid—Slow	Medium Stiff	Slight—Medium
Sandy Clay.....	Low—High	Slow—None	Medium Stiff	Slight—Medium
Silty Clay.....	Medium—High	Slow—None	Medium Stiff	Slight—Medium
Clay.....	High—Very High	None	Very Stiff	High
Organic Silt.....	Low—Medium	Slow	Weak—Soft	Slight
Organic Clay.....	Medium—Very High	None	Medium Stiff	Medium—High

* The term low may be substituted for slight in the description of plasticity.

to angular but have somewhat rounded edges.

6.4.3 *Subrounded* particles exhibit nearly plane sides but have well-rounded corners and edges.

6.4.4 *Rounded* particles have smoothly curved sides and no edges.

6.5 Add appropriate descriptive notes regarding maximum size, size distribution, per cent cobbles and boulders, mineralogy, color, odor, moisture condition, natural density, structure, cementation, local or geologic name, and group symbol. Follow check list, Table 2.

NOTE 6—A complete description of a river valley sample estimated to contain about 20 per cent gravel, 65 per cent sand and 15 per cent silt could take the form of this example: *Silty Sand* well-graded gravelly. Maximum size,

has a black, dark brown or dark gray color (Munsell value 4 or less, chroma 3 or less) and a distinctive organic odor.

7.4.1 Identify the soil as *highly organic* if it has predominantly a woody or fibrous texture resulting from a composition of partially decayed leaves, twigs, needles, stems, roots, etc. Further identification is unnecessary.

7.4.2 Identify the soil as *partly organic* if it does not have a fibrous texture and appears to be predominantly mineral in character. Proceed with identification procedure for fine-grained soils.

7.5 From the representative sample, select enough material to provide two cubes approximately $\frac{1}{4}$ in. (13 mm) in size after the gravel and coarse sand fraction has been removed. Use these

DESCRIPTION OF SOILS (VISUAL-MANUAL PROCEDURE) (D 2488)

samples to perform the dry strength, dilatancy and plasticity tests.

7.5.1 *Dry Strength*—Mold one of the samples until it attains the consistency of putty, adding a small amount of water if necessary, and form into a cube or ball. Allow the sample to dry completely in the sun, air or oven at a temperature not exceeding 110 C. Test the strength of the dry sample by crushing between the fingers.

NOTE 7—If the soil sample contains dry lumps, an experienced operator can determine the dry strength without preparing a pat for this particular purpose. The process of molding and drying usually produces higher strengths than are found in natural aggregates of soil. The presence of high-strength water-soluble cementing materials, such as calcium carbonates, may cause exceptionally high dry strengths but this can usually be detected from the intensity of the reaction with dilute hydrochloric acid (see 5.6).

7.5.1.1 Describe as *very low* or *none* if the dry sample crumbles with the mere pressure of handling.

7.5.1.2 Describe as *low* if the dry sample crumbles to powder with little finger pressure.

7.5.1.3 Describe as *medium* if considerable finger pressure is required to powder the sample. Usually, when the soil has medium dry strength a smear of powder can be easily rubbed off the smooth surface of the sample.

7.5.1.4 Describe as *high* if the sample cannot be crushed to powder by finger pressure, even though it may be broken. Usually, when the sample has high dry strength it is not even possible to rub off a smear of powder from a smooth surface of the dry sample.

7.5.1.5 Describe as *very high* if the sample cannot be broken between the thumb and a hard surface.

7.5.2 *Dilatancy*—Add sufficient water, if necessary, to the other one of the samples to produce a soft, but not sticky, consistency. Smooth the soil pat in the

palm of one hand with the blade of a knife or small spatula, shake horizontally, and strike the back of the hand vigorously against the other hand several times. Note reaction. Squeeze the sample by closing the hand and note reaction.

7.5.2.1 Describe the reaction as *rapid* if water appears on the surface during shaking and disappears quickly upon squeezing. The presence or absence of the free water can be noted by the shiny or dull appearance of the surface.

7.5.2.2 Describe the reaction as *slow* if vigorous tapping is required to bring water to the surface and squeezing causes little change in appearance.

7.5.2.3 Describe the reaction as *none* if the test produces no visible change in the sample.

7.5.3 *Plastic Thread*—Following the completion of the dilatancy test the sample is shaped into an elongated pat and rolled by hand on a smooth surface or between the palms into a thread about $\frac{1}{8}$ in. (3 mm) in diameter. (If the sample is too wet to roll easily it should be spread out into a thin layer and allowed to lose some water by evaporation.) Fold the sample threads and reroll repeatedly until the thread crumbles at a diameter of about $\frac{1}{8}$ in. (3 mm). The thread will crumble near the *plastic limit*. Note the pressure required to roll out the thread especially near the plastic limit; also note the strength of the thread. After the thread crumbles, the pieces should be lumped together and kneaded until the lump crumbles. Note the toughness of the material during kneading.

7.5.3.1 Describe the thread as *weak and soft* if, near the plastic limit, only slight pressure is required to roll it, the thread has little or no strength and after crumbling the thread pieces cannot be formed into a coherent mass.

7.5.3.2 Describe the thread as *medium stiff* if, near the plastic limit, medium

DESCRIPTION OF SOILS (VISUAL-MANUAL PROCEDURE; (D 2488)

pressure is required to roll it, the thread will support its own weight when a few inches long, and after crumbling the thread pieces can be molded into a lump which crumbles with slight kneading.

7.5.3.3 Describe the thread as *very stiff* if, near the plastic limit, considerable pressure is required to roll it, the thread will easily support its own weight when several inches long, and after crumbling the thread pieces can be molded into a lump which is coherent and tough.

7.6.1 *Sandy silt* has very low dry strength or none, a reaction to the dilatancy test of rapid, a plastic thread which is weak and soft, and a significant sand content which can be noted by a gritty feel. It can be described as having slight plasticity or none.

7.6.2 *Silt* has very low to low dry strength, a reaction to the dilatancy test of rapid, and a plastic thread which is weak and soft. It can be described as having slight plasticity or none.

TABLE 4—CHECK LIST FOR DESCRIPTION OF FINE-GRAINED AND PARTLY-ORGANIC SOILS.

1. <i>Typical Name</i>	Sandy Silt Silty Clay	Silt Clay	Clayey Silt Organic Silt	Sandy Clay Organic Clay		
2. <i>Maximum Particle Size</i>	Note percentage of boulders and cobbles					
3. <i>Size Distribution</i> in. (76 mm)	Approximate per cent gravel, sand and fines in fraction finer than 3					
4. <i>Dry Strength</i>	None	Very Low	Low	Medium	High	Very High
5. <i>Dilatancy</i>	None	Slow	Rapid			
6. <i>Plastic Thread</i>	Weak and Soft		Medium Stiff	Very Stiff		
7. <i>Plasticity of Fines</i>	None	Slight (low)	Medium	High		
8. <i>Color</i>	Use Munsell notation, if possible. Note presence of mottling or banding.					
9. <i>Odor</i>	None	Earthy	Organic			
	May be neglected except for dark-colored soils.					
10. <i>Moisture Content</i>	Dry		Moist	Wet		
11. <i>Consistency</i>	Soft	Firm (Medium)	Stiff	Very Stiff	Hard	
12. <i>Structure</i>	Stratified	Blocky		Laminated (Varved)	Flakeured	
	Siliceousaided	Blocky		Lensed	Homogeneous (Nonstratified)	
13. <i>Cementation</i>	Weak		Strong			
	Note reaction with dilute hydrochloric acid as none, weak or strong.					
14. <i>Local or Geologic Name</i>						
15. <i>Group Symbol</i>	Estimate if desired. See Classification Chart, Fig. 1, ASTM Method D 2487					

7.5.4 *Plasticity*—On the basis of its dry strength, dilatancy and toughness describe the overall plasticity as shown in Table 3.

7.6 Identify the soil as *silt* or *clay* with appropriate adjectives. See Table 3.

NOTE 8—The relative percentage of coarse and fine-grained material may be estimated by thoroughly shaking a mixture of soil and water in a test tube and then allowing the mixture to settle. The coarse particles will fall to the bottom and successively finer particles will be deposited with increasing time; the sand sizes will fall out of suspension in 20 to 30 sec. The relative proportions can be estimated from the relative volume of each size separate.

7.6.3 *Clayey silt* has low to medium dry strength, a reaction to the dilatancy test of rapid to slow, and a medium stiff plastic thread. It can be described as having slight or medium plasticity.

7.6.4. *Sandy clay* has low to high dry strength, a reaction to the dilatancy test of slow to none, and a medium stiff plastic thread which may break prematurely because of the presence of sand grains. It can be described as having slight or medium plasticity.

7.6.5 *Silty clay* has medium to high dry strength, a reaction to the dilatancy test of very slow to none, and a medium

DESCRIPTION OF SOILS (VISUAL-MANUAL PROCEDURE) (D 2488)

stiff plastic thread. It can be described as having slight or medium plasticity.

7.6.6 *Clay* has a high to very high dry strength, no reaction to the dilatancy test and a very stiff plastic thread. It can be described as having high plasticity.

7.6.7 *Organic silt* has low to medium dry strength, a slow reaction to dilatancy test, and a weak and soft plastic thread. It can be described as having slight plasticity.

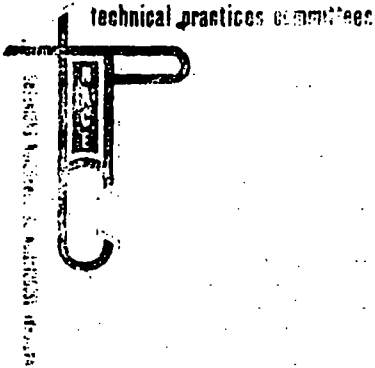
7.6.8 *Organic clay* has medium to very high dry strength, a reaction to the dilatancy test of very slow to none, and a medium stiff plastic thread. It can be

described as having medium or high plasticity.

7.7 Add appropriate descriptive notes regarding maximum size, size distribution, per cent cobbles and boulders, plasticity of fines, color, odor, moisture condition, consistency, structure, cementation, local or geologic name and group symbol. Follow check list, Table 4.

NOTE 9—A complete description of an undisturbed sample of a windblown silt could take the form of this example: *Clayey silt*, some fine sand. Maximum size about 0.1 mm. About 10 per cent fine sand, 90 per cent slightly plastic fines. Yellowish brown (10 YR 5/6 dry). Dry. Firm. Nonstratified, but with numerous vertical root holes. Strong reaction to HCl. Loess (ML).

Appendix G



NACE Standard TM-01-69

Test Method

**Laboratory Corrosion Testing of Metals
for the Process Industries**

**Approved March, 1969
National Association of Corrosion Engineers
2400 West Loop South
Houston, Texas 77027
713/622-8980**

The National Association of Corrosion Engineers issues this Standard in conformity to the best current technology regarding the specific subject. This Standard represents minimum requirements and should in no way be interpreted as a restriction on the use of better procedures or materials. Neither is this Standard intended to apply in any and all cases relating to the subject. Numerous external factors may negate the usefulness of this Standard in specific instances.

This Standard may be used in whole or in part by any party

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Nothing contained in this Standard of the National Association of Corrosion Engineers is to be construed as granting any right, by implication or otherwise, for manufacture, sale, or use in connection with any method, apparatus, or product covered by Letters Patent, nor as indemnifying or protecting anyone against liability for infringement of Letters Patent.

Foreword

Unit Committee T-5A ("Corrosion in Chemical Processes") of the National Association of Corrosion Engineers issues this Standard with a dual purpose.

The first purpose is to standardize, as much as possible, simple immersion corrosion studies. In this sense, this Standard is reasonable and effective without imposing inflexible requirements as to apparatus, conditions or techniques. The actual conditions of test will be determined by the problem at hand and limited only by the ingenuity of the individual investigator.

The second purpose of this Standard is to present to the user a consensus on the best current technology in this field of laboratory corrosion testing. As such, this Standard enumerates and discusses the many factors which must be

considered, controlled, and reported in order to aid in correlation or reproducibility of such studies.

The techniques described permit the investigator to reproduce to a considerable extent in the laboratory, through judicious experimental design, the process conditions which govern corrosion mechanisms. The tests are not to be construed as "accelerated" tests, which are generally unreliable. The methods described are also applicable to materials qualification tests for quality control. However, the latter require more rigid definition of apparatus, conditions, and technique.

The ultimate purpose is better correlation of results in the future and the reduction of conflicting reports through a more detailed recording of meaningful factors and conditions.

TEST METHOD**Laboratory Corrosion Testing of Metals
for the Process Industries****CONTENTS**

1. General	2
2. Specimen Preparation	2
3. Equipment and Apparatus	3
4. Test Conditions	4
5. Methods of Cleaning Specimens After the Test	7
6. Evaluation of Results	8
7. Calculating Corrosion Rates	9
8. Reporting the Data	10
References	10

1. General

1.1 This Standard describes the factors which influence laboratory tests. These factors include specimen preparation, apparatus, test conditions (solution composition, temperature, velocity, aeration, volume, method of supporting specimens, duration of test), methods of cleaning specimens, evaluation of results, and calculation of corrosion rates. This Standard also emphasizes the importance of recording all pertinent data and provides a check list for reporting test data.

1.2 Experience has shown that all metals and alloys do

not respond alike to the many factors that control corrosion and that "accelerated" corrosion tests give indicative results only. Consequently, it is impractical to propose an inflexible standard laboratory corrosion testing procedure for general use except for material qualification tests, where standardization is obviously required.

1.3 In designing any corrosion test, consideration must be given to the various factors discussed in this test method because these factors have been found to affect greatly the results obtained.

2. Specimen Preparation

2.1 In laboratory tests, corrosion rates of duplicate specimens are usually within $\pm 10\%$ under the same test conditions. Occasional exceptions, in which a large difference is observed, can occur under conditions of borderline passivity of metals or alloys that depend on a passive film for their resistance to corrosion. Therefore, at least duplicate specimens should be exposed in each test.

2.2 If the effects of corrosion are to be determined by changes in mechanical properties, untested duplicate specimens should be preserved in a non-corrosive environment for comparison with the corroded specimens. The mechanical property commonly used for comparison is the tensile strength. The procedure for determining this value is shown in detail in ASTM Standard E-8-66.

2.3 The size and the shape of specimens will vary with the purpose of the test, nature of the materials, and apparatus used. A large surface-to-mass ratio and a small ratio of edge area to total area are desirable. These ratios can be achieved through the use of square or circular specimens of minimum thickness. Circular specimens should be cut preferably from sheet and not bar stock to minimize the exposed end grain.

2.3.1 A circular specimen of about 1 1/2-inch diameter is a convenient shape for laboratory corrosion tests. With a thickness of approximately 1/8 inch and a 5/16 or 7/16-inch diameter hole for mounting, these specimens will readily pass through a 45/50 ground glass joint of a distillation kettle. The total surface area of a circular specimen is given by the following equation:

$$A = \frac{\pi}{2} (D^2 - d^2) + \pi t + \pi d$$

where t = thickness, D = diameter of the specimen, and d = diameter of the mounting hole. If the hole is completely covered by the mounting support, the last term (πd) in the equation is omitted.

2.3.2 Strip coupons (2 x 1 x 1/16 or 1/8 inch) may be preferred as corrosion specimens, particularly if interface or liquid line effects are to be studied by the laboratory test, but such effects are beyond the scope of this Standard.

2.3.3 All specimens should be measured carefully to permit accurate calculation of the exposed areas. An area calculation accurate to plus or minus 1% is usually adequate.

2.4 More uniform results may be expected if a substantial layer of metal is removed from the specimens to eliminate variations in condition of the original metallic surface. This can be done either by chemical treatment (pickling), electrolytic removal, or by grinding with a coarse abrasive paper or cloth, such as No. 50, using care not to work harden the surface (see Section 2.7). At least 0.0001 inch or 10 to 15 milligrams per square inch should be removed. If clad alloy specimens are to be used, special attention must be given to insure that excessive metal is not removed. After final preparation of the specimen surface, the specimens should be stored in a desiccator until exposure if they are not used immediately.

2.5 Exposure of sheared edges should be avoided unless the purpose of the test is to study effects of the shearing operation. It may be desirable to test a surface representative of the material and metallurgical condition used in practice.

2.6 The specimen can be stamped with an appropriate identifying mark.

2.6.1 The stamp, besides identifying the specimen, introduces stresses and cold work in the specimen, that could be responsible for localized corrosion and/or stress corrosion cracking.

2.6.2 Stress corrosion cracking at the identifying mark is a positive indication of susceptibility to such

corrosion; however, the absence of cracking should not be interpreted as indicating resistance. Additional tests should be run to study specifically the effects of stress.

2.7 Final surface treatment of the specimens should include finishing with No. 120 abrasive paper or cloth, or the equivalent, unless the surface is to be used in the mill-finished condition. This resurfacing may cause some surface work-hardening to an extent which will be determined by the vigor of the surfacing operation but is not ordinarily significant.

2.7.1 Coupons of different alloy compositions should never be ground on the same cloth.

2.7.2 Wet grinding should be used on alloys which work harden quickly, such as the austenitic stainless steels.

2.8 The specimens should be finally degreased by scrubbing with bleach-free scouring powder, followed by thorough rinsing in water and in a suitable solvent (such as acetone, methanol, or a mixture of 50% methanol and 50% ether) and air dried. For relatively soft metals such as aluminum, magnesium, and copper, scrubbing with abrasive powder is not always needed and can mar the surface of the specimen. The use of towels for drying may introduce an error through contamination of the specimens with grease or lint.

2.9 The dried specimens should be weighed on an analytical balance to an accuracy of plus or minus 0.5 milligram.

2.10 The method of specimen preparation should be described when reporting test results to facilitate interpretation of data by other persons.

2.10.1 Reports should include trade name or composition of specimens in the following order of preference: (a) chemical composition determined by analysis, (b) approximate or nominal chemical composition, and (c) trade name or grade and specification (if bought to MIL, ASTM, etc.)

2.10.2 Metallurgical condition of the specimens including the degree of hot or cold working and heat treatment, should be described as completely as possible.

2.11 The use of welded specimens is often desirable because some welds may be cathodic or anodic to the base metal and may affect the corrosion.

2.11.1 The heat-affected zone is also of importance but should be studied separately because welds on coupons do not faithfully reproduce heat input or size effects of full-size vessels.

2.11.2 Corrosion of a welded coupon is best reported by description and thickness measurements rather than a mill-per-year rate because the attack is normally localized and not representative of the entire surface.

2.11.3 A complete discussion of corrosion testing of welded coupons or the effect of heat treatment on the corrosion resistance of a metal is not within the scope of this Standard.

3. Equipment and Apparatus

3.1 A versatile and convenient apparatus should be used, consisting of a kettle or flask of suitable size (usually 500 to 5000 milliliters), a reflux condenser with atmospheric seal, a sparger for controlling atmosphere or aeration, a thermowell and temperature regulating device, a heating device (mantle, hot plate, or bath), and a specimen support system. If agitation is required, the apparatus can be modified to accept a suitable stirring mechanism such as a magnetic stirrer. A typical resin flask set up for this type test is shown in Figure 1.

3.2 These suggested components can be modified, simplified, or made more sophisticated to fit the needs of a particular investigation. The suggested apparatus is basic, and the apparatus is limited only by the judgment and ingenuity of the investigator.

3.2.1 A glass reaction kettle can be used where configuration and size of specimens will permit entry through the narrow kettle neck.

3.2.2 In some cases, a wide mouth jar with a suitable closure is sufficient when simple immersion tests at ambient temperatures are to be investigated.

3.2.3 Open beaker tests should not be used because of evaporation and contamination.

3.2.4 In more complex tests, provisions might be needed for continuous flow or replenishment of the corrosive liquid while simultaneously maintaining a controlled atmosphere.

4. Test Conditions

4.1 Selection of the conditions for a laboratory corrosion test will be determined by the purpose of the test.

4.1.1 If the test is to be a guide for the selection of a material for a particular purpose, the limits of controlling factors in service must be determined. These factors include oxygen concentration, temperature, rate of flow, pH value, and other important characteristics of the solution.

4.2 An effort should be made to duplicate all service conditions in the corrosion test.

4.3 It is important that test conditions be controlled throughout the test in order to ensure reproducible results.

4.4 The spread in corrosion rate values for duplicate specimens in a given test probably should not exceed $\pm 10\%$ of the average when the attack is uniform.

4.5 Composition of solution.

4.5.1 Test solutions should be prepared accurately from chemicals conforming to the Standards of the Committee on Analytical Reagents of the American Chemical Society,¹ and distilled water, except in those cases where naturally occurring solutions or those taken directly from some plant process are used.

4.5.2 The composition of the test solution should be controlled to the fullest extent possible and should be described as completely and as accurately as possible when the results are reported.

4.5.2.1 Minor constituents should not be overlooked because they often affect corrosion rates.

4.5.2.2 Chemical content should be reported as percentage by weight of the solution. Molarity and normality are also helpful in defining the concentration of chemicals in the test solution.

4.5.3 The composition of the test solution should be checked by analysis at the end of the test to determine the extent of change in composition, such as might result from evaporation.

4.5.4 Evaporation losses should be controlled by a constant level device or by frequent additions of appropriate solution to maintain the original volume within $\pm 1\%$.

4.5.5 In some cases, composition of the test solution may change as a result of catalytic decompo-

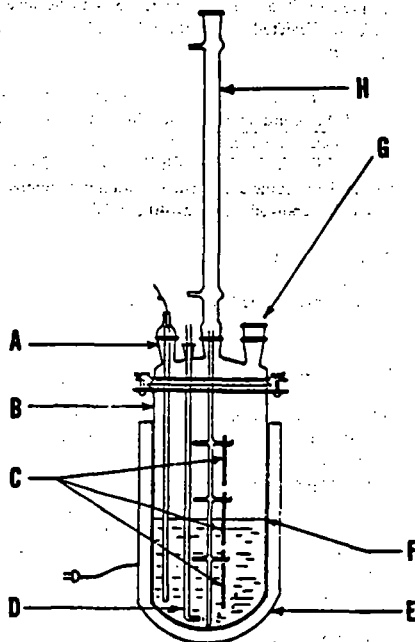


Figure 1 - Typical resin flask that can be used as a versatile and convenient apparatus to conduct simple immersion tests. Configuration of the flask top is such that more sophisticated apparatus can be added as required by the specific test being conducted. A = thermowell, B = resin flask, C = specimens hung on supporting device, D = gas inlet, E = heating mantle, F = liquid interface, G = opening in flask for additional apparatus that may be required, and H = reflux condenser.

sition or by reaction with the test coupon. These changes should be determined if possible. Where required, the exhausted constituents should be added or a fresh solution provided, during the course of the test.

4.5.6 When possible, only one type of metal should be exposed in a given test. If several different metals are exposed in the same solution, the corrosion products from one metal may affect the rate of attack on another metal. For example, copper corrosion products can reduce corrosion of stainless steel and titanium but can accelerate corrosion of aluminum.

4.6 Temperature of solution.

4.6.1 Temperature of the corroding solution should be controlled within $\pm 1\text{ C}$ ($\pm 1.8\text{ F}$) and must be stated in the report of test results.

4.6.2 If no specific temperature, such as boiling, is required or if a temperature range is to be investigated, the selected temperatures used in the test must be reported.

4.6.3 For tests at ambient temperatures, the tests should be conducted at the highest temperature anticipated for stagnant storage in summer months. This temperature may be as high as 40 to 45 C (104 to 113 F) in some areas. The variation in temperature should be reported also (e.g., 40 C \pm 2 C).

4.7 Aeration of solution.

4.7.1 Unless specified, the solution should not be aerated. Most tests related to process equipment should be run with the natural atmosphere inherent in the process, such as the vapors of the boiling liquid.

4.7.2 If aeration is used, the specimens should not be located in the direct air stream from the sparger. Extraneous effects can be encountered if the air stream impinges on the specimens.

4.7.3 If complete exclusion of dissolved oxygen is necessary, specific techniques are required such as prior heating of the solution and sparging with an inert gas (usually nitrogen). A liquid atmospheric seal is required on the test vessel to prevent further contamination.

4.7.4 If oxygen saturation of the test solution is desired, this can best be achieved by sparging. For other degrees of aeration, the solution should be sparged with synthetic mixtures of air or oxygen with an inert gas.

4.8 Solution velocity.

4.8.1 The effect of velocity is not usually determined in normal laboratory tests although specific tests have been designed for this purpose. However, for the sake of reproducibility, some velocity control is desirable.

4.8.2 Tests at the boiling point should be conducted with minimum possible heat input, and boiling chips should be used to avoid excessive turbulence and bubble impingement.

4.8.3 In tests conducted below the boiling point, thermal convection generally is the only source of liquid velocity.

4.8.4 In test solutions with high viscosities, supplemental controlled stirring with a magnetic stirrer is recommended.

4.9 Volume of test solution.

4.9.1 The volume of the test solution should be large enough to avoid any appreciable change in its corrosiveness either through exhaustion of corrosive constituents or accumulation of corrosion products that might affect further corrosion.

4.9.2 A suitable volume-to-area ratio is 125 milliliters of solution per square inch of specimen surface. This corresponds to the recommendation of ASTM Standard A262-64T for the Huey Test.

4.9.3 The preferred volume-to-area ratio is 250 milliliters of solution per square inch of specimen surface as stipulated in ASTM Standard A-279-63 on "Total Immersion Corrosion Test of Stainless Steels."

4.9.4 When the test objective is to determine the effect of a metal or alloy on the characteristics of the test solution (for example, to determine the effects of metals on dyes), it is desirable to reproduce the ratio of solution volume to exposed metal surface that exists in practice. The actual time of contact of the metal with the solution also must be taken into account. Any necessary distortion of the test conditions must be considered when interpreting the results.

4.10 Method of supporting specimens.

4.10.1 The supporting device and container should not be affected by or cause contamination of the test solution.

4.10.2 The method of supporting specimens will vary with the apparatus used for conducting the test but should be designed to insulate the specimens from each other physically and electrically and to insulate the specimens from any metallic container or supporting device used with the apparatus.

4.10.3 Shape and form of the specimen support should assure free contact of the specimen with the corroding solution, the liquid line, or the vapor phase as shown in Figure 1. If clad alloys are exposed, special procedures will be required to insure that only the cladding is exposed unless the purpose is to test the ability of the cladding to protect cut edges in the test solution.

4.10.4 Some common supports are glass or ceramic rods, glass saddles, glass hooks, fluorocarbon plastic strings, and various insulated or coated metallic supports.

4.11 Duration of test.

4.11.1 Although duration of any test will be determined by the nature and purpose of the test an

excellent procedure for evaluating the effect of time on corrosion of the metal and also on the corrosiveness of the environment in laboratory tests has been presented by Wachter and Treveder.² This technique is called the "Planned Interval Test," and the procedure and evaluation of results are given in Table 1. Other procedures that require the removal of solid corrosion products between exposure periods will not measure accurately the normal changes of corrosion with time.

4.11.2 Materials which experience severe corrosion generally do not need lengthy tests to obtain accurate corrosion rates. Although this assumption is valid in many cases, there are cases where it is not valid. For example, lead exposed to sulfuric acid corrodes at an extremely high rate at first while building a protective film, then the rates decrease considerably so that further corrosion is negligible. The phenomenon of forming a protective film is observed with many corrosion resistant materials, and therefore short tests on such materials would indicate a high corrosion rate and would be completely misleading.

4.11.3 Short time tests also can give misleading results on alloys that form passive films, such as stainless steels. With borderline conditions, a prolonged test may be needed to permit breakdown of the passive film and subsequently more rapid attack. Consequently, tests run for long periods are considerably more realistic than those conducted for short durations. This statement must be qualified by stating that corrosion should not proceed to the point where the original specimen size or the exposed area is drastically reduced or where the metal is perforated.

4.11.4 If anticipated corrosion rates are moderate or low, the following equation² gives a suggested test duration:

$$\text{Duration of test (hr)} = \frac{2000}{\text{corrosion rate (mpy)}}$$

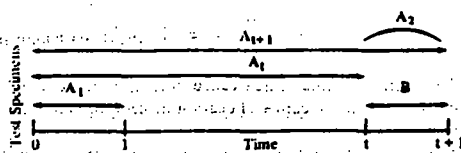
Examples: Where the corrosion rate is 10 mpy, the test should run for at least 200 hours. If the rate is 1 mpy, the duration should be at least 2000 hours.

4.11.4.1 This method of estimating test duration is useful only as an aid in deciding after a test has been made, whether or not it is desirable to repeat the test for a longer period. The most common testing periods are 48 to 168 hours (2 to 7 days).

4.11.5 In some cases, it may be necessary to know the degree of contamination caused by the products of corrosion; this can be accomplished by analysis of

TABLE 1 - Planned Interval Test²

(Reprinted by permission from "Chemical Engineering Progress," June, 1947.)



Identical specimens all placed in the same corrosive fluid. Imposed conditions of the test kept constant for entire time $t + 1$. Letters, A_1 , A_2 , A_{t+1} , B, represent corrosion damage experienced by each test specimen. A_2 is calculated by subtracting A_1 from A_{t+1} .

Occurrences During Corrosion Test		Criteria
Liquid corrosiveness	unchanged	$A_1 = B$
	decreased	$B < A_1$
	increased	$A_1 < B$
Metal corrodibility	unchanged	$A_2 = B$
	decreased	$A_2 < B$
	increased	$B < A_2$

Combinations of Situations		
Liquid Corrosiveness	Metal Corrodibility	Criteria
1. unchanged	unchanged	$A_1 = A_2 = B$
2. unchanged	decreased	$A_2 < A_1 = B$
3. unchanged	increased	$A_1 = B < A_2$
4. decreased	unchanged	$A_2 = B < A_1$
5. decreased	decreased	$A_2 < B < A_1$
6. decreased	increased	$A_1 > B < A_2$
7. increased	unchanged	$A_1 < A_2 = B$
8. increased	decreased	$A_1 < B > A_2$
9. increased	increased	$A_1 < B < A_2$

Example of Planned Interval Corrosion Test

Conditions: Duplicate strips of low-carbon steel, each 3/4 by 3 in., immersed in 200 ml of 10% $AlCl_3$ - 90% $SbCl_3$ mixture through which dried HCl gas was slowly bubbled at atm. pressure. Temperature 90 C.

Interval, days	Wt. Loss, mg	Penetration, mils	Apparent Corrosion Rate, mils/yr
A_1	0-1	1.69	620
A_t	0-3	1430	270
A_{t+1}	0-4	1460	210
B	3-4	70	40
A_2	calc. 3-4	30	0.05

$$A_2 < B < A_1$$

$$0.05 < 0.11 < 1.69$$

Therefore, liquid markedly decreased in corrosiveness during test, and formation of partially protective scale on the steel was indicated.

the solution after corrosion has occurred. The corrosion rate can be calculated from the concentration of the matrix metal found in the solution, and it can be compared to that determined from the weight loss of

the specimens. However, some of the corrosion products usually adhere to the specimen as a scale, and the corrosion rate calculated from the metal content in the solution is not always correct.

5. Methods of Cleaning Specimens After the Test

5.1 Before specimens are cleaned, their appearance should be observed and recorded. Location of deposits, variations in types of deposits, or variations in corrosion products are extremely important in evaluating localized corrosion, such as pitting and concentration cell attack.

5.2 Cleaning specimens after the test is a vital step in the corrosion test procedure and, if not done properly, can cause misleading results.

5.2.1 Generally, the cleaning procedure should

TABLE 2—Methods for Chemical Cleaning of Corrosion Test Specimens After Exposure

Material	Chemical	Time	Temperature	Remarks
Aluminum and Aluminum Alloys	70% HNO ₃	2-3 min	Room	Follow by light scrub.
	2% CrO ₃ , 5% H ₃ PO ₄ Soln.	10 min	175-185 F (79-85 C)	Used when oxide film resists HNO ₃ treatment. Follow by 70% HNO ₃ treatment previously described.
Copper and Copper Alloys	15-20% HCl	2-3 min	Room	Follow by light scrub.
	5-10% H ₂ SO ₄	2-3 min	Room	Follow by light scrub.
Lead and Lead Alloys	1% acetic acid	10 min	Boiling	Follow by light scrub. Removes PbO.
	5% ammonium acetate	5 min	Hot	Follow by light scrub. Removes PbO and/or PbSO ₄ .
	80 g/l NaOH, 50 g/l mannitol, 0.62 g/l hydrazine sulfate	30 min, or until clean	Boiling	Follow by light scrub.
Iron and Steel	20% NaOH, 200 g/l zinc dust	5 min	Boiling	---
	conc. HCl, 50 g/l SnCl ₂ + 20 g/l SbCl ₃	Until clean	Cold	---
Magnesium and Magnesium Alloys	15% CrO ₃ , 1% AgCrO ₄ Soln.	15 min.	Boiling	---
Nickel and Nickel Alloys	15-20% HCl	Until clean	Room	---
	10% H ₂ SO ₄	Until clean	Room	---
Stainless Steel	10% HNO ₃	Until clean	140 F (60 C)	Avoid contamination with chlorides
Tin and Tin Alloys	15% Na ₂ PO ₄	10 min	Boiling	Follow by scrubbing.
Zinc	10% NH ₄ Cl followed by 5% CrO ₃ , 1% AgNO ₃ Soln.	5 min 20 sec	Room Boiling	Follow by light scrubbing. ---
	Saturated ammonium acetate	Until clean	Room	Follow by light scrub.
	or 100 g/l NaCN	15 min	Room	---

remove all corrosion products from specimens with a minimum removal of sound metal.

5.2.2 Set rules cannot be applied to specimen cleaning because procedures will vary depending on the type of metal being cleaned and on the degree of adherence of corrosion products.

5.3 Cleaning methods can be divided into three general categories: mechanical, chemical, and electrolytic.

5.3.1 Mechanical cleaning includes scrubbing, scraping, brushing, mechanical shocking, and ultrasonic procedures. Scrubbing with a bristle brush and mild abrasive is the most popular of these methods; the others are used principally as a supplement to remove heavily encrusted corrosion products before scrubbing. Care should be used to avoid the removal of sound metal.

5.3.2 Chemical cleaning implies the removal of material from the surface of the specimen by dissolution in an appropriate chemical solution. Solvents such as acetone, carbon tetrachloride, and alcohol, are used to remove oil, grease, or resin and are usually applied prior to other methods of cleaning. Chemicals are chosen for application to a specific material. Some of these treatments in general use are outlined in Table 2.

5.3.3 Electrolytic cleaning should be preceded by scrubbing to remove loosely adhering corrosion products. One method of electrolytic cleaning that

has been found to be useful for many metals and alloys is as follows:

Solution	5% (by weight) H_2SO_4
Anode	Carbon or lead
Cathode	Test specimen
Cathode C.D.	20 amp/dm ² (129 amp/sq in)
Inhibitor	2 cc organic inhibitor per liter
Temperature	74 C (165 F)
Exposure period	3 minutes

5.3.3.1 Precautions must be taken to insure good electrical contact with the specimen, to avoid contamination of the solution with easily reducible metal ions, and to insure that inhibitor decomposition has not occurred. Instead of using 2 milliliters of any proprietary inhibitor, 0.5 gram per liter of inhibitors such as diorthotolyl thiourea or quinoline ethiodide can be used.

5.4 Whatever treatment is used to clean specimens after a corrosion test, its effect in removing metal should be determined, and the weight loss should be corrected accordingly. A "blank" specimen should be weighed before and after exposure to the cleaning procedure to establish this weight loss.

5.4.1 Following removal of all scale, the specimen should be treated as discussed in Section 2.8.

5.4.2 A description of the cleaning method should be included with the data reported.

6. Evaluation of Results

6.1 After corroded specimens have been cleaned, they should be reweighed with an accuracy corresponding to that of the original weighing. The weight loss during the test period can be used as the principal measure of corrosion.

6.2 After the specimens have been reweighed, they should be examined carefully for the presence of pits. If there are pits, the average and maximum depths of pits are determined after measurement with a pit gauge or a calibrated microscope which can be focused first on the edge and then on the bottom of the pit. An excellent discussion of pitting corrosion has been published.³

6.2.1 Pit depths should be reported in millimeters or thousandths of an inch for the test period and not interpolated or extrapolated to millimeters per year or thousandths of an inch per year or any other arbitrary period because rarely, if ever, is the rate of initiation or propagation of pits uniform.

6.2.2 The size, shape, and distribution of pits should be noted. A distinction should be made between those occurring underneath the supporting devices (concentration cells) and those on surfaces that were freely exposed to the test solution.

6.3 If the material being tested is suspected of being subject to dealloying forms of corrosion such as dezincification, or to intergranular attack, a cross section of the specimen should be microscopically examined to determine the type and depth of such attack.

6.4 The specimen may be subjected to simple bending tests to determine whether any embrittlement has occurred.

6.5 It may be desirable to make quantitative mechanical tests to compare the exposed specimens with uncorroded specimens reserved for the purpose, as described in Section 2.2.

7. Calculating Corrosion Rates

7.1 The calculation of corrosion rates requires several pieces of information and several assumptions.

7.1.1 The use of corrosion rates implies that all weight loss has been due to general corrosion and not to localized corrosion, such as pitting or sensitized areas on welded coupons. Localized corrosion is reported separately.

7.1.2 The use of corrosion rates also implies that the material has not been internally attacked as by dezincification or intergranular corrosion.

7.1.3 Internal attack can be expressed as a corrosion rate if desired. However, the calculations must not be based on weight loss, which is usually small, but on microsections which show depth of attack.

7.2 Assuming that localized or internal corrosion is not

present or are recorded separately in the report, the corrosion rate expressed as mils penetration per year (mpy) or millimeters per year (mmpy) can be calculated by the equations.

$$\text{mpy} = \frac{\text{wt loss} \times 534}{(\text{area}) (\text{time}) (\text{metal density})}$$

$$\text{mmpy} = \frac{\text{wt loss} \times 13.56}{(\text{area}) (\text{time}) (\text{metal density})}$$

where weight loss is in milligrams, area is square inches of metal surface exposed, and time is hours exposed.

Metal density of many common alloys (expressed in grams per cubic centimeter) is listed in Table 3. The density for new or unlisted alloys can be obtained from the producer or from various metal handbooks.

TABLE 3 - Density of Common Metals for Use in Corrosion Rate Calculations^a

Alloy	Density, g/cc	Alloy	Density, g/cc
Aluminum		Lead	
99.0 + Al	2.71	99.90 + Pb	11.34
AL 1.2 Mn	2.73	Nickel	
AL 1.0 Mg, 0.6 Si, 0.25 Cr	2.70	99.4 Ni + Cu	8.89
Brass		67 Ni, 30 Cu	8.84
85 Cu, 15 Zn	8.75	62 Ni, 30 Mo, 5 Fe	9.24
71 Cu, 28 Zn, 1 Sn	8.53	58 Ni, 17 Mo, 15 Cr, 5 W, 5 Fe	8.94
65 Cu, 35 Zn	8.47	80 Ni, 14 Cr, 6 Fe	8.91
60 Cu, 39.25 Zn, 0.75 Sn	8.41	Steel	
Bronze		0.20 C, Mn, P, S	7.85
95 Cu, 5 Sn	8.86	Stainless Steel	
90 Cu, 10 Sn	8.78	11.50-13.50 Cr, 0.15 C	7.75
85 Cu, 5 Sn, 5 Zn, 5 Pb	8.80	14.00-18.00 Cr, 0.12 C	7.70
94.8 Cu, 3 Si	8.53	18.00-20.00 Cr, 8.00-12.00 Ni, 0.08 C	7.93
95 Cu, 5 Al	8.17	16.00-18.00 Cr, 10.00-14.00 Ni, 2.00-3.00 Mo, 0.08 C	7.98
85-90 Cu, 10 Al	7.58	17.00-19.00 Cr, 9.00-12.00 Ni, 0.08 C, Ti	8.02
Copper		17.00-19.00 Cr, 9.00-12.00 Ni, 0.08 C, Nb	8.02
99.90 Cu, 0.01 P	8.91	19.00-21.00 Cr, 24.00-30.00 Ni, 2.00-3.00 Mo, 3.00-4.00 Cu	8.00
Capro-Nickel		Tantalum	
90 Cu, 10 Ni	8.93		16.60
70 Cu, 30 Ni	8.94	Tin	
Iron			7.30
94 Fe, 3.5 C, 2.5 Si	7.00	Titanium	
96 Fe, 3.0 C	7.60		4.54
99.94 Fe, 0.025 S, 0.017 Mn, 0.012 C, 0.005 P	7.86	Zirconium	
84.3 Fe, 14.5 Si, 0.35 Mn, 0.85 C	7.00		6.53

8. Reporting the Data

- 8.1 The importance of reporting all data as completely as possible cannot be overemphasized.
- 8.2 Expansion of the testing program in the future or correlating the results with tests of other investigators will be possible only if all pertinent information is properly recorded.
- 8.3 The following checklist is a recommended guide for reporting all important information and data:
- 8.3.1 Corrosive media and concentration (changes during test).
 - 8.3.2 Volume of test solution.
 - 8.3.3 Temperature (maximum, minimum, average).
 - 8.3.4 Aeration (describe conditions or technique).
 - 8.3.5 Agitation (describe conditions or technique).
 - 8.3.6 Type of apparatus used for test.
 - 8.3.7 Duration of each test.
 - 8.3.8 Chemical composition or trade name of metals tested.
 - 8.3.9 Form and metallurgical conditions of specimens.
 - 8.3.10 Exact size, shape, and area of specimens.
 - 8.3.11 Treatment used to prepare specimens for test.
 - 8.3.12 Number of specimens of each material tested, and whether specimens were tested separately or which specimens were tested in the same container.
 - 8.3.13 Method used to clean specimens after exposure and the extent of any error expected by this treatment.
 - 8.3.14 Actual weight losses for each specimen.
 - 8.3.15 Evaluation of attack if other than general, such as crevice corrosion under support rod, pit depth and distribution, and results of microscopic examination or bend tests.
 - 8.3.16 Corrosion rates for each specimen expressed as mils per year.
- 8.4 Minor occurrences or deviations from the proposed test program often can have significant effects and should be reported if known.
- 8.5 Statistics can be a valuable tool for analyzing the results from test programs designed to generate adequate data and should be used wherever possible. Excellent references for the use of statistics in corrosion studies include References 4 through 8.

References

1. Joseph Rosin. Reagent Chemicals and Standards, Fifth Edition. D. Van Nostrand Co., Inc., 120 Alexander St., Princeton, N. J., 1966.
2. A. Wächter and R. S. Trexler. Corrosion Testing Evaluation of Metals for Process Equipment. *Chemical Engineering Progress*, 43, 315-326 (1947) June.
3. N. D. Greene and M. G. Fontana. A Critical Analysis of Pitting Corrosion. *Corrosion*, 15, 251 (1959) January.
4. Harold S. Mickley, Thomas K. Sherwood, and Charles L. Reed (editors). Applied Mathematics in Chemical Engineering, (second edition). McGraw-Hill, New York, N. Y., 1957.
5. D. M. Douglas. Are You Using or Abusing Data? Paper presented at the Northeast-North Central Region Conference, National Association of Corrosion Engineers, October 4-6, 1965, Pittsburgh, Pa.
6. W. J. Youden. Experimentation and Measurement. National Science Teachers Association, Washington, D. C., 1962.
7. E. F. Booth and G. E. G. Tucker. Statistical Distribution of Endurance in Electrochemical Stress-Corrosion Tests. *Corrosion*, 21, 173 (1965) May.
8. Compilation of Examples of Applying Statistics to Corrosion Problems. Report of ASTM Committee G-1 on Corrosion of Metals, prepared by Subcommittee III on Statistics. ASTM, 1916 Race St., Philadelphia, Pa.
9. Metals Handbook. American Society for Metals, Metals Park, Novely, Ohio, 8th Edition, Volume 1, 1961.

Appendix H

Title 10 C.F.R. Waste Disposal

§ 20.301 General requirement.

No licensee shall dispose of licensed material except:

(a) By transfer to an authorized recipient as provided in the regulations in Part 30, 40, or 70 of this chapter, whichever may be applicable; or

(b) As authorized pursuant to § 20.302; or

(c) As provided in § 20.303 or § 20.304, applicable respectively to the disposal of licensed material by release into sanitary sewerage systems or burial in soil, or in § 20.106 (Radioactivity in effluents to unrestricted areas).

[25 FR 10914, Nov. 17, 1960, as amended at 39 FR 27121, July 25, 1974]

§ 20.302 Method for obtaining approval of proposed disposal procedures.

(a) Any licensee or applicant for a license may apply to the Commission for approval of proposed procedures to dispose of licensed material in a manner not otherwise authorized in the regulations in this chapter. Each application should include a description of the licensed material and any other radioactive material involved, including the quantities and kinds of such material and the levels of radioactivity involved, and the proposed manner and conditions of disposal. The application should also include an analysis and evaluation of pertinent information as to the nature of the environment, including topographical, geological, meteorological, and hydrological characteristics; usage of ground and surface waters in the general area; the nature and location of other potentially affected facilities; and procedures to be observed to minimize the risk of unexpected or hazardous exposures.

(b) The Commission will not approve any application for a license to receive licensed material from other persons for disposal on land not owned by the Federal government or by a State government.

(c) The Commission will not approve any application for a license for disposal of licensed material at sea unless the applicant shows that sea disposal offers less harm to man or the environment than other practical alternative methods of disposal.

[25 F.R. 10914, Nov. 17, 1960, as amended at 26 F.R. 352, Jan. 18, 1961; 36 F.R. 23138, Dec. 4, 1971]

§ 20.303 Disposal by release into sanitary sewage systems.

No licensee shall discharge licensed material into a sanitary sewerage system unless:

(a) It is readily soluble or dispersible in water; and

(b) The quantity of any licensed or other radioactive material released into the system by the licensee in any one day does not exceed the larger of subparagraphs (1) or (2) of this paragraph:

(1) The quantity which, if diluted by the average daily quantity of sewage released into the sewer by the licensee, will result in an average concentration equal to the limits specified in Appendix B, Table I, Column 2 of this part; or

(2) Ten times the quantity of such material specified in Appendix C of this part; and

(c) The quantity of any licensed or other radioactive material released in any one month, if diluted by the average monthly quantity of water released by the licensee, will not result in an average concentration exceeding the limits specified in Appendix B, Table I, Column 2 of this part; and

(d) The gross quantity of licensed and other radioactive material released into the sewerage system by the licensee does not exceed one curie per year.

Excreta from individuals undergoing medical diagnosis or therapy with radioactive material shall be exempt from any limitations contained in this section.

§ 20.304 Disposal by burial in soil.

No licensee shall dispose of licensed material by burial in soil unless:

(a) The total quantity of licensed and other radioactive materials buried at any one location and time does not exceed, at the time of burial, 1,000 times the amount specified in Appendix C of this part; and

(b) Burial is at a minimum depth of four feet; and

(c) Successive burials are separated by distances of at least six feet and not more than 12 burials are made in any year.

§ 20.305 Treatment or disposal by incineration.

No licensee shall treat or dispose of licensed material by incineration except as specifically approved by the Commission pursuant to §§ 20.106(b) and 20.302.

[29 FR 14435, Oct. 21, 1964]

§ 20.106 Radioactivity in effluents to unrestricted areas.

(a) A licensee shall not possess, use, or transfer licensed material so as to release to an unrestricted area radioactive material in concentrations which exceed the limits specified in Appendix "B", Table II of this part, except as authorized pursuant to § 20.302 or paragraph (b) or this section. For purposes of this section concentrations may be averaged over a period not greater than one year.

(b) An application for a license or amendment may include proposed limits higher than those specified in paragraph (a) of this section. The Commission will approve the proposed limits if the applicant demonstrates:

(1) That the applicant has made a reasonable effort to minimize the radioactivity contained in effluents to unrestricted areas; and

(2) That it is not likely that radioactive material discharged in the effluent would result in the exposure of an individual to concentrations of radioactive material in air or water exceeding the limits specified in Appendix "B", Table II of this part.

(c) An application for higher limits pursuant to paragraph (b) of this section shall include information demonstrating that the applicant has made a reasonable effort to minimize the radioactivity discharged in effluents to unrestricted areas, and shall include, as pertinent:

(1) Information as to flow rates, total volume of effluent, peak concentration of each radionuclide in the effluent, and concentration of each radionuclide in the effluent averaged over a period of one year at the point where the effluent leaves a stack, tube, pipe, or similar conduit;

(2) A description of the properties of the effluents, including:

(i) chemical composition;

(ii) physical characteristics, including sus-

pended solids content in liquid effluents, and nature of gas or aerosol for air effluents;

(iii) the hydrogen ion concentrations (p^H) of liquid effluents; and

(iv) the size range of particulates in effluents released into air.

(3) A description of the anticipated human occupancy in the unrestricted area where the highest concentration of radioactive material from the effluent is expected, and, in the case of a river or stream, a description of water uses downstream from the point of release of the effluent.

(4) Information as to the highest concentration of each radionuclide in an unrestricted area, including anticipated concentrations averaged over a period of one year:

(i) In air at any point of human occupancy;

or

(ii) In water at points of use downstream from the point of release of the effluent.

(5) The background concentration of radionuclides in the receiving river or stream prior to the release of liquid effluent.

(6) A description of the environmental monitoring equipment, including sensitivity of the system, and procedures and calculations to determine concentrations of radionuclides in the unrestricted area and possible reconcentrations of radionuclides.

(7) A description of the waste treatment facilities and procedures used to reduce the concentration of radionuclides in effluents prior to their release.

(d) For the purpose of this section the concentration limits a Appendix "B", Table II of this part shall apply at the boundary of the restricted area. The concentration of radioactive material discharged through a stack, pipe or similar conduit may be determined with respect to the point where the material leaves the conduit. If the conduit discharges within the restricted area, the concentration at the boundary may be determined by applying appropriate factors for dilution, dispersion, or decay between the point of discharge and the boundary.

(e) In addition to limiting concentrations in effluent streams, the Commission may limit quantities of

radioactive materials released in air or water during a specified period of time if it appears that the daily intake of radioactive material from air, water, or food by a suitable sample of an exposed population group, averaged over a period not exceeding one year, would otherwise exceed the daily intake resulting from continuous exposure to air or water containing one-third the concentration of radioactive materials specified in Appendix "B", Table II of this part.

(f) The provisions of this section do not apply to disposal of radioactive material into sanitary sewerage systems, which is governed by § 20.303.

[29 F.R. 14434, Oct. 21, 1964]

Appendix I

Title 16 C.F.R.

§ 1500.41 Method of testing primary irritant substances.

Primary irritation to the skin is measured by a patch-test technique on the abraded and intact skin of the albino rabbit, clipped free of hair. A minimum of six subjects are used in abraded and intact skin tests. Introduce under a square patch, such as surgical gauze measuring 1 inch by 1 inch and two single layers thick, 0.5 milliliter (in the case of liquids) or 0.5 gram (in the case of solids and semisolids) of the test substance. Dissolve solids in an appropriate solvent and apply the solution as for liquids. The animals are immobilized with patches secured in place by adhesive tape. The entire trunk of the animal is then wrapped with an impervious material, such as rubberized cloth, for the 24-hour period of exposure. This material aids in maintaining the test patches in position and retards the evaporation of volatile substances. After 24 hours of exposure, the patches are removed and the resulting reactions are evaluated on the basis of the designated values in the following table:

Skin reaction	Value ¹
Erythema and eschar formation:	
No erythema	0
Very slight erythema (barely perceptible)	1
Well-defined erythema	2
Moderate to severe erythema	3
Severe erythema (beet redness) to slight eschar formations (injuries in depth)	4
Edema formation:	
No edema	0
Very slight edema (barely perceptible)	1
Slight edema (edges of area well defined by definite raising)	2

¹The "value" recorded for each reading is the average value of the six or more animals subject to the test.

Moderate edema (raised approximately 1 millimeter)	3
Severe edema (raised more than 1 millimeter and extending beyond the area of exposure)	4

Readings are again made at the end of a total of 72 hours (48 hours after the first reading). An equal number of exposures are made on areas of skin that have been previously abraded. The abrasions are minor incisions through the stratum corneum, but not sufficiently deep to disturb the derma or to produce bleeding. Evaluate the reactions of the abraded skin at 24 hours and 72 hours, as described in this paragraph. Add the values for erythema and eschar formation at 24 hours and at 72 hours for intact skin to the values on abraded skin at 24 hours and at 72 hours (four values). Similarly, add the values for edema formation at 24 hours and at 72 hours for intact and abraded skin (for values). The total of the eight values is divided by four to give the primary irritation score; for example:

Skin reaction	Exposure time (hours)	Evaluation value
Erythema and eschar formation:		
Intact skin	24	2
Do	72	1
Abraded skin	24	3
Do	72	2
Subtotal		8
Edema formation:		
Intact skin	24	0
Do	72	1
Abraded skin	24	1
Do	72	2
Subtotal		4
Total		12

Thus, the primary irritation score is 12÷4=3.

Appendix J

Title 49 C.F.R.

§ 173.50 An explosive.

(a) For the purpose of Parts 170-189 of this subchapter an explosive is defined as any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion, i.e., with substantially instantaneous release of gas and heat, unless such com-

pound, mixture, or device is otherwise specifically classified in Parts 170-189 of this subchapter.

§ 173.300 Definitions.

For the purpose of Parts 170-189 of this chapter, the following terminology is defined:

(a) *Compressed gas.* The term "compressed gas" shall designate any material or mixture having in the container an absolute pressure exceeding 40 p.s.i. at 70°F. or, regardless of the pressure at 70°F., having an absolute pressure exceeding 104 p.s.i. at 130°F.; or any liquid flammable material having a vapor pressure exceeding 40 p.s.i. absolute at 100°F. as determined by ASTM Test D-323.

(b) *Flammable compressed gas.* Any compressed gas as defined in paragraph (a) of this section shall be classified as "flammable compressed gas" if any one of the following occurs:

(1) Either a mixture of 13 percent or less (by volume) with air forms a flammable mixture or the flammable range with air is wider than 12 percent regardless of the lower limit. These limits shall be determined at atmospheric temperature and pressure. The method of sampling and test procedure shall be acceptable to the Bureau of Explosives.

(2) Using the Bureau of Explosives' Flame Projection Apparatus (see Note 1), the flame projects more than 18 inches beyond the ignition source with valve opened fully, or the flame flashes back and burns at the valve with any degree of valve opening.

(3) Using the Bureau of Explosives' Open Drum Apparatus (see Note 1) there is any significant propagation of flame away from the ignition source.

(4) Using the Bureau of Explosives' Closed Drum Apparatus (see Note 1), there is any explosion of the vapor-air mixture in the drum.

(c) *Non-liquefied compressed gas.* A "non-liquefied compressed gas" is a gas, other than gas in solution, which under the charged pressure is entirely gaseous at a temperature of 70°F.

(d) *Liquefied compressed gas.* A "liquefied

NOTE 1: A description of the Bureau of Explosives' Flame Projection Apparatus, Open Drum Apparatus, Closed Drum Apparatus, and method of tests may be procured from the Bureau of Explosives.

compressed gas" is a gas which, under the charged pressure, is partially liquid at a temperature of 70°F.

(e) *Compressed gas in solution.* A "compressed gas in solution" is a non-liquefied compressed gas which is dissolved in a solvent.

(f) *Flammable range.* The term "flammable range" shall designate the difference between the minimum and maximum volume percentages of the material in air that forms a flammable compressed gas.

(g) *Filling density.* The term "filling density" shall designate the percent ratio of the weight of gas in a container to the weight of water that the container will hold at 60°F. (One pound of water equals 27.737 cubic inches at 60°F.) For example, for a liquefied petroleum gas of 0.504/0.510 specific gravity, a 100-pound cylinder holds 238.1 pounds of water and the filling density is 42 percent; therefore the amount of gas permitted is 0.42×238.1 or 100 pounds.

(h) *Service pressure.* The term "service pressure" shall designate the authorized pressure marking on the container. For example, for cylinders marked "DOT 3A1800", the service pressure is 1800 psig (pounds per square inch gauge).

[29 F.R. 18743, Dec. 29, 1964, as amended by Amdt. 173-16, 34 F.R. 18248, Nov. 14, 1969; Amdt. 173-54, 36 F.R. 18469, Sept. 15, 1971]

§ 173.300 Definitions.

(b) *Flammable compressed gas.* Any compressed gas as defined in paragraph (a) of this section shall be classed as "flammable gas" if any one of the following occurs:

§ 177.824 Retesting and inspection of cargo tanks.

(a) *General.* In accordance with § 173.33 of this chapter (cargo tank use authorization) every cargo tank and every compartment of a cargo tank authorized as a qualified container, except those cargo tanks having a capacity of 3,000 gallons or less used exclusively for the transportation of flammable liquids, must fulfill the applicable requirements as set forth in this section.

(1) Each cargo tank, except specifications MC 330 and MC 331 cargo tanks, must be in compliance with the testing requirements prescribed in paragraphs (a), (b),

(c), and (d) of this section. Each cargo tank must be in accordance with the marking requirement of paragraph (h) of this section.

(2) Every cargo tank whether constructed in accordance with DOT specifications or being operated as a novel tank under special permit authorization shall not continue in service unless it has successfully fulfilled the testing requirements as set forth in this section.

(b) *Visual inspection requirements.* Every cargo tank shall receive an external visual inspection at least once in every 2-year period. The first such inspection shall be required at the time the next hydrostatic retest is due or prior to January 31, 1969, whichever comes first. This inspection shall be made by a responsible and experienced inspector who shall record the condition of the items set forth below. The inspection record shall be approved and signed by an authorized representative of the owner or operator. A written report of each inspection shall be retained in carrier's or owner's files for a period of 2 years after the date of inspection. Where insulation precludes external visual inspection, the cargo tank shall receive a visual internal inspection for corroded areas, defects in welds or tank sheets. Where visual inspection is precluded by both internal coating and external insulation or when the cargo tank is not equipped with a manhole, the tank shall be hydrostatically tested at 5-year intervals except as otherwise provided in paragraph (c) of this section. The tank shall not be placed in or returned to service if evidence of any unsafe condition is discovered and until such condition has been corrected. Inspection shall consist of the following items:

(1) The tank shall be inspected for: Corroded areas, bad dents, and defects in welds; defects in piping, valves, and gaskets; and other conditions, including leakage, which indicate weakness in the tank that might render it unsafe for transportation service.

(2) Devices for tightening manhole covers must be operative and leakage at manhole covers and gaskets must be corrected.

(3) Spring-loaded safety-relief valves rated in excess of 7 p.s.i.g. shall be removed from the cargo tank and tested.

(4) All emergency devices and valves must be free from corrosion, distortion, and any damage which will prevent their normal operation.

(5) Missing or loose bolts or nuts on any flanged connection or blank flange must be replaced or tightened.

(6) Required markings on the tank shall be legible.

(7) The entire vehicle shall be inspected for and comply with the Motor Carrier Safety Regulations, Part 393, Chapter III, of this title.

(c) *Hydrostatic or pneumatic testing requirements.* In addition to the visual inspection requirements as contained in paragraph (b) of this section, hydrostatic or pneumatic testing of cargo tanks (or compartments) is required to be conducted in accordance with the provisions contained in paragraph (d) of this section to qualify as an authorized container if:

(1) The cargo tank has been out of service (transporting dangerous articles) 1 year or more, or

(2) The cargo tank has been involved in an accident in which it may have been dented, torn, or otherwise damaged so as to affect its product retention integrity, or

(3) The shell of the cargo tank as originally manufactured has been modified, or

(4) The cargo tank is operating under special permit authorization. Such tanks shall be hydrostatically tested once every calendar year unless otherwise provided for in the special permit, and shall successfully fulfill the requirements set forth in paragraph (d) of this section. No two such required tests shall be closer than 6 months.

(d) *Hydrostatic or pneumatic testing procedure.* The requalification as an authorized container of cargo tanks (or compartments) required to be hydrostatically or pneumatically tested in accordance with paragraph (a) of this section shall be based on successfully meeting the requirements of this paragraph.

(1) *General.* (i) If a cargo tank is compartmented each compartment shall be similarly tested with the adjacent compartment empty and at atmospheric pressure.

(ii) All closures shall be in place while the test is being made. During the test all relief devices shall be clamped, plugged or otherwise rendered inoperative. Relief devices shall be returned to their operative condition immediately after the tests are completed.

(iii) The tank or compartment must hold the prescribed pressure for at least 10 minutes. All tank valves, piping, and other accessories in communication with the lading must be pressure tested and proven tight at the tank design pressure.

(iv) All pressure bearing portions of the heating system of a cargo tank (or compartment) employing such media as steam or hot water for heating the lading shall be tested under hydrostatic pressure and proven to be tight at 14.06 kg./sq. cm (200 psig). Systems employing flues for

heating the lading shall be suitably tested to insure against product leakage into the flues or into the atmosphere.

(2) *Hydrostatic test.* For Hydrostatic testing, the tank (including its domes, if any) must be completely filled with water or a liquid having a viscosity similar to water. Pressure must be gauged at the top of the tank applied in accordance with Table I following paragraph (d)(3) of this section.

(3) *Pneumatic test.* Pneumatic pressure must be applied in accordance with Table I of this paragraph. During the pneumatic test the entire surface of all joints under pressure must be coated with a solution of soap and water, heavy oil, or other materials suitable for the purpose of foaming or bubbling to indicate the presence of leaks. Other methods equally sensitive for determining leaks may be used.

TABLE I

	Test pressure. KG/SQ. CM.
Container type:	
MC 300, 301, 302, 303, 305, 306	0.2109 (3 psig)
MC 304, 307	1.76 ¹ (25 ¹ psig)
MC 310, 311, 312	0.2109 ¹ (3 ¹ psig)
¹ Or 1½ times design pressure whichever is greater.	

(4) *Required results.* A cargo tank (or compartment) required to be hydrostatically or pneumatically tested in accordance with paragraph (a) of this section may not be returned to service as a specification cargo tank unless it has successfully retained the applicable test pressure (see Table I in paragraph (d) (3) of this section) without leakage, undue distortion, excessive permanent expansion, or evidence of impending failure. The suitability of any repairs shall be determined by the same method of test.

(i) Cargo tanks (or compartments) with heating systems shall successfully withstand the hydrostatic pressure and examination specified in paragraph (d) (1) (iv) of this section.

(e) *Compressed gas cargo tanks, specifications MC 330 and MC 331.* Each cargo tank constructed in compliance with specification MC 330 or MC 331 (§ 178.337 of this subchapter) must be inspected and tested in accordance with § 173.33 of this subchapter.

(f) *Reporting requirements.* Each motor carrier shall file with the Director, Bureau of Motor Carrier Safety, Federal Highway Administration, Department of Transportation, Washington, D.C. 20590, a written listing of all MC 330 and MC 331 cargo tanks he has in service.

Each motor carrier, upon placing in service or withdrawing from service any MC 330 and MC 331 cargo tank (other than a cargo tank used in interchange service which is reported upon by another carrier), shall file a supplemental report with the Bureau.

(1) The initial listing and each subsequent report must include the following information:

(i) The carrier's name, address, and telephone number.

(ii) One of the following statements: "Cargo tank placed in service" or "Cargo tank withdrawn from service;" as appropriate, followed by the date of placement or removal;

(iii) The carrier's equipment number, manufacturer's name, manufacturer's serial number, specification MC 330 or MC 331, and "QT" (quenched and tempered) or "NQT" (not quenched and tempered).

(2) A copy of each report required by this paragraph must be retained by the carrier at its principal place of business during the period the tank is in the carrier's service and for 1 year thereafter. However, upon a written request to, and with the approval of, the Director, Regional Motor Carrier Safety Office, for the region in which a motor carrier has his principal place of business, the carrier may maintain the reports at a regional or terminal office.

(g) *Special testing required by the Department.* Upon the showing of probable cause of the necessity for retest, the Department may require any cargo tank to be retested at any time in accordance with the requirements prescribed for its periodic retest.

(h) *Test date markings.* The month and year of the last test must be durably and legibly marked on the tank in letters not less than 1/4 inches high, on the right side near the front. These markings must be near the metal certification plate, except on any tank having the plate other than on the right side near the front.

(i) *Withdrawal of certification.* If, as the result of an accident or for any other reason a cargo tank no longer meets the applicable specification, the carrier shall remove the metal certification plate or make it illegible (see § 173.24(c)(1)(v) of this subchapter). The details of the conditions necessitating withdrawal of the certification must be recorded and signed on the written certificate for that cargo tank. The vehicle owner shall retain the certificate for at least 1 year after withdrawal of the certification.

Subpart C—Loading and Storage Chart of Hazardous Materials
§ 177.848 Loading and storage chart of hazardous materials.
 (a) Hazardous materials must not be loaded, transported or stored together, except as provided in the Loading and Storage Chart of Hazardous Materials shown in this section.

The following table shows the hazardous materials which must not be loaded or stored together.

The letter X at an intersection of horizontal and vertical columns shows that these articles must not be loaded or stored together. For example, Detonating fuzes, class A, with or without radioactive components & horizontal column must not be loaded or stored with high explosives or propellant explosives, class A vertical column.

CLASS A EXPLOSIVES		
Low explosives or black powder.....	(1)	a
High explosives or propellant explosives, class A.....	(2)	b
Initiating or priming explosives, wet: Diazodinitrophenol, fulminate of mercury, guanyl nitrosamino guanlyldene hydrazine, lead azide, lead styphnate, nitro mannite, nitrosoguanidine, pentaerythrite tetranitrate, tetrazane, lead mononitrosocarbonate	X	c
Blasting caps, with or without safety fuse (including electric blasting caps), detonating primers	*X	d
Ammunition for cannon with explosive projectiles, gas projectiles, smoke projectiles, incendiary projectiles, illuminating projectiles or shell; ammunition for small arms with incendiary projectiles; ammunition for small arms with explosive projectiles, rocket ammunition with explosive projectiles, gas projectiles, smoke projectiles, incendiary projectiles, illuminating projectiles; boosters (explosive); bursters (explosive); and supplementary charges (explosive) without detonators * *		e
Explosive projectiles; bombs; torpedoes; mines; rifle or hand grenades (explosive); jet thrust units (jato), class A; igniters, jet thrust, class A; rocket motors, class A; igniters, rocket motor, class A * *		f
Detonating fuzes, class A, with or without radioactive components	X	g
Ammunition for cannon with empty, inert-loaded or solid projectiles, or without projectiles; rocket ammunition with empty, inert-loaded or solid projectiles		h
Propellant explosives, class B; jet thrust units (jato), class B; igniters, jet thrust, class B; rocket motors, class B; rocket engines (liquid), class B; igniters, rocket motor, class B; starter cartridges, jet engine, class B		i
Fireworks special or railway torpedoes	X	j
Small arms ammunition, or cartridges, practice ammunition.	X	k
Primers for cannon or small arms, empty cartridge bags—black powder igniters, empty cartridge cases, primed, empty grenades, primed, combination primers or percussion caps, toy caps, explosive cable cutters, explosive rivets		l
Percussion fuzes, tracer fuzes or tracers		m
Time, combination or detonating fuzes, class C		n
Cordeau detonant fuse, safety squibs, fuse lighters, fuse igniters, delay electric igniters, electric squibs, instantaneous fuse or igniter cord		o
Fireworks, common,	X	p
Flammable liquids or flammable gases; Flammable liquid or flammable gas label.	X	q
Flammable solids or oxidizing materials, Flammable solid, oxidizer, or organic peroxide label.	X	r
Corrosive liquids; Corrosive label.	X	s
Nonflammable gases; Nonflammable gas label.	X	t
Poisonous gases or liquids, in tank car tanks, cylinders, projectiles or bombs, poison gas label	X	u
Radioactive materials	*X	v

Title 49—Transportation

§ 177.848

stypnate, nitro mannite, nitro-squandine pentacythrite tetra-nitrate, tetrazene, lead mono-nitroseselenate

Blasting caps, with or without safety fuse (including electric blasting caps), detonating primers

Ammunition for cannon with explosive projectiles, gas projectiles, smoke projectiles, incendiary projectiles, illuminating projectiles or shell ammunition for small arms with explosive bullets, or ammunition for small arms with explosive projectiles, or rocket ammunition with explosive projectiles, gas projectiles, smoke projectiles, incendiary projectiles, illuminating projectiles, and boosters (explosive), bursters (explosive), or supplementary charges (explosive) without detonators

Explosive projectiles, bombs, torpedoes, or mines, rifle or hand grenades (explosive), jet thrust units (jato), explosive, class A, or igniters, jet thrust (jato), explosive, class A

Detonating fuses, class A, with or without radioactive components

CLASS B EXPLOSIVES

Ammunition for cannon with empty, inert-loaded or solid projectiles, or without projectiles, or rocket ammunition with empty projectiles, inert-loaded or solid projectiles or without projectiles

Propellant explosives, class B, jet thrust units (jato), class B, igniters, jet thrust (jato), class B, or starter cartridges, jet engine, class B

Fireworks, special or railway torpedoes

(*)	X	X	-----	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(*)		X	X	-----	X	X				X							X	X	X	X	X	X	X	X	X	X
(*)					X	X				X							X	X	X	X	X	X	X	X	X	X
(*)					X	X				X							X	X	X	X	X	X	X	X	X	X
(*)		X	X		X	X				X							X	X	X	X	X	X	X	X	X	X
1					X																		X			X
2					X																		X			X
3	X	X	X	X	X	X																				X

See footnotes at end of table.

Time, combination or detonating fuses, class O.....	7		X																																				
Cordeau detonant fuse, safety squibs, fuse lighters, fuse igniters, delay electric igniters, electric squibs, instantaneous fuse or igniter cord.....	8		X																																				
Fireworks, common.....	9	X	X	X	*X	X	X	X																															
OTHER DANGEROUS ARTICLES																																							
Flammable liquids or flammable gases; Flammable liquid or flammable gas label.....	10	X	X	X	*X	X	X	X																															
Flammable solids or oxidizing materials; Flammable solid, oxidizer, or organic peroxide label.....	11	X	*X	X	**X	X	X	X																															
Corrosive liquids; Corrosive label.....	12	X	X	X	*X	X	X	X	*X	*X																													
Nonflammable gases; Nonflammable gas label.....	13	X	X	X	*X	X	X	X																															
Poisonous gases or liquids in tank cars, tanks, cylinders, projectiles or bombs, poison gas label.....	14	X	X	X	X	X	X	X	X	X	X	X	X														X	X	X	X									
Radioactive materials.....	15	*X	*X	*X	*X	*X	*X	*X																															

* Blasting caps or electric blasting caps in quantities not exceeding 1,000 caps may also be loaded and transported with articles named in vertical and horizontal columns 3, 9, 10, 11, 12, and 13. Loading and transportation of blasting caps or electric blasting caps except as prescribed in § 177.835, in any quantity, with articles named in vertical or horizontal columns h, c, e, or f is prohibited.

† Corrosive liquids must not be loaded above or adjacent to flammable solids, oxidizing materials, ammunition for cannon with or without projectiles, or propellant explosives, except that shippers loading truckload shipments of corrosive liquids and flammable solids or oxidizing materials packages and who have obtained prior approval from the Department may load such materials together when it is known that the mixture of contents would not cause a dangerous evolution of heat or gas.

‡ Explosives, class A and explosives, class B must not be loaded or stored with chemical ammunition containing incendiary charges or white phosphorus either with or without bursting charges.

§ Bursting (explosive), boosters (explosive), or supplementary charges (explosive) without detonators when shipped by, to or for the Departments of the Army, Navy, and Air Force of the United States Government may be loaded with any of the articles named except those in columns c, d, 3, 9, 10, 11, 12, 13, 14, and 15.

¶ Does not include nitro carbo nitrate or ammonium nitrate, fertilizer grade, which

may be loaded, transported or stored with high explosives or with blasting caps or electric blasting caps, and detonating primers.

‡ Normal uranium, depleted uranium, and thorium metal in solid form may also be loaded and transported with articles named in vertical and horizontal columns a, b, c, d, e, f, and g.

Note 1: Charged electric storage batteries must not be loaded in the same vehicle with explosives, class A.

Note 2: Cyanides or cyanide mixtures must not be loaded or stored with acids or corrosive liquids.

Note 3: Gas identification sets may be loaded and transported with all articles named except those in column c.

Note 4: Nitric acid, when loaded in the same motor vehicle with other acids or other corrosive liquids in carboys, must be separated from the other carboys. A 2 by 6 inch plank, set on edge, should be nailed across the motor vehicle floor at least 12 inches from the nitric acid carboys, and the space between the plank and the carboys of nitric acid should be filled with sand, sifted ashes, or other incombustible absorbent material.

Note 5: Smokeless powder for small arms in quantities not exceeding 100 pounds net weight in one motor vehicle shall be classed as a flammable solid for purposes of transportation when approved for such classification by the Bureau of Explosives.

Appendix K

TYPE 3 - INLAND SHALLOW FRESH MARSHES. The soil is usually waterlogged during the growing season: often it is covered with as much as six inches or more of water. Vegetation includes, grasses, bulrushes, spikerushes, and various other marsh plants such as cattails, arrowheads, pickerelweed, and smartweeds. Common representatives in the north are reed, whitetop, rice cutgrass, carex, and giant burreed. In the southeast, maidencane, sawgrass, arrowhead, and pickerelweed are characteristic. These marshes may nearly fill shallow lake basins or sloughs, or they may border deep marshes on the landward side. They are also common as seep areas on irrigated lands.

Marshes of this type are used extensively as nesting and feeding habitat in the pothole country of the north central states and elsewhere. In combination with deep fresh marshes (Type 4), they constitute the principal production areas for waterfowl. Florida and Georgia are the only states where the majority of the shallow fresh marshes are considered to be of lesser importance to waterfowl. Florida alone contains more than two million acres of this type.

	Flyway area	Acres
1.	Pacific north	33,700
2.	Pacific south	64,100
3.	Central north	817,600
4.	Central south	84,600
5.	Mississippi north	758,500
6.	Mississippi south	15,300
7.	Atlantic north	35,900
8.	Atlantic south	2,159,900

TYPE 4 - INLAND DEEP FRESH MARSHES. The soil is covered with six inches to three feet or more of water during the growing season. Vegetation includes cattails, reeds, bulrushes, spikerushes, and wildrice. In open areas, pondweeds, naiads, coontail, watermilfoills, waterweeds, duckweeds, waterlilies, or spatterdocks may occur. Water-hyacinth and waterprimroses form surface mats in some localities in the southeast. These deep marshes may almost completely fill shallow lake basins, potholes, limestone sinks, and sloughs, or they may border open water in such depressions.

Deep fresh marshes constitute the best breeding habitat in the country, and they are also important feeding places. In the western states they are heavily used by migrating birds, especially diving ducks. Florida and Texas are the only states in which the vast majority of these marshes are not rated as being of primary importance to waterfowl.

Flyway area	Acres
1. Pacific north	92,500
2. Pacific south	62,500
3. Central north	686,500
4. Central south	46,800
5. Mississippi north	427,700
6. Mississippi south	21,500
7. Atlantic north	25,700
8. Atlantic south	984,100

TYPE 5 - INLAND OPEN FRESH WATER. Shallow ponds and reservoirs are included in this type. Water is usually less than ten feet deep and is fringed by a border of emergent vegetation. Vegetation (mainly at water depths of less than six feet) includes pondweeds, naiads, wildcelery, coontail, watermilfoils, muskgrasses, waterlilies, spatterdocks, and (in the south) water-hyacinth.

In the pothole country of the north central states, Type 5 areas are used extensively as brood areas when, in midsummer and late summer, the less permanent marshes begin to dry out. The borders of such areas are used for nesting throughout the northern states. Where vegetation is plentiful, they are used in all sections of the country as feeding and resting areas by ducks, geese, and coots, especially during the migration period.

Flyway area	Acres
1. Pacific north	40,500
2. Pacific south	51,900
3. Central north	676,800
4. Central south	87,100
5. Mississippi north	1,000,200
6. Mississippi south	186,500
7. Atlantic north	12,000
8. Atlantic south	541,000

Appendix L

Appendix I—Representative Sampling Methods

The methods and equipment used for sampling waste materials will vary with the form and consistency of the waste materials to be sampled. Samples collected using the sampling protocols listed below, for sampling waste with properties similar to the indicated materials, will be considered by the Agency to be representative of the waste.

Extremely viscous liquid—ASTM Standard D140-70 Crushed or powdered material—ASTM Standard D346-75 Soil or rock-like material—ASTM Standard D420-69 Soil-like material—ASTM Standard D1452-65

Fly Ash-like material—ASTM Standard D2234-76 (ASTM Standards are available from ASTM, 1916 Race St., Philadelphia, PA 19103)

Containerized liquid waste—"COLIWASA" described in "Test Methods for the Evaluation of Solid Waste, Physical Chemical Methods,"¹ U.S. Environmental Protection Agency, Office of Solid Waste, Washington, D.C. 20460. (Copies may be obtained from Solid Waste Information, U.S. Environmental Protection Agency, 26 W. St. Clair St., Cincinnati, Ohio 45268)

Liquid waste in pits, ponds, lagoons, and similar reservoirs.—"Pond Sampler" described in "Test Methods for the Evaluation of Solid Waste, Physical Chemical Methods."¹

This manual also contains additional information on application of these protocols.

Appendix II—EP Toxicity Test Procedure

A. Extraction Procedure (EP)

1. A representative sample of the waste to be tested (minimum size 100 grams) should be obtained using the methods specified in Appendix I or any other methods capable of yielding a representative sample within the meaning of Part 290. (For detailed guidance on conducting the various aspects of the EP see "Test Methods for the Evaluation of Solid Waste, Physical Chemical Methods," SW-846, U.S. Environmental Protection Agency Office of Solid Waste, Washington, D.C. 20460.)¹

2. The sample should be separated into its component liquid and solid phases using the method described in "Separation Procedure" below. If the solid residue obtained using this method totals less than 0.5% of the original weight of the waste, the residue can be discarded and the operator should treat the liquid phase as the extract and proceed immediately to Step 8.

3. The solid material obtained from the Separation Procedure should be evaluated for its particle size. If the solid material has a surface area per gram of material equal to, or greater than, 3.1 cm² or passes through a 9.5 mm (0.375 inch) standard sieve, the operator should proceed to Step 4. If the surface area is smaller or the particle size larger than specified above, the solid material should be prepared for extraction by crushing, cutting or grinding the material so that it passes through a 9.5 mm (0.375 inch) sieve or, if the material is in a single piece, by subjecting the material to the "Structural Integrity Procedure" described below.

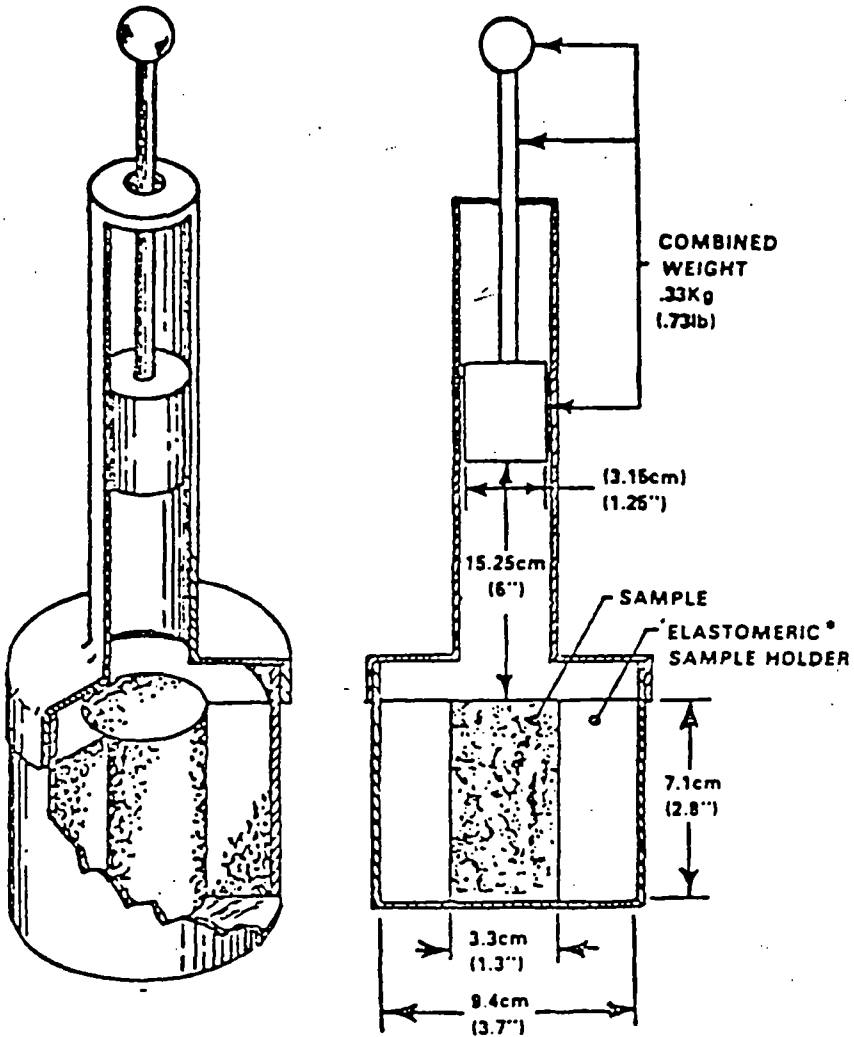
4. The solid material obtained in Step 3 should be weighed and placed in an extractor with 16 times its weight of deionized water. Do not allow the material to dry prior to weighing. For purposes of this test, an acceptable extractor is one which will

¹ These methods are also described in "Samplers and Sampling Procedures for Hazardous Waste Streams," EPA 600/2-80-018, January 1980.

¹ Copies may be obtained from Solid Waste Information, U.S. Environmental Protection Agency, 26 W. St. Clair Street, Cincinnati, Ohio 45268.

² The percent solids is determined by drying the filter pad at 80°C until it reaches constant weight and then calculating the percent solids using the following equation:

$$\frac{(\text{weight of pad + solid}) - (\text{tare weight of pad})}{\text{initial weight of sample}} \times 100 = \% \text{ solids}$$



*ELASTOMERIC SAMPLE HOLDER FABRICATED OF MATERIAL FIRM ENOUGH TO SUPPORT THE SAMPLE

Figure 1
COMPACTION TESTER

ILLUSTRATION CODE 888-97-C

impart sufficient agitation to the mixture to not only prevent stratification of the sample and extraction fluid but also insure that all sample surfaces are continuously brought into contact with well mixed extraction fluid.

5. After the solid material and deionized water are placed in the extractor, the operator should begin agitation and measure the pH of the solution in the extractor. If the pH is greater than 5.0, the pH of the solution should be decreased to 5.0 ± 0.2 by adding 0.5 N acetic acid. If the pH is equal to or less than 5.0, no acetic acid should be added. The pH of the solution should be monitored, as described below, during the course of the extraction and if the pH rises above 5.2, 0.5N acetic acid should be added to bring the pH down to 5.0 ± 0.2 . However, in no event shall the aggregate amount of acid added to the solution exceed 4 ml of acid per gram of solid. The mixture should be agitated for 24 hours and maintained at $20\text{--}40\text{ }^{\circ}\text{C}$ ($68\text{--}104\text{ }^{\circ}\text{F}$) during this time. It is recommended that the operator monitor and adjust the pH during the course of the extraction with a device such as the Type 45-A pH Controller manufactured by Chemtrix, Inc., Hillsboro, Oregon 97123 or its equivalent, in conjunction with a metering pump and reservoir of 0.5N acetic acid. If such a system is not available, the following manual procedure shall be employed:

- (a) A pH meter should be calibrated in accordance with the manufacturer's specifications.
- (b) the pH of the solution should be checked and, if necessary, 0.5N acetic acid should be manually added to the extractor until the pH reaches 5.0 ± 0.2 . The pH of the solution should be adjusted at 15, 30 and 60 minute intervals, moving to the next longer interval if the pH does not have to be adjusted more than 0.5N pH units.
- (c) The adjustment procedure should be continued for at least 6 hours.
- (d) If at the end of the 24-hour extraction period, the pH of the solution is not below 5.2 and the maximum amount of acid (4 ml per gram of solids) has not been added, the pH should be adjusted to 5.0 ± 0.2 and the extraction continued for an additional four hours, during which the pH should be adjusted at one hour intervals.

6. At the end of the 24 hour extraction period, deionized water should be added to the extractor in an amount determined by the following equation:

$$V = (20(W) - 16(A)) - A$$

V = ml deionized water to be added

W = weight in grams of solid charged to extractor

A = ml of 0.5N acetic acid added during extraction

7. The material in the extractor should be separated into its component liquid and solid phases as described under "Separation Procedure."

8. The liquids resulting from Steps 2 and 7 should be combined. This combined liquid (or the waste itself if it has less than 2 percent solids, as noted in Step 2) is the extract and should be analyzed for the presence of any of the contaminants specified in Table I of § 261.24 using the Analytical Procedures designated below.

Separation Procedure

Equipment: A filter holder, designed for filtration media having a nominal pore size of 0.45 micrometers and capable of applying a 5.3 kg/cm^2 (75 psi) hydrostatic pressure to the solution being filtered shall be used. For mixtures containing nonabsorptive solids, where separation can be affected without imposing a 5.3 kg/cm^2 pressure differential, vacuum filters employing a 0.45 micrometers filter media can be used. (For further guidance on filtration equipment or procedures see "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.")

Procedure:³

- (i) Following manufacturer's directions, the filter unit should be assembled with a filter bed consisting of a 0.45 micrometer

³ This procedure is intended to result in separation of the "free" liquid portion of the waste from any solid matter having a particle size $>0.45\text{ }\mu\text{m}$. If the sample will not filter, various other separation techniques can be used to aid in the filtration. As described above, pressure filtration is employed to speed up the filtration process. This does not alter the nature of the separation. If liquid does not separate during filtration, the waste can be centrifuged. If separation occurs during centrifugation the liquid portion (centrifugate) is filtered through the 0.45 μm filter prior to becoming mixed with the liquid portion of the waste obtained from the initial filtration. Any material that will not pass through the filter after centrifugation is considered a solid and is extracted.

filter membrane. For difficult or slow to filter mixtures a prefilter bed consisting of the following prefilters in increasing pore size (0.65 micrometer membrane, fine glass fiber prefilter, and coarse glass fiber prefilter) can be used.

(ii) The waste should be poured into the filtration unit.

(iii) The reservoir should be slowly pressurized until liquid begins to flow from the filtrate outlet at which point the pressure in the filter should be immediately lowered to 10-15 psig. Filtration should be continued until liquid flow ceases.

(iv) The pressure should be increased stepwise in 10 psi increments to 75 psig and filtration continued until flow ceases or the pressurizing gas begins to exit from the filter outlet.

(v) The filter unit should be depressurized, the solid material removed and weighed and then transferred to the extraction apparatus, or, in the case of final filtration prior to analysis, discarded. Do not allow the material retained on the filter pad to dry prior to weighing.

(vi) The liquid phase should be stored at 4°C for subsequent use in STEP —.

B. Structural Integrity Procedure

Equipment: A Structural Integrity Tester having a 3.18 cm (1.25 in.) diameter hammer weighing 0.33 kg (0.73 lbs.) and having a free fall of 15.24 cm (6 in.) shall be used. This device is available from Associated Design and Manufacturing Company, Alexandria, VA, 22314, as Part No. 125, or it may be fabricated to meet the specifications shown in Figure 1.

Procedure:

1. The sample holder should be filled with the material to be tested. If the sample of waste is a large monolithic block, a portion should be cut from the block having the dimensions of a 3.3 cm (1.3 in.) diameter × 7.1 cm (2.8 in.) cylinder. For a fixated waste, samples may be cast in the form of a 3.3 cm (1.3 in.) diameter × 7.1 cm (2.8 in.) cylinder for purposes of conducting this test. In such cases, the waste may be allowed to cure for 30 days prior to further testing.

2. The sample holder should be placed into the Structural Integrity Tester, then the hammer should be raised to its maximum height and dropped. This should be repeated fifteen times.

3. The material should be removed from the sample holder, weighed, and transferred to the extraction apparatus for extraction.

Analytical Procedures for Analyzing Extract Contaminants

The test methods for analyzing the extract are as follows:

(1) For arsenic, barium, cadmium, chromium, lead, mercury, selenium or silver: "Methods for Analysis of Water and Wastes," Environmental Monitoring and Support Laboratory, Office of Environmental Protection Agency, Cincinnati, Ohio 45268 (EPA-800/4-79-020, March 1979).

(2) For Endrin; Lindane; Methoxychlor; Toxaphene; 2,4-D; 2,4,5-TP Silver; in "Methods for Benzidine, Chlorinated Organic Compounds, Pentachlorophenol and Pesticides in Water and Wastewater," September 1978, U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268.

as standardized in "Test Methods for the Evaluation of Solid Waste, Physical Chemical Methods."

For all analyses, the method of standard addition shall be used for the quantification of species concentration. This method is described in "Test Methods for the Evaluation of Solid Waste." (It is also described in "Methods for Analysis of Water and Wastes.")

Billing Code 6580-01-M

[45 F.R. 33127, May 19, 1980]

Appendix M

Title 49 C.F.R.

§ 172.202 Description of hazardous material on shipping papers.

(a) Each description of a hazardous material on the shipping paper must include—

- (1) The proper shipping name prescribed for the material as required by § 172.101.
- (2) The class prescribed for the material as required by § 172.101. When the words of the proper shipping name are identical (excluding the entry "n.o.s.") with the words of the class, the inclusion of the class is not required.

(3) [Reserved]

(4) Except for empty packagings, the total quantity (by weight, volume, or as otherwise appropriate) of the hazardous material covered by the description.

(b) The basic description specified in paragraphs (a)(1) and (a)(2) of this section must be shown in sequence except that the technical name of the material may be entered between the proper shipping name and the class. For example: "Gasoline, Flammable liquid"; or "Flammable solid, n.o.s."; or "Corrosive liquid, n.o.s. (acrylyl chloride), corrosive material."

(c) The total quantity of the material covered by one description must appear before or after, or both before and after, the description required and authorized by this subpart.

(1) Abbreviations may be used to specify the type of packaging and weight or volume. For example: 40 cyl. Nitrogen, Non-flammable Gas-300 pounds; 1 box Cement, liquid n.o.s., Flammable liquid, 25 lbs.

(2) The type of packaging may be entered in any appropriate manner.

[Amdt. 172-29A, 41 FR 40677, Sept. 20, 1976]

§ 172.203 Additional description requirements.

(a) *Exemptions.* Each shipping paper issued in connection with a shipment made under an exemption must bear the notation "DOT-E" followed by the exemption number assigned and so located that the notation is clearly associated with the description to which the exemption applies.

(b) *Limited quantities.* The description for a material defined as "limited quantities" in this subchapter must include the words "Limited Quantities" or "Ltd. Qty." following the basic description.

(c) *Blasting caps.* The description for a shipment of blasting caps must have an entry stating the number of caps in the shipment, either before or after the basic description.

(d) *Radioactive material.* (1) The description for a shipment of radioactive material must include the following additional entries as appropriate:—

(i) The name of each radionuclide in the radioactive material that is listed in § 173.390 of this subchapter. Abbreviations, e.g., "90Mo" are authorized.

(ii) A description of the physical and chemical form of the material, if the material is not in special form.

(iii) The activity contained in each package of the shipment in terms of curies, millicuries, or microcuries. Abbreviations are authorized.

(iv) The category of label applied to each package in the shipment. For example: "RADIOACTIVE WHITE-I."

(v) The transport index assigned to each package in the shipment bearing RADIOACTIVE YELLOW-II or RADIOACTIVE YELLOW-III labels.

(vi) For a shipment of fissile radioactive materials—

(A) The words "Fissile Exempt," if the package is exempt pursuant to § 173.396(a) of this subchapter; or

(B) If not exempt, the fissile class of each package in the shipment, pursuant to § 173.389(a) of this subchapter; and

(C) For a Fissile Class III shipment, the additional notation, "Warning—Fissile Class III Shipment. Do not Load More than * * * Packages per Vehicle." (Asterisks to be replaced by appropriate number.) "In loading and Storage Areas, Keep at Least 20 Feet (6 Meters) from Other Packages Bearing Radioactive Labels."

(D) If a Fissile Class III shipment is to be transported by water, the supplementary notation must also include the following statement: "For shipment by water, only one Fissile Class III shipment is permitted in each hold."

(vii) For a package approved by the U.S. Energy Research and Development Administration (ERDA) or U.S. Nuclear Regulatory Commission (USNRC), a notation of the package identification marking as prescribed in the applicable ERDA or USNRC approval. (See § 173.393a of the subchapter.)

(viii) For an export shipment or a shipment in a foreign made package, a notation of the package identification marking as

prescribed in the applicable International Atomic Energy Agency (IAEA) Certificate of Competent Authority which has been issued for the package. (See § 173.393h(a)(3) of the subchapter.)

(ix) For a shipment of radioactive materials being offered and accepted for transportation and transported within the United States under the provisions of § 171.12(e) of this subchapter, the shipping paper shall be annotated with the following entry:

This shipment contains packages of Type A/low specific activity radioactive materials limited in accordance with the 1973 IAEA Regulations, pursuant to the provisions of 49 CFR 171.12(e). (Non-applicable entry to be deleted.)

(e) *Empty packagings.* For other than a tank car, the description on the shipping paper for an empty packaging containing the residue of a hazardous material may contain the word(s) "EMPTY"; or "EMPTY; Last contained * * *" followed by the name of the hazardous material last contained in the packaging. This entry may be before or after the basic description. For empty tank cars, see § 174.25(e) of this subchapter.

(f) *Transportation by air.* When a package containing a hazardous material is offered for transportation by air and this subchapter prohibits its transportation aboard passenger-carrying aircraft, the words "Cargo-only aircraft" must be entered after the basic description.

(g) *Transportation by rail.* (1) The shipping paper for a rail car containing a hazardous material must contain the notation "Placarded" followed by the name of the placard required for the rail car.

(2) The shipping paper for each specification DOT 112A or 114A tank car (without head shields) containing a flammable compressed gas must contain the notation, "DOT 112A" or "DOT 114A," as appropriate, and either "Must be handled in accordance with FRA E.O. No. 5" or "Shove to rest per E.O. No. 5."

(h) *Transportation by highway.* Following the basic description for a hazardous material in a specification MC 330 or MC 331 cargo tank made of quenched and tempered steel, there must be entered for—

(i) *Anhydrous ammonia.* (i) The words "0.2 per cent water" to indicate the suitability for shipping anhydrous ammonia in the cargo tank as authorized by § 177.817 of this subchapter, or

(ii) The words "NOT FOR Q AND T TANKS" when the anhydrous ammonia does not contain 0.2 per cent or more water by weight.

(2) *Liquefied petroleum gas.* The word "Non-corrosive" or "Non-cor" to indicate the suitability for shipment of the "Non-corrosive" liquefied petroleum gas offered for transportation by cargo tank as authorized by § 173.315(a)(1) Note 15 of this subchapter.

(i) *Transportation by water.* (1) Each shipment by water must have the following additional shipping paper entries:

(i) Identification of the type of packages such as barrels, drums, cylinders, and boxes.

(ii) The number of each type of package including those in a freight container or on a pallet, and

(iii) The gross weight of each type of package or the individual gross weight of each package.

(2) The shipping paper for a hazardous material offered for transportation by water to any country outside the United States must have in parenthesis the technical name of the material following the proper shipping name when the material is described by a "n.o.s." entry in § 172.101. For Example: Corrosive liquid, n.o.s. (acrylyl chloride). Corrosive material. However, for a mixture, only the technical name of any hazardous material giving the mixture its hazardous properties must be identified.

(3) The entry "Skin corrosive only" must be included to also authorize "under deck" stowage for corrosive liquid, n.o.s. and corrosive solid, n.o.s. that meet only the corrosion to skin criteria of § 173.240(a)(1).

(49 U.S.C. 1803, 1804, 1808)

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