

State Disposal System**MNG960000**

Permittee: Minnesota Pollution Control Agency
Facility name: Industrial By-Product General
Issuance date: January 15, 2019
Expiration date: December 31, 2028

The Permittee is an owner or operator of facilities within the boundary of the state of Minnesota that:

- a. Meet the applicability criteria of this permit will be eligible for permit coverage.
- b. Land apply industrial by-product waste streams that contain a beneficial use to the soil.
- c. Store waste streams similar in nature to food and beverage processing wastes.

The state of Minnesota, on behalf of its citizens through the Minnesota Pollution Control Agency (MPCA), authorizes the Permittee to operate a disposal system at the facility named above, in accordance with the requirements of this permit.

The goal of this permit is to reduce pollutant levels in point source discharges and protect water quality in accordance with the U.S. Clean Water Act, Minnesota statutes and rules, and federal laws and regulations.

This permit is effective on the issuance date identified above. This permit expires at midnight on the expiration date identified above.

Signature: **Theresa Haugen**

This document has been electronically signed.

Theresa Haugen, Supervisor
Water Section
Industrial Division

for the Minnesota Pollution Control Agency

Submit electronic Discharge Monitoring Reports (eDMRs)

Submit via the MPCA e-Services at
https://rsp.pca.state.mn.us/TEMPO_RSP/Orchestrate.do?initiate=true

Submit Water Quality reports to:

Attention: WQ Submittals Center
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Or Electronically: wq.submittals.mPCA@state.mn.us
Include Water quality submittals form:
<https://www.pca.state.mn.us/>

Questions on this permit?

For eDMR and other permit reporting issues, contact:
Belinda Nicholas, 651-757-2613

For specific permit requirements, please refer to:

Contact the appropriate MPCA regional office below.

Wastewater Permit Program general questions, contact:

MPCA, 651-282-6143 or 1-800-657-3938.

MPCA Offices

Toll Free Number: 800-657-3864

To report emergencies, call the Minnesota State Duty Officer at 651-649-5451
or toll free at 800-422-0798

24-hour emergency number: 651-297-5353 or 800-627-3529

Brainerd/Baxter Office 7678 College Road, Suite 105 Baxter, Minnesota 56425 Phone: 218-828-2492 Fax: 218-828-2594	Mankato Office 12 Civic Center Plaza, Suite 2165 Mankato, Minnesota 56001 Phone: 507-389-5977 Fax: 507-389-5422
Detroit Lakes Office 714 Lake Avenue, Suite 220 Detroit Lakes, Minnesota 56501 Phone: 218-847-1519 Fax: 218-846-0719	Marshall Office 504 Fairgrounds Road, Suite 200 Marshall, Minnesota 56258 Phone: 507-537-7146 Fax: 507-537-6001
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1. Summary of stations and station locations

Station	Type of station	Local name	PLS location
GW 001	Tile Line Monitoring	Tile Line Monitoring	
LA 301	Non-biosolids WWT/Sludge Appl Site	Non-biosolids WWT/Sludge Appl Site	
WS 301	Solids to Land Treatment/Application	Solids to Land Treatment/Application	

2. Permit requirements

GW 001	Tile Line Monitoring	
		Groundwater Well: MNG96 Tile Line Requirements
	2.1.1	The Permittee shall submit a monthly DMR : Due by 21 days after the end of each calendar month following permit issuance. [Minn. R. 7001.0150, Subp. 2(B)]
	2.1.2	Sampling Location. [Minn. R. 7001.0150, Subp. 2(B)]
	2.1.3	The Permittee(s) shall collect samples for the pond Tile Line Discharge Station from the final tile outlet prior to entering any surface water. [Minn. R. 7001.0150, Subp. 2(B)]
	2.1.4	The Permittee(s) shall submit monitoring results for discharges in accordance with the limits and monitoring requirements for this station. If no discharge or no flow occurred during the reporting period, the Permittee(s) shall check the "No Discharge/No Flow" box on the Discharge Monitoring Report (DMR). [Minn. R. 7001.0150, Subp. 2(B)]
MNG960000	Industrial By-Product General	
		Industrial By-Products General Permit Requirements
	2.2.1	The Permittee(s) shall land apply industrial by-products in accordance with the provisions of this permit. Examples of industrial by-products eligible for coverage under this permit include liquid or dewatered wastewater treatment sludges from industrial wastewater facilities, wash water from food preparation industries, livestock truck wash water and solids, vehicle wash facilities (wash water holding tanks only), pretreatment solids settled from wastewater before discharging to a municipal wastewater system, whey from cheese processing, sweet corn silage, sweet corn silage leachate and ethanol by-products. Industries that produce industrial by-products which have characteristics similar to the above by-products may also apply for coverage under this permit. [Minn. R. 7001]
	2.2.2	General Permit Applicability Criteria. [Minn. R. 7001]
	2.2.3	The Permittee(s) shall meet all criteria identified in this section in order for an industrial by-product to be eligible for coverage under this permit. [Minn. R. 7001]
	2.2.4	The Permittee(s) shall characterize the industrial by-product in the permit application to show the following eligibility requirements are met: a. The industrial by-product cannot be a hazardous waste. b. The Permittee(s) shall meet the concentrations below prior to the first land application of industrial by-product and shall evaluate industrial by-product if there are changes to its industrial process and/or chemical additives. Before making a concentration determination, Permittees cannot dilute industrial by-products or mix with other materials. Concentration limits for industrial by-products on a dry weight basis: Total Arsenic: 41 mg/kg Total Cadmium: 39 mg/kg Total Copper: 1500 mg/kg Total Lead: 300 mg/kg Total Mercury: 5 mg/kg Total Molybdenum: 75 mg/kg Total Nickel: 420 mg/kg Total Selenium: 100 mg/kg

		Total Zinc: 2800 mg/kg Total Dioxin equivalents: 10 parts per trillion Total Polychlorinated biphenyls: 6 mg/kg c. Annual application rates of the industrial by-product cannot exceed a sodium application rate limitation of 170 lb/acre/year. [Minn. R. 7001]
	2.2.5	The following do not qualify for coverage under this permit: a. Egg shells managed in accordance with Minn. R. 7035.2860 (Beneficial Use Rules); b. Industrial by-products from the processing of sugar beets; c. Animal manures and paunch manure covered under Minn. R. 7020 (Feedlot Rules). Animal manures and paunch manure generated and land applied by an industry are not regulated by Minn. R. 7020, thus are authorized to land apply under this permit; d. Dead animals; e. Residuals from the treatment of drinking water or for conditioning of industrial process water managed in accordance with Minn. R. chapter 7035.2860 or covered under general permit MNG820000 or MNG640000 (water treatment plant general permits); f. Solid or liquid wastes generated at industrial by-product permitted facilities as part of other operations, such as vehicle maintenance, shipping, cooling water; and g. Sediment from floor drains and from flammable and sediment traps at vehicle wash facilities. [Minn. R. 7001]
	2.2.6	The MPCA may require a permit applicant or Permittee(s) to submit an application for an individual permit if individual coverage is more appropriate in accordance with Minn. R. 7001.0210, subp. 6. [Minn. R. 7001]
	2.2.7	The Permittee(s) shall notify the MPCA immediately if there is any change in the operation of a facility covered by this general permit or conditions exist which may cause the facility to violate any of the terms and conditions of this permit. The MPCA may require the Permittee(s) to submit an application for an individual permit. [Minn. R. 7001]
	2.2.8	Sampling, Analysis, and Field Equipment Calibration Plan. [Minn. R. 7001]
	2.2.9	The Permittee(s) shall submit a Sampling, Analysis and Field Equipment Calibration Plan to address storage, management, and land application schedules by 60 days after permit issuance. The MPCA requires all permitted facilities to submit this plan. The Permittee(s) may submit an updated version of a plan submitted as part of a previous permit term. The Permittee(s) shall submit a Sampling, Analysis and Field Equipment Calibration Plan : Due by 60 days after permit issuance. [Minn. R. 7001]
	2.2.10	The Sampling, Analysis and Field Equipment Calibration plan must include, but is not limited to the following: a. A description of sample collection methods to ensure representative samples of the industrial by-product land applied, including sampling location identification, and a description of a sampling schedule; b. A list of all analyzed parameters, the analysis frequency, maximum holding times, and preservation methods; c. The laboratory methods used for analysis and reporting limits; d. A field equipment calibration schedule and detailed procedures to determine actual application rates of industrial by-product with an accuracy of plus or minus ten percent; e. An example of record keeping forms for sampling, analysis, and equipment calibration; f. The position of the person(s) responsible for sampling and calibration of field equipment; and g. A description of measures and practices to provide reasonable assurance that the land application, staging and/or storage of industrial by-product will not cause

		nuisance conditions. [Minn. R. 7001]
	2.2.11	Sampling Requirements. [Minn. R. 7001]
	2.2.12	The Permittee(s) shall measure flows to ensure accuracy within plus or minus ten percent of the true flow values. Flow meters shall be calibrated in accordance with the Total Facility Requirements section of this Permit. The Permittee(s) shall maintain written records of all calibrations and maintenance. [Minn. R. 7001]
	2.2.13	Limits and Monitoring Requirements. [Minn. R. 7001]
	2.2.14	Parameters. The Permittee(s) shall collect and analyze the parameters listed in the Limits & Monitoring Section of this permit for each industrial by-product. The Permittee(s) shall analyze each industrial by-product individually if it produces more than one type of industrial by-product, unless approval for mixing the industrial by-product for storage or land application is approved by the MPCA. Analysis is not required for sweet corn silage. Analysis of "Oil and Grease, Total" is not required at facilities where oil and grease are not present in the waste stream. [Minn. R. 7001]
	2.2.15	Analysis Frequency. The Permittee(s) shall refer to the Limits & Monitoring Section of this permit to determine the minimum frequency of parameter analysis. The Permittee(s) shall determine the minimum analytical frequency for each type of industrial by-product land applied. In some cases, the minimum frequencies of analysis will not be adequate to obtain representative samples and additional analysis may be required. [Minn. R. 7001]
	2.2.16	Site Suitability Criteria. [Minn. R. 7001]
	2.2.17	The MPCA requires an industrial by-product land application site to meet all the criteria in this section. [Minn. R. 7001]
	2.2.18	The Permittee(s) shall determine the suitability of the site for industrial by-product application, including a determination that the soils at the site meet the soil sample limitations identified in the Land Application Stations in the 'Limits and Monitoring' section of this permit, and the 'Site Suitability Criteria' of this section. The Permittee(s) shall submit this information to the MPCA prior to land application and according to the procedures in the Notification to MPCA section of this permit. [Minn. R. 7001]
	2.2.19	Slope Restrictions. All industrial by-products land application sites shall meet the slope restrictions in Table 4 of the permit appendix. [Minn. R. 7001]
	2.2.20	Separation Distances. All industrial by-product land application sites shall meet the minimum separation distances in Table 5 of the permit appendix. [Minn. R. 7001]
	2.2.21	Soil Sampling Requirements and Limits. [Minn. R. 7001]
	2.2.22	The Permittee(s) shall submit an 'Industrial By-Products Site Notification form' as outlined in the Notification Procedures section of this permit, including soils and waste analysis collected within six (6) months of form submission. After submittal, the Permittee(s) shall collect and analyze soil samples within the three-year period prior to industrial by-product application for the parameters listed for Land Application Stations in the Limits and Monitoring section of this permit. The Permittee(s) shall receive sample results and determine soil suitability before using a site for land application. Sample results shall meet limits before the Permittee(s) uses a site for land application. [Minn. R. 7001]
	2.2.23	The Permittee(s) shall collect a composite soil sample consisting of a mixture of 15-20 sub-samples taken in the plow layer. A minimum of one composite sample per site is required. Sites greater than 40 acres in size require a minimum of one composite sample per 40 acres of area. If using an alternative soil sampling method, the Permittee shall describe how the alternative protocol meets the minimum sampling frequency requirements for characterizing soils through representative sampling in the Sampling, Analysis and Field Equipment Calibration Plan. In no case shall the proposed sampling frequency be less than the requirements of this permit. [Minn. R. 7001]

	2.2.24	Soil Suitability Requirements. [Minn. R. 7001]
	2.2.25	The site used for land application of industrial by-product shall have a growing crop, which is harvested and removed during the cropping year that the industrial by-product is land applied. If the site does not meet this condition or the application site is set aside land (CRP), pasture land, non-agricultural land, or the industrial by-product contain pathogens, all the soil suitability criteria in a through c, below, shall be met: a. The soil texture at the zone of industrial by-product application shall be fine sand, loamy sand, sandy loam, loam, silt, silt loam, sandy clay loam, clay loam, sandy clay, silty clay loam, silty clay or clay. b. The depth to bedrock shall be at least 3 feet, unless the soil classifies as a highly permeable soil, in which case the minimum depth is increases to 5 feet. c. The depth to the seasonal high water table shall be at least 3 feet, unless the soil is classifies as a highly permeable soil, in which case the minimum depth is increases to 5 feet. [Minn. R. 7001]
	2.2.26	Tile Lines. On sites installed with tile drainage, the depth to tile lines is the depth to the seasonal high water table. The MPCA requires sites maintain a three foot separation distance to saturated soils for tiled sites. The Permittee(s) shall provide maps of the tiling system indicating their depth and placement in the field. Water tables classified as perched or epi-saturated by the Natural Resources Conservation Service are not considered to be the seasonal high water table. [Minn. R. 7001]
	2.2.27	The Permittee(s) shall obtain information to determine soil suitability from the Web Soil Survey published by the Natural Resources Conservation Service or by characterization of the site by a state of Minnesota licensed soil scientist or another qualified person. [Minn. R. 7001]
	2.2.28	Site Management, Limitations, and Restrictions. [Minn. R. 7001]
	2.2.29	Annual Application Limits. Annual application rates of the industrial by-product shall not exceed a sodium application rate limitation of 170 lb/acre/year. [Minn. R. 7001]
	2.2.30	Hydraulic Loading Limits. The MPCA sets hydraulic loading limits to prevent ponding and runoff from land application sites. The limitations specified in this section shall not cause any exceedances of other application limits of this permit. Limits for daily surface application rates for industrial by-products include: a. 10,000 gallons/acre/day for fine textured surface soils with United States Department of Agriculture (USDA) textural classifications of clay loam, silty clay loam, sandy clay, silty clay; b. 15,000 gallons/acre/day for medium textured surface soils with USDA textural classifications of loam, silt, silt loam, and sandy clay loam; and, c. 25,000 gallons/acre/day for coarse textured surface soils with USDA textural classifications of sand, loamy sand, and sandy loam. [Minn. R. 7001]
	2.2.31	Winter Application. The Permittee(s) shall meet the following requirements for frozen or snow-covered soils when incorporation or injection is not possible: a. The Permittee(s) shall not exceed a maximum hydraulic loading rate of 15,000 gallons/acre/winter for liquid industrial by-product. b. Applications are restricted to areas with 0 % to 2 % slopes. c. The Permittee(s) shall maintain all separation distances identified in Table 5 of the appendix to this permit. The MPCA assumes industrial by-product incorporation or injection cannot occur during the months of December, January, February, and March unless the Permittee(s) observes specific field or climatic conditions and documents them appropriately in the Daily Hauling Record in accordance with the Records section of this permit. [Minn. R. 7001]
	2.2.32	The Permittee(s) may be required to take additional measures to prevent runoff of the industrial by-product from the site during the spring thaw, such as the installation of silt fences and berms and planting of grass buffer strips. [Minn. R. 7001]
	2.2.33	Miscellaneous Management Practices/Restrictions. The Permittee(s) shall meet the

		following requirements for land application of industrial by-products: a. The Permittee(s) shall not allow runoff of the industrial by-product from the application site. This may require management tools such as the installation of silt fences and berms and planting of grass buffer strips. b. The Permittee(s) shall not allow ponding of liquid industrial by-products after 6 hours of application. c. All of the industrial by-product land applied shall be uniformly distributed over the area of the site used during application. d. The application area shall be clearly identified with GPS mapping used in the application equipment, flags, stakes, or other easily seen markers at the time of application to identify the site boundaries, separation distances, and unsuitable application areas within the site. Site boundaries identified by field roads, and fences, and so forth, do not require identification. e. The industrial by-product shall be immediately incorporated or injected on sites subject to flooding; f. Application of the industrial by-product is not allowed on areas of a site ponded with water or industrial by-product. g. Application of the industrial by-product is not allowed on areas that remain fallow for the entire cropping year. h. The Permittee(s) shall inject or immediately incorporate liquid industrial by-products when applied on soil with a surface horizon permeability rate of less than 0.2 inches/hour. i. The Permittee(s) shall not apply the industrial by-product by spraying from public roads or across road right of ways without prior written MPCA approval. [Minn. R. 7001]
	2.2.34	Multiple Permittees may use a land application site; however, both Permittee's annual report shall include application and additional source(s) of nitrogen. [Minn. R. 7001]
	2.2.35	Nuisance conditions. The Permittee(s) shall perform land application, staging and/or the storage of industrial by-product to minimize odors, noise, and vector attraction. The Permittee(s) shall provide reasonable assurance that the land application, staging and/or storage of industrial by-product will not cause nuisance conditions. The Permittee(s) shall consider all aspects of land application of the industrial by-product when providing reasonable assurance including loading, unloading, transportation, storage and land application of the industrial by-product, and shall specify this information in the Sampling, Analysis, and Field Equipment Calibration Plan. [Minn. R. 7001]
	2.2.36	Additional Requirements - Industrial By-Products Supplying Nitrogen. [Minn. R. 7001]
	2.2.37	Total Available Nitrogen. [Minn. R. 7001]
	2.2.38	The total quantity of nitrogen available for crop uptake for all industrial by-product during the cropping year is the sum of available organic nitrogen and ammonia nitrogen. [Minn. R. 7001]
	2.2.39	Available organic nitrogen. The Permittee(s) shall use one of the following methods to determine the available organic nitrogen for industrial by-products: i. The total quantity of organic nitrogen present in the industrial by-product is considered 50% available during the cropping year it is applied and 25% the following cropping year (carry over nitrogen). ii. A mineralization study shall determine the quantity of organic nitrogen available in the industrial by-product during the cropping year it is applied and subsequent years (carry over). The mineralization study determines the rate and quantity of organic nitrogen mineralized during the applied cropping year it is applied and the rate and quantity of nitrogen mineralized during the second cropping year after application. The MPCA shall approve the mineralization study, including study protocol, prior to

		initiation of the study. [Minn. R. 7001]
	2.2.40	Ammonia nitrogen. The quantity of ammonia nitrogen used for calculating total available nitrogen is equal to 100% of the ammonia nitrogen contained in the industrial by-product when it is injected or immediately incorporated or 50% of the ammonia nitrogen when it is surface applied without immediate incorporation. [Minn. R. 7001]
	2.2.41	Maximum Allowable Nitrogen Application Rates. [Minn. R. 7001]
	2.2.42	The Permittee(s) shall not apply industrial by-products at rates that cause exceedances of the annual maximum allowable nitrogen application rate. Maximum allowable nitrogen application rates shall take into account all available nitrogen supplied by farmers, industrial and municipal by-products such as manure, biosolids, compost, septage, other industrial by-products and fertilizers applied on the site. [Minn. R. 7001]
	2.2.43	Total available nitrogen loading limit cannot exceed the maximum allowable nitrogen application rate for the cropping year. [Minn. R. 7001]
	2.2.44	Maximum allowable nitrogen application rates shall be based on recommendations from the University of Minnesota Extension Service. These recommendations are based on soil analyses, realistic crop yield goals, and previously grown crops. This information is available from the MPCA upon request. MPCA requires written approval for a proposed nitrogen application rate when information on recommended nitrogen application rates is not readily available or agreed upon. [Minn. R. 7001]
	2.2.45	Table 7 in the appendix of this permit lists maximum allowable nitrogen application rates for selected crops that do not have University of Minnesota Extension Service recommendations. [Minn. R. 7001]
	2.2.46	Application Management. [Minn. R. 7001]
	2.2.47	The Permittee(s) shall comply with the following requirements when no crop is grown on the application site during the time period between July 1 through August 31: a. Applications are limited to rates which supply no more than 50 pounds per acre of available nitrogen. b. Available nitrogen for the following cropping year shall be the sum of the total amount of nitrogen applied between July 1 and August 31 plus applicable carry over from earlier industrial by-product application. [Minn. R. 7001]
	2.2.48	The maximum application rate of an industrial by-product allowed after the second cutting of a hay crop shall not provide more than 50 percent of the maximum allowable nitrogen based on the recommendations from the University of Minnesota Extension Service or Table 7 in the appendix of this permit. [Minn. R. 7001]
	2.2.49	Additional Requirements - Industrial By-Products Containing Pathogens. [Minn. R. 7001]
	2.2.50	Applicability. Permittees with industrial by-products containing pathogens shall meet additional separation distances and site restrictions (Table 6 of the appendix). The MPCA assumes an industrial by-product contains pathogens when it contains waste streams known or likely to contain pathogens, including wastes containing blood, animal feces and raw meats. All requirements of this section shall be met for industrial by-products containing pathogens. [Minn. R. 7001]
	2.2.51	Site Restrictions. Permittees with industrial by-products containing pathogens shall meet the following restrictions on crop harvest and access restriction. If necessary, the Permittee shall post signs at the area to meet restrictions. The minimum duration between time of application of an industrial by-product containing pathogens and harvest, grazing, and public access to the site is as follows: a. For food crops whose harvested part may touch the soil/industrial by-product mixture, such as melons, squash, and tomatoes, the waiting period is 14 months. b. For food crops whose harvested parts grow in the soil, such as potatoes and carrots, the waiting period is 38 months. This waiting period reduces to a 20 month duration

		between application and harvest when the industrial by-product is surface applied and stays on the soil surface four months or longer prior to incorporation into the soil. c. For feed, other food crops, such as field corn or sweet corn, hay, or fiber crop, the waiting period is 30 days. d. For the grazing of animals, the waiting period is 30 days. e. For public access to land with a high potential for exposure, including public contact sites, reclamation sites located in populated areas, turf farms, or plant nurseries, the waiting period is one year. f. For public access to land with a low potential for exposure, including lands with infrequent public use such as agricultural land, forests, or reclamation sites located in an unpopulated area, the waiting period is 30 days. [Minn. R. 7001]
	2.2.52	Notification Procedures. [Minn. R. 7001]
	2.2.53	Notification to MPCA. [Minn. R. 7001]
	2.2.54	The Permittee(s) shall submit a completed 'Industrial By-Products Site Notification' at least 30 days prior to application of industrial by-product at a site used for land application of an industrial by-product for the first time. The Permittee(s) shall collect the soil test results submitted with this form no more than six (6) months prior to submittal of the form. The Permittee(s) shall repeat this notification if any of the properties or conditions of the site changes, including a change in site name, site ownership, acreage used, soil types, slope and/or drainage capacity (tile lines). A copy of the form is included in the appendices section of this permit and is available electronically at http://www.pca.state.mn.us/water/industrial-products.html. [Minn. R. 7001]
	2.2.55	The Permittee(s) shall provide the appropriate and respective certifications required by the Industrial By-Product Storage section of this permit to the MPCA prior to the use of a structure for the storage of an industrial by-product. [Minn. R. 7001]
	2.2.56	Local Notification. [Minn. R. 7001]
	2.2.57	The Permittee(s) shall provide written notification to local officials at least 30 days before initiating land application activities within a county, city or township for the first time. The Permittee(s) shall: a. Notify the county's Planning and Zoning or Solid Waste Officer (whichever is appropriate for the county) in writing 30 days before the industrial by-product is land applied within the county; and, b. Notify the township clerk in writing 30 days before the industrial by-product is land applied within the township; or, c. Notify the mayor or another appropriate official of the city in writing 30 days before the industrial by-product is land applied within the city limits. [Minn. R. 7001]
	2.2.58	The Permittee(s) shall date the notifications and include a description with the following elements: a. Description of the industrial by-product to be land applied, including how the industrial by-product is produced, what nutrients/pollutants are present in the industrial by-product, and the limiting nutrient/pollutant in the industrial by-product application; b. Description of any staging and/or short-term storage of the industrial by-product conducted prior to land application; or, c. Description of the applicable slope and setback requirements followed during land application; and d. A response section to notify the local officials there is an opportunity to request additional information regarding copies of records, testing information, individual site information, listing of all sites, etc.; and/or a section to provide information to the generator of the waste, applicator(s) and land owner(s) of any local requirements. [Minn. R. 7001]
	2.2.59	The Permittee(s) shall repeat the notification process if any significant changes in the

		management of the industrial by-product described in the notification occur, including changes affecting the staging and/or storage of the industrial by-product. [Minn. R. 7001]
	2.2.60	End User Notification. [Minn. R. 7001]
	2.2.61	The end user shall receive, at a minimum, the information necessary to meet the requirements of this permit for each site used for land application of the industrial by-product. This includes information such as actual nutrient application rates, any restrictions on the by-product use, crop restrictions, and so forth. The application rates provided to the end user shall be the same nutrient loading rates submitted in the annual report. [Minn. R. 7001]
	2.2.62	The Permittee(s) shall provide the end user with this information in writing as soon as possible and in no case more than 6 weeks after completion of application at the land application site. The Permittee(s) shall maintain records demonstrating compliance with end user notification in accordance with the Records section of this permit. [Minn. R. 7001]
	2.2.63	The Permittee(s) shall inform end users that they should take appropriate credits for all plant nutrients supplied by industrial and municipal by-products, manures, septage and fertilizers so that maximum allowable application rates are not exceeded. [Minn. R. 7001]
	2.2.64	Operator Certification. [Minn. R. 7001]
	2.2.65	A Type IV certified operator, or someone under the supervision of a Type IV certified operator, shall complete all land application activities. [Minn. R. 7001]
	2.2.66	The number of certified operators required for land application activities is subject to the requirements of Minn. R. 7048.0500. [Minn. R. 7001]
	2.2.67	A private livestock truck wash is not required to have a Type IV certified operator if the wastewater is applied by the feedlot operator to cropland owned or leased by the feedlot operator or by a commercial animal waste technician licensed by the commissioner of agriculture. [Minn. Stat. ch. 116.07]
	2.2.68	Records. [Minn. R. 7001]
	2.2.69	Record Retention. The Permittee(s) shall maintain the following records at the facility for as long as that site is considered active, and shall be available at the facility for review at any time by MPCA staff: a. Copy of the submitted 'Industrial By-Products Site Notification Form' for each land application site, including the site map identifying the exact site location of the site, soil types on the site, tile maps, and areas that are required to be excluded from use; b. Documentation of site suitability of each site, including a copy of any lab results and other analytical information related to the industrial by-product or site used for application; c. Documentation of loading calculations for each site, including the maximum allowable industrial by-product application rate for each site used during the current cropping year; d. Documentation of acres used for application; e. Daily hauling records which indicate quantities of industrial by-product transferred to storage or land applied with the storage or site location identified for each land application site or storage area/structure; f. Sampling and calibration records as required by the Sampling, Analysis, and Field Equipment Calibration Plan as well as a copy of the submitted Sampling, Analysis, and Field Equipment Calibration Plan; g. Copy of the submitted 'Industrial By-Products Annual Report Form' and any other reported information necessary to prepare the Annual Report; h. Copy of notification letter(s) and other information submitted to each city, county, and township; i. Copy of written information provided to each end user of the industrial by-product;

		[Minn. R. 7001]
	2.2.70	Record Retention continued: j. Any approved plans or special approvals required by this permit; k. Copy of any 'Industrial By-Product Transfer to Manure Storage Application Form' submitted for storage of industrial by-product in a manure storage structure; and l. Any applicable records requirements pertaining to the storage of industrial by-product as specified by Industrial By-Products Storage section of this permit. [Minn. R. 7001]
	2.2.71	The Permittee(s) shall maintain the following information as the 'Daily Hauling Record,' organized by site or storage area/structure for each site or storage unit used for the land application or storage of industrial by-product covered by this permit and structures used for the storage of sweet corn silage: a. Name of site; b. Date delivered to site/storage area/structure; c. Date applied to site/removed from storage area/structure; d. Volume applied/delivered to site/storage area/structure; e. Application rate; f. Visual observations of site, including but not limited frozen or snow-covered soils, such that incorporation or injection of industrial by-product is not possible; and g. Running total of industrial by-product applied to site/added to storage unit during the cropping year. Records for industrial by-product transferred to manure storage structures do not need to include items c, e or f above; however these do need to indicate on the 'Daily Hauling Record' whether three-foot freeboard existed within the manure structure at the time of transfer. [Minn. R. 7001]
	2.2.72	Industrial By-Product Storage. [Minn. R. 7001]
	2.2.73	General Requirements for Storage of All Industrial By-Product. [Minn. R. 7001]
	2.2.74	Applicability. The Permittee(s) may store or stage industrial by-product prior to land application only under the terms and conditions of this permit for the industrial by-product(s) covered by this permit. This section is divided into several subparts. This first section is applicable to all industrial by-product storage. The permit lists additional requirements for dewatered and liquid industrial by-product following this section. [Minn. R. 7001]
	2.2.75	The Permittee(s) shall notify the appropriate local authorities prior to use of an area or structure for storage of an industrial by-product within a county, township, or city. Notification to local officials as required by this section shall include as least the following information, and a response section: a. A description of the necessity for storage at the land application site; b. The location of the storage area delineated on maps submitted; c. The dimensions of the storage area; d. The quantity of industrial by-product to be stored; e. The expected duration of storage before land application; and, f. A description of precautions or practices to minimize or prevent drainage, runoff or nuisance conditions at the storage area. [Minn. R. 7001]
	2.2.76	Management of Storage Area. All of the following requirements apply to areas and structures used for the storage of industrial by-products: a. No runoff of the industrial by-product from the storage site is allowed. b. If the storage area contains any particulate matter that may be subject to wind dispersion, the owner or operator shall cover or otherwise manage the waste to control wind dispersion. c. The Permittee(s) shall control and manage nuisance conditions resulting from the storage of industrial by-product. [Minn. R. 7001]
	2.2.77	Records Requirements. In addition to the records retention requirements of this permit, owners and operators of structures used for the storage of industrial by-

		products shall retain, for the life of the storage structure, the following additional records: a. maintenance and repair documentation; b. third-party certifications of storage structure(s) used for the storage of industrial by-product; and c. as-built drawings of any storage structure(s) used for the storage of industrial by-product. Additional requirements pertaining to record retention is required in accordance with Minn. R. chapter 7151 for storage of an industrial by-product in a tank or tank system. [Minn. R. 7001]
	2.2.78	A. Requirements for the Storage of Industrial By-Product in an Aboveground Storage Tank System. [Minn. R. 7001]
	2.2.79	If the Permittee(s) stores industrial by-product in an aboveground storage tank system as defined in Minn. R. 7151.1200, subp. 2, the Permittee(s) shall comply with the design and operating requirements of Minn. R. ch. 7151 as applicable to storage of other regulated substances as defined in Minn. R. 7151.1200, subp. 25. The exclusion for wastewater treatment equipment in Minn. R. 7151.1300, subp. 2.A, does not apply to such storage. [Minn. R. 7001]
	2.2.80	Certification Required. Prior to use of a tank for the storage of an industrial by-product under this section, owners and operators shall obtain written certification from an engineer licensed in Minnesota stating that the tank, based on their assessment of the applicable provisions of Minn. R. chapter 7151 is compliant with the Aboveground Storage Tank Rules. [Minn. R. 7001]
	2.2.81	The following standards apply to the short-term storage of industrial by-products in a vehicle, such as a tank truck, frac tank, or railroad tank car, or similar designed and used to transport substances from one location to another: a. Storage under this section shall not exceed thirty (30) days. b. Short-term storage shall only occur at the facility or on the land application site where the industrial by-product will be applied. The quantity of industrial by-product stored at an application site shall not exceed the quantity of material that can be applied to that site. c. The Permittee(s) shall maintain the separation distances in Table 8 of the appendix of this permit for all areas and structures used for the storage of industrial by-products. d. The storage structure shall be structurally sound and leak proof. [Minn. R. 7001]
	2.2.82	B. Additional Requirements for the Transfer of Industrial By-Products to Manure Storage Structures. [Minn. R. 7001]
	2.2.83	Applicability. The MPCA regulates structures designed primarily for the storage of manure wherein industrial by-product and manure are co-mingled under the requirements of this section. [Minn. R. 7001]
	2.2.84	Maximum Amount Transferred to Each Structure. The Permittee(s) may transfer a maximum of 50,000 gallons of industrial by-product, or up to 10 % of the available volume of the structure, whichever is greater, to each approved manure storage structure. A second transfer to the manure storage structure during a cropping year is also subject to a maximum of 50,000 gallons, or up to 10% of the available volume of the structure, whichever is greater. Two transfers of product may occur as long as the Permittee removes the first quantity prior to receiving the second transfer. The Permittee(s) shall record the available capacity of the structure at the time of transfer and the amount transferred in the Daily Hauling Record as required by the Records section of this permit. [Minn. R. 7001]
	2.2.85	Storage Structure Minimum Standards. The following restrictions apply to the storage of industrial by-product in a manure storage structure: a. The structure shall meet the design and operational standards of Minn. R. 7020.2100 pertaining to liquid manure storage areas. b. The Permittee(s) shall not use biological treatment lagoons for the storage of

		industrial by-product. c. The manure storage structure shall maintain a minimum of three-foot freeboard at all times. d. Industrial by-products shall be compatible with the structure and manure to prevent damage to the structure and changes in biological activity. Examples of problems associated with incompatible wastes are damage to concrete and soil liners, physical or chemical changes in the mixture which make it difficult to agitate or pump, cause odors, or cause other nuisance or structural problems. [Minn. R. 7001]
	2.2.86	Prior to the use of the manure storage structure, the Permittee(s) shall: a. Complete an Industrial By-Product Transfer to Manure Storage Application Form and submit it to the appropriate county official (feedlot officer in delegated counties or the county solid waste official in nondelegated counties) in the county in which the manure storage structure is located. A copy of the 'Industrial By-Product Transfer to Manure Storage' form is included in the appendices section of this permit and is available electronically at http://www.pca.state.mn.us/water/industrial-byproducts; b. Submit a copy of the county completed and signed form to the township or city where the manure storage structure is located; and c. Submit a copy of the county completed and signed form to the MPCA. [Minn. R. 7001]
	2.2.87	Feedlot Facility Minimum Standards. In order for a facility to obtain approval for a manure storage structure for industrial by-product use the feedlot receiving the industrial by-product shall be in compliance with MPCA feedlot, manure management requirements, and have no unresolved compliance issues. [Minn. R. 7020]
	2.2.88	Land Application of Industrial By-product/Manure Mixtures. The following requirements apply to the land application of mixtures of industrial by-products and manure: a. Sampling and analysis of the industrial by-product/manure mixture shall occur prior to land application to determine allowable application rates. b. Land application of the mixture shall be in accordance with Minn. R. 7020.2225, pertaining to the land application of manure. c. The Permittee(s) shall provide the following information to the owner and operator of the manure storage structure at the time of transfer: i. a copy of the analysis of the industrial by-product as required in the 'Limits and Monitoring' section and Table 4 of the appendix to this permit; and ii. an account of the volume transferred to the manure storage facility. [Minn. R. 7020]
	2.2.89	Land Application of Industrial By-product/Manure Mixtures (continued): d. The Permittee(s) shall obtain a copy of the Manure Management Plan from the owner or operator of the manure storage structure and ensure that the addition of the industrial by-product is appropriately addressed in the Plan. Minn. R. chapter 7020 requires a Manure Management Plan for operations with more than 300 animal units; for operations with less than 300 animal units, a MMP is not required, but the manure shall be land applied in accordance with the requirements of Minn. R. chapter 7020. e. The Permittee(s) shall not relinquish control of the industrial by-product until the Manure Management Plan has been appropriately updated or if there is reason to believe that the industrial by-product will not be managed in accordance with this permit or Minn. R. 7020.2225. f. The Permittee(s) shall submit the total quantity of by-product transferred and a copy of analysis results to the MPCA in accordance with the 'Annual Report' section of this permit. g. The Permittee(s) shall maintain Daily Hauling Records pertaining to the transfer of the industrial by-product to/from a manure storage structure, as required by the Records section of this permit. h. The Permittee(s) shall manage the resulting mixture of materials land applied as manure and the mixture is subject to the requirements for manure management.

		[Minn. R. 7020]
	2.2.90	Dewatered Industrial By-Product Storage Requirements. [Minn. R. 7001]
	2.2.91	Permittees that spread dewatered industrial by-products concurrently with the unloading of bulk material on the land application site and do not stockpile greater than 24 hours are not subject to the additional requirements for storage under this part. [Minn. R. 7001]
	2.2.92	Permittees that received approval for storage of a dewatered industrial by-product under a previous permit action or other written approval shall meet the requirements of the applicable parts of this section. [Minn. R. 7001]
	2.2.93	Separation Distances. The Permittee(s) shall maintain the separation distances in Table 8 of the appendix of this permit for all areas and structures used for the storage of industrial by-products. [Minn. R. 7001]
	2.2.94	A. Short-Term Storage of Dewatered Industrial By-Product. [Minn. R. 7001]
	2.2.95	Short-term storage requirements under this section are applicable to industrial by-products that meet the definition of "Dewatered Industrial By-product," as defined by this permit. [Minn. R. 7001]
	2.2.96	The following standards apply to the short-term storage of industrial by-products: a. Storage under this section shall not exceed thirty (30) days. b. Short-term storage shall only occur on the land application site where the industrial by-product will be applied. The quantity of industrial by-product stored at an application site shall not exceed the quantity of material that can be applied to that site. c. Short-term storage shall not take place on land with a slope greater than two percent (2%) unless the Permittee takes measures to control water runoff. [Minn. R. 7001]
	2.2.97	B. Long-Term Storage of Dewatered Industrial By-Product. [Minn. R. 7001]
	2.2.98	Long-term storage requirements under this section are applicable to industrial by-products that meet the definition of "Dewatered Industrial By-product," as defined by this permit. [Minn. R. 7001]
	2.2.99	The following standards apply to the long-term storage of industrial by-products: a. Long term storage shall not exceed a period of 7 months. b. Long-term storage of an industrial by-product is allowed only when land application will occur on the site where it is stored, or on land that is owned, leased, or rented by the same person, and all sites are within a one-half mile radius of the storage site. c. Long-term storage shall not occur on land with greater than a two percent (2%) slope unless the Permittee takes measures to control water runoff. d. Long-term storage areas shall be located in areas where the texture of all the horizons in the soil profile to a depth of five feet is sandy loam or finer, unless there is construction of an impervious pad with a drainage collection system. e. Long-term storage shall not take place on the same area for two or more consecutive years unless there is construction of an impervious pad with a drainage collection system. f. Prior to the use of an area for long-term storage (whether or not a pad is constructed), the Permittee(s) shall submit boring logs from at least two soil borings taken to a depth of ten feet at the perimeter of the proposed storage area. Boring logs shall include the following information: i. Texture and thickness of each soil horizon encountered; ii. Color and presence or absence of mottling for each soil horizon encountered (by the Munsell Soil Color Charts); iii. Depth to seasonal high water table, if encountered; and, iv. Depth to bedrock, if encountered. [Minn. R. 7001]
	2.2.100	Locational Prohibitions. All of the locational standards in Table 8 of the appendix apply to all areas and structures used for the storage of industrial by-products.

		[Minn. R. 7001]
	2.2.101	Certification Required. Prior to use of a constructed pad or other structure for the long-term storage of an industrial by-product under this section, owners and operators shall obtain and submit written certification from a Professional Engineer registered in the state of Minnesota stating that the storage area and/or structure (storage facility), based on their assessment of the requirements of the Long Term Storage of Dewatered Industrial By-Products section of this permit, is suitable for the long-term storage of the industrial by-product. [Minn. R. 7001]
	2.2.102	Certification Required. Prior to the use of an area for the long-term storage of an industrial by-product, the Permittee(s) shall submit written certification by a Professional Soil Scientist registered by the state of Minnesota or a Professional Engineer registered in the state of Minnesota, that the site, based on their assessment of the boring logs required under the Long Term Storage of Dewatered Industrial By-Products of this permit, is suitable for the long-term storage of the industrial by-product. [Minn. R. 7001]
	2.2.103	C. Permanent Storage of Dewatered Industrial By-Product. [Minn. R. 7001]
	2.2.104	Permanent Storage Requirements are applicable to Dewatered Industrial By-Products that are stored for a period of more than seven months and are not stored in a tank or tank system. [Minn. R. 7001]
	2.2.105	The following standards apply to the permanent storage of industrial by-products: a. Any area used for permanent storage of dewatered industrial by-products shall be paved with asphalt, concrete, or other material designed to restrict seepage to less than 500 gallons per acre per day, and shall be 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 must be collected and managed in a manner approved by the MPCA. b. The Permittee(s) shall not store the industrial by-product at the permanent storage location for more than three years without being processing or utilizing the product. c. Prior to operation of a storage facility, the Permittee(s) shall evaluate the potential for migration of contaminants into adjacent subsurface soil, groundwater, or surface water from the stored industrial by-product. This evaluation shall take into consideration the characteristics of the industrial by-product, the quantity of industrial by-product to be stored, and the length of time the industrial by-product will be stored. [Minn. R. 7001]
	2.2.106	Certification Required. Prior to use of a constructed area or structure for the permanent storage of an industrial by-product under this section, the Permittee(s) shall obtain and submit written certification from an engineer licensed in Minnesota stating that the storage area and/or structure (storage facility), based on their assessment of the requirements of this permit are suitable for the permanent storage of the industrial by-product. [Minn. R. 7001]
	2.2.107	Liquid Industrial By-Product Storage Requirements in an Industrial Pond. [Minn. R. 7001]
	2.2.108	If manure becomes co-mingled with industrial by-products, all the waste in the structure is considered an industrial by-product. [Minn. R. 7001]
	2.2.109	Liner Performance. Wastewater ponds at the facility shall maintain liner systems that restrict infiltration losses to less than 500 gallons per acre per day if the pond was constructed after May 16, 1975 or less than 3,500 gallons per acre per day if the pond was constructed before May 16, 1975. [Minn. R. 7001]
	2.2.110	Locational Standards. All of the following locational standards apply to construction of any new wastewater impoundment at the Facility: a. The impoundment shall be located entirely above the high water table. A minimum separation of 4 feet (1.2m) between the bottom of the pond and the maximum groundwater elevation shall be maintained.

		b. The impoundment shall not be located within a shoreland or wild and scenic river land use district governed by Minn. R. chapters 6105 and 6120. c. The impoundment shall not be located within a wetland. d. The impoundment shall not be located within an area where emissions of air pollutants would violate the ambient air quality standards in Minn. R. chapters 7005, 7007, 7009, 7011, 7017, 7019, and 7028 and Minn. R. parts 7023.0100 to 7023.0120. e. The impoundment shall not be located in the designated Karst Region in the Southeastern portion of Minnesota that was subject to the 1993 Administrative Order that required the preparation of a contingency plan. f. The impoundment shall not be located in an area which is unsuitable because of topography, geology, hydrology, or soils. [Minn. R. 7001]
	2.2.111	Operating Depth. All of the following apply to impoundments at the Facility: a. Except for impoundments lined with synthetic material, such as HDPE or PVC, impoundments that do not discharge continuously shall maintain a minimum depth of 2 feet at all times, except for maintenance. b. At least 3 feet freeboard on all impoundments and wastewater solids containment dams at the Facility shall be maintained at all times. [Minn. R. 7001]
	2.2.112	An approved riprap cover that meets the MPCA's "Riprap Criteria for Stabilization Ponds" (5/91) shall be maintained on any earthen wastewater impoundment dikes from one foot above the high water line to the toe of the dike. Where riprap is not used, the Permittee(s) shall maintain a vegetative cover of shallow-rooted, perennial, low-growing grasses that withstand erosion and inundation and that can be mowed. [Minn. R. 7001]
	2.2.113	Plants with long root structures, such as alfalfa, reed canary, willows, poplars, cottonwoods, shrubs, and cattails shall not grow in the pond or on the dikes, regardless of water depth in the pond. The Permittee(s) shall control harmful vegetative growth and remove the plants from the pond and pond structure. [Minn. R. 7001]
	2.2.114	The Permittee(s) shall use approved methods to prevent muskrats and other burrowing animals from tunneling and causing damage to the pond liner or dikes. [Minn. R. 7001]
	2.2.115	The Permittee(s) shall provide appropriate signs around the wastewater treatment system to designate the nature of the facility and advise against trespassing. At least one sign shall be provided on each side of the site, and one for every 500 feet of its perimeter. [Minn. R. 7001]
	2.2.116	Prior to the excavation or removal of solids from any wastewater pond at the facility, the Permittee(s) shall implement measures to maintain the integrity of the pond liner during the removal process. The removal of solids incidental to routine liquid pumping activities does not constitute excavation or removal of solids and does not trigger the water balance evaluation, groundwater impacts requirements or no impact demonstration below. [Minn. R. 7001]
	2.2.117	The Permittee(s) shall complete a water balance evaluation on the pond within seven months of excavation or removal of solids, the results of which shall be available for MPCA review at the facility or upon request. The water balance evaluation procedure is described in the MPCA document "Prefill and Water Balance Criteria (7/89)." [Minn. R. 7001]
	2.2.118	The Permittee(s) shall evaluate groundwater quality monitoring results before and after the excavation or removal of solids to assess the potential impacts of the pond on ground water. Any significant changes shall be reported to the MPCA on the next scheduled report. [Minn. R. 7001]
	2.2.119	No impact demonstration. The requirement to complete a water balance evaluation and monitor groundwater can be foregone if the Permittee(s) can successfully demonstrate that the removal action will not impact the liner of the wastewater impoundment, or the integrity thereof. To make this demonstration, the Permittee(s)

		may submit a Removal Plan for MPCA review and approval at least 90 days prior to the anticipated removal date. The Removal Plan should include, at a minimum, a description of the proposed methodology(ies) for the excavation or removal of solids, any proposed deviations from the water balance procedure and justification that the removal action does not impact the liner of the wastewater impoundment. The MPCA shall waive the water balance evaluation and requirement to monitor groundwater after MPCA written approval of the Removal Plan. [Minn. R. 7001]
	2.2.120	The Permittee(s) shall inspect the pond system weekly, take measurements of pond water depth, estimate the coverage of aquatic plants, floating mats and ice cover on the surface of the ponds, note odors, and the condition of the dikes and the presence of muskrats. The Permittee(s) shall maintain records of these weekly inspections for the last three (3) years. [Minn. R. 7001]
	2.2.121	The Permittee(s) shall maintain daily precipitation records. [Minn. R. 7001]
	2.2.122	Every five years, the Permittee(s) shall inspect and certify the wastewater storage ponds for structural integrity, complete containment, and compliance with performance standards. A registered professional engineer with expertise in wastewater structures shall complete the inspection and certification. The professional engineer shall prepare an inspection report and the Permittee(s) shall submit certification : Due by the end of each calendar five years following permit issuance to the MPCA. If repairs are necessary as a result of the professional engineer's inspection, the Permittee(s) shall submit a detailed proposal for restoration to the MPCA for review within 180 days of discovery, and at least 60 days prior to initiation of restoration work. [Minn. R. 7001]
	2.2.123	Annual Report. [Minn. R. 7001]
	2.2.124	The Permittee(s) shall submit an Industrial By-Product Land Application Annual Report by December 31 of each year following permit issuance. The Permittee(s) shall report on the MPCA form in the appendices section of this permit or the Annual Report form available electronically at http://www.pca.state.mn.us/water/industrial-products or another MPCA approved form. [Minn. R. 7001]
	2.2.125	The Permittee(s) shall submit an industrial by-product land application annual report : Due by December 31 of each year following permit issuance. [Minn. R. 7001]
	2.2.126	The Industrial By-Product Land Application Annual Report shall include the following information: a. Total quantity of each industrial by-product land applied during the cropping year (if none land applied, indicate on the form); b. Results of all analyses conducted and the average of these analyses. c. Site specific information: i. Crops grown/vegetation receiving nutrient benefit; ii. Realistic yield goal; iii. Months site used; iv. Soil analysis results; v. Application rate of industrial by-product; vi. Application rates for sodium, phosphorus, and nitrogen; and, vii. Description of any management problems associated with land application that occurred during the cropping year and how these problems have been or will be resolved; and d. Total quantity of industrial by-product transferred to/from a storage area/structure under the terms of the Industrial By-Product Storage section of this permit, if applicable. [Minn. R. 7001]
	2.2.127	The Permittee(s) shall report monitoring results for the completed reporting period in the units specified by this permit on the Industrial By-Product Land Application Annual Report form, as provided in the appendices section of this permit or electronically at http://www.pca.state.mn.us/water/industrial-products.html . [Minn. R. 7001]

	2.2.128	Groundwater Stations/Pond Tile Line Monitoring. [Minn. R. 7001]
	2.2.129	Tile Line Discharge Monitoring. If the MPCA requires the Permittee(s) to conduct tile line sampling, the permit will contain a GW monitoring station. [Minn. R. 7001]
	2.2.130	The Permittee(s) shall collect samples for the Tile Line Discharge Station from the final outlet prior to entering any surface water. [Minn. R. 7001]
	2.2.131	For all applicable GW (Tile Line) stations, submit a DMR monthly by 21 days after the end of each calendar month following permit issuance. [Minn. R. 7001]
	2.2.132	If no discharge or no flow occurred during the reporting period, the Permittee(s) shall check the "No Discharge/No Flow" box on the DMR. [Minn. R. 7001]
	2.2.133	Total Facilities Requirements. [Minn. R. 7001]
	2.2.134	General Requirements. [Minn. R. 7001]
	2.2.135	No Discharge. There shall be no point source discharge to surface water from the permitted activity. [Minn. R. 7001]
	2.2.136	Incorporation by Reference. The following applicable federal and state laws are incorporated by reference in this permit, are applicable to the Permittee, and are enforceable parts of this permit: 40 CFR pts. 122.41, 122.42, 136, 403 and 503; Minn. R. pts. 7001, 7041, 7045, 7050, 7052, 7053, 7060, and 7080; and Minn. Stat. Sec. 115 and 116. [Minn. R. 7001]
	2.2.137	Permittee Responsibility. The Permittee shall perform the actions or conduct the activity authorized by the permit in compliance with the conditions of the permit and, if required, in accordance with the plans and specifications approved by the Agency. [Minn. R. 7001.0150, Subp. 3(E)]
	2.2.138	Toxic Discharges Prohibited. Whether or not this permit includes effluent limitations for toxic pollutants, the Permittee shall not discharge a toxic pollutant except according to Code of Federal Regulations, Title 40, sections 400 to 460 and Minnesota Rules 7050, 7052, 7053 and any other applicable MPCA rules. [Minn. R. 7001.0150, Subp. 1(A)]
	2.2.139	Nuisance Conditions Prohibited. The Permittee's discharge shall not cause any nuisance conditions including, but not limited to: floating solids, scum and visible oil film, acutely toxic conditions to aquatic life, or other adverse impact on the receiving water. [Minn. R. 7001.0210, Subp. 2]
	2.2.140	Property Rights. This permit does not convey a property right or an exclusive privilege. [Minn. R. 7001.0150, Subp. 3(C)]
	2.2.141	Liability Exemption. In issuing this permit, the state and the MPCA assume no responsibility for damage to persons, property, or the environment caused by the activities of the Permittee in the conduct of its actions, including those activities authorized, directed, or undertaken under this permit. To the extent the state and the MPCA may be liable for the activities of its employees, that liability is explicitly limited to that provided in the Tort Claims Act. [Minn. R. 7001.0150, Subp. 3(O)]
	2.2.142	The MPCA's issuance of this permit does not obligate the MPCA to enforce local laws, rules, or plans beyond what is authorized by Minnesota Statutes. [Minn. R. 7001.0150, Subp. 3(D)]
	2.2.143	Liabilities. The MPCA's issuance of this permit does not release the Permittee from any liability, penalty or duty imposed by Minnesota or federal statutes or rules or local ordinances, except the obligation to obtain the permit. [Minn. R. 7001.0150, Subp. 3(A)]
	2.2.144	The issuance of this permit does not prevent the future adoption by the MPCA of pollution control rules, standards, or orders more stringent than those now in existence and does not prevent the enforcement of these rules, standards, or orders against the Permittee. [Minn. R. 7001.0150, Subp. 3(B)]
	2.2.145	Severability. The provisions of this permit are severable and, if any provisions of this permit or the application of any provision of this permit to any circumstance are held invalid, the application of such provision to other circumstances and the remainder of

		this permit shall not be affected thereby. [Minn. R. 7001]
	2.2.146	Compliance with Other Rules and Statutes. The Permittee shall comply with all applicable air quality, solid waste, and hazardous waste statutes and rules in the operation and maintenance of the facility. [Minn. R. 7001]
	2.2.147	Inspection and Entry. When authorized by Minn. Stat. Sec. 115.04; 115B.17, subd. 4; and 116.091, and upon presentation of proper credentials, the agency, or an authorized employee or agent of the agency, shall be allowed by the Permittee to enter at reasonable times upon the property of the Permittee to examine and copy books, papers, records, or memoranda pertaining to the construction, modification, or operation of the facility covered by the permit or pertaining to the activity covered by the permit; and to conduct surveys and investigations, including sampling or monitoring, pertaining to the construction, modification, or operation of the facility covered by the permit or pertaining to the activity covered by the permit. [Minn. R. 7001.0150, Subp. 3(I)]
	2.2.148	Control Users. The Permittee shall regulate the users of its wastewater treatment facility so as to prevent the introduction of pollutants or materials that may result in the inhibition or disruption of the conveyance system, treatment facility or processes, or disposal system that would contribute to the violation of the conditions of this permit or any federal, state or local law or regulation. [Minn. R. 7001.0150, Subp. 3(F)]
	2.2.149	Sampling. [Minn. R. 7001]
	2.2.150	Representative Sampling. Samples and measurements required by this permit shall be conducted as specified in this permit and shall be representative of the discharge or monitored activity. [40 CFR 122.41(j)(1)]
	2.2.151	Additional Sampling. If the Permittee monitors more frequently than required, the results and the frequency of monitoring shall be reported on the Discharge Monitoring Report (DMR) or another MPCA-approved form for that reporting period. [Minn. R. 7001.1090, Subp. 1(E)]
	2.2.152	Certified Laboratory. A laboratory certified by the Minnesota Department of Health and/or registered by the MPCA shall conduct analyses required by this permit. Analyses of dissolved oxygen, pH, temperature, specific conductance, and total residual oxidants (chlorine, bromine) do not need to be completed by a certified laboratory but shall comply with manufacturers specifications for equipment calibration and use. [Minn. R. 4740, Minn. R. 4740.2050 through 2120]
	2.2.153	Sample Preservation and Procedure. Sample preservation and test procedures for the analysis of pollutants shall conform to 40 CFR Part 136 and Minn. R. 7041.3200. [40 CFR 136, Minn. R. 7041.3200]
	2.2.154	Equipment Calibration: Flow meters, pumps, flumes, lift stations or other flow monitoring equipment used for purposes of determining compliance with permit shall be checked and/or calibrated for accuracy at least twice annually. [Minn. R. 7001.0150, Subp. 2(B and C)]
	2.2.155	Maintain Records. The Permittee shall keep the records required by this permit for at least three years, including any calculations, original recordings from automatic monitoring instruments, and laboratory sheets. The Permittee shall extend these record retention periods upon request of the MPCA. The Permittee shall maintain records for each sample and measurement. The records shall include the following information (Minn. R. 7001.0150, subp. 2, item C): a. The exact place, date, and time of the sample or measurement; b. The date of analysis; c. The name of the person who performed the sample collection, measurement, analysis, or calculation; and d. The analytical techniques, procedures and methods used; and e. The results of the analysis. [Minn. R. 7001.0150, Subp. 2(C)]
	2.2.156	Completing Reports. The Permittee shall submit the results of the required sampling

		and monitoring activities on the forms provided, specified, or approved by the MPCA. The information shall be recorded in the specified areas on those forms and in the units specified. Required forms may include: DMR Supplemental/Sample Value Form Individual values for each sample and measurement must be recorded on the DMR Supplemental/Sample Value Form which, if required, will be provided by the MPCA. DMR Supplemental/Sample Value Forms shall be submitted with the appropriate DMRs. You may design and use your own supplemental form; however, it must be approved by the MPCA. Note: Required summary information MUST also be recorded on the DMR. Summary information that is submitted ONLY on the DMR Supplemental/Sample Value Form does not comply with the reporting requirements. [Minn. R. 7001.0150, Subp. 2(B), Minn. R. 7001.1090, Subp. 1(D)]
	2.2.157	Incomplete or Incorrect Reports. The Permittee shall immediately submit an electronically amended report or DMR to the MPCA upon discovery by the Permittee or notification by the MPCA that it has submitted an incomplete or incorrect report or DMR. The amended report or DMR shall contain the missing or corrected data along with a cover letter explaining the circumstances of the incomplete or incorrect report. If it is impossible to electronically amend the report or DMR, the Permittee shall immediately notify the MPCA and the MPCA will provide direction for the amendment submittals. [Minn. R. 7001.0150, Subp. 3(G)]
	2.2.158	Required Signatures. All DMRs, forms, reports, and other documents submitted to the MPCA shall be signed by the Permittee or the duly authorized representative of the Permittee. Minn. R. 7001.0150, subp. 2, item D. The person or persons that sign the DMRs, forms, reports or other documents must certify that he or she understands and complies with the certification requirements of Minn. R. 7001.0070 and 7001.0540, including the penalties for submitting false information. Technical documents, such as design drawings and specifications and engineering studies required to be submitted as part of a permit application or by permit conditions, must be certified by a registered professional engineer. [Minn. R. 7001.0540]
	2.2.159	Detection Level. The Permittee shall report monitoring results below the reporting limit (RL) of a particular instrument as "<" the value of the RL. For example, if an instrument has a RL of 0.1 mg/L and a parameter is not detected at a value of 0.1 mg/L or greater, the concentration shall be reported as "<0.1 mg/L." "Non-detected," "undetected," "below detection limit," and "zero" are unacceptable reporting results, and are permit reporting violations. Where sample values are less than the level of detection and the permit requires reporting of an average, the Permittee shall calculate the average as follows: - If one or more values are greater than the level of detection, substitute zero for all nondetectable values to use in the average calculation. - If all values are below the level of detection, report the averages as "<" the corresponding level of detection. - Where one or more sample values are less than the level of detection, and the permit requires reporting of a mass, usually expressed as kg/day, the Permittee shall substitute zero for all nondetectable values. [Minn. R. 7001.0150, Subp. 2(B)]
	2.2.160	Records. The Permittee shall, when requested by the Agency, submit within a reasonable time the information and reports that are relevant to the control of pollution regarding the construction, modification, or operation of the facility covered by the permit or regarding the conduct of the activity covered by the permit. [Minn. R. 7001.0150, Subp. 3(H)]
	2.2.161	Confidential Information. Except for data determined to be confidential according to Minn. Stat. Sec. 116.075, subd. 2, all reports required by this permit shall be available for public inspection. Effluent data shall not be considered confidential. To request the

		Agency maintain data as confidential, the Permittee must follow Minn. R. 7000.1300. [Minn. R. 7000.1300]
	2.2.162	Noncompliance and Enforcement. [Minn. R. 7001]
	2.2.163	Subject to Enforcement Action and Penalties. Noncompliance with a term or condition of this permit subjects the Permittee to penalties provided by federal and state law set forth in section 309 of the Clean Water Act; United States Code, title 33, section 1319, as amended; and in Minn. Stat. Sec. 115.071 and 116.072, including monetary penalties, imprisonment, or both. [Minn. R. 7001.1090, Subp. 1(B)]
	2.2.164	Criminal Activity. The Permittee may not knowingly make a false statement, representation, or certification in a record or other document submitted to the Agency. A person who falsifies a report or document submitted to the Agency, or tampers with, or knowingly renders inaccurate a monitoring device or method required to be maintained under this permit is subject to criminal and civil penalties provided by federal and state law. [Minn. R. 7001.0150, Subp. 3(G), Minn. R. 7001.1090, Subp. 1(G and H)]
	2.2.165	Noncompliance Defense. It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. [40 CFR 122.41(c)]
	2.2.166	Effluent Violations. If sampling by the Permittee indicates a violation of any discharge limitation specified in this permit, the Permittee shall immediately make every effort to verify the violation by collecting additional samples, if appropriate, investigate the cause of the violation, and take action to prevent future violations. If the permittee discovers that noncompliance with a condition of the permit has occurred which could endanger human health, public drinking water supplies, or the environment, the Permittee shall within 24 hours of the discovery of the noncompliance, orally notify the commissioner and submit a written description of the noncompliance within 5 days of the discovery. The written description shall include items a. through e., as listed below. If the Permittee discovers other non-compliance that does not explicitly endanger human health, public drinking water supplies, or the environment, the non-compliance shall be reported during the next reporting period to the MPCA with its Discharge Monitoring Report (DMR). If no DMR is required within 30 days, the Permittee shall submit a written report within 30 days of the discovery of the noncompliance. This description shall include the following information: a. a description of the event including volume, duration, monitoring results and receiving waters; b. the cause of the event; c. the steps taken to reduce, eliminate and prevent reoccurrence of the event; d. the exact dates and times of the event; and e. steps taken to reduce any adverse impact resulting from the event. [Minn. R. 7001.0150, Subp. 3(K)]
	2.2.167	Upset Defense. In the event of temporary noncompliance by the Permittee with an applicable effluent limitation resulting from an upset at the Permittee's facility due to factors beyond the control of the Permittee, the Permittee has an affirmative defense to an enforcement action brought by the Agency as a result of the noncompliance if the Permittee demonstrates by a preponderance of competent evidence: a. The specific cause of the upset; b. That the upset was unintentional; c. That the upset resulted from factors beyond the reasonable control of the Permittee and did not result from operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or increases in production which are beyond the design capability of the treatment facilities; d. That at the time of the upset the facility was being properly operated;

		e. That the Permittee properly notified the Commissioner of the upset in accordance with Minn. R. 7001.1090, subp. 1, item I; and f. That the Permittee implemented the remedial measures required by Minn. R. 7001.0150, subp. 3, item J. [Minn. R. 7001.1090]
	2.2.168	Release. [Minn. R. 7001]
	2.2.169	Unauthorized Releases of Wastewater Prohibited. Except for discharges from outfalls specifically authorized by this permit, overflows, discharges, spills, or other releases of wastewater or materials to the environment, whether intentional or not, are prohibited. However, the MPCA will consider the Permittee's compliance with permit requirements, frequency of release, quantity, type, location, and other relevant factors when determining appropriate action. [40 CFR 122.41, Minn. Stat. ch. 115.061]
	2.2.170	Discovery of a release. Upon discovery of a release, the Permittee shall: a. Take all reasonable steps to immediately end the release. b. Notify the Minnesota Department of Public Safety Duty Officer at 1(800)422-0798 or (651)649-5451 (metro area) immediately upon discovery of the release. You may contact the MPCA during business hours at 1(800)657-3864 or (651)296-6300 (metro area). c. Recover as rapidly and as thoroughly as possible all substances and materials released or immediately take other action as may be reasonably possible to minimize or abate pollution to waters of the state or potential impacts to human health caused thereby. If the released materials or substances cannot be immediately or completely recovered, the Permittee shall contact the MPCA. If directed by the MPCA, the Permittee shall consult with other local, state or federal agencies (such as the Minnesota Department of Natural Resources and/or the Wetland Conservation Act authority) for implementation of additional clean-up or remediation activities in wetland or other sensitive areas. [Minn. R. 7001.1090]
	2.2.171	Sampling of a release. Upon discovery of a release, the Permittee shall: a. Collect representative samples of the release. The Permittee shall sample the release for parameters of concern immediately following discovery of the release. The Permittee may contact the MPCA during business hours to discuss the sampling parameters and protocol. In addition, Fecal Coliform Bacteria samples shall be collected where it is determined by the Permittee that the release contains or may contain sewage. If the release cannot be immediately stopped, the Permittee shall consult with MPCA regarding additional sampling requirements. Samples shall be collected at least, but not limited to, two times per week for as long as the release continues. b. Submit the sampling results on the Release Sampling Form (http://www.pca.state.mn.us/index.php/view-document.html?gid=18867). The Release Sampling Form shall be submitted to the MPCA with the next DMR or within 30 days whichever is sooner. [Minn. R. 7001.1090]
	2.2.172	Bypass. [Minn. R. 7001]
	2.2.173	Anticipated bypass. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if the bypass is for essential maintenance to assure efficient operation of the facility. The permittee shall submit prior notice, if possible at least ten days before the date of the bypass to the MPCA. The notice of the need for an anticipated bypass shall include the following information: a. The proposed date and estimated duration of the bypass; b. The alternatives to bypassing; and c. A proposal for effluent sampling during the bypass. Any bypass wastewater must enter waters of the state from outfalls specifically authorized by this permit. Therefore, samples shall be collected at the frequency and location identified in this

		permit or two times per week for as long as the bypass continues, whichever is more frequent. [40 CFR 122.41(m)(2 and 3), Minn. R. 7001.1090, Subp. 1(J)]
	2.2.174	All other bypasses are prohibited. The MPCA may take enforcement action against the Permittee for a bypass, unless the specific conditions described in Minn. R. Ch. 7001.1090 subp. 1, K and 122.41(m)(4)(i) are met. In the event of an unanticipated bypass, the permittee shall: a. Take all reasonable steps to immediately end the bypass. b. Notify the Minnesota Department of Public Safety Duty Officer at 1(800)422-0798 or (651)649-5451 (metro area) immediately upon commencement of the bypass. You may contact the MPCA during business hours at 1(800)657-3864 or (651)296-6300 (metro area). c. Immediately take action as may be reasonably possible to minimize or abate pollution to waters of the state or potential impacts to human health caused thereby. If directed by the MPCA, the Permittee shall consult with other local, state or federal agencies for implementation of abatement, clean-up, or remediation activities. d. Only allow bypass wastewater as specified in this section to enter waters of the state from outfalls specifically authorized by this permit. Samples shall be collected at the frequency and location identified in this permit or two times per week for as long as the bypass continues, whichever is more frequent. The permittee shall also follow the reporting requirements for effluent violations as specified in this permit. [40 CFR 122.41(m)(4)i, Minn. R. 7001.1090, Subp. 1(K)]
	2.2.175	Operation and Maintenance. [Minn. R. 7001]
	2.2.176	The Permittee shall at all times properly operate and maintain the facilities and systems of treatment and control, and the appurtenances related to them which are installed or used by the Permittee to achieve compliance with the conditions of the permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. The Permittee shall install and maintain appropriate backup or auxiliary facilities if they are necessary to achieve compliance with the conditions of the permit and, for all permits other than hazardous waste facility permits, if these backup or auxiliary facilities are technically and economically feasible Minn. R. 7001.0150. subp. 3, item F. [Minn. R. 7001.0150, Subp. 3(F)]
	2.2.177	In the event of a reduction or loss of effective treatment of wastewater at the facility, the Permittee shall control production or curtail its discharges to the extent necessary to maintain compliance with the terms and conditions of this permit. The Permittee shall continue this control or curtailment until the wastewater treatment facility has been restored or until an alternative method of treatment is provided. [Minn. R. 7001.1090, Subp. 1(C)]
	2.2.178	Solids Management. The Permittee shall properly store, transport, and dispose of biosolids, septage, sediments, residual solids, filter backwash, screenings, oil, grease, and other substances so that pollutants do not enter surface waters or ground waters of the state. Solids should be disposed of in accordance with local, state and federal requirements. [40 CFR 503, Minn. R. 7041]
	2.2.179	Scheduled Maintenance. The Permittee shall schedule maintenance of the treatment works during non-critical water quality periods to prevent degradation of water quality, except where emergency maintenance is required to prevent a condition that would be detrimental to water quality or human health. [Minn. R. 7001.0150, Subp. 2(B), Minn. R. 7001.0150, Subp. 3(F)]
	2.2.180	Control Tests. In-plant control tests shall be conducted at a frequency adequate to ensure compliance with the conditions of this permit. [Minn. R. 7001.0150, Subp. 2(B), Minn. R. 7001.0150, Subp. 3(F)]

	2.2.181	Changes to the Facility or Permit. [Minn. R. 7001]
	2.2.182	Permit Modifications. Except as provided under Minnesota Statutes, section 115.07, subdivisions 1 and 3, no person required by statute or rule to obtain a permit may construct, install, modify, or operate the facility to be permitted, nor shall a person commence an activity for which a permit is required by statute or rule until the agency has issued a written permit for the facility or activity. Permittees that propose to make a change to the facility or discharge that requires a permit modification must follow Minn. R. 7001.0190. If the Permittee cannot determine whether a permit modification is needed, the Permittee must contact the MPCA prior to any action. It is recommended that the application for permit modification be submitted to the MPCA at least 180 days prior to the planned change. [Minn. R. 7001.0030]
	2.2.183	Plans, specifications and MPCA approval are not necessary when maintenance dictates the need for installation of new equipment, provided the equipment is the same design size and has the same design intent. For instance, a broken pipe, lift station pump, aerator, or blower can be replaced with the same design-sized equipment without MPCA approval. If the proposed construction is not expressly authorized by this permit, it may require a permit modification. If the construction project requires an Environmental Assessment Worksheet under Minn. R. 4410, no construction shall begin until a negative declaration is issued and all approvals are received or implemented. [Minn. R. 7001.0030]
	2.2.184	Report Changes. The Permittee shall give advance notice as soon as possible to the MPCA of any substantial changes in operational procedures, activities that may alter the nature or frequency of the discharge, and/or material factors that may affect compliance with the conditions of this permit. [Minn. R. 7001.0150, Subp. 3(M)]
	2.2.185	Chemical Additives. The Permittee shall receive prior written approval from the MPCA before increasing the use of a chemical additive authorized by this permit, or using a chemical additive not authorized by this permit, in quantities or concentrations that have the potential to change the characteristics, nature and/or quality of the discharge. The Permittee shall request approval for an increased or new use of a chemical additive at least 60 days, or as soon as possible, before the proposed increased or new use. This written request shall include at least the following information for the proposed additive: a. The process for which the additive will be used; b. Safety Data Sheet (SDS) which shall include aquatic toxicity, human health, and environmental fate information for the proposed additive. The aquatic toxicity information shall include at minimum the results of: a) a 48-hour LC50 or EC50 acute study for a North American freshwater planktonic crustacean (either Ceriodaphnia or Daphnia sp.) and b) a 96-hour LC50 acute study for rainbow trout, bluegill or fathead minnow or another North American freshwater aquatic species other than a planktonic crustacean; c. a complete product use and instruction label; d. the commercial and chemical names and Chemical Abstract Survey (CAS) number for all ingredients in the additive (If the MSDS does not include information on chemical composition, including percentages for each ingredient totaling to 100%, the Permittee shall contact the supplier to have this information provided); and e. The proposed method of application, application frequency, concentration, and daily average and maximum rates of use. Upon review of the information submitted regarding the proposed chemical additive,

		the MPCA may require additional information be submitted for consideration. This permit may be modified to restrict the use or discharge of a chemical additive and include additional influent and effluent monitoring requirements. Approval for the use of an additive shall not justify the exceedance of any effluent limitation nor shall it be used as a defense against pollutant levels in the discharge causing or contributing to the violation of a water quality standard. [Minn. R. 7001.0170]
	2.2.186	MPCA Initiated Permit Modification, Suspension, or Revocation. The MPCA may modify or revoke and reissue this permit pursuant to Minn. R. 7001.0170. The MPCA may revoke without reissuance this permit pursuant to Minn. R. 7001.0180. [Minn. R. 7001.0170, Minn. R. 7001.0180]
	2.2.187	TMDL Impacts. Facilities that discharge to an impaired surface water, watershed or drainage basin may be required to comply with additional permits or permit requirements, including additional restriction or relaxation of limits and monitoring as authorized by the CWA 303(d)(4)(A) and 40 CFR 122.44.I.2.i., necessary to ensure consistency with the assumptions and requirements of any applicable US EPA approved wasteload allocations resulting from Total Maximum Daily Load (TMDL) studies. [40 CFR 122.44(l)(2)i]
	2.2.188	Permit Transfer. The permit is not transferable to any person without the express written approval of the Agency after compliance with the requirements of Minn. R. 7001.0190. A person to whom the permit has been transferred shall comply with the conditions of the permit. [Minn. R. 7001.0150, Subp. 3(N)]
	2.2.189	Facility Closure. The Permittee is responsible for closure and post-closure care of the facility. The Permittee shall notify the MPCA of a significant reduction or cessation of the activities described in this permit at least 180 days before the reduction or cessation. The MPCA may require the Permittee to provide to the MPCA a facility Closure Plan for approval. Facility closure that could result in a potential long-term water quality concern, such as the ongoing discharge of wastewater to surface or ground water, may require a permit modification or reissuance. The MPCA may require the Permittee to establish and maintain financial assurance to ensure performance of certain obligations under this permit, including closure, post-closure care and remedial action at the facility. If financial assurance is required, the amount and type of financial assurance, and proposed modifications to previously MPCA-approved financial assurance, shall be approved by the MPCA. [Minn. Stat. ch. 116.07, Subp. 4]
	2.2.190	Permit Reissuance. If the Permittee desires to continue permit coverage beyond the date of permit expiration, the Permittee shall submit an application for reissuance at least 180 days before permit expiration. If the Permittee does not intend to continue the activities authorized by this permit after the expiration date of this permit, the Permittee shall notify the MPCA in writing at least 180 days before permit expiration. If the Permittee has submitted a timely application for permit reissuance, the Permittee may continue to conduct the activities authorized by this permit, in compliance with the requirements of this permit, until the MPCA takes final action on the application, unless the MPCA determines any of the following (Minn. R. 7001.0040 and 7001.0160): a. The Permittee is not in substantial compliance with the requirements of this permit, or with a stipulation agreement or compliance schedule designed to bring the Permittee into compliance with this permit; b. The MPCA, as a result of an action or failure to act by the Permittee, has been unable to take final action on the application on or before the expiration date of the permit; c. The Permittee has submitted an application with major deficiencies or has failed to

		properly supplement the application in a timely manner after being informed of deficiencies. [Minn. R. 7001.0160]
	2.2.191	The Permittee shall submit an application for permit reissuance : Due by 180 days prior to permit expiration. [Minn. R. 7001.0160]
	2.2.192	Submitting Reports. DMRs, DMR supplemental forms and related attachments must be electronically submitted via MPCA e-Services after authorization is approved. DMRs and DMR Supplemental Forms shall be electronically submitted by the 21st day of the month following the sampling period or otherwise as specified in this permit. Electronic DMR submittal shall be complete on or before 11:59 PM of the 21st day of the month following the sampling period or as otherwise specified in this permit. A DMR shall be submitted for each required station even if no discharge occurred during the reporting period. Other reports required by this permit shall be postmarked by the date specified in the permit to: MPCA, Attn: WQ Submittals Center, 520 Lafayette Road North, St Paul Minnesota 55155-4194. [Minn. R. 7001.0150, Subp. 2(B), Minn. R. 7001.0150, Subp. 3(H)]
	2.2.193	Definitions. [Minn. R. 7001]
	2.2.194	"Agency" means the Minnesota Pollution Control Agency (MPCA). [Minn. R. 7001]
	2.2.195	"Agronomic Rate" means the industrial by-product application rate (dry weight basis) designed to: a. provide the amount of nitrogen which can be utilized by the food crop, feed crop, fiber crop, cover crop, or vegetation grown on the land; and b. minimize the amount of nitrogen in the industrial by-product that passes below the root zone of the crop or vegetation grown on the land to the ground water. [Minn. R. 7001]
	2.2.196	"Available Nitrogen" means the nitrogen present in the industrial by-product which is available for the plant to use during the cropping year. [Minn. R. 7001]
	2.2.197	"By-Product" has the same meaning as solid waste given in Minn. R. 7035.0300. [Minn. R. 7001]
	2.2.198	"Carbon to Nitrogen Ratio" means the calculated ratio of total elemental carbon to total elemental nitrogen reported on a dry weight basis. [Minn. R. 7001]
	2.2.199	"Class 2 Surface Water," as defined in Minn. R. 7050.0200, means all waters of the state that are or may be used for fishing, fish culture, bathing, or any other recreational purpose, and for which quality control is or may be necessary to protect aquatic or terrestrial life, or the public health, safety, or welfare. [Minn. R. 7001]
	2.2.200	"Compatible" means the ability of two or more substances or materials in a tank system to maintain their respective physical and chemical properties upon contact with one another. [Minn. R. 7001]
	2.2.201	"Cover Crop" means vegetation which is planted specifically to prevent soil erosion and to take up nutrients that may otherwise be lost before the next cropping year. This typically includes crops such as rye, oats, or other types of fast-growing vegetation. Cover crops, in general, are not harvested. [Minn. R. 7001]
	2.2.202	"Cropping Year" means a year beginning on September 1 of the year prior to the growing season and ending August 31 the year the crop is harvested. For example, the 1994 cropping year began September 1, 1993 and ended August 31, 1994. [Minn. R. 7001]
	2.2.203	"Crop Year Total" is the calculated total quantity of a given measurement for a cropping year (September 1 - August 31). For example, total quantity of biosolids land applied during the cropping year. The "Crop Year Total" limit is an upper limit. [Minn. R. 7001]
	2.2.204	"Dewatered Industrial By-product" means an industrial by-product with a total solids content of 20% or greater or which can be transported and handled as a solid material. [Minn. R. 7001]

	2.2.205	"Dike" means an embankment, ridge, or wall which is impermeable to stored substances and which forms the perimeter of the secondary containment area. [Minn. R. 7001]
	2.2.206	"Dry Weight Basis" means calculated on the basis of having been dried at 105 degrees Celsius until reaching a constant mass, or essentially 100 percent solids content. [Minn. R. 7001]
	2.2.207	"End User" means the person that has accepted the by-product for their use as a soil amendment. [Minn. R. 7001]
	2.2.208	"Fallow Land" means land which is not cropped throughout a cropping year and has a vegetative cover of less than 25 percent. [Minn. R. 7001]
	2.2.209	"Grassed Waterways" means natural or constructed and seeded to grass as protection against erosion. Separation distances are from the centerline of grassed waterways. For a grassed waterway which is wider than the separation distances required, application is allowed to the edge of the grass strip. [Minn. R. 7001]
	2.2.210	"Hazardous Waste" means a waste that may pose greater human health or environmental risks due to their chemical properties. See the following fact sheet: https://www.pca.state.mn.us/sites/default/files/w-hw1-01.pdf . [Minn. R. 7001]
	2.2.211	"Highly Permeable Soil" means soils whose soil leaching potentials are rated as severe, poor filter for soil pesticide loss, by the Natural Resources Conservation Service using the procedure found in part 620, Soil Interpretation Rating Guides of the United States Department of Agriculture-Natural Resources Conservation Service National Soils Survey Handbook. [Minn. R. 7001]
	2.2.212	"Immediately Incorporated" means incorporated into the soil with tillage within 48 hours after surface application of an industrial by-product. [Minn. R. 7001]
	2.2.213	"Industrial By-Product" has the same meaning as solid waste given in Minn. R. 7035.0300. [Minn. R. 7001]
	2.2.214	"Intermittent Stream" means a drainage channel with definable banks that provides for runoff flow to any of the surface waters during snow melt or rainfall events. [Minn. R. 7001]
	2.2.215	"Karst topography" means an area underlain by fractured carbonate bedrock in which erosion has produced geological characteristics such as: sinkholes; springs, subsurface drainage; caves; sinking streams; dissolutionally enlarged joints (grikes) or bedding planes, and bedrock surface channels (karren). Counties known for karst features include parts of Dakota, Rice, Dodge, and Mower, and most of Goodhue, Olmsted, Winona, Wabasha, Houston and Fillmore. [Minn. R. 7001]
	2.2.216	"Liquid Industrial By-Product" means any industrial by-product that does not meet the definition of dewatered industrial by-product. [Minn. R. 7001]
	2.2.217	"Long-term Storage" means storage of dewatered industrial by-product less than 7 months. Further requirements are listed in the Industrial By-Product Storage section of the permit. [Minn. R. 7001]
	2.2.218	"Maximum Allowable Nitrogen Application Rate" means the maximum amount of available nitrogen which can be applied to a site during a single cropping year. [Minn. R. 7001]
	2.2.219	"MPCA" means the Minnesota Pollution Control Agency, or Minnesota Pollution Control Agency staff as delegated by the Minnesota Pollution Control Agency. [Minn. R. 7001]
	2.2.220	"Other Regulated Substances" means any substance, including a food-based product intended for human or animal consumption, which may cause pollution of waters of the state and is not: a. a petroleum substance under standard temperature and pressure; or, b. a hazardous material. [Minn. R. 7001]
	2.2.221	"Pathogens" means organisms that are capable of producing an infection or disease in a susceptible host. [Minn. R. 7001]
	2.2.222	"Perched Water Table" means the soil is saturated with water in one or more layers

		within 200 centimeters of the mineral soil surface and has one or more unsaturated layers with an upper boundary above 200 centimeters in depth below the saturated layer. The zone of saturation , i.e. the water table is perched on top of a relatively impermeable layer. The Natural Resources Conservation Service also classifies this as epi-saturation. [Minn. R. 7001]
	2.2.223	"Permanent Storage" means storage of dewatered industrial by-product more than 7 months. Further requirements are listed in the Industrial By-Product Storage section of the permit. [Minn. R. 7001]
	2.2.224	"Permittee" means the entity or multiple entities identified as Permittee(s) on the permit cover page of this permit. [Minn. R. 7001]
	2.2.225	"Private truck wash" means a truck washing facility owned or leased, operated, and used only by a feedlot operator to wash trucks owned or leased by the feedlot operator and used to transport animals or supplies to and from the feedlot. [Minn. Stat. ch. 116.07]
	2.2.226	"Public Contact Site" means land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, and golf courses. [Minn. R. 7001]
	2.2.227	"Realistic Yield Goal" means the most recent five-year average of crop yields, excluding the worst year, or the most recent three to five year average yield increased by ten percent. If the crop has never been grown, the yield goal can be determined based on information provided by the Natural Resources Conservation Service, county Extension agent, or crop consultant. [Minn. R. 7001]
	2.2.228	"Short-term Storage" means storage of dewatered of industrial by-product less than 30 days. Further requirements are listed in the Industrial By-Product Storage section of the permit. [Minn. R. 7001]
	2.2.229	"Single Value" is a reported value from a single sample or measurement for which there is no limit. [Minn. R. 7001]
	2.2.230	"Soil Horizon" means a layer of soil that is approximately parallel to the soil surface and has some set of properties that has 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, consistency, and bulk density. [Minn. R. 7001]
	2.2.231	"Soil Texture" means the relative portion of the soil separates sand, silt, and clay. It can be measured using methods described in Minn. R. 7041.3400, subp. 1. Coarse texture is US Department of Agriculture textural classifications sand, loamy sand, and sandy loam. Medium texture is US Department of Agriculture classifications loam, silt, silt loam, and sandy clay loam. Fine texture is US Department of Agriculture classifications clay loam, silty clay loam, sandy clay, and clay. [Minn. R. 7001]
	2.2.232	"Type IV Certified Operator or Inspector" means a person certified according to Minn. R. ch. 7048 for land application. A Type IV facility is any disposal facility that applies on the land any sewage sludge or semisolids from commercial or industrial operations. [Minn. R. 7001]
	2.2.233	"Underground Storage Tank" means any one or combination of containers including tanks, vessels, enclosures, or structures and appurtenances connected to them that is used to contain or dispense regulated substances pursuant to Minn. R. 7150, and the volume of which, including the volume of piping connected to them, is ten percent or more beneath the surface of the ground. [Minn. R. 7001]
	2.2.234	"Vector Attraction" means the characteristic of industrial by-product that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents. [Minn. R. 7001]
	2.2.235	"Waters of the State" means all streams, lakes, ponds, marshes, wetlands, watercourses, waterways, wells, springs, reservoirs, aquifers, irrigation systems, drainage systems and all other bodies or accumulations of water, surface or underground, natural or artificial, public or private, which are contained within, flow

		through, or border upon the state or any portion thereof. [Minn. R. 7001]
	2.2.236	"Wetlands" means those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Constructed wetlands designed for wastewater treatment are not waters of the state. Wetlands must have the following attributes: a. a predominance of hydric soils; b. inundated or saturated by surface water or groundwater at a frequency and duration to support a prevalence of hydrophytic vegetation typically adapted for life in a saturated soil condition; and, c. under normal circumstances support a prevalence of such vegetation. [Minn. R. 7001]

3. Submittal action summary

GW 001	Tile Line Monitoring	
		Groundwater Well: MNG96 Tile Line Requirements
	6.1.1	The Permittee shall submit a monthly DMR : Due by 21 days after the end of each calendar month following permit issuance. [Minn. R. 7001.0150, Subp. 2(B)]
MNG960000	Industrial By-Product General	
		Industrial By-Products General Permit Requirements
	6.2.1	The Permittee(s) shall submit a Sampling, Analysis and Field Equipment Calibration Plan to address storage, management, and land application schedules by 60 days after permit issuance. The MPCA requires all permitted facilities to submit this plan. The Permittee(s) may submit an updated version of a plan submitted as part of a previous permit term. The Permittee(s) shall submit a Sampling, Analysis and Field Equipment Calibration Plan : Due by 60 days after permit issuance. [Minn. R. 7001]
	6.2.2	Every five years, the Permittee(s) shall inspect and certify the wastewater storage ponds for structural integrity, complete containment, and compliance with performance standards. A registered professional engineer with expertise in wastewater structures shall complete the inspection and certification. The professional engineer shall prepare an inspection report and the Permittee(s) shall submit certification : Due by the end of each calendar five years following permit issuance to the MPCA. If repairs are necessary as a result of the professional engineer's inspection, the Permittee(s) shall submit a detailed proposal for restoration to the MPCA for review within 180 days of discovery, and at least 60 days prior to initiation of restoration work. [Minn. R. 7001]
	6.2.3	The Permittee(s) shall submit an industrial by-product land application annual report : Due by December 31 of each year following permit issuance. [Minn. R. 7001]
	6.2.4	The Permittee shall submit an application for permit reissuance : Due by 180 days prior to permit expiration. [Minn. R. 7001.0160]

4. Limits and monitoring

Subject item	Parameter	Discharge limitations					Monitoring requirements					Notes
		Quantity /Loading avg.	Quantity /Loading max.	Quantity /Loading units	Quality /Conc. min.	Quality /Conc. avg.	Quality /Conc. max.	Quality/ Conc. units	Frequency	Sample type	Effective period	
GW 001 Tile Line Monitoring	Chloride, Total						Monitor only. calendar month maximum	milligrams per liter	once per month	Grab	Apr, Jul, Oct	
GW 001 Tile Line Monitoring	Fecal Coliform, MPN or Membrane Filter 44.5C						Monitor only. calendar month maximum	organisms per 100 milliliter	once per month	Grab	Apr, Jul, Oct	
GW 001 Tile Line Monitoring	Nitrogen, Kjeldahl, Total						Monitor only. calendar month maximum	milligrams per liter	once per month	Grab	Apr, Jul, Oct	
GW 001 Tile Line Monitoring	Nitrogen, Nitrate, Total (as N)						Monitor only. calendar month maximum	milligrams per liter	once per month	Grab	Apr, Jul, Oct	
GW 001 Tile Line Monitoring	Oxygen, Dissolved						Monitor only. calendar month maximum	milligrams per liter	once per month	Grab	Apr, Jul, Oct	
GW 001 Tile Line Monitoring	Solids, Total Dissolved (TDS)						Monitor only. calendar month maximum	milligrams per liter	once per month	Grab	Apr, Jul, Oct	
GW 001 Tile Line Monitoring	Specific Conductance						Monitor only. calendar month maximum	micromhos per cm	once per month	Grab	Apr, Jul, Oct	

Waste Stream Station: Industrial By-Product to Land Application

Table 1. Analytical requirements for specific industrial by-products.

		Dairy			All			Miscellaneous
Analyte	Units 1	Whey	Antibiotic Milk or Milk	Rinse & Wash Waters	Primary & Secondary Wastewater Treatment Sludges	Vegetative Wastes 2	Vehicle Wash	Miscellaneous By - Products and Wash Waters
Chloride, Dry Weight (as Cl)	mg/kg	X		X	X	X	X	X
Nitrogen, Ammonia, Dry Weight	%			X	X		X	X
Nitrogen, Kjeldahl, Total, Solids Fraction, Dry Weight	%	X	X	X	X	X	X	X
Oil and Grease, Total Recoverable (Hexane Extraction)	mg/kg			X ³	X ³		X	X ³
pH, sludge	SU	X		X	X		X	X
Phosphorus, Total	%	X	X	X	X		X	X
Sodium, Dry Weight (as Na)	mg/kg	X		X	X	X	X	X
Solids, Total	%	X	X	X	X	X	X	X
Solids, Total Volatile, Percent of Total	%				X			X
Process Controls: - Temperature - Solids Retention Time	Varies				X			X

¹Reported on a dry weight basis, except for pH.

²Monitoring not required because of adequate information on constituents present, conduct application calculations according to Appendix B

³Required only at facilities where grease and oil are present in waste stream.

Table 2. Minimum analysis frequencies for industrial by-products (IBPs).

<i>When Total Solids of IBP are Greater Than or Equal to 20%, use this analysis frequency</i>	<i>When Total Solids of IBP are Less Than 20%, use this analysis frequency</i>	
Quantity Land Applied Per Year (dry tons)	Quantity Land Applied Per Year (million gallons)	Minimum Frequency of Analysis per Cropping Year
0	0	No Sampling Required
> 0 but < 320	> 0 but < 1.5	Once
> 320 but < 1,650	> 1.5 but < 8.0	Four
> 1,650 but < 16,500	> 8.0 but < 80	Six
> 16,500	> 80	Twelve

Land Application Station: Land Application Sites

Table 3. Analytical requirements for specific land application sites.

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Organic Matter, Total in Soil	Monitor Only	%	Crop Year Max	Sep-Aug	Composite	1x 3 Years	1
pH	Monitor Only	SU	Crop Year Max	Sep-Aug	Composite	1x 3 Years	1
Phosphorus, BRAY-1 Ext in Soil	200	ppm	Crop Year Max	Sep-Aug	Composite	1x 3 Years	1,
Potassium, NH4AC, Exch in Soil	Monitor Only	ppm	Crop Year Max	Sep-Aug	Composite	1x 3 Years	1
Salts, Water Soluble in Soil	4	mmh/cm	Crop Year Max	Sep-Aug	Composite	1x 3 Years	1
Soil Texture	Monitor Only	-	Crop Year Max	Sep-Aug	Composite	1x 3 Years	1,3

NOTES:

1. Soil testing must be conducted on each site that is used for land application within the 3-year period prior to the date that the land application is conducted. The soil tests submitted with the 'Industrial By-Products Site Notification' form must be collected no greater than 6 months prior to submittal of the form. The composite sample shall consist of a mixture of 15-20 sub-samples taken in the plow layer for every 40 acres.
2. USDA Classification.

5. Appendix A

Table 4. Slope restrictions for application sites where industrial by-product is applied.

Slope (percent)	Surface application	Injection or Immediate Incorporation ¹
0 - 6	Allowed	Allowed
>6 - 12	Not allowed	Allowed
>12	Not Allowed	Not Allowed

¹Immediate incorporation is mixing of the by-product into the soil with some form of tillage within 48 hours of application.

Table 5. Minimum separation distances from the land application site.

Separation Distances (feet)				
Feature		Surface Applied	Incorporated within 48 hours	Injected
Private drinking water supply wells		200 feet	200 feet	200 feet
Public drinking water supply wells		1000 feet	1000 feet	1000 feet
Down gradient lakes, rivers, streams, type 3, 4, and 5 wetlands, intermittent streams, or tile inlets connected to these surface water features, ¹ and sinkholes	Slope 0 % to 6 %	200 feet	50 feet	50 feet
	Slope 6 % to 12 %	Not Allowed	100 feet	100 feet
	Winter (0 % to 2 %)	600 feet	Not Applicable	Not Applicable
Grassed Water Ways ²	Slope 0 % to 6 %	100 feet	33 feet	33 feet
	Slope 6 % to 12 %	Not Allowed	33 feet	33 feet

¹Intermittent stream means a drainage channel with definable banks that provides for runoff flow to any of the surface waters listed in the above table during snow melt or rainfall events.

²Grassed waterways are natural or constructed and seeded to grass as protection against erosion. Separation distances are from the centerline of grassed waterways. For a grassed waterway, which is wider than the separation distances required, application is allowed to the edge of the grass strip.

Table 6. Additional minimum separation distances from application sites when the industrial by-product contains pathogens.

Separation Distances (feet)			
Feature	Surface Applied	Incorporated within 48 hours	Injected
Residences	200 ¹ feet	200 ¹ feet	100 feet
Residential development	600 ¹ feet	600 ¹ feet	300 feet
Public contact site	600 feet	600 feet	300 feet
Depth to Bedrock	5 ² feet	5 ² feet	5 ² feet
Depth to Seasonal High Water Table or drain tile ³	5 ² feet	5 ² feet	5 ² feet
Private Supply Wells	200 feet	200 feet	200 feet
Public Supply Wells	1000 feet	1000 feet	1000 feet
Irrigation Wells	50 feet	25 feet	25 feet

¹This distance may be reduced with written permission from all persons responsible for residential developments, places of recreation, and all persons inhabiting residence within the designated separation distance.

²The separation distance may be decreased to 3 feet if the soil is not classified as a “highly permeable soil,” as defined by this permit.

³The depth to subsurface drainage tiles shall be considered the depth to the seasonal high water table for sites that are designed according to Natural Resources Conservation Services engineering standards and criteria.

Table 7. Maximum allowable nitrogen application rates for selected crops.

Crop	Maximum Allowable Nitrogen Application Rates - When Actual Yields Are Not Measured (lb/acre)	Maximum Allowable Nitrogen Application Rates - When Actual Yields Are Measured
Non-harvested vegetation, set aside acreage, cover crops ¹	50	—
Soybeans	—	Yield goal (bu/acre) x 3.5 lbs N
Alfalfa	200	Yield goal (tons/acre) x 50 lbs N/acre
Clover, alfalfa-grass, or clover-grass mixtures	100	Yield goal (tons/acre) x 50 lbs N/acre
Brome grass, orchard grass, or timothy	75	Yield goal (tons/acre) x 30 lbs N/acre

¹This category does not include land used as pasture.

Table 8. Minimum separation distances for storage areas and structures of industrial by-products.

Feature		Short-Term Storage Area/Structure	Long-Term Storage Area/Structure	Permanent Storage Structure
Depth to Bedrock		3 feet	5 ¹ feet	3 feet
Depth to Seasonal High Water Table or drain tile ²		3 feet	5 ¹ feet	3 feet
Private drinking water supply wells		200 feet	200 feet	200 feet
Public drinking water supply wells		1000 feet	1000 feet	1000 feet
Irrigation Wells		50 feet	50 feet	50 feet
Residences		200 feet	1000 ³ feet	1000 ³ feet
Residential Development		600 feet	1000 feet	1000 feet
Public Contact Site		600 feet	1000 feet	1000 feet
Adjacent Properties/Roads		100 feet	100 feet	100 feet
Down gradient lakes, rivers, streams, type 3, 4, and 5 wetlands, intermittent streams, or tile inlets connected to these surface water features, ⁵ and sinkholes	Slope 0 % to 2 %	200 feet	1000 ⁴ feet	1000 ⁴ feet
	Slope 2 % to 12 %	Not Allowed	Not Allowed	Not Allowed
Grassed Water Ways ⁶	Slope 0 % to 2 %	100 feet	100 feet	100 feet
	Slope 2 % to 12 %	Not Allowed	Not Allowed	Not Allowed

¹ The separation distance may be decreased to 3 feet if the storage area or structure includes an engineered pad or liner.

² The depth to subsurface drainage tiles shall be considered the depth to the seasonal high water table for sites that are designed according to Natural Resources Conservation Services engineering standards and criteria.

³ Storage of industrial by-products at a location of 40 acres or less shall not take place within 400 feet from any residence. This separation distance shall increase 100 feet for every additional ten acres of land application 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 residing within the otherwise protected distance.

⁴ Storage of industrial by-product shall not take place within 1,000 feet of any downgradient surface waters, wetlands, tile inlets, or sinkholes unless measures are taken to control runoff; in which case, the separation distance may be reduced to 200 feet.

⁵ Intermittent stream means a drainage channel with definable banks that provides for runoff flow to any of the surface waters listed in the above table during snow melt or rainfall events.

⁶ Grassed waterways are natural or constructed and seeded to grass as protection against erosion. Separation distances are from the centerline of grassed waterways. For a grassed waterway, which is wider than the separation distances required, application is allowed to the edge of the grass strip.

6. Appendix B

BEST MANAGEMENT PRACTICES FOR LAND APPLIED SWEET CORN SILAGE WASTE

University of Minnesota
Southern Experiment Station
Departments of Horticultural Science and Soil, Water, and Climate

August 11, 1997

Vincent A. Fritz, Gyles W. Randall, and Carl J. Rosen

Recommendations

These recommendations are based on a single silage waste application rate of 100 wet tons/A. Application rates higher than 100 t/A were investigated, however they were not practical due to great difficulty in effectively incorporating the silage waste into the soil and possible environmental consequences. In addition, our findings will be summarized within the context of nitrogen availability from the silage in order to be independent of specific crop needs. It is our intent that the amount of nitrogen release from silage waste will be credited to the total nitrogen needs of the subsequent crop.

First, the following recommendations are based on the following properties of sweet corn silage waste:

1. 18% dry matter
2. Contains 1.2% Nitrogen (on a dry weight basis)

Application rates up to 100 wet tons/A, when incorporated into the soil, do not pose any environmental threat.

- It is **recommended that the silage waste be moldboard plowed** to ensure adequate incorporation and subsequent nitrogen release. Chisel plowing the silage waste does not provide for adequate incorporation and as a result, there is limited nitrogen release from the silage waste.
- In the **first production year** following silage waste application, about 20% of the total nitrogen contained within the silage is released. This translates into 80-85 lbs. N/A that is available to the subsequent crop and should be credited to its total nitrogen needs.
- In **both the second and third production years** following silage waste application, about 6% of the total nitrogen contained within the silage is released. This translates into 25-30 lbs. N/A that is available to the crop and should be credited to its total nitrogen needs.

- In the **fourth production year** following silage waste application, < 3% of the total nitrogen contained within the silage is released and available for crop uptake. Because of this low amount of nitrogen release, it is recommended that full nitrogen fertilizer recommendations for the crop to be grown be applied. The results of our study are also represented as a formula, independent of the amount of silage waste applied, as is comprised of the following:
Pounds of N release/yr (Y) = Wet tons applied each year (A) * [2000 lb./ton * 18% DM * 1.2% N] *

Year after application factor (B) where:

B = .20 for year 1
.06 for year 2
.06 for year 3
.03 for year 4

So in summation, the formula is:

$$Y = A * 4.32 * B$$

Example #1:

100 T/A silage waste was applied in fall of 1996; how much N will be available for the 1997 crop?

$$Y = 100 * 4.32 * .20$$

$$Y = 86 \text{ lbs. N released}$$

Example #2:

100 T/A silage waste was applied in fall of 1995 and again in fall of 1996; how much N will be released for the 1997 crop?

$$Y = [100 * 4.32 * .06 \text{ (for 1995)}] + [100 * 4.32 * .20 \text{ (for 1996)}]$$

$$= 26 + 86 = 112 \text{ lbs. N released}$$