

LAND APPLICATION of INDUSTRIAL SLUDGE
Fact Sheet For Public Notice
WPDES Permit No. WI-0057657-4
May 2007 Revised July 2007

The changes to the Industrial Sludge Land Application General Permit (WI-0057657-3) are intended for all the land application general permits to look as similar to each other as possible. Most of the changes are format and various specific language changes to both the specific part of the General Permit and the Standard Requirements language. The Industrial Sludge Land Application GP adopts these changes to the degree possible.

The monitoring and limitation requirements tables and language changes are added to allow flexibility for monitoring specific sludge and site conditions. The requirement changes are needed since the monitoring cannot be expanded in the letter of coverage but can be reduced. So the proposed changes limit coverage more than the previous permit. This change still enables the general permit to be used while a specific permit application is being processed. The new permit emphasizes site conformance to the location requirements and has a specific time requirement nuisances. Having application rate records available at the landspreading site is a new requirement.

The Standard Requirements section has been updated to the extent practical to make the language consistent with individual permits currently issued by the Department. Changes to the previous permit language are primarily editorial since changes have not been made to the applicable Administrative Code (NR 205). The following summarizes the permit requirements.

A. Background and Rationale

Chapter 283.35 Wis. Statutes authorizes the Department to issue a general permit for discharges from specified categories or classes of point sources if they are not a significant contributor of pollution. The general permit is enforceable. The general permit can be withdrawn if the point source is not in compliance with the terms and conditions of the general permit.

The Department may withdraw a discharge from the coverage of a general WPDES permit and issue an individual WPDES permit on its own motion, or upon the petition of any general permittee, affected state, or 5 or more persons affected by the disposal practices of a general permittee. This general permit is intended to regulate the infrequent or temporary land application of industrial sludge where the potential for environmental degradation is very low.

Chapter NR 518, Wis. Adm. Code, Landspreading of Solid Waste, exempts industrial sludges that have value as a soil conditioner or fertilizer. A test may be required to determine if a sludge meets these criteria. However, it is anticipated that any sludge regulated by this permit will already be considered to be beneficial as determined by analytical results or from previous experience with the same type of sludge. Another requirement for exemption from ch. NR 518 is that the sludge application be regulated by a WPDES permit and, in this case, it will be a general permit. Although the term "industrial sludge" is used throughout the permit and fact sheet, this also includes sludges from commercial or agricultural (aquaculture) activities. This is in accordance with ch. NR 214, Wis. Adm. Code, which specifically lists certain commercial and agricultural activities. Examples of these sludges are from fish raising and bakery products.

It is not the intent of the Department for this general permit to be issued to contract haulers servicing multiple industrial customers, even though the permit does not have the same strong limiting language as in the liquid wastewater general permit. In the event that a contract hauler land applies similar waste for multiple industries, a specific permit will be issued as appropriate. In the past, the general permit was used and still may be used as an interim regulatory tool until a specific permit could be issued, however each industrial source will be designated in the management plan and given a distinct sample point number for tracking purposes. This interim tool is intended to be phased out and for now is limited to those parameters listed in the permit since monitoring parameters cannot be added. As land application sites are added, dropped or modified, and/or as waste types or sources change, the

management plan shall be amended but the permit does need to be modified. The customer name need not be identified in the management plan but other necessary information, as outlined in the permit, will be required.

A sludge management plan can be submitted after coverage under the general permit is authorized as long as, with written Department approval, the plan is submitted within 3 months of the permittee initiating land application activities. This allows first time dischargers sufficient time to gather samples, have them analyzed, and calculate which substance is the critical limiting pollutant. For dischargers that already have the necessary analysis information, a management plan must be submitted prior to determination of eligibility for the general permit.

B. Discharges Eligible for the General Permit

This permit is intended to be issued for the infrequent or temporary spreading of industrial sludges containing primarily organic material and crop nutrients, and small amounts of metals, and which have been known to have beneficial properties as a soil conditioner or fertilizer. This general permit will be available to act on urgent requests to land apply sludge as noted above. However, the permittee must submit a sludge management plan and have it approved by this Department. The following situations are examples of how this general permit can be used to regulate sludge application.

1. Regulating the Disposal of Unexpected Sludge Accumulations

Occasionally an industrial wastewater treatment system is emptied for maintenance and large deposits of sludge are discovered. This situation most often occurs when an aeration basin or aerated lagoon is repaired. It is important to remove and dispose of the sludge as soon as possible so that the industrial wastewater treatment system can be put back in operation. Since this is a one-time operation that will be completed in accordance with a Department approved management plan, a specific permit would not be issued.

2. Small Volumes and/or Infrequent Discharges of Sludge

For small treatment systems that discharge sludge occasionally (such as a septic tank that is pumped out once a year or a biological treatment system generating a sludge without metals or other contaminants) a general permit would be appropriate. However, if these dischargers have a specific permit for a wastewater discharge, all discharges, including sludge disposal, shall be regulated by one specific permit. If the septic tank soil absorption system is regulated by a general permit, then the sludge can be regulated by a second general permit.

3. Interim Regulation of Regular Sludge Application

The previous permit allowed for the use of the general permit in some situations where the permittee applied for an individual WPDES permit for sludge application in a timely manner but, due to a Department permit backlog or other unforeseen problems, the permit cannot be issued before the anticipated start-up date. If the sludge discharge meets all the eligibility requirements, the general permit could and still can be used to regulate the sludge application until a specific permit can be issued. The difference now is that the allowable waste characteristics are limited to those in the section 4 permit tables. This excludes industrial sludge containing or requiring monitoring for oil and grease, nitrate nitrogen, COD, volatile organic chemicals, bio-accumulating toxic substances and sodium, mercury, arsenic, chromium, etc., since these can not be added to the general permit requirements. The situation of interim regulation should be limited to extraordinary situations, and is only likely to occur for a biological pretreatment system as most other treatment systems will already require a specific WPDES permit for discharge of the treated wastewater. This permit further limits its application for interim regulation and sets the trend for future elimination of the practice.

If an industrial sludge is handled by a septic tank or holding tank pumper licensed under NR 113, a WPDES permit is still required for sludge application. Sludge hauled by a licensed pumper may be eligible for a general permit but the decision to issue either a general or a specific permit is not dependent on the hauling

arrangement. The permit shall be issued to the sludge generator unless the hauler applies for the permit and agrees to accept total responsibility for its disposal.

Sludges specifically not eligible for coverage under this permit are those containing toxic or hazardous substances unless the facility demonstrates to the Department that the discharge of such pollutants will be in such small quantities that no environmental pollution will result and that the groundwater standards established in ch. NR 140, Wis. Adm. Code, or the surface water criteria established in chs. NR 102 thru 106, Wis. Adm. Code will not be exceeded. Examples of toxics or hazardous substances not eligible are: solvents, lubricants, biocides, dioxin, PCB's, phenolics, pesticides, and bio-accumulative organics.

C. Sludge Information Required to be Submitted

The general permit can only be used in situations where the industrial sludge discharge is not a significant contributor of pollution and poses a negligible environmental impact. To make this determination the Department will require the general permittee to submit information about their sludge and a land application management plan. The Department may request that this information be submitted on a wastewater and sludge discharge information summary form which is similar to a permit application form. In addition, the permittee will need to submit a sludge management plan in accordance with NR 214.18. The plan must have the following information:

1. Industrial Processes Discharging the Wastewater and Type of Wastewater Treatment System Generating Sludge

The permittee must explain how the wastewater was generated and how the treatment process operates so the Department can assess the biodegradability of the sludge. The permittee must list and/or identify the raw materials, processes and additives that are being used. Any nonbiodegradable ion that could accumulate in the sludge, such as metals, must be identified and quantified.

2. Sludge Storage and Transportation

The permittee must explain the handling of the sludge from its generation to the land application site. This will include a description of the sludge dewatering tank or lagoon if one is used. In some situations a filter bed or a mechanical press is used to dewater sludge. Describe any chemicals used to aid dewatering. The storage structure size, shape, materials of construction, and location of the structure in relation to the factory shall be supplied. If the structure is buried, provide information on the depth it is buried, types of soil around the structure, and depth to groundwater and bedrock. If the structure is a tank, the vent, manhole, and high-level alarm shall be described as well. Describe the method of pumping the sludge to the haul vehicle and describe the hauling vehicle. Explain how the land application vehicle will be unloaded such as with a high pressure spraying gun, direct injection, a spreader bar, splash pad, or other device. State how the total volume hauled will be measured and what kind of records will be kept. Explain where the sludge samples will be collected. Discuss what contingency plans have been developed in case of inclement weather.

3. Land Application Sites

Each site must be approved by the Department, prior to use. The permittee must provide information to the Department to review the sites to determine compliance with NR 214. This will include a site request form (3400-53), a plat map and soil information sheet showing soil type, slope, and depth to groundwater and bedrock. A site map showing location of nearby wells, residences, waterways, and surface water shall be included. A proposed cover crop management plan and harvesting plan are necessary. Also state the proposed loading rate for each site and the period of loading and resting. Describe any special means for incorporating the sludge into the soil.

The Department has prepared an "Industrial Sludge Management Plan Outline" memo to assist the permittees develop their sludge management plan.

D. Sludge Site Approval Requirements

The general permit requires that all sludge land application fields be approved by the Department prior to use. This will be done to be sure that sludge is being spread on sites that meet Department criteria and that we have a record of these sites. The permittee will be required to provide and in some cases, re-provide the requested information on form 3400-53, along with other pertinent information, that will allow Department staff to make a timely determination on site acceptability according to the criteria. If an approved site or portion of a site is later found to not meet the criteria, a written notice will be issued to modify or withdraw approval of that site or portion of that site. The environmentally acceptable site conditions listed in the general permit regarding slope, separation distances, and other criteria are taken directly from NR 214.18 and are as follows:

1. Land Application Sites Shall Have Minimum Separation Distances of:
 - a. 500 feet from an inhabited dwelling except that this distance may be reduced to 200 feet if the sludge is incorporated with the soil and the resident owner and occupant give their written consent.
 - b. 250 feet from a potable water supply well and 1000 feet from a well serving a community public water supply.
 - c. 200 feet from any surface water except that this may be reduced to 100 feet when a vegetative buffer strip of at least 20 feet in width is maintained between the site and the surface water.
 - d. 36 inches between the ground surface and bedrock or groundwater. The Department may allow a reduced separation distance to a minimum of 18 inches on a case-by-case basis provided the rate of application is reduced.
2. Land application sites may not be located in wetlands or in a floodway. Ch. NR 116, Wis. Adm. Code, defines floodway as the channel of a river or stream, and those portions of the floodplain adjoining the channel. Land application sites may be located in the floodplain (land which has been or may be covered by flood water during a flood) but the site may not be used when the floodplain is flooded.
3. Land application sites shall be limited to cultivated cropland, tree plantations, pasture, or hayland. This is based on the sludge having beneficial properties as a soil conditioner or fertilizer, and the nutrient loading is a function of crop removal. Other sites may be reviewed and approved by the Department in writing on a case-by-case basis for this general permit provided the applicability requirements are met.
4. Land application sites shall be limited to a slope of 12% or less when the ground is not frozen or snow covered. When the ground is frozen or snow covered, land application shall be limited to sites with slopes up to 2%. Sites with slopes of 2% to 6% may be approved by the Department in writing for winter land application on a case-by-case basis.

E. Limits on the Application of Sludge

The general permit has limits on the per acre loading rate for total annual nitrogen, total annual chloride, and cumulative amounts of cadmium, copper, lead, nickel, and zinc which are taken from NR 214.18. Generally nitrogen will be the limiting parameter for the type of sludges eligible for the general permit. The nitrogen limit of 165 pounds per acre per year in the general permit is more specific than the code limit which is "the total amount of nutrient applied per year may not exceed the nutrient needs of the crop to be grown minus available nutrients in the

soil or applied as fertilizer". The nitrogen loading rate specified in the permit is a conservative value which is easier to track and enforce than a variable limit based on crop needs.

However, if a permittee wishes to apply more than 165 pounds of nitrogen per acre per year they may justify the higher loading in a management plan approved by the Department or apply for a specific permit. Only sludge with metal concentrations low enough so that the discharge will be in such small quantities that no environmental pollution will result and the groundwater standards established in ch. NR 140 will not be exceeded will be considered eligible for the general permit.

One objective of the management plan is to have the permittee analyze their sludge, evaluate their land application sites, and make a self-determination of which parameter is most limiting and what that limit will be. The cover letter for the general permit may contain a paragraph on the sites that have been approved and the site loading limits. Loading limits will be specified when the form 3400-53 submitted for each site is approved. The following application rates are specified in the general permit:

1. The maximum daily or yearly volume of sludge which can be applied to a site will be limited to the volume specified in the approved management plan or in the site approval letter for each facility. These volumes will be determined in accordance with ch. NR 214, Wis. Adm. Code.
2. The total pounds of nitrogen applied per acre per year shall not exceed 165 pounds per acre per year minus any other nitrogen, including fertilizer or manure, added to the land application site unless the amount of nitrogen is based on specific crop needs, described in a management plan, and approved in writing by the Department.
3. The total pounds of chloride applied shall be limited to 340 pounds per acre per two-year period.
4. The cumulative amount of cadmium, copper, lead, nickel, and zinc applied on any site may not exceed the levels listed in s. NR 214.187(4)(g), Table 4, Wis. Adm. Code.

F. Land Application Operational Requirements

Operational requirements in the general permit are from s. NR 214.18 except that the conditions are edited for ease of understanding by the permittee. These requirements include even distribution of the sludge with a moving vehicle or a high pressure spray nozzle. Spillage and leakage from the transportation vehicle must be prevented. Any storage or stacking of the sludge prior to land application must be done in a structure that complies with the design requirements in ch. NR 213. There are separation distance requirements from wells, homes, and streams. Generally sludge can be surface applied and incorporated into the soil during normal soil agricultural tillage. However, in some cases immediate incorporation may be necessary and this can be specified in the general permit cover letter and covered in the management plan. For example, if a lagoon were being emptied of sludge creating a lot of odor, immediate incorporation would be necessary. If the site was located such that runoff from rainfall would result in significant sludge runoff, incorporation at the time of application would be required. New to the permit is the definition of how quickly to incorporate the sludge when necessary to control nuisance occurrences. Incorporation must be accomplished within 6 hours of land application. A longer period for incorporation is conditioned on no nuisance condition developing.

The sludge land application program must be operated in conformance with the sludge management plan reviewed and approved by the Department. If significant operational changes are needed or operational concerns arise, the approved plan must be amended by submitting a written request to the Department for approval.

G. Monitoring and Reporting Requirements

1. The permittee will be required to keep a daily record of the volume of sludge land applied, the actual acres and land area onto which it was applied, track by DNR land application site number, total loadings of all required

parameters in pounds per acre, and the application rate in gallons or tons per acre. The volume may be determined by actual measurement of the volume of the hauling truck or by some other volumetric measurement. These records shall be available to the Department for a period of three years following application. New to the permit is the clarification that "records shall be available to the Department" as meaning that the **completed log sheets shall be kept (securely) in the application vehicle for a minimum of seven days following an application**, to allow field inspection and verification of application rates. After the seven-day period, the original log sheets shall be kept by the permittee's place of business as required by the permit. Note, if spreading resumes on a field in the same year, the original daily log must be on the application vehicle. The management plan and daily logs should clearly state this 7-day requirement and method for ensuring a permanent record of landspreading activities.

2. The sludge shall be analyzed for percent solids, total Kjeldahl nitrogen (TKN), phosphorus and chlorides unless different parameters are specified for the application. The Department will evaluate factors such as the type of industrial process generating the wastewater and the volume of wastewater to determine if one or more the other parameters covered by the general permit, ammonia nitrogen, organic nitrogen, potassium, pH, lead, zinc, copper, nickel or cadmium parameters are also appropriate. These other covered parameters will be specified as required parameters at the time of general permit issuance in the cover letter. The Department may also require the sludge to be tested for the parameters oil and grease, nitrate nitrogen, COD, volatile organic chemicals, sodium, total suspended solids, PCBs, bio-accumulators, solvents, lubricants, biocides, pesticides or other substances to determine applicability of the general permit. The general permit is not applicable if the later substances are present at significant levels requiring monitoring.

For sludge generated on a regular basis, composite samples shall be collected which are representative of all the sludge being discharged. For sludge from lagoons, composite samples shall consist of a series of grab samples taken over the entire lagoon area at several different depths. Samples can also be collected from a truckload of sludge that is representative of all the sludge that is being hauled. In many general permit situations, the sludge will be analyzed prior to permit issuance and no further analysis will be required during the land application operation.

3. The permittee shall submit annual analytical and land application reports on forms provided by the Department (3400-49 and 3400-55, respectively). In situations where nitrogen or chlorides are the limiting pollutants the permittee will be required to calculate the annual loading rate for each site. The reports must be signed by an appropriate official. The reporting conditions are similar to those required in other general permits. The annual report shall be submitted by January 31 of the year following the completed reporting period.
4. Since the industrial sludge, land application general permit will be used mostly for sludge from the food processing industry, the required analysis will provide the necessary soil loading information. However, it is the responsibility of the permittee to report any other raw materials, additives, or processes which may result in significant concentrations of other parameters and to then analyze for these parameters as noted above.

For large volumes of sludge, or if there is a potential for metals in the sludge, an analysis for all the metals listed in Table 4 will be required (lead, zinc, copper, nickel and cadmium). Generally it is not anticipated that chlorides will accumulate in the sludge from wastewater treatment plants because chlorides are soluble. However, if other waste such as salt brine and salt whey are intermixed with the sludge, a chloride analysis will be required.

Respectfully Submitted,

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Bureau of Watershed Management
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Industrial Sludge Management Plan Outline Guidance

Chapter NR 214, Wis. Adm. Code requires industrial sludge generators that land application sludge to develop a management plan. The code requires that each sludge land application program owner or operator submit a management plan for optimizing system performance and demonstrating compliance with the requirements of the chapter. Following approval by the Department, the system must be operated in conformance with the management plan.

If the facility wishes to operate differently than specified in the approved plan, a written request must be submitted and approved by the Department to amend the management plan. The plan must specify information on: sludge volumes and characteristics, beneficial or nondetrimental fertilizer or soil conditioner properties, production and pretreatment processes, description of all site limitations, vegetative cover control and removal, availability of storage, type of transportation and land application vehicles, sludge application rates, load and rest schedules, record keeping and reporting, availability of record at the landspreading site, contingency plans for periods of adverse weather, odor and nuisance abatement, and any other pertinent information. The management plan must be modified for each generator added or deleted during the course of the permit, by a contract hauler covered by this permit. Generally a specific permit will be issued when multiple generators contract with a single permitted hauler, but the general permit may be used on an interim basis until such time as the specific permit is issued. In those situations a unique sample point shall be assigned to each sludge source to allow for effective tracking of land application loadings.

Since industrial sludge can be generated by a very wide and diverse range of industrial and commercial activities, a comprehensive outline for a management plan has been developed. This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts. Each item on the outline shall be adequately discussed in the plan. If an item is omitted, the owner/operator shall have an explanation as to why the requested information is not relevant.

A. Sludge Source and Handling

1. Describe the industrial processes that generate the wastewater that produced the sludge. List the raw materials used and the products produced.
2. Specify the type of wastewater treatment processes from which the sludge originated (for example aerated lagoons, activated sludge, anaerobic digester, sequencing batch reactor, etc.). List any chemicals used in the wastewater treatment processes.
3. If the sludge is conditioned prior to disposal describe the process used. This could include such things as gravity thickening, mechanical dewatering, chemical treatment, filter bed dewatering, or pH adjustment. List any chemicals used to aid conditioning.

B. Sludge Characteristics

1. A representative sample of sludge shall be analyzed for percent solids, organic nitrogen, ammonia nitrogen, Total Kjeldahl Nitrogen (TKN), phosphorus, chlorides and potassium. Results shall be reported on a dry weight basis except for percent solids and pH.
2. If the industrial processes or treatment process use any raw materials or chemicals containing significant quantities of metals, a metal analysis of the sludge will be necessary. The Department's letter of coverage would address specific requirements for testing and inclusion in the management plan. Metals tested for may include zinc, nickel, mercury, lead, chromium, copper, cadmium, and arsenic.

3. Report the quantity of sludge to be applied either on a daily, monthly, or annual basis.
4. Sludges that originate from some types of industry or commercial processes may be required to do further testing and a leach test.

C. Sludge Storage and Transportation

1. The type of sludge storage and/or conditioning vessels must be described. This will include size, shape, volume, and materials of construction. For earthen lagoons, the liner or sealing soils shall be specified and the depth to groundwater and bedrock determined. For buried tanks, also specify the depth to groundwater and bedrock and the type of vent, manhole and high level alarm provided.
2. Describe the method of pumping the sludge to the hauling vehicle and describe the type and capacity of the hauling vehicle.
3. Explain if the land application vehicle will be unloaded with a high pressure spraying gun, direct injection, spreader bar, splash pad or some other device.
4. State how the total volume hauled will be measured and the daily record of sludge land application activities will be organized.
5. Explain where the sludge samples will be collected to obtain a representative sample.
6. Discuss what contingency plans have been developed in case of inclement weather.
7. Explain how the sludge will be incorporated into the soil. This can generally be done through normal agricultural tillage except when odors develop or when significant runoff due to rainfall is likely.

D. Sludge Land Application Site Information

1. Show the location of each land application site indicated on the USDA soil survey map, the description of each soil type and slope, and estimated depth to groundwater and bedrock.
2. Provide either a plat map, a USGS topographic map, or aerial photograph with the proposed site outlined. Aerial photographs are generally available from the County Agricultural Stabilization and Conservation Service (ASCS) office.
3. Each site map shall clearly show by cross hatching lines or some other means exactly which areas have suitable conditions and are proposed for land application.
4. Describe the crops to be grown or the dominant vegetation on the land application site and the anticipated harvest and removal schedule.
5. Describe adjacent land use, drainage, and land features associated with the site. Show the distance to wells and streams.
6. Explain the ownership of the site and the site number used for identification by the hauler.
7. Attach a copy of any land use agreement.
8. Estimate the total acreage to which the sludge will be applied.
9. Include a section for Department approval(s) of Land Application Site Request Form 3400-53.

E. Sludge Site Loading Information

1. Specify the total volume of sludge that can be applied to reach the nitrogen needs of the crop and other limitations. The nitrogen loading will generally be limited to 165 pounds per year in the general permit. However, if a permittee wishes to apply more than 165 pounds of nitrogen per acre per year they may justify the higher loading in a management plan requiring approval by the Department or apply for a specific permit.
2. Describe equipment and methods to be used to land apply the industrial sludge in conformance with the permit requirements. Include procedures for routine nuisance control of the sludge and for unexpected nuisance occurrences at the land application site.
3. Specify how the application will be tracked to ensure uniform distribution across the site. This shall include a discussion on the use of methods such as staking of the site or use of a Global Positioning System (GPS) to locate areas of previous application.
4. Include daily log sheet to be used and steps for tracking application rates. Clearly indicated that the vehicle driver **“shall be kept completed log sheets in the application vehicle for a minimum of seven days following an application.”** After the seven-day period, the original log sheets shall be kept by the permittee’s place of business as required by the permit. Note, if spreading resumes on a field in the same year, the original daily log must be on the application vehicle. Reporting procedures must include to insuring the daily log accuracy and authenticity.
5. Calculate the chloride loading rate and specify that it will not exceed 340 pounds per acre per two year period.
6. Calculate per acre the loading rate of phosphorous.
7. Describe how the wastes will be applied. For meat processing wastewater, this should include an explanation on any special considerations, such as injection or immediate incorporation, to reduce the risk of spreading TSE.
8. Describe any special restrictions on cropping practices to reflect the type of wastes.