

# Water-quality Permit Requirements for Wastewater Discharges to Ground Surface and Subsurface

Wastewater dischargers who wish to discharge treated effluent to the ground surface (e.g., spray irrigation) or subsurface (e.g., subsoil dispersal) must obtain a permit which sets terms and conditions for these activities. This fact sheet explains permitting for ground-surface and subsurface water discharges.

## Types of Water-quality Discharge Permits

In Minnesota there are two types of water-quality permits issued, the NPDES/SDS Permit and the SDS Permit. The National Pollutant Discharge Elimination System (NPDES) is a federal program established under the Clean Water Act. The State Disposal System (SDS) is a Minnesota program established under Minn. Stat. § 115. When both permits are required, they are issued jointly as an NPDES/SDS Permit. The NPDES/SDS Permit always regulates a treatment and disposal system which has a surface-water discharge. The SDS Permit alone regulates water discharges to the ground surface or subsurface. Both permits are administered by the Minnesota Pollution Control Agency (MPCA), the NPDES under delegation from the U.S. Environmental Protection Agency (EPA).

This fact sheet specifically discusses permitting for domestic-strength wastewater that is discharged to the **ground surface or subsurface of the ground**.

(A separate fact sheet, *NPDES/SDS Permits: Permitting Process for Surface-water Dischargers*, details permitting requirements for facilities which discharge to surface waters.)

## Requirement for an SDS Permit

The SDS Permits are required for any ground-surface or subsurface discharges to waters of the state. Examples include individual sewage treatment systems (ISTS), rapid infiltration basins (RIB), and spray irrigation. All RIB and spray facilities must obtain an SDS Permit. The ISTS may or may not require an SDS Permit. Minn. R. 7080 defines that permits are required when a single ISTS, or group of ISTS located on adjacent properties and under single ownership, are designed to treat an average design flow greater than 10,000 gallons per day (gpd).<sup>\*</sup> All discharges to the ground surface require an SDS Permit regardless of flow.

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<sup>\*</sup> Note: the management of ISTS over 10,000 gpd is established by rule (Chapter 7080); however, the U.S. EPA has defined any ISTS designed to treat 1,200 gpd or more as a Class V facility. Thus, it is recommended that local permitting authorities regulate ISTS over 1,200 gpd in a similar manner to assure environmental and public health protection.

## **SDS Permit Applications**

Application for SDS Permits is made on a form provided by the MPCA. Forms can be obtained from the MPCA's Customer Assistance Center at 651-297-2274 or

800-646-6247 or our Web site at [Water permits and regulations | Minnesota Pollution Control Agency](#)

The application and public participation process involved can be quite lengthy, so applicants should contact the MPCA as early as possible to start the exchange of information. The permit application itself should be submitted at least 180 days prior to starting construction.

## **Preparing for a Permit Application**

The first step toward obtaining a permit is to have an engineer identify the planning area, proposed design flows, and possible treatment alternatives. The engineer must be registered with the state of Minnesota's Board of Professional Engineers.

If the selected alternative is an ISTS requiring a permit, the registered engineer must also be licensed for (or be employed by a business which is licensed for) ISTS Design I or Design II. Contact the MPCA's ISTS Information Line at 651-282-6246 for ISTS licensing information. For a list of licensed businesses check the MPCA Web site at: <https://webapp.pca.state.mn.us/ssts/business-search>.

## **Permit Application Activities**

As part of the permitting process, a site evaluation must be performed to verify that the system's proposed location meets the site suitability requirements for a subsurface-discharging system. A hydrogeologic study also must be conducted to determine the system's potential effects on ground-water quality.

## **Site Evaluation**

A site evaluation consists of determining the suitability of the proposed location by digging soil pits and/or taking soil borings to identify any limiting soil features, including determining the depth to the seasonally high water table and bedrock. The site evaluation also gathers information necessary for design, including soil texture, percolation rate, setbacks, and slope.

## Hydrogeologic Study

The hydrogeologic study will determine any effects the system will have on ground-water quality and possible ground-water mounding. Because of the study's complexity, a hydrogeologist is required for this part of the project. The hydrogeologist will need the design flow information and site evaluation report from the engineer to conduct the study. The goals of the study are to:

- Identify the depth to the static ground-water level and any perched water or areas likely to be seasonally saturated;
- Determine the direction of ground-water flow (both horizontally and vertically);
- Determine background ground-water quality at the location;
- Estimate the height of ground-water mounding from the proposed system;
- Determine whether drinking-water standards can be met at the property boundary;
- Determine piezometer locations for monitoring ground-water mounding during system operation; and
- Determine the number and placement of monitoring wells necessary to monitor the system's effects on ground-water quality.

The number of monitoring wells necessary will vary depending on the complexity of the hydrogeology and the size of the treatment system. The wells should include at least one nested set to determine whether the system is in a ground-water recharge or discharge zone. A control well should also be placed in a location that will represent the background conditions of the site.

Because of the expense of installing monitoring wells, installation should be staged to allow for possible changes in placement as information is gathered in the hydrogeologic study. It's also possible the study might require the location or design of the proposed system to be changed. All wells must be installed before the permit can be issued.

Information from the engineer's report and the hydrogeologic study is used to determine if the location is suitable for a large system and guides final placement and system design.

## Permit Requirements

The MPCA sets water-quality limitations for surface- and ground-water discharges to protect the quality and designated uses of waters of the state. Water-quality standards are specified in Minn. R. 7050. Monitoring may differ for particular wastewater system designs and will vary depending on site-specific information. For example, monitoring for volatile organic compounds may be required.

The table on the next page shows monitoring requirements which are typically required for large ground- and subsurface-discharging wastewater systems. The schedules provide an example of what to expect for three types of water discharges.

## Typical monitoring requirements

Monitoring location	Parameter	Frequency	Standard
Overall system	Visual check	Weekly or monthly	<ul style="list-style-type: none"> <li>• ISTS: no water surfacing</li> <li>• RIB and spray: aquatic plants, floating mats, dike condition, ice cover, precipitation</li> <li>• All: rodent problems, odors, or other maintenance concerns</li> </ul>
Monitoring wells	Total Kjeldahl nitrogen	3x/year	
	Ammonia nitrogen	3x/year	
	Nitrate nitrogen	3x/year	10 mg/L
	Chlorides	3x/year	250 mg/L
	Water-level elevation	3x/year	
	Specific conductance	3x/year	
	Temperature	3x/year	
	pH	3x/year	
Influent to facility (RIB and spray only)	Flow CBOD5 TSS pH (only RIB)	Daily Quarterly Quarterly Quarterly	
Pond effluent to RIB	Total Kjeldahl nitrogen Ammonia nitrogen Nitrate nitrogen Chlorides pH Flow to each basin	Monthly* Monthly* Monthly* Monthly* Monthly* Daily <i>*during discharge</i>	
Soil tests at spray sites	pH Texture Phosphorus Exchangeable potassium Organic matter	Annually Annually Annually Annually Annually Annually	
Piezometers	Water-level elevation	3x/year	

## Completion of the Draft Permit Application

The draft application is submitted to the MPCA and includes an application fee, the site evaluation information, hydrogeologic study report, and preliminary plans and specifications. Other items may include a plan to identify and eliminate discharges of nondomestic wastewater, meter readings of flow (if available), an operation and maintenance manual, and a biosolids plan. The draft permit is then put on public notice through a public participation process.

## Public Participation

After all necessary information is submitted, the MPCA will determine if there should be an environmental review process; in some cases, an Environmental Assessment Worksheet (EAW) will be required (mandatory if design flow is greater than 50,000 gallons per day). If a project triggers the EAW process, there will be a 30-day public notice and comment period on the results of the EAW. The comments generated during this process, along with any information collected during the application process, will be considered in developing the draft permit.

After the draft permit is completed, it is put on public notice for 30 days for review by any interested parties. Comments received during this period may result in revisions to the draft permit. When all concerns are adequately addressed, a final permit is issued and its conditions become effective upon issuance.

## Certified Operator

The permit also requires the permittee to employ a certified operator to operate the treatment system. The certification level required for the operator will depend on the complexity of the system's operation. Proof that a certified operator is employed must be submitted to the MPCA.

## Annual Permit Fee

Annual permit fees are charged for most NPDES/SDS Permits. Fees for permits regulating surface water discharge are found under Minn. R. 7002.0210 to 7002.0310. Annual fees begin once a permit application has been submitted and the fee invoice mailing occurs in the spring each year.

## For More Information

For further information on SDS Permits, the MPCA's Customer Assistance Center at 651-297-2274 or 800-646-6247, or write to the MPCA, Customer Assistance Center, 520 Lafayette Road North, St. Paul, Minnesota 55155.

**MPCA Web site:** <http://www.pca.state.mn.us>

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