

SWIMMING POOL FACT SHEET

WPDES Permit No. WI-0046523-5
March 2009

GENERAL PERMIT COVERAGE

General Permits (GP) are designed to cover discharges from a class of facilities or industries that are similar in nature. When a GP is issued, all facilities meeting its requirements are covered by the GP. GP's currently exist for groundwater remediations, nonmetallic mining operations, swimming pools and numerous other types of facilities. For facilities that are eligible for coverage under a GP, the Department sends a cover letter and a copy of the permit to the facility. The cover letter includes the Department's determination that a facility's discharge is covered under the GP and may specify alternate requirements outlined in the permit such as modified sampling frequencies for certain parameters or the inclusion of monitoring for parameters in addition to those requiring regular monitoring.

MORE THAN ONE GP CAN APPLY

A facility may need to be covered under more than one GP, depending on the different types of wastestreams that a facility discharges. A facility that manufactures concrete block could also mine gravel on site. The wastewater from the concrete block operation could be discharged in compliance with one GP and the wastewater from the gravel mining operation could be discharged in compliance with a different GP. However, a facility that requires an individual permit for any part of its discharge may have all of its discharges covered under an individual permit. An obvious exception would be for a facility that commences a discharge that is eligible for a GP, after an individual permit has already been issued or reissued for the facility. For example, a facility that currently has an individual permit may begin a process that results in the discharge of noncontact cooling water. The noncontact cooling water discharge can be covered under a GP, as long as it meets the requirements of the GP, until the individual permit can be reissued or modified to include the noncontact cooling water discharge.

APPLICABILITY

This general permit applies to discharges of wastewater associated with the operation and maintenance of swimming pools and water attractions (e.g. plunge pools, wading pools, splash pads, wave pools, spas, or whirlpools) as defined in ch. Comm. 90, Wis. Adm. Code.

This permit does not apply to discharges that meet any of the following conditions. Facilities that have any of these discharges are regulated under an individual WPDES permit (as opposed to a general WPDES permit).

- Discharges that contain pollutants not regulated by this general permit (for example, discharges from bumperboat operations that are contaminated with oil and grease)
- Discharges to a wetland where the Department has determined that the discharge of pollutants will not meet the wetland protection requirements of ch. NR 103, Wis. Adm. Code;
- Discharges directly to an outstanding resource water as defined in s. NR 102.10, Wis. Adm. Code, or discharges that would lower the water quality of downstream outstanding resource waters;
- Discharges directly to an exceptional resource water as defined in s. NR 102.11, Wis. Adm. Code, or discharges that would lower the water quality of downstream exceptional water resources;

The discharges from facilities eligible for this permit are not expected to exceed any surface water or groundwater standards. Facilities with discharges that have a reasonable potential to violate surface water quality standards or groundwater quality standards would normally require the increased oversight and monitoring found in a site-specific individual permit. If a swimming pool operation would proposed a new or significantly increased pollutant discharge, evaluation of the proposed increase would begin via notification to the Department in a new request for general permit coverage or via notification of a planned change under standard requirement 5.6 of the permit. Upon notification of the proposed new or increased discharge, the Department would evaluate the proposed new or increased pollutant discharge amount to insure the antidegradation requirements of NR 207 are met. In a case where significant lowering of water quality is proposed, the Department may require the permittee to evaluate a variety of options to insure there is no significant lowering of water quality occurs in the receiving water, such as improved wastewater treatment effectiveness, wastewater reuse, directing the discharge to a seepage area, an alternate discharge location, process changes to reduce the pollutant discharge level, pollutant prevention activities, etc.

This general permit does not apply to discharges to a municipal sanitary sewer. Rather, this general permit applies only to direct discharges to waters of the State (i.e. discharges to storm sewers or other conveyances to a surface water, or seepage to the groundwater).

TYPICAL SWIMMING POOL OPERATION AND TREATMENT

Most swimming pools operate with chemical addition and filtration to maintain a closed-recirculating system. Chemicals are added for disinfection and control of pH, alkalinity, and hardness. Sanitizers are added to kill and control disease-carrying bacteria, algae and dirt. The most common sanitizers are chlorine gas, chlorine

compounds (trichloroisocyanuric acid, calcium hypochlorite, sodium dichloroisocyanurate, sodium dichloroisocyanurate dihydrate, lithium hypochlorite, and sodium hypochlorite), and bromine compounds. Other sanitizing agents include 1,3-dichlorohydantoin, 1,3-dichloro-5,5-dimethylhydantoin, 3-chloro-4,4-dimethyl-2-oxazolidinone and 1-chloro-3-bromo-5,5-dimethylhydantoin. Upon addition these algaecides float. Recently, salt (sodium chloride) is being used in some pools to reduce the demand for sanitizers. If the filter is backwashed or the pool drained down (e.g., as a result of a heavy rain) prior to allowing these chemicals to mix with the pool volume, the filter backwash will likely contain toxic levels of these algaecides. To get the most effective use of the chemicals added, standard operating procedures would call for complete mixing (i.e., approximately 24 hours) prior to backwash of the filter.

The control of pH in the range of 7.2 - 7.6 is necessary for swimmer comfort and optimal effectiveness of chlorine. Hydrochloric acid or sodium bisulfate is added to lower pH and sodium carbonate is added to raise it. A balance between pH, alkalinity and hardness must be maintained to control corrosion and scaling. Sodium bicarbonate is generally added to increase alkalinity and muriatic (hydrochloric) acid or sodium bisulfate to reduce it. Hardness is raised with calcium chloride and lowered by draining out pool water and replacing with lower hardness makeup water. A facility may pass pool water through a softener or demineralize to reduce hardness.

Pool water needs to be continuously filtered for removal of organic and inorganic suspended solids which would otherwise cloud water and interfere with disinfection. Since pool water is commonly used for backwash, the filter backwash also usually provides for blowdown of hardness, perspiration, body oils, lotions, nitrogen compounds (chloramines) and other dissolved solids as the pool water is replaced with fresh water. The wastewater discharges from swimming pool type facilities include pool cleaning, filter backwash, and pool drainage.

Pool Cleaning

Extensive pool cleaning usually takes place at the beginning of the season. Highly concentrated muriatic (hydrochloric) acid may be used for cleaning. The chemicals disperse in the volume of water remaining in the pool prior to drainage. It is anticipated that discharge pH will be within the 6 - 9 s.u. range.

Minor pool cleaning with muriatic acid also takes place throughout the year. This is the same acid used for pH adjustment and the acid for pool cleaning is just calculated into the total amount necessary for proper pool pH adjustment.

Filter Backwash

Filter systems include granular media filters (sand or anthracite filters) and fabric filters (paper or cloth cartridge filters and precoat diatomaceous earth filters). Backwash of sand filters will result in the discharge of an initial high concentration of solids. Backwash of diatomaceous earth filters will result in the discharge of the same types of solids as from sand filters plus the precoat diatomaceous earth added to the filter fabric.

Cloth cartridge filters are manually cleaned by rinsing in water and paper cartridges can be cleaned or simply disposed of. Since pool water is commonly used for backwash, the filter backwash water will usually contain chlorine at a concentration equivalent to the level maintained in the pool (a minimum of 1 to 1.5 mg/l free chlorine residual).

Pool Drainage

At the end of the operating season, the outdoor facilities will drain out approximately 1/2 the pool volume. Drawing down the pool allows space for ice expansion and yet provides adequate pressure on the walls to prevent collapse. Discharge to the groundwater via seepage in the proximity of the pool can cause floatation of the pool due to groundwater pressure. Indoor facilities may operate for many years before the pool needs to be drained and refilled.

Whirlpools contain extremely high concentrations of disinfectants [a minimum of 3 to 4 mg/l free chlorine residual] and are drained on approximately a biweekly basis. Unless the facility has adequate holding and treatment capacity, this wastewater should be discharged to a sanitary sewage system.

RATIONALE FOR PERMIT REQUIREMENTS

Monitoring Reports (applies to both groundwater and surface water discharges)

For swimming pools with a capacity of less than 67,000 gallons, the permittee need not submit monitoring reports to the Department. This capacity of 67,000 gallons was established more than twenty years ago as the “cutoff” volume that separates a residential from a public swimming pool. It may or may not be a valid number today. Regardless, since the inception of the WPDES permit program over thirty years ago, the Department has received no anecdotal evidence that discharges from pools with a capacity of less than 67,000 gallons have had a deleterious impact on waters of the State.

For swimming pools with a capacity of 67,000 gallons or greater, the permittee must submit monitoring reports to the Department. Monitoring results are to be summarized and reported on a Department Wastewater Discharge Monitoring Report or other reporting form or system approved by the Department (including the electronic Discharge Monitoring Report (edmr) system when available for General WPDES permits).

Requirements for Groundwater Discharges

Groundwater Discharge Defined

For the purpose of this permit, a discharge that flows onto the ground surface and which does not ultimately reach a natural waterbody is presumed to be a groundwater discharge. There are innumerable discharge scenarios that can be presumed to be a groundwater discharge. Typically, the discharge to a swale or depression having no outlet would be considered a groundwater discharge, as would the discharge to a designed seepage pond. A seeping overland flow would

have to be evaluated by a Department field staff person to ascertain the potential for reaching a surface waterbody. In this case, the staff person would have to apply best professional judgment, taking into account such factors as flow rate, gradient, distance to waterbody, and permeability of the soil.

Flow

The only parameter for which monitoring is required is flow, which can be measured or estimated. The permittee shall submit an annual report to the Department, by February 15th, that shows the flow rate monitoring results for the previous calendar year.

An estimate of the average daily flow performed annually will be sufficient to assure that the facility is aware of the loading to the seepage area. An estimate means a reasonable approximation of flow based on any of the following: (a) water balance, (b) an uncalibrated weir, (c) calculations from the velocity and cross section of the discharge, (d) intake water meter readings where the intake, or a specific portion of it, is discharged, (e) discharge water meter readings, and (f) any of the more complex methods listed in section NR 218.05(1), Wis. Adm. Code. The Department may approve additional methods for estimating flow.

Solids Removal

Solids in wastewater can clog spaces between soil particles, resulting in decreased seepage capacity. Occasional removal of solids from seepage areas is necessary to insure that these areas can continue to absorb wastewater.

Requirements for Surface Water Discharges

Surface water discharges include ditches, storm sewers and pipes that convey wastewater to creeks, streams, rivers and lakes in Wisconsin.

Requirements for Discharges to 303(d) Listed Impaired Surface Waters and TMDL allocations

If a facility discharges a pollutant of concern to an 303(d) listed impaired water body, the pollutant discharge needs to be minimized as much as possible as part of an overall state effort to reduce the pollutant loading to the water body. The 303(d) list of Wisconsin impaired water bodies may be identified by contacting the Department or by searching for the 303(d) list on the Department's Internet site. The current link to the 303(d) list is:

<http://dnr.wi.gov/org/water/wm/wqs/303d/>. For an existing swimming pool operation, the most common pollutant of concern may be a total suspended solids (TSS) discharge to a sediment impaired water body. The above Department internet page contains county based maps that show the location of Wisconsin waters impaired by excessive sediment/solids levels.

The permit requires that an annual check be conducted, by February 15th each calendar year, to determine whether the permittee discharges process wastewater to a section 303(d) listed impaired water body. If so, the permittee shall evaluate, within 180 days of the annual check, whether additional control measures and practices could be used to voluntarily minimize, with the goal of elimination, the discharge of pollutant(s) of concern that contribute to the impairment of the water body. The permittee should keep a record of the amount of pollutant discharge reduction that has been voluntarily achieved. The exact amount of pollutant reduction will be legally established in the State and Federal Approved Total Daily Maximum Load (TMDL) allocation established for the discharge.

Federal Statutes, 40 CFR 122.4, prohibit the issuance of a WPDES permit to a new source or new discharger that will contribute to a violation of a water quality standard in a 303(d) listed water. Also, an increased discharge of a pollutant of concern that would cause or contribute to a violation of a water quality standard in a 303(d) listed water is not be allowed. Therefore, this general permit specifies that a permittee may not establish a new pollutant of concern discharge to a 303(d) listed impaired water body or significantly increase the discharge of a pollutant of concern to an impaired water body unless the new or increased discharge does not contribute to the receiving water impairment, or the new discharge is consistent with a Department finalized total maximum daily load (TMDL) allocation for the impaired water body. The general permit can not be used if this requirement is not met for a new discharge. For a new swimming pool operation requesting coverage under this general permit, the Department will evaluate the proposed new pollutant discharge amount and receiving water to determine if the above requirement can be met. A variety of options may be available to insure any proposed new discharge does not contribute to the receiving water impairment such as on-site capture of the pollutant of concern, an alternate discharge location, wastewater reuse opportunities, directing the discharge to a seepage area, enhanced treatment options so the discharge would meet the water quality standard, etc.

Discharges to surface waters shall meet the monitoring requirements and effluent limitations indicated in the table below. Samples are to be taken prior to discharge to surface waters.

Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type
Flow Rate		gpd	See note 1.	Estimate
Suspended Solids, Total	Daily Max	40 mg/L	See note 2.	Grab
pH	Daily Min	6.0 mg/L	See note 3.	Grab
pH	Daily Max	9.0 mg/L	See note 3.	Grab
Dissolved Oxygen for Cold Water Fisheries	Daily Min	6.0 mg/L	See note 4.	Grab

Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type
Dissolved Oxygen for Non-Cold Water Fisheries	Daily Min	5.0 mg/L	See note 4.	Grab
Total Residual Chlorine (TRC)	Daily Max	0.037 mg/L	See note 5.	Grab

Note 1: Flow Rate

An estimate of the average daily flow means a reasonable approximation of flow based on any of the following: (a) water balance, (b) an uncalibrated weir, (c) calculations from the velocity and cross section of the discharge, (d) intake water meter readings where the intake, or a specific portion of it, is discharged, (e) discharge water meter readings, and (f) any of the more complex methods listed in section NR 218.05(1), Wis. Adm. Code. The Department may approve additional methods for estimating flow.

Monitor flow quarterly for filter backwash discharges and annually for other discharges such as annual pool cleaning and pool drainage, but not routine daily cleaning. The permit does not require flow rate monitoring for routine daily cleaning operations because volumes are typically very low.

Note 2: Total Suspended Solids (TSS)

Swimming pool wastewaters contain suspended solids. For discharges other than filter backwash, the TSS daily maximum effluent limit of 40 mg/L permit can be met without treatment of the effluent. For filter backwash, it may be necessary to treat the backwash prior to discharge to a surface water. The TSS daily maximum effluent limit is 40 mg/l (milligrams per liter), and is based on the ability of simple settling equipment to easily remove suspended solids from the discharge to concentrations below 40 mg/L.

The permit requires quarterly TSS monitoring for filter backwash discharges and annual monitoring for other discharges such as annual pool cleaning and pool drainage, but not routine daily cleaning. For the filter backwash discharge, the TSS grab sample must be taken during the first five minutes of backwash. This is the period when TSS will be at the highest concentration and will identify if adequate treatment is being provided. The permit does not require monitoring for routine daily cleaning operations because volumes and pollutants are typically very low.

Over time, settling equipment fills up with settled solids, resulting in decreased volume and residence time for wastewater and ultimately, ineffective solids treatment. Solids should be removed occasionally to insure effective settling occurs and that permit limits are met.

The permit prohibits the discharge of floating solids or visible foam in other than trace amounts. This is a standard requirement for treatment systems. It is not expected that discharges from swimming pools will have floating solids or foam, with or without treatment.

Note 3: pH

Monitor pH quarterly for filter backwash discharges and annually for other discharges such as annual pool cleaning and pool drainage, but not routine daily cleaning. The permit does not require monitoring for routine daily cleaning operations because volumes are typically very low.

The pH is limited to within the range of 6.0 to 9.0 standard units. This requirement is consistent with the water quality based pH range for waters classified for fish and aquatic life. Pool drainage and filter backwash should be within this range at all times. Start-of-the-year pool cleaning waste may require some adjustment to raise the pH if the muriatic acid has lowered the pH below this range.

Note 4: Dissolved Oxygen (D.O.)

Although D.O. limits apply to all surface water discharges, D.O. monitoring is only being required for discharges of wastewater that have been chemically dechlorinated. Facilities that do not use chemical dechlorination are expected to meet the D.O. limits and are not required to monitor D.O. discharge levels.

Chemical agents designed to reduce chlorine levels also consume oxygen in the process. The 6 mg/l daily minimum D.O. limit is designed to protect fisheries classified as cold water communities. The 5 mg/l daily minimum limit is designed to protect all other fisheries. The 5 mg/l limit is based on warm water communities and will be overly protective for certain fisheries. However, 5 mg/l of D.O. should be relatively easy to achieve if chemical dechlorination is done appropriately or if there is natural or mechanical aeration.

Monitor D.O. quarterly for filter backwash discharges and annually for other discharges such as annual pool cleaning and pool drainage, but not routine daily cleaning.

Note 5: Total Residual Chlorine (TRC)

Pool water contains high concentrations of disinfectant to eliminate infectious material. The free available chlorine (FAC) concentration in pool water is maintained at greater than 1 mg/l indoors and greater than 1.5 mg/l outdoors. The discharge of this water as pool drainage or filter backwash cannot comply with the permit requirements without treatment. To protect the aquatic environment of the receiving water, these disinfectant concentrations must be minimized prior to discharge to meet effluent limitations. The following are acceptable minimization methods:

Natural Dissipation - For pool drainage, discontinuing chlorination and allowing the pool water to sit for a few days prior to drainage should be sufficient in most cases to allow dissipation of chlorine levels to the point where permit limits are met. The actual amount of time necessary will need to be verified by analysis.

Chemical Reduction - A treatment system consisting of a holding tank and chemical addition will most likely be necessary for the elimination of chlorine in the filter backwash water, whirlpool water, and other highly chlorinated discharges. Sulfur compounds (e.g., dechlorination compounds include sulphur dioxide, sodium metabisulfite, sodium bisulfite, sodium sulfite, and sodium thiosulfate) can be used to reduce chlorine levels to meet permit limits. If chemical reduction of chlorine is used, D.O. monitoring and effluent limitations apply.

The TRC daily maximum effluent limitation of 0.037 mg/l is based on the acute water quality criterion for chlorine contained in ch. NR 105, Wis. Adm. Code. Since the discharges from these facilities are short in duration, chronic limits are not applied.

To ensure that a discharge is in compliance with the 0.037 mg/l TRC limit, a facility can take one of the following approaches:

- Use an analytical method with a limit of detection (LOD) equal to or less than 0.1 mg/l. Established test methods for TRC are typically unable to achieve Levels of Detection (LOD's) down to the permit limit of 0.037 mg/l. Therefore, if an approved test method is used that can achieve a LOD of 0.1 mg/l or lower and the substance is not detected (i.e., reported level is less than the LOD), the facility is considered in compliance with the permit limit. U.S. EPA methods 330.1 and 330.2 are two acceptable analytical methods that can regularly achieve a LOD of 0.1 mg/l or lower.
- Certify that it is using a chlorine minimization procedure that will achieve levels of chlorine in compliance with permit limits. The typical holding time for the chlorine analytical method is 15 minutes. In many cases, swimming pool facilities cannot maintain personnel and equipment to perform the

analysis on site. However, since the wastewater is easily dechlorinated, the facility can demonstrate permit compliance by submitting to the Department for approval, a minimization procedure that will reduce concentrations of chlorine to meet the permit limit.

The TRC limit does not apply to filter backwash discharges where the backwash water comes directly from a potable water supply (as opposed to using pool water to backwash).

Monitor TRC quarterly for filter backwash discharges and annually for other discharges such as annual pool cleaning and pool drainage, but not routine daily cleaning.

Monitoring Reports

The permittee shall submit an annual report to the Department, by February 15th each year that summarizes the monitoring information and shows all of the sample results for the previous calendar year.

STANDARD REQUIREMENTS

With the exception of the following, all of the standard requirements described in the permit are self explanatory and need no further elaboration.

Other Permits

Other permits or approvals may be required of the facility. The facility is responsible for obtaining necessary approvals. For example, any work performed below, or within 500 feet of the ordinary high water mark of navigable waters, in wetland areas, or within areas subject to local floodplain and shoreland regulations, must conform to all such county or local ordinances. Also, all applicable state permits and/or contracts required by Chapters 30, 31, and 87, Stats. (or Wisconsin Administrative Code adopted under these laws), and federal permits must be obtained as necessary.

Adequate Design

Chapter NR 205 identifies the design rainfall amount and probable intensity of 10-year and 25-year, 24-hour rainfall events for locations in Wisconsin. For facilities where a wastewater disposal or treatment facility is needed to meet permit requirements, this permit only requires that treatment systems be capable of handling the water resulting from a storm having a 10-year, 24-hour event

frequency which falls within or flows into the area of the treatment/disposal system. This design parameter is common to industrial treatment facilities in Wisconsin. Treatment systems must have sufficient capacity to allow adequate retention time for settling. Precipitation must be taken into account for exposed settling systems.

CHANGES FROM THE PREVIOUS GENERAL PERMIT REISSUANCE

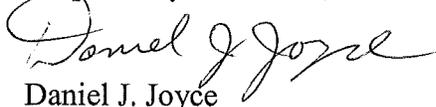
Two substantive changes have been made to the previous permit:

- The frequency of monitoring for filter backwash has been reduced from monthly to quarterly.
- Requirements for discharges to “impaired” surface waters and waters with “total maximum daily load allocations” were added to the permit.

Other changes, as noted below, have been made to improve readability.

- Monitoring requirements and effluent limitations for surface water discharges have been consolidated into a single table.
- The permit language and formatting has been changed to make it more obvious that the pool volume threshold of 67,000 gallons is used for determining whether a permittee must submit discharge monitoring reports. It does not, nor did it ever, establish an exemption for the need to obtain a WPDES permit.

Respectfully submitted,



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Wastewater Section
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cc: U.S. EPA, Region V, Permits Branch South Central Region
Northeast Region Northern Region
Southeast Region West Central Region