NPDES Permit No.OHW000003
Ohio EPA Permit No. 5IGW0003

Ohio Environmental Protection Agency

Fact Sheet For

National Pollutant Discharge Elimination System (NPDES)

General Permit for Discharges from Water Treatment Plants

I. Background

The Federal Water Pollution Control Act [also referred to as the Clean Water Act (CWA)], and the Ohio Water Pollution Control Act and the Ohio Revised Code (ORC Chapter 6111) provide that discharge of pollutants to waters of the state from any point source is unlawful, unless the discharge is in compliance with an effective NPDES permit.

The purpose of issuing NPDES permits to water treatment plant operators is to ensure that any wastewater discharges from these systems are in compliance with all applicable state and federal water pollution control laws.

Wastewaters are generated while producing potable water in water treatment plants. The common types of wastewaters from water plants and the processes that generate them are (a) clarifier sludge blowdown and particulate filter backwash from plain purification and lime-soda softening process, (b) iron filter backwash wastewater from iron and manganese removal process, (c) wastewater containing dissolved solids from sodium cycle ion-exchange processes and reverse osmosis processes.

Discharge limitations are listed in Part V of this fact sheet. Draft changes to the permit are described in Part VI.

II. Description of General Permit Coverage and Type of Discharge

The permit covers discharges from three types of water treatment plants to waters of the state. The permit does not cover any discharges that the Director of the Ohio EPA has determined to be contributing to a violation of a Water Quality Standard (WQS) as determined in Ohio Administrative Code, Chapter 3745-1.

Ohio EPA has classified water treatment plant discharge into five different types, for purposes of setting limitations:

- Plain Purification Processes
- Lime-Soda Softening Processes
- Iron/Manganese Removal Processes
- Ion Exchange Processes
- Reverse Osmosis Processes

Plain Purification Processes are processes where raw water is treated by settling, sand filtration, disinfection and fluoridation. Wastewaters are generated by filter-backwash and settling basin sludge supernatant waters. Pollutants generated included total suspended solids and chlorine. These wastewaters are typically treated by settling to remove solids, and if necessary to meet limits, de-chlorination.

Lime-Soda Softening refers to the reduction of water hardness by the application of hydrated lime to precipitate calcium magnesium carbonates and hydroxides. Complete lime softening also requires the addition of soda ash (sodium carbonate). Wastewaters generated by this process include sludge de-watering, clarifier blowdown, and wash water. Pollutants generated include total suspended solids, chlorine and alkaline pH values. These wastewaters are typically treated by settling, neutralization and de-chlorination (if necessary to meet limits).

Iron/Manganese Removal refers to the process of removing soluble iron and manganese from ground water by oxidation. Oxidation is accomplished by aeration, chlorine dioxide or potassium permanganate. Aeration is followed by filtration through a mixed media filter for removal of solids. Wastewaters are generated from iron filter backwash, settling tank decant water preceding cleanout, and potassium permanganate regeneration waste from batch regeneration. Pollutants generated include total suspended solids and suspended metals These wastewaters are typically treated by settling or clarification.

Ion Exchange means the process pertaining to demineralization of water by ion exchange units that use acids, bases, or salts to regenerate the exchange resins. The hydrogen-ion exchangers have cation-exchange resins that can be regenerated with sulfuric or hydrochloric acid. The hydroxide-ion exchangers have anion resins that can be regenerated with sodium hydroxide (NaOH), sodium carbonate (Na2CO3), or ammonia (NH3). In the case of a sodium cycle ion exchange unit, the zeolite media softener is regenerated with high concentration of sodium chloride (brine). In case of hydrogen-ion and hydroxyl-ion exchangers, the regeneration wastes are neutralized, pH adjusted, and discharged. For sodium cycle ion-exchange units, the regeneration wastewater and the first flush of rinse water contains TDS and chloride concentration of concern.

Reverse Osmosis is the process of removing contaminants from the wastewater by passing the water through a membrane filter that will allow water to pass, but not pollutant molecules. The backwash from these facilities contains high concentrations of dissolved solids, as well as concentrated amounts of any other contaminants that might be present in the source water supply.

Ohio EPA has elected to issue a statewide general permit to cover discharges from the following types of water treatment plants:

- Plain Purification
- Lime-Soda Softening
- Iron/Manganese Removal

Discharges from these types of plants can meet all applicable NPDES requirements through treatment technology limits, or broadly set water quality limitations.

Ohio EPA has not included discharges from the following types of water treatment plants:

- Ion Exchange Processes
- Reverse Osmosis Processes

Discharges from these processes require individual permits because site-specific water quality-based limitations for total dissolved solids, and possibly other related pollutant parameters, will be needed.

Discharges not eligible for coverage under this permit may still obtain an individual NPDES permit by submitting individual permit applications (Form 1, Form 2D or 2E, and an Antidegradation Addendum).

III. Description of Application Process

Notice of Intent - Facilities must submit a Notice of Intent (NOI) application to apply for coverage under the general permit. The USEPA's regulations at 40 CFR 122.21 (a) exclude facilities covered by general permits from requirements to submit an application for an individual permit.

NOI requirements are intended to establish a mechanism that can be used to establish a clear accounting of the number of facilities covered by the general permit, their identities, locations, mailing addresses, and the nature and amount of discharge.

To apply for general permit coverage, all applicants will be required to complete and submit an NOI application form that is available from Ohio EPA, along with an application fee of $200. The NOI application form and appropriate fees shall be submitted to the following address:

Ohio Environmental Protection Agency
Office of Fiscal Administration
P.O. Box 1049
Columbus, Ohio 43216 - 1049

A copy of the NOI should also be sent to the appropriate district office of the Ohio EPA; a copy of the NOI should also be provided to the MS4 operator.

Facilities who intend to obtain coverage under the general permit shall submit an NOI form within 45 days of the effective date of the permit. Dischargers who fail to obtain coverage under the general permit and are not otherwise covered by an NPDES permit are in violation of Ohio Revised Code (ORC) 6111.

IV. Eligibility Determining Factors

A. Except for discharges identified in paragraph B, this permit may cover discharges of wastewater from water treatment plants to waters of the state.

B. The following wastewater discharges associated with water treatment plants are not eligible for coverage under this permit:

1. wastewater discharges associated with ion-exchange and reverse osmosis processes; this includes wastewater from plants using combined treatment of ion-exchange and iron and manganese removal process;

2. discharges of solids to the Ohio River that may result in more than 5 percent net increase (measured over a 30-day period) over the amount of solids in the water removed from the river;

3. any discharge that is mixed with another type of discharge prior to reaching the receiving water. If the wastewater discharge does combine with another type of waste stream from the applicant prior to reaching the receiving stream, and it is possible to sample each waste stream separately, the wastewater discharge may

be covered by this permit. The other waste stream(s) must be covered under a different NPDES permit,

4. any discharges that are subject to an existing NPDES permit with an effluent limitation, monitoring requirement, and/or other requirement that is not addressed by this permit, or is more stringent than contained in this permit,

5. wastewater discharges that the Director has determined to be contributing to a potential violation of Ohio's surface water quality standards;

6. water treatment plant discharges that are discharged to combined or sanitary sewer systems; or

7. wastewater discharges associated with water treatment plants that treat concentrated arsenic streams.

V. Effluent Limitations and Monitoring Requirements

Treatment-technology based limits
The main pollutant common to all of the covered wastestreams is total suspended solids. All of the water treatment processes and associated wastewater processes are designed to remove suspended material from potable water and wastewater. Wastewater treatment plants at these facilities typically have clarifiers or equivalent settling technologies that can meet TSS limits that are roughly equivalent to secondary treatment levels. The current permit contains TSS limits of 30 mg/l (monthly average) and 45 mg/l (daily maximum) as the performance standard associated with these treatment levels.

During the Plain Purification Process, few plants discharge solids to the Ohio River that may result in a slight increase in the amount of solids removed from the river. Plants that discharge solids to the Ohio River and may result in more than 5 percent net (measured over a 30-day period) increase in the amount of solids discharged to the river will not be covered by general permit. For those plants, coverage by individual permits will continue.

Iron and manganese removal processes also have specific treatment standards of 1000 ug/l (monthly average) and 2000 ug/l (daily maximum) each for suspended iron and suspended manganese. These limits are representative of treatment standards applicable to all metals treatable by precipitation. The purpose of these limits is to ensure that metals are well treated, and that nuisance concentrations are not discharged to receiving waters.

Water quality-based limits
The permit contains water quality-based limits for chlorine and pH. Chlorine limits for plants discharging to low-flow streams are based on outside-mixing zone maximum criteria applied at the discharge. This limit protects streams with zero critical flow and other small bodies of water. Chlorine limits for other streams are based on inside-mixing zone maximum (IMZM) WQS applied at the discharge. Wasteload allocations for chlorine default to IMZM standards when instream dilution ratios are 2:1 or greater.

The pH limits are generally WQS applied at the end of the pipe. For lime-soda softening processes, it may be difficult to meet maximum pH WQS at the discharge point. The permit provides a maximum pH limit based on a wasteload allocation for receiving waters with sufficient assimilative capacity to accept the higher pH wastewater and still meet WQS after mixing. Ohio EPA's pH modeling gives a close approximation that shows a minimum dilution ratio 1:3 (effluent flow vs. receiving stream flow) will result in a pH of 9.0 S.U. in the receiving water. Therefore, a 1:3 dilution ratio has been set as the criteria for

allowing pH up to 11.0 S.U. Those facilities that fail to have a minimum 1:3 dilution ratio will have to meet pH of 9.0 S.U. at the end of the pipe. The attachment to this fact sheet contains an analysis of the dilution/assimilation needed to meet WQS for pH.

In the absence of WQ (Water Quality) criteria for Trihalomethane, monitoring for individual halomethane compounds namely, bromoform (tribromomethane), bromodichloromethane, methyl bromide (bromomethane), methylene chloride (dichloromethane), dibromochloromethane, methyl chloride and chloroform (trichloromethane) is required. Only yearly monitoring will be required. These compounds are by-products from the halogenation of methane, which may be present in surface waters intakes. Based on Ohio EPA's experience with water treatment plants, there is a low risk of THM formation in the wastewater. Therefore, monitoring once per year for these compounds has been recommended in the permit for plain purification and lime-soda softening processes. These processes usually use surface water as the water source.

VI. Changes from Current Permit

The draft permit contains only minor changes from the current permit. The standard permit conditions in Part V of the permit have been revised to incorporate the current standard conditions. These affect mostly the REPORTING and NON-COMPLIANCE NOTIFICATION sections.

VII. Notice of Termination

Each individual facility covered by the general permit must submit a Notice of Termination (NOT) form to terminate coverage under this permit. Permittees are to request permit coverage termination once the wastewater discharges are eliminated. Failure to submit an NOT form constitutes a violation of the permit and is a violation of ORC 6111.

Attachment – pH Wasteload Allocation for a 3:1 Dilution Ratio

Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

Upstream flow (cfs)	**0.12**
Effluent Flow (cfs)	**0.04**

INPUT

1. DILUTION FACTOR AT MIXING ZONE BOUNDARY	4.000
2. UPSTREAM/BACKGROUND CHARACTERISTICS	
Temperature (deg C):	**4.00**
pH:	**8.00**
Alkalinity (mg CaCO3/L):	**50.00**
3. EFFLUENT CHARACTERISTICS	
Temperature (deg C):	**25.00**
pH:	**11.00**
Alkalinity (mg CaCO3/L):	**1300.00**

OUTPUT

1. IONIZATION CONSTANTS	
Upstream/Background pKa:	6.52
Effluent pKa:	6.35
2. IONIZATION FRACTIONS	
Upstream/Background Ionization Fraction:	0.97
Effluent Ionization Fraction:	1.00
3. TOTAL INORGANIC CARBON	
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	51.67
Effluent Total Inorganic Carbon (mg CaCO3/L):	1300.03
4. CONDITIONS AT MIXING ZONE BOUNDARY	
Temperature (deg C):	9.25
Alkalinity (mg CaCO3/L):	362.50
Total Inorganic Carbon (mg CaCO3/L):	363.76
pKa:	6.47
pH at Mixing Zone Boundary:	8.93