MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

ADDRESSING PFAS FROM PUBLIC AND PRIVATE MUNICIPAL GROUNDWATER DISCHARGES

Compliance Strategy

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EGLE, WATER RESOURCES DIVISION

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BACKGROUND

Per- and polyfluoroalkyl substances (PFAS), also known as PFCs, have been classified by the United States Environmental Protection Agency as emerging contaminants on a national level. PFAS are a suite of chemicals historically used in thousands of applications throughout the industrial, food, and textile industries. Historical uses include firefighting foams, fume suppressants in chrome plating, food packaging, and various other products. PFAS are also used by industries such as tanneries, carpet manufacturers, and clothing manufacturers where waterproofing or stain resistance is desired. These chemicals are incredibly stable, breaking down very slowly in the environment, and are highly soluble which makes them easily transferable through soil to groundwater. For two of these chemicals, perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA), Michigan has established Water Quality Values (WQV) under the Part 4, Water Quality Standards, administrative rules promulgated pursuant to Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). Additionally, Michigan has established groundwater cleanup criteria under Part 201, Environmental Remediation, of the NREPA, for seven of these chemicals: PFOS, PFOA, perfluorohexanoic acid (PFHxA), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), perfluorobutanesulfonic acid (PFBS), and hexafluoropropylene oxide dimer acid (HFPO-DA) also known as Gen-X. Should groundwater cleanup criteria be developed in the future for additional PFAS compounds under these administrative rules, the compliance strategy described in this document will be expanded to address those compounds as well.

In February 2018, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) launched the Industrial Pretreatment Program (IPP) PFAS Initiative, requiring all wastewater treatment plants (WWTPs) with either federal- or state-required IPPs to determine whether they may be passing through PFOS and/or PFOA to surface waters and reduce and eliminate any sources, if found. For municipal WWTPs, the majority of PFOS sources were metal finishers, contaminated sites associated with industries or activities associated with PFOS, and landfills that accepted industrial wastes containing PFOS. Chemical manufacturers in the United States voluntarily stopped making PFOS and PFOA years ago; however, these chemicals may still be manufactured in other countries and imported. Industries were prohibited from using PFOS-containing chemicals in chromium electroplating tanks in September 2015, but these persistent chemicals have been found in factories years after they were used. Sites contaminated by firefighting foams or PFAS-contaminated industrial wastes have also been found to be sources for WWTPs if they discharge to the sanitary sewer. Unfortunately, conventional WWTP treatment does not effectively remove PFAS if it is discharged to the sewer system by industries or contaminated sites. Instead, PFAS may be passed through WWTPs to lakes, streams, and groundwater, as well as interfere with the WWTP by impacting management of solids from the treatment process. To reduce or eliminate PFOS and PFOA at municipal WWTPs with National Pollutant Discharge Elimination System (NPDES) permits, EGLE's Water Resources Division (WRD) developed and implemented the Municipal NPDES Permitting Strategy for PFOS and PFOA. WRD also developed and implemented the Compliance Strategy for Addressing PFAS (PFOS/PFOA) From Industrial Direct Discharges and Industrial Storm Water Discharges to reduce or eliminate PFOS and PFOA from industrial (non-municipal) facilities with NPDES permits.

The WRD regulates wastewater discharges to groundwaters of the state under the Part 22, Groundwater Quality, administrative rules promulgated pursuant to Part 31, Water Resources Protection, of the NREPA. When compared to the total amount of wastewater discharged to waters of the state, only a small percentage consists of discharges to groundwater. However, based on data obtained through the IPP PFAS Initiative and WRD statewide sampling efforts, WRD has determined that discharges to groundwater from municipal WWTPs and non-municipal facilities can contain concentrations of PFAS that may result in exceedances of Part 201 criteria in groundwater. The WRD will follow the *Compliance Strategy for Addressing PFAS (PFOS/PFOA) From Industrial Direct Discharges and Industrial Storm Water Discharges* to address PFAS at non-municipal facilities with Part 22 Groundwater Discharge permits. WRD has developed the following strategy to address PFAS in WWTP effluent and groundwater at public and private (i.e., privately owned, but serving the public) municipal WWTPs with Part 22 Groundwater Discharge permits.

GOAL

The goal of this Compliance Strategy is to evaluate, prioritize, and reduce and/or eliminate PFAS at public and private municipal WWTPs with Part 22 Groundwater Discharge permits to ensure protection of public health and groundwaters used for drinking water.

Privately owned wastewater treatment systems serving the public may include:

- Mobile Home Communities
- Condominium Developments
- Campgrounds
- Schools

APPROACH

DATA EVALUATION

The WRD's Emerging Pollutants Section (WRD EPS) may receive PFAS monitoring data for influent, effluent, and/or groundwater monitoring wells from public and private municipal WWTPs with Part 22 Groundwater Discharge permits from a range of sources, including samples collected by:

- WRD EPS staff
- WRD Point Source Monitoring (PSM) staff
- WRD district office staff
- The WWTP itself (regulated entity) or
- Other EGLE divisions

Once data is received, WRD EPS will evaluate the data using the Part 201 groundwater cleanup criteria. For influent and effluent data, the Part 201 criteria will be used as screening values for comparison purposes only. The presence of PFAS in the effluent is not a violation of the Part 22 Groundwater Discharge permit but is rather considered new effluent information.

PRIORITIZATION

WWTPs WITH EXISTING PFAS DATA

Once the data has been received and evaluated by WRD EPS, the WWTP will be prioritized into one of the categories described below. WRD EPS will use the following criteria to assign each WWTP to the appropriate category: PFAS concentrations in influent, effluent, and/or groundwater monitoring wells (especially those with applicable risk-based criteria), discharge flow, discharge method, known or potential sources, regional/local geology, groundwater flow direction, downgradient receptors and other compliance issues (e.g., a leaky lagoon).

Category 1 (High) – Concentrations in groundwater above Part 201 criteria, elevated concentrations in influent and/or effluent, high flows, known source(s) identified, downgradient receptors present or impacted, and/or potential to migrate off-site readily.

Category 2 (Medium) – Concentrations in groundwater above Part 201 criteria, lower concentrations in influent and/or effluent, medium to lower flows, potential sources identified, and/or no immediate downgradient receptors, but potential to migrate off-site readily.

Category 3 (Low) – Concentrations in groundwater below Part 201 criteria, lower concentrations in influent and/or effluent, lower flows, downgradient receptors not present, and/or low likelihood of off-site migration.

ALL OTHER PUBLIC AND PRIVATE MUNICIPAL WWTPs WITH PART 22 GROUNDWATER DISCHARGE PERMITS

In addition to addressing PFAS at WWTPs that WRD EPS is made aware of through data submittals, WRD EPS will also conduct PFAS sampling at a limited number of public and private municipal WWTPs with Part 22 Groundwater Discharge permits on a yearly basis. The goal of this sampling is to better understand PFAS in municipal groundwater discharges and assist with prioritization of WWTPs to ensure protection of public health and groundwaters used for drinking water. WRD EPS will use the following prioritization scheme to select a limited number of WWTPs for PFAS sampling each year, beginning with WWTPs in Priority 1. WWTPs will be sampled by WRD EPS or included in the annual PSM plan. WRD's initial goal is to sample 5-10 WWTPs per year.

Priority 1 – Public municipal WWTPs with an Industrial Pretreatment Program (IPP), and/or public and private municipal WWTPs with known sources of PFAS, known groundwater contamination of any chemical associated with the discharge (e.g., sodium, chloride, nitrate), known or potential impacts to downgradient drinking water wells, and/or previous PFAS results from any environmental media (e.g., soil, storm water, biosolids) above applicable criteria, including MPART sites.

Priority 2 – Public and private municipal WWTPs that accept landfill leachate, septage, and/or other high strength waste (regardless of permit category), and/or have a 2218 Groundwater Discharge permit with an average daily flow greater than 0.5 million gallons per day (MGD).

Priority 3 – Public and private municipal WWTPs with a 2218 Groundwater Discharge permit with an average daily flow less than 0.5 million gallons per day (MGD).

Priority 4 – Public and private municipal WWTPs with a non-2218 Groundwater Discharge permit.

Within each priority, sites will be further prioritized on a site-by-site basis. This includes unique conditions that may lead to a greater potential to impact groundwater and/or public health such as, downgradient receptors, unlined or leaky lagoons, lagoons with undetermined integrity, sludge management and/or storage issues, or discharge management issues. Data obtained from the sampling efforts will be used to categorize the WWTPs as outlined above.

MICHIGAN PFAS ACTION RESPONSE TEAM (MPART) SITE DESIGNATION & ASSESSING DOWNGRADIENT RECEPTORS

Public and private municipal WWTPs with Part 22 Groundwater Discharge permits that have PFAS in one or more compliance monitoring wells above the applicable Part 201 criteria and are suspected to be the source of PFAS to groundwater, will become Michigan PFAS Action Response Team (MPART) Sites. The WRD EPS will follow the established MPART procedures for coordinating with the Michigan Department of Health and Human Services (MDHHS) and local health officials to initiate response activities. At a minimum, response activities will include evaluation and sampling (if determined to be necessary) of downgradient drinking water wells and development of a Public Health Action Plan.

PART 201 FACILITY NOTIFICATION AND REMEDIAL INVESTIGATION

Public and private municipal WWTPs with Part 22 Groundwater Discharge permits, whose discharge has resulted in PFAS-contaminated groundwater above applicable Part 201 criteria, will become a "Facility" as that term is defined by Part 201. The WRD EPS will issue a Violation Notice to the permittee notifying the permittee of the Facility status, MPART Site designation, and their Due Care obligations. The Violation Notice will require a Remedial Investigation and Feasibility Study (RI/FS), which at a minimum shall:

1. Define groundwater flow direction.
2. Identify risks to the public health, safety, and welfare and to the environment and natural resources, including identification of any public and residential drinking water wells and wellhead protection zones in the vicinity of the facility and an evaluation of the impact of the facility on any such wells or zones.
3. Define the extent to which groundwater quality exceeds the applicable criteria established by the department under section 20120a(1)(a) of Part 201, including identification of contamination that may have migrated beyond the boundary of the source property in excess of applicable generic residential cleanup criteria.
4. Evaluate a range of alternatives that reflects the practical options, the level of complexity of the contamination problem, and the remedial action that is needed to address the problem.

MONITORING AND SOURCE EVALUATION REQUIREMENTS

Public and private municipal WWTPs with Part 22 Groundwater Discharge permits with higher concentrations of PFAS in influent, effluent and/or groundwater should investigate potential PFAS sources to their system, through their IPP program if applicable or with guidance provided by WRD EPS. Source investigations should consider current collection system users, circumstances such as a groundwater contamination plume intersecting a collection sewer line or other scenarios that may result from inflow and infiltration issues. Further, historical contributions should also be considered as past contributions from collection system users may have had a significant influence on the observed groundwater concentrations at the WWTP, even though the source may have ceased or been greatly reduced.

In general, facilities categorized above will be required to conduct the following monitoring and source evaluation requirements.

Category	Effluent Monitoring	Groundwater Monitoring	Monitoring Frequency Reduction	Pollutant Minimization and Source Evaluation Program & Reporting
1	Monthly Grab	Quarterly	Yes	Yes
2	Quarterly Grab	Semi-Annual	Yes	Yes
3	Semi-Annual Grab	Annual	No	No

At a minimum, effluent and groundwater monitoring well samples will be analyzed for the seven PFAS analytes with groundwater protection criteria listed under Part 201 (PFOS, PFOA, PFBS, PFHxA, PFHxS, PFNA, and HFPO-DA). These seven PFAS analytes may be listed as "(report)" under the applicable effluent and groundwater monitoring well limitations tables in the permit when it is reissued (depending on the status of the investigation).

POLLUTANT MINIMIZATION AND SOURCE EVALUATION PROGRAM FOR PFAS

A Pollutant Minimization and Source Evaluation Program may be included in the permit or requested by WRD EPS staff, which will require public and private municipal WWTPs to identify potential sources of PFAS entering the WWTP and implement preventative measures and source controls to reduce or eliminate PFAS. At a minimum, the Pollutant Minimization and Source Evaluation Program shall include the following items:

1. Identification of and strategies to identify any potential and probable sources of PFAS.
2. A plan for periodic monitoring of the permitted facility's influent.
3. Proposed measures and implementation schedules for elimination, control, and/or reduction of the identified sources (prioritizing highest loadings and concentrations), and the strategies that will be used to measure success.

The Pollutant Minimization and Source Evaluation Program will be required to be submitted to WRD 90 days from issuance of the permit or as requested by WRD EPS staff. The Pollutant Minimization and Source Evaluation Program shall be implemented upon approval of the WRD EPS.

On or before May 1 of each year following Pollutant Minimization and Source Evaluation Program implementation, the permittee shall submit to the Department a status report for the previous calendar year. Upon written notification by the Department, the permittee may be required to submit more frequent status reports. Status reports at a minimum shall include:

a. Complete listing of PFAS sources.
b. Summary of influent and effluent monitoring data.
c. Implemented measures to eliminate, reduce, or control sources (prioritizing highest loadings and concentrations), and an assessment of the degree of success and the strategies used to measure success.
d. Proposed measures and schedules for elimination, control, or reduction of any newly identified PFAS sources (prioritizing highest loadings and concentrations), and the strategies that will be used to measure success.
e. Barriers to implementation and revisions to the implementation schedule.
f. Laboratory reports, if not previously supplied.

Any information generated as a result of the Pollutant Minimization and Source Evaluation Program could be used to support a request to modify the Pollutant Minimization and Source Evaluation Program or to demonstrate that the requirement has been completed satisfactorily.

Any request for modification of the approved Pollutant Minimization and Source Evaluation Program shall be submitted, in writing, to the Department along with supporting documentation for review and approval. The Department may approve modifications to the approved Pollutant Minimization and Source Evaluation Program, including a reduction in the frequency of the influent monitoring requirements. Approval of a Pollutant Minimization and Source Evaluation Program modification would not require a permit modification, if applicable.

CONCLUSION

PFAS is an emerging pollutant that needs to be addressed when it is being discharged into waters of the state above applicable standards. Only a small percentage of the total amount of wastewater being discharged consists of discharges to groundwater. However, WRD has determined that those discharges to groundwater from municipal WWTPs and industrial (non-municipal) facilities can contain concentrations of PFAS that may result in exceedances of Part 201 criteria in groundwater. WRD will use the Compliance Strategy for Addressing PFAS (PFOS/PFOA) From Industrial Direct Discharges and Industrial Storm Water Discharges to reduce or eliminate PFAS from industrial (non-municipal) facilities with Part 22 Groundwater Discharge permits.

The Compliance Strategy presented in this document will require monitoring, source evaluation, and/or reduction of PFAS at public and private municipal WWTPs with Part 22 Groundwater Discharge permits, when existing PFAS data is available. When the Part 22 Groundwater Discharge permit for those WWTPs becomes eligible for reissuance, the monitoring and source evaluation requirements may be added to the permit as needed. Monitoring and source evaluation requirements will be determined by which Category the WWTP is assigned as described in this Compliance Strategy.

Public and private municipal WWTPs with concentrations of PFAS in groundwater above applicable Part 201 criteria will also be required to define the nature and extent of PFAS contamination in groundwater and ensure protection of downgradient receptors.

The ultimate objective is to bring all discharges into compliance with applicable standards, but progress may be incremental based on priority dictated by individual circumstances at each WWTP. As WRD develops knowledge about the extent of the problem of PFAS in groundwater discharges and hence receiving waters, alternative wastewater disposal systems (e.g., converting to a surface water discharge under an NPDES permit or discharging to an existing WWTP) will have to be contemplated as well as an investigation of treatment options.