



MICHIGAN COMMERCIAL AQUACULTURE

REGULATORY RESOURCE BOOK

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Introduction

This resource book identifies potential permits, licenses, registrations, and requirements (i.e., regulations) that may be applicable to a commercial aquaculture facility in Michigan. Although written for aquaculture facilities, it is also relevant to commercial aquaponic facilities. These state and federal regulations serve to protect the health of fish, maintain water quality standards, and ensure a sustainable Michigan aquaculture industry. The Departments of Agriculture and Rural Development; Natural Resources; and Environment, Great Lakes, and Energy cooperatively implement these regulations and are referred to collectively as the Quality of Life Agencies (QOL).

For this document, commercial aquaculture facilities include ponds, flow-through systems, and recirculating aquaculture systems. This document will not address net pens. For more information about net pens, go to [MDARD's Commercial Net-Pen Aquaculture: Science, Regulatory and Economic Reviews website](#). If you are a hobbyist that is growing fish for your own consumption, many of these regulations will not apply to you. Please contact the relevant Quality of Life agency directly with questions you may have about your specific circumstances.

CHAPTER 1: Facility Registration

All aquaculture facilities, including aquaponics, must obtain an aquaculture facility registration or an aquaculture research permit¹ from the Michigan Department of Agriculture and Rural Development (MDARD) prior to startup. If you want to grow fish identified on the [approved species list](#)², you must apply for the aquaculture facility registration. If you want to grow fish not on the list, then you would apply for a research permit. Although one application is used for both the registration and research permit, applying for a research permit also requires a thorough invasive species risk analysis, including proposals for mitigation of risk and protocols indicating research goals and methods. Requirements for a research permit are tailored individually for the species being raised.

Retail bait outlets, retail ornamental fish facilities, persons using privately controlled waters (see definition below) for noncommercial purposes, public aquariums or zoos, and portable retail fishing concessions are exempt from facility registration or research permitting.

To obtain an aquaculture facility registration, a facility must meet the following requirements:

- All species are on the approved species list
- The facility exists in privately controlled waters
- Appropriate precautions are taken, and physical barriers are in place to prevent the escape of farmed species into any nearby public waters

PRIVATELY CONTROLLED WATERS AND REGISTRATION

Aquaculture facilities may only receive a facility registration or research permit if they are operating in privately controlled waters.³

Privately controlled waters are waters contained within ponds, vats, raceways, tanks, and any other indoor or outdoor structure wholly within or on land owned or leased by an aquaculturist and used within an aquaculture facility or research facility. Privately controlled waters include waters that are diverted for use by an aquaculturist exercising their riparian rights.

Since the Great Lakes and many inland lakes and quarries do not meet the definition of privately controlled waters, MDARD cannot issue a facility registration or research permit for aquaculture facilities that use net pen in these waters. For more information on net pens, go to [MDARD's Commercial Net-Pen Aquaculture: Science, Regulatory and Economic Reviews website](#).

FACILITY REGISTRATION OR RESEARCH PERMIT APPLICATION SUBMISSION

The application for the registration or permit must be submitted at least 60 days before the facility is open for business. Within 30 days of the application being received by the MDARD Central Licensing Unit, an inspection will be conducted to determine whether the facility meets all registration

¹ Michigan Aquaculture Development Act, [1996 PA 199](#), MCL [286.876](#) and [286.878](#)

² 1996 PA 199, MCL [286.875](#)

³ 1996 PA 199, MCL [286.872](#) (c) and (p)

requirements. If all requirements are met, the registration or permit will be issued within 60 days of the application being received.

There may be other permits needed from other departments, some of which may take up to 180 days; so generally, the application for the MDARD registration or permit is the last step in the overall permitting process.

It is important to stress that familiarizing one's self with the regulations that may affect one's business (especially, by reading this Regulatory Guidebook in particular) is crucial before pursuing any registrations or permits. In addition, preparing a project plan and contacting the QOL departments to request a pre-application review is highly recommended. This review can help to clarify the specific application requirements in support of one's business and the timing of various permits.

The application and answers to Frequently Asked Questions can be found on MDARD's [Aquaculture Facility Licensing](#) website. To discuss project plans or receive more information on the application process, please contact the Aquaculture Program Manager at 517-284-5685.

Registration and permit fees

Facility Registration

Initial Application: \$100

Annual Renewal: \$75

Research Permit

Initial Application: \$250

Annual Renewal: \$100

CHAPTER 2: Bringing Fish into the State

Aquaculture must have an official interstate certificate of veterinary inspection (CVI) filled out by a U.S. Department of Agriculture accredited veterinarian in the state of origin. In place of a CVI, a Fish Disease Inspection Report or a Fish Health Certificate (FHC) can be used if it is filled out by a certified Fish Health Official.

Aquaculture must test negative for Viral Hemorrhagic Septicemia virus (VHS) and the test information must be provided. Tilapia, Lake Sturgeon, Common Shiners, and aquaculture going to food markets and retail ornamental fish facilities do not require VHS testing. All baitfish and aquaculture species ultimately destined for stocking public waters that are being imported into Michigan must follow the Michigan Department of Natural Resources (DNR) fish health testing guidance in Appendix 1 to ensure faster importation request processing.

Importing aquaculture from a hatchery or other facility with a record of an emergency fish disease (as listed in Great Lakes Fish Health Commission's [Model Program for Fish Management in the Great Lakes](#) and/or the [Michigan Reportable Animal Disease List](#)) within the past two years is **NOT** allowed. While subject to change, these diseases include: Viral Hemorrhagic Septicemia (VHS), Infectious Hematopoietic Necrosis (IHN), Epizootic Hematopoietic Necrosis (EHN), Gyrodactylosis, Ceratomyxosis, Salmonid alphavirus, Infectious Salmon Anemia virus (ISA), White Sturgeon herpesvirus, White Sturgeon iridovirus, Red Sea Bream Iridoviral Disease, Spring Viremia of Carp, and Bacterial Kidney Disease (BKD).

Aquaculture must obtain a prior entry permit before being brought into Michigan. To obtain a permit, contact the Aquaculture Program at MDARD-Aquaculture@michigan.gov at least two business days before importation. In addition to providing a Fish Health Certificate (FHC) or CVI, an invoice or shipping statement with the following information must be submitted to the Michigan Department of Agriculture and Rural Development (MDARD) to obtain a prior entry permit:

- Name, address and phone number of the selling facility, the receiving facility, and the trucker transporting the fish.
- Detailed list of the species, lot number, and the quantity (or total weight) of fish in the shipment.
- Proof of VHS testing (Note: baitfish and aquaculture destined for public waters will need additional disease testing, which is required by DNR as listed in [Appendix 1](#)).

If you have any questions regarding bringing fish into the state, visit MDARD's Bringing Animals into Michigan website at www.michigan.gov/animalimport or call 800-292-3939.

AQUACULTURE DESTINED FOR PUBLIC WATERS

In addition to the above regulations, aquaculture destined for stocking in public waters will also need a permit through the DNR and will require fish health testing following the guidance in Appendix 1.

CHAPTER 3: Disease Reporting and Antibiotic Use

REPORTABLE DISEASES

Producers should become familiar with the [Michigan Reportable Animal Disease List](#). This list contains all animal diseases required to be reported to the State Veterinarian. Anyone (e.g., producers, veterinarians, and laboratories) who suspects or confirms these diseases must ensure it's reported to the Michigan Department of Agriculture and Rural Development (MDARD) at mireportableanimal@michigan.gov or 800-292-3939. Usually these diseases will be reported to MDARD by the veterinarian or laboratory making the diagnosis; however, the producer should always verify with the veterinarian that the disease has been reported. The list is updated annually. For the latest version, visit www.michigan.gov/animaldiseases.

ANTIBIOTIC USE

In 1999, the [Animal Drug Availability Act of 1996](#) implemented a new category of drugs called veterinary feed directive (VFD). The VFD category is a part of the Food and Drug Administration's (FDA) overall directive to ensure the judicious use of human medically important antibiotics. In 2016, the VFD category was expanded to include medically important antibiotics fed to animals and is defined in [FDA Guidance Document #213](#). The revised VFD policy puts into place important control factors that dictate the appropriate use of feed-grade antibiotics.

In the past, the FDA has allowed antibiotics to have label claims for therapeutic (prevention, control, treatment) reasons, growth promotant and feed efficiency. As a part of judicious use strategy, the FDA has aligned with drug sponsors to voluntarily revise label claims, removing growth promotant and feed efficiency. Since antibiotics cannot be used for purposes other than those allowed by label, their use for non-therapeutic purposes is not allowed.

To use these human medically important antibiotics, a producer must have a veterinarian-client-patient relationship (VCPR). A VCPR is a working relationship between a veterinarian and a producer. The veterinarian's primary role is to advise and guide the producer in determining which medications are appropriate for their animals. If necessary, the veterinarian will write a VFD order, which is a written statement issued by a licensed veterinarian that gives producers permission to use feed that contains these antibiotics. A copy of the form will be given to the feed distributor when the feed is ordered. All VFD orders must be kept in their original form (either written record or electronic copy) by the issuing veterinarian and a copy must be retained by the producer and feed distribution company. Both the original and copies must be retained for two years.

Resources: [List of VFD Drugs](#) and [List of Distributors](#)

Visit the MDARD's Veterinary Feed Directive website at www.michigan.gov/vfd for more information.

CHAPTER 4: Generally Accepted Agriculture and Management Practices

The Michigan Right to Farm Act⁴ requires the establishment of Generally Accepted Agricultural and Management Practices (GAAMPs). The GAAMPs provide uniform statewide standards and acceptable management practices based on sound science.

The GAAMPs that have been developed are as follows:

- 1) 1988-Manure Management and Utilization
- 2) 1991-Pesticide Utilization and Pest Control
- 3) 1993-Nutrient Utilization
- 4) 1995-Care of Farm Animals
- 5) 1996-Cranberry Production
- 6) 2000-Site Selection and Odor Control for New and Expanding Livestock Facilities
- 7) 2003-Irrigation Water Use
- 8) 2010-Farm Markets

Producers who voluntarily follow the practices are provided protection from public or private nuisance litigation under the Michigan Right to Farm Act.

Management practices for aquaculture facilities can be found in two GAAMPs: Care of Farm Animals and Manure Management and Utilization for land application of fish manure. The Care of Farm Animals GAAMP addresses management practices such as stock procurement and transportation, recommendations for the aquatic environment, facilities and equipment, and healthcare and medical procedures. The Manure Management and Utilization GAAMP addresses rainfall and snowfall-induced runoff of manure into surface and groundwaters, odor management, manure storage, and manure application to land. The disposal of fish waste material such as whole fish, fish offal, sludge from fish production, and wash water from fish cleaning is discussed in Chapter 6.

Go to the Michigan Department of Agriculture and Rural Development's Right to Farm website at www.michigan.gov/righttofarm for more information.

⁴ [Michigan Right to Farm Act, 1981 PA 93](#)

CHAPTER 5: Invasive Species⁵

An invasive species is a species that is not native and whose introduction causes harm, or is likely to cause harm to Michigan's economy, environment, and/or human health. The Michigan Departments of Natural Resources; Environment, Great Lakes, and Energy; and Agriculture and Rural Development collaboratively implement the Aquatic Invasive Species Program. If you suspect there is an invasive (non-native) plant or animal (including algae, insects, fish, crustaceans, etc.) on your property, go to www.michigan.gov/invasives and click on "[Species Profiles and Reporting](#)" for invasive species lists, identification, reporting, and contact information.

Examples of invasive species that have been found near Michigan aquaculture facilities are pictured below:

[Parrot Feather \(*Myriophyllum aquaticum*\)](#)



[New Zealand Mudsnail \(*Potamopyrgus antipodarum*\)](#)



⁵ [Part 413](#), Transgenic and Nonnative Organisms, of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451; [Invasive Species Order](#) Amendment 1 of 2014; [Invasive Species Order](#) No. 1 of 2015; and [Part 33](#), Aquatic Nuisance Control, of NREPA

CHAPTER 6: Solid Waste Disposal and Bodies of Dead Animal Regulations

The Department of Environment, Great Lakes, and Energy (EGLE) and the Michigan Department of Agriculture and Rural Development (MDARD) have regulations pertaining to the disposal of fish and fish waste. The disposal of whole fish, fish offal, sludge from fish production, and wash water from fish cleaning containing over one percent solids is exempted from statute⁶, provided a facility complies with the requirements contained in the [Fish Waste Exemption](#). This document addresses disposal of these materials in landfills, wastewater treatment plants, burial, land application, composting, and transportation of the waste.

MDARD enforces the disposal of animals through statute⁷ and rules⁸. These regulations allow for the burial, composting, and other means of disposal for animal carcasses, provided various conditions are met. For assistance in complying with these regulations, go to [MDARD's Transporting and Disposal of Dead Animals website](#) or call 800-292-3939.

⁶ [Part 115](#), Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451

⁷ Bodies of Dead Animals Act, [1982 PA 239](#)

⁸ Bodies of Dead Animals [rules](#)

CHAPTER 7: Pesticide Use

A pesticide⁹ is a substance or mixture of substances intended for preventing, destroying, repelling, or mitigating a pest. Fungicides, herbicides, insecticides, and rodenticides are all examples of pesticides. Pesticides are regulated at both the federal and state level. In Michigan, the Michigan Department of Agriculture and Rural Development (MDARD) is the agency responsible for regulating the use and distribution of pesticides and the Michigan Department of Environment, Great Lakes, and Energy (EGLE) regulates the impact herbicides can have on the environment through a permit.

USE AND DISTRIBUTION OF PESTICIDES

Although there are many laws and regulations regarding pesticide use and distribution, one of the most important documents applicators need to be aware of is the pesticide label itself. Pesticide labels are legal documents and pesticide users are obligated to follow all label directions. Failing to follow the directions on a pesticide label can result in significant harm to the applicator, the public, and the environment, which can lead to significant fines and penalties from both the U.S. Environmental Protection Agency (USEPA) and MDARD.

In Michigan, most aquatic pesticides may be applied by individuals with proper authorization, including a permit, if required, and permission of the property owner. However, the majority of treatments are carried out by certified applicators. If you decide to apply chemicals on your own, be sure to follow all directions indicated on the product label to protect yourself, others, and the environment. Certain chemical products, such as those with the active ingredient imazapyr or diquat dibromide, are categorized as restricted-use pesticides, which mean they can only be purchased and applied by certified applicators.

MDARD certifies commercial applicators of pesticides. For more information, go to the [Pesticide Applicator Certification website](#). For more information about the proper use of pesticides, contact Brian Verhougstraete, Pesticide Section Manager at 517-284-5655 or verhougstraeteb@michigan.gov.

⁹ The Federal Insecticide, Fungicide, and Rodenticide Act ([FIFRA](#)) is a United States federal law that set up the basic U.S. system of pesticide regulation to protect applicators, consumers, and the environment. USEPA is the federal agency with the authority to regulate pesticides for the protection of human health and the environment.

The Pesticide & Plant Pest Management Division (PPPMD) of the Michigan Department of Aquaculture and Rural Development (MDARD) has primacy over pesticide regulation. It regulates the appropriate use of pesticides in Michigan including enforcement, certification, registration, and worker protection standards. [Part 83](#), Pesticide Control, of the Natural Resources and Protection Act (NREPA), 1994 PA 451, as amended is the state law. Regulation No. 636 Pesticide Applicator are the state [rules](#) promulgated under Part 83.

EGLE regulates the impact herbicides has on the environment through [Part 33](#), Aquatic Nuisance Control, of the NREPA.

PERMITS

The aquatic pesticide control of nuisance aquatic vegetation and algae in ponds is typically a regulated activity that requires a permit from EGLE's Aquatic Nuisance Control Program.

A permit is generally not required from EGLE to control aquatic submerged vegetation in inland lakes by mechanical harvesting (i.e., cutting plants above the lake bottom with no soil disturbance). Vegetation removal by hand does not require a permit.

If you have questions about the permitting requirements, please go to EGLE's website at www.michigan.gov/anc. The Aquatic Nuisance Control Program's phone number is 517-284-5593 and e-mail is egle-wrd-anc@michigan.gov.

CHAPTER 8: Public Water Fish Stocking

A private party can stock fish into public waters of the state provided they have obtained a Fish Stocking Permit from the Department of Natural Resources (DNR).

Water is considered public if it meets one or more of the following:

- Waters that have permanent outlets or inlets;
- Waters with public access sites; or
- Waters that have been previously stocked by the state of Michigan.

FISH STOCKING PERMITS

Fish Stocking Permits¹⁰ ensure that fish stocking public waters are healthy; will not pose a disease or management risk to wild fish; is a species that currently exists in the watershed; and is compatible with overall fishery management goals.

The private entity (landowner, angling group, etc.) that purchases the fish for stocking in public water is responsible for obtaining the stocking permit. All fish to be stocked in public waters will need to be tested for and free of pathogens in Appendix 1.

PERMIT REQUIREMENTS

To obtain a Fish Stocking Permit, the following requirements must be met:

- The species being stocked must be on the approved species list
- The Fish Stocking Permit must be available onsite when the fish are stocked.
- The DNR Fisheries Management Unit must be notified of the stocking date at least three, but no more than 10 calendar days prior to the actual stocking date.
- Fish stocked into public waters must come from a lot (specific group of fish) that has been certified to stock in public water and free from the pathogens as listed in Appendix 1.

An [application for a Fish Stocking Permit](#) and additional information can be found on the [DNR's Fish Stocking website](#). There is no cost for the permit. For more information, contact the [DNR Fisheries Management Unit Office](#) servicing your location.

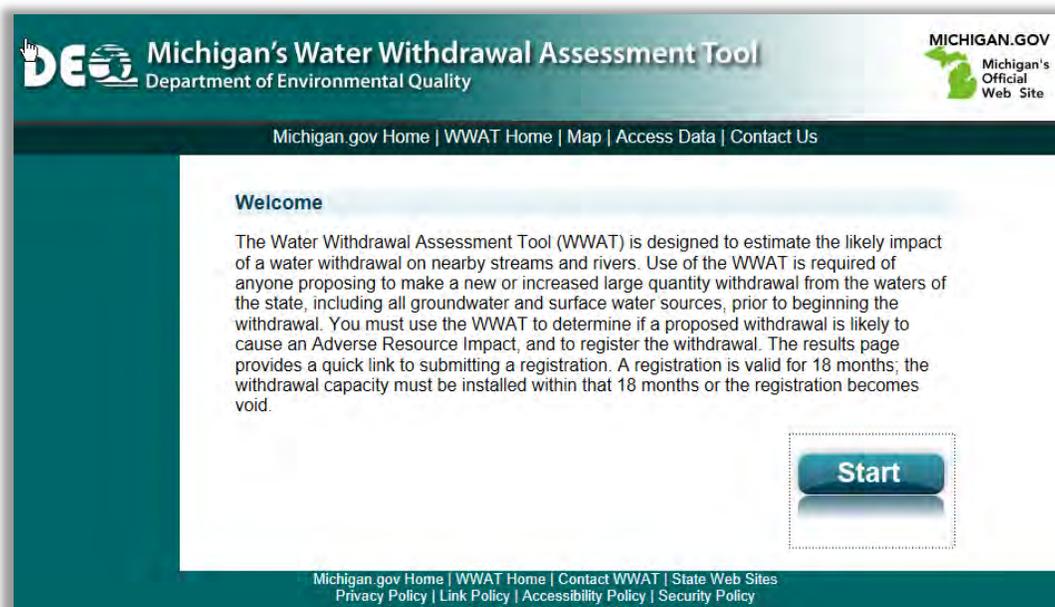
¹⁰ Required under [Part 487](#), Sport Fishing, of the Natural Resources and Protection Act (NREPA), 1994 PA 451, (MCL 324.48735).

CHAPTER 9: Water Withdrawal¹¹

In 2008, Michigan committed to responsibly manage the abundant waters and water-dependent natural resources by signing the Great Lakes – St. Lawrence River Basin Water Resources Compact. To fulfill this commitment, the Michigan Legislature enacted laws to manage large quantity water withdrawals using hydrologic and ecological sciences for the framework for policy development. If you plan to use well water in your aquaculture process, it may trigger registration and reporting, or permitting requirements, depending on how and how much water you withdraw. The requirements associated with this practice are explained below.

TOTAL PUMP CAPACITY OF 70 GALLONS PER MINUTE OR MORE

Large quantity water withdrawals must be registered with the Michigan Department of Environment, Great Lakes, and Energy (EGLE) prior to beginning withdrawal. To apply for the registration, the use of the online [Water Withdrawal Assessment Tool](#) is required.



If the proposed large quantity withdrawal cannot be authorized by the Water Withdrawal Assessment Tool, a request for a site-specific review will be needed. You can use the tool to request a site-specific review.

All large quantity withdrawal facilities must report annual water use. You can do this through the [Online Water Use Reporting System](#). The reporting is segregated for agricultural producers and for all other facilities. When using the reporting system, aquaculture facilities should choose the Michigan Department of Agriculture and Rural Development logo, which allows their report to be submitted to the correct agency.

¹¹ [Part 327](#), Great Lakes Preservation, of the Natural Resources and Environmental Protection Act, 1994 PA 451.

WITHDRAWAL RATE OVER TWO MILLION GALLONS PER DAY

A [Water Withdrawal Permit](#) must be applied for prior to making a withdrawal more than two million gallons per day. This includes withdrawals from groundwater, inland surface water, and the Great Lakes and connecting channels. There is a \$2,000 permit application fee. If you have a withdrawal rate over two million gallons per day, you do not have to comply with the requirements pertaining to combined pump capacity over 70 gallons per minute.

REGULATIONS ASSOCIATED WITH DRILLING A WELL

Well drillers must comply with the Michigan Water Well Construction and Pump Installation Code¹² and the associated rules¹³. The local health department will likely require the well owner to obtain a permit before the installation of an aquaculture facility well. Your local health department can answer permitting and other well requirement questions.

For the latest version of the Pump Installation Code along with other pertinent information regarding construction, operation, and decommission of water wells, go to EGLE's website at www.michigan.gov/waterwellconstruction

WATER WITHDRAWAL ASSISTANCE

For more information on water withdrawal, contact the [Water Use Program staff](#) or visit EGLE's website at www.michigan.gov/wateruse.

¹² [Part 127](#), Water Supply and Sewer Systems, of the Public Health Code, 1978 PA 368

¹³ Groundwater Quality Control [Rules](#)

CHAPTER 10: Groundwater Discharge Authorizations¹⁴

DISCHARGING OF WASTEWATER TO THE GROUND OR GROUNDWATER

The discharge of wastewater from aquaculture facilities to groundwater may require a groundwater discharge permit by the Water Resources Division of the Michigan Department of Environment, Great Lakes, and Energy (EGLE). The volume and frequency of the wastewater discharges, the type of wastewater, the strength of the nutrients, and the degree to which soils will play an active role in breaking down the wastewater will all enter into the determination of whether a permit, self-certification, or exemption applies. EGLE field staff review wastewater and groundwater sampling data. Field staff also inspect facilities who are discharging to ensure legal requirements are being met.

ANNUAL FEES

The discharge authorizations in the rules are established in order of relative impact to the environment and the program's annual fees are set in the same manner. The annual fee can range from \$200 to \$3,650, depending on the type of permit appropriate for the facility.

For more information about the Groundwater Discharge Program, go to EGLE's website at www.michigan.gov/groundwaterdischarge and/or contact the [Groundwater Discharge Compliance staff](#).

¹⁴ [Part 31](#), Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451 and the [Part 22](#), Groundwater Quality Rules

CHAPTER 11: Soil Erosion and Sedimentation Control¹⁵

The Soil Erosion and Sedimentation Control (SESC) program helps prevent soil erosion and aims to protect adjacent properties and the waters of the state from sedimentation. A permit is generally required for any activity that disturbs the soil one or more acres of land or is within 500 feet of a lake or stream, regardless of the how much land is disturbed. County and local enforcing agencies issue the permits, your [local agency can be found on the Michigan Department of Environment, Great Lakes, and Energy's \(EGLE\) website](#). Authorized agencies have inspectors certified by EGLE.

Construction activities which disturb one or more acres of land and have a direct discharge of storm waters to waters of the state (streams, rivers, lakes, and wetlands) requires a National Pollutant Discharge Elimination System (NPDES) permit from EGLE.

If you have questions about the permitting requirements under SESC or NPDES, go to EGLE's website at www.michigan.gov/soilerosion or contact the appropriate [Groundwater Discharge Compliance staff](#) for your location.

¹⁵ [Part 91](#), Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451 and [Part 17](#). Soil Erosion and Sedimentation Control Rules

CHAPTER 12: Permits for Construction of Dams or Construction in Inland Lakes, Streams, Wetlands, and Floodplains

INTRODUCTION

Many activities conducted in or near the Great Lakes, wetlands, ponds, inland lakes, streams, floodplains, sand dunes, or other environmental features are regulated by the state and may require authorization by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) prior to construction. These valuable water resources and the benefits they provide are protected from impairment due to pollution, physical alterations, and nuisance aquatic species. Review of this chapter will help to ensure that your project is complying with state and federal laws regarding these land-water interfaces (i.e., where water and land meet and interact).

In 1984, Michigan received authorization from the federal government to administer federal wetlands, lakes, and streams law¹⁶ through state law¹⁷ in most areas of the state; and thus, permits are issued through EGLE. Michigan was the first of only two states currently authorized to administer the permit program for the federal government through state law. Federal oversight of state-administered wetlands, lakes, and streams programs is primarily the responsibility of the U.S. Environmental Protection Agency (USEPA). A state administered wetlands, lakes, and streams program must be consistent with the requirements of the federal law. However, state and federal authorities are shared in coastal and certain other waters¹⁸, and both federal and state permits are required. In these cases, both permits may be obtained through a Joint Permit Application process.

The remainder of this chapter will highlight the four major land-water interface permitting programs EGLE, Water Resources Division (WRD) administers and the permitting process:

1. Inland Lakes and Streams: canal, channel, ditch, drain, inland lake, pond, river, and stream.
2. Wetlands
3. Floodplains and Floodways
4. Dam

Privately and publicly controlled waters are treated the same when determining the need for a permit. The fact that a water is privately controlled does not exempt it from permitting.

INLAND LAKES AND STREAMS PERMITS

The intent of the Inland Lakes and Streams Protection Program is to protect public places for public use and the rights of riparian owners. Activities that disturb or fill land in an inland lake or stream likely require a permit under state law¹⁹. Examples of common projects that may require a permit are: road and pedestrian crossings, utility crossings, storm water outfalls or basins, stream relocations and

¹⁶Clean Water Act and associated regulations set forth in Section 404

¹⁷ Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

¹⁸ According to Section 10 of the federal Rivers and Harbors Act.

¹⁹ [Part 301](#), Inland Lakes and Streams, of the NREPA.

enclosures, streambank stabilization, maintenance dredging, creation of a lake, and construction or maintenance of a pond.

Definitions of Inland Lakes and Streams According to State Law

Stream: a waterbody that has definite banks, a bed, and visible evidence of a continued occurrence of water. This includes streams that are natural or artificial features, including drains or impoundments.

Inland lake: A surface waterbody of greater than five acres. This includes lakes that are natural or artificial features, including drains or impoundments. This does not include the Great Lakes, Lake St. Clair, or a lake or pond that has a surface area of less than five acres. However, it should be noted that a surface waterbody of less than five acres in size may be regulated under the wetlands law.

Typical terms used to identify inland lakes and streams:

Ordinary high-water mark (OHWM): the line between upland and bottomland that persists through successive changes in water levels, and that can be seen by a characteristic mark on the land.

Bottomland: the area of land that lies below the OHWM and that may or may not be covered by water.



Figure 1 This picture shows where the character land is marked distinctly from the upland to denote the *Ordinary High-Water Mark*, below which is considered *bottomland*.

Activities Requiring a Permit

A permit is required for the following activities:

- Dredging or filling inland lakes and streams
- Constructing, enlarging, extending, removing, or placing a structure within inland lakes and streams
- Constructing, reconfiguring, or expanding a marina
- Creating, enlarging, or diminishing an inland lake or stream
- Structurally interfere with the natural flow of an inland lake or stream
- Constructing, dredging, extending, or enlarging an artificial canal, ditch, lagoon, pond, lake, or similar waterway through which the purpose is ultimate connection with an existing inland lake or stream, or where any part of the artificial waterway is located within 500 feet of the ordinary high-water mark of an existing inland lake or stream
- Connecting any natural or artificially constructed waterway, canal, channel, ditch, lagoon, pond, lake, or wetland with an existing inland lake or stream for navigation or any other purpose

A permit is required to construct or maintain a pond when it is connected to or within 500 feet of an inland lake or stream. However, it should be noted that even if the pond is not within 500 feet of an inland lake or stream, construction or maintenance activities may require a permit under the Wetlands

Protection law²⁰ if the pond is an acre or more in size, within a wetland, or connected to a wetland by either a permanent, seasonal, or intermittent surface water connection.

If an inland lake or stream is enlarged, diminished, or created, which would include the creation of a pond in line with a stream, or expansion of a lake area. An inline pond is when a pond is constructed where the stream flows through the pond itself. This is typically discouraged by the state because there is high potential for many negative effects on the stream such as pollutant loading, warming of water affecting fish and invertebrate populations, changes in sediment transport, flow velocity fluctuations, etc. This should not be a common practice for aquaculture facilities and if it is being considered, contact EGLE.

Where to Go for Help

If you have questions about the permitting requirements, go to the [Inland Lakes and Streams Permits website](#) or contact [Land/Water Interface Permitting staff](#).

PERMITS FOR WETLANDS PROTECTION

Wetlands serve many valuable functions such as flood and storm control, wildlife habitat, clean subsurface water resources, pollution treatment, erosion control, nutrient cycling, and economic and educational services. The Wetlands Protection Program is intended to protect these functions and out state's ecosystems. Activities that fill, dredge, drain, or use a wetland likely require a permit under state law²¹. Examples of common projects that require a permit include: road and pedestrian crossings, utility crossings, storm water outfalls or basins, residential/commercial/industrial developments, and construction or maintenance dredging of a pond.

Wetlands Regulated by the State

Wetlands are specifically defined in state law as "land characterized by the presence of water at a frequency and duration sufficient to support, and that under normal circumstances does support, wetland vegetation or aquatic life, and is commonly referred to as a bog, swamp, or marsh." The definition applies to public and private lands regardless of zoning or ownership.

Wetlands are regulated by the state if one of the following applies:

- Connected to or located within 1,000 feet of one of the Great Lakes or Lake St. Clair.
- Connected to or located within 500 feet of an inland lake, pond, river, or stream.
- More than five acres in size and not connected to one of the Great Lakes; Lake St. Clair; or an inland lake, pond, stream, or river.
- Contains the documented presence of a Threatened or Endangered Species.
- Is a rare and imperiled wetland.
- Is a "waters of the United States" as defined in the Federal Water Pollution Control Act.

²⁰ [Part 303](#), Wetlands Protection, of the NREPA and Wetlands Protection Rule [\[R 281.9219\(e\)\(iii\)\]](#)

²¹ [Part 303](#), Wetlands Protection, of the NREPA

Wetlands Identification

Because wetlands are identified according to site-specific conditions, an onsite inspection is necessary to determine if wetlands are present. Information like EGLE Wetland Inventory Maps, National Wetland Inventory Maps, county soil surveys, and aerial photos can provide indications of where wetlands *might* exist. However, these may not include all wetlands and may identify areas that once were, but no longer are, wetlands. As a result, the actual conditions on a property will always take precedence over any other information source.

Further, state law stipulates that the presence of a wetland be determined according to the technical wetland delineation standards as set forth in the U.S. Army Corps of Engineers' (USACE) [Wetland Delineation Manual \(January 1987 – Final Report\)](#) along with the [Midwest Regional Supplement \(August 2010\)](#) and the [Northcentral and Northeast Regional Supplement \(January 2012\)](#).

A wetland delineation is the physical marking in the field of the actual wetland boundaries and should be completed by a wetland professional to determine with certainty whether a site is or contains wetland. A wetland professional can be either a state employee or private consultant. EGLE's WRD has the Wetland Identification Program that offers wetland delineation services. This is a voluntary program, not required (see below for more information). If a private consultant is hired, it is up to them to show they are qualified to conduct wetland delineations. A list of wetland consultants and what to look for when hiring a wetland consultant is available on [EGLE's Wetland Consultants List website](#). EGLE does not endorse or recommend any consultant, nor do they verify the services they provide. Consultant simply submit to be included in the list.

The standards in the USACE manual use three attributes to determine the presence of wetlands:

1. Hydric soils (soils that have specific characteristics showing evidence of prolonged water),
2. Hydrophytic vegetation (plants adapted for living in wet areas), and
3. Wetland hydrology (indicators of water on the surface or within 12 inches below the ground surface).

Any area with all three attributes is a wetland by the federal and state definitions. The definition of wetland applies regardless of zoning or ownership.

EGLE's WRD's WIP is a fee-based program that offers two levels of service to identify wetland and upland areas on a property. For a Level 2 Identification, a Wetlands Specialist conducts an onsite review to determine the presence or absence of wetlands, and physically marks the wetland boundaries in the field. A Wetlands Specialist can also provide a Level 3 Identification, which is an onsite review to confirm specific wetland boundaries marked by a wetland consultant. Both Levels of service include a letter and map from EGLE summarizing the findings, which is guaranteed for a period of three years. Individuals interested in WIP services must submit a WIP application to the WRD, Wetlands, Lakes and Streams Unit. The WIP application and a fee calculator can be downloaded at from the [Wetland Identification Program website](#).

ACTIVITIES IN WETLANDS REQUIRING A PERMIT

The following activities are prohibited in regulated wetlands unless a permit has been obtained from EGLE:

- depositing or placing fill material in a wetland;
- dredging, removing, or permitting the removal of soil or minerals from a wetland;

- constructing, operating, or maintaining any use or development in a wetland; and
- draining surface water from a wetland.

EXEMPT ACTIVITIES FOR FISHPONDS IN WETLANDS

Farm or stock ponds are only exempt under the Wetlands Protection law for the purpose of irrigation of crops or watering of livestock associated with a farming operation. The term “livestock” under these regulations does not include fish.²²

Because aquaculture ponds are not included in this exemption, construction of a pond in a wetland would require a permit. Likewise, there are no exemptions for construction of buildings, whether they are farm buildings or any other type of building.

If you have questions about the permitting requirements under the Wetlands Protection law, visit EGLE’s [Protecting Michigan’s Wetland website](#) or contact [Land/Water Interface Permitting staff](#).

FLOODPLAINS AND FLOODWAYS

Definitions

100-year Floodplain: the land adjacent to a river, lake or stream that will be flooded by water at some point within 100 years. This has a one percent chance of occurring in any given year.

Floodway: the stream channel and the portion of the floodplain that is required to convey the flow of floodwater.

Permit Requirements

A permit is required for any occupation, construction, filling, or grade change within the 100-year floodplain of a river, stream, or drain with a drainage area of two square miles or more²³. Bridges and culverts are considered an occupation of the floodplain, as are activities that involve storage of materials in the floodplain. These activities are regulated to ensure channels and floodways are kept clear and uninhabited and that structures placed outside the floodway are properly protected from flood damage. Structures that are placed outside of the floodway portion of the floodplain must be properly protected from flood damage. This can be accomplished by elevating structures above the 100-year floodplain elevation or by designing non-residential structures to be watertight without human intervention.

Any fill placed in the 100-year floodplain requires a permit under state law. In certain situations, compensating cut for loss of flood storage may be required.

²² As part of Michigan’s administration of the Section 404 Program, EGLE must administer its program consistent with the Federal Clean Water Act. The Part 303 exemption [[Section 30305\(2\)\(g\)](#)] mirrors the exemption in [Section 404\(f\)](#) of the federal Clean Water Act (CWA). The CWA exemptions do not exempt aquaculture ponds. A 1990 EPA and USACE memo regarding the Section 404(f) agriculture exemption states that “construction of fish ponds is not an exempt activity.”

²³ [Part 31](#), Water Resources Protection, of the NREPA

Flood Insurance Rate Map

Many cities and townships within Michigan participate in the National Flood Insurance Program (NFIP). Those communities usually have a Flood Insurance Rate Map. If your site is located in the floodplain area (frequently designated as an “A Zone”), any new or substantially improved structure must have its first floor, including the basement, elevated above the 100-year floodplain elevation or flood-proofed to the elevation of the floodplain. Flood proofing must be done in a manner that the building is watertight and able to withstand hydrostatic pressures up to the 100-year floodplain elevation.

If you have questions about the permitting requirements under the Floodplains and Floodways law, please contact EGLE’s [Floodplain Management/National Flood Insurance website](#) or [Floodplain Engineering staff](#).

DAM SAFETY

Permits are required for dams with a height²⁴ of six feet or more and have an impounded surface area of five acres or more at the design flood elevation, according to the dam safety state law²⁵. A permit is also required to construct a new dam; enlarge an existing dam or impoundment; repair or alter a dam; remove a dam; abandon a dam; or reconstruct a failed dam. A licensed Professional Engineer must prepare, sign, and seal the construction plans, except for minor projects as defined in the dam safety state law²⁶ or for projects by non-profit organizations under certain circumstances.

If you have questions about the permitting requirements under the dam safety state law, please contact the [Dam Safety staff](#).

LAND-WATER INTERFACE PERMITTING PROCESS

To simplify the permit process for Michigan’s residents, the WRD has developed a [EGLE/USACE - Joint Permit Application](#) process with the USACE to jointly regulate activities at or near the land/water interface. Submittal of a single, completed EGLE/USACE - Joint Permit Application to the WRD ensures that permit applications will be processed by all appropriate agencies, including projects that require both EGLE and USACE authorization. Permit applicants need to only complete the portions of the application applicable to their proposed activities. The Joint Permit Application should be submitted through the online MiWaters tool where required attachments can be added, and the processing fee can be paid. Information on MiWaters is found on the [MiWaters website](#).

²⁴ “Height” means the difference in elevation measured vertically between the natural bed of a stream or watercourse at the downstream toe of the dam, or, if it is not across a stream channel or watercourse, from the lowest elevation of the downstream toe of the dam, to the design flood elevation or to the lowest point of the top of the dam, whichever is less.

²⁵ [Part 315](#), Dam Safety, of the NREPA

The WRD district offices review permit applications, conduct site inspections, and issue permits for regulated activities covered on the EGLE/USACE - Joint Permit Application. Technical assistance and permit review negotiations with the applicant conducted by field staff minimize negative impacts to natural resources. District staff may make a site inspection, collect comments, or ask for modifications to the proposal. During the application process, EGLE staff screen the project site for applicable regulations such as Threatened and Endangered Species, State Historic Preservation Sites, and Wild and Scenic Rivers and provide information and coordinate with the agencies responsible for those regulations. District offices also respond to complaints and conduct compliance activities.

Pre-Application Meetings

Pre-application meetings for proposed impacts to inland lakes, streams, wetlands, and critical dune areas are available upon request. Meeting with WRD district permit staff ensures that a complete and accurate application is submitted that avoids and/or minimizes potential impacts and proposes mitigation when resource impacts are unavoidable.

There is a fee for the pre-application meeting, with the exception of in-office meetings on single-family residential lots less than 1-acre size. For more information, go to the [Pre-application Meeting – Wetlands and Inland Lakes and Streams website](#).

Permit Timeframe

Permit application review timeframes vary by the type of project and timeframes are dictated by law²⁷. For all projects, there is an initial 30-day timeframe to determine if the application contains all the required information necessary for the project review to begin. Once the application is considered administratively complete, the review timeframe starts. If the project requires a public hearing, additional time will be required. The entire process can take up to 180 days for a complicated project; however, on average a permit decision is about 45 days.

Expedited Permitting Options

There are categories of projects that outline specific activities that qualify for expedited permitting. The permitting system is set up as a three-tier system with the bottom tier representing projects that include the least impacting activities, called [General Permit Categories](#). The middle tier represents slightly more complicated projects, called [Minor Project Categories](#). Finally, the top tier representing all

²⁷ [Part 13](#), Permits, of the NREPA

other projects that do not fit either of these groups are called Public Notice Projects. Each category has specific criteria required to meet that category. Please note that permit categories are updated periodically, so the most recent version should be consulted on the [Inland Lakes and Stream Permits website](#). Some expedited categories related to pond construction and aquaculture include the following:

Minor Project Category #29

- Construction or enlargement of ponds less than five acres in size
- Within 500 feet of inland lakes or streams with certain additional criteria
- Not for ponds in line with a lake or stream or ponds constructed in wetlands or a Great Lake

Minor Project Category #30

- Construction of a pond impacting not more than one-third acre of wetland
- Maintenance dredging of man-made ponds up to one acre in size, with certain additional criteria
- Not for pond construction involving an inland lake or stream or a Great Lake

Minor Project Category #28

- Farm buildings may be permitted under the “Pads for Farm Building and Farm Structures”
- This category is for wetland impacts up to maximum of 0.5 acre but impacts over 0.1 acre can only be approved under this category if the wetland impacts are to be mitigated by the use of approved wetland mitigation banking credits.
- This category cannot be used for impacts over 0.1 acres in areas where there are no approved mitigation banking credits available, nor does it include construction involving an inland lake, stream, or a Great Lake.

Minor Project Category #12

- New dredging of 25 cubic yards in 1,000 square feet of inland lake or stream may be permitted under this category.
- This category is not for activities conducted in wetlands or a Great Lake.

Minor Project Category #21

- Maintenance dredging of 1,000 cubic yards over a five-year period in previously dredged inland lakes or streams may be permitted under this category.
- This category is not for activities conducted in wetlands or a Great Lake.

General Permit Category X

- Maintenance dredging of 100 cubic yards over a five-year period from inland lakes or streams where a previous EGLE permit has been obtained, may be permitted under this category.
- This category is not for activities conducted in wetlands or a Great Lake.

Fees

The [fees for permit applications](#) vary significantly, depending on the scope of the project. Permitting fees are also tied to the permitting categories.

Where to Go for Help

The [WRD District staff](#) can answer questions regarding the EGLE/USACE - Joint Permit Application, MiWaters, and regulations.

Chapter 13 - National Pollutant Discharge Elimination System Permit

PURPOSE

The National Pollutant Discharge Elimination System (NPDES) program was established under the federal Clean Water Act “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”²⁸ The NPDES permit is a water quality permit that protects surface waters by helping to ensure that discharges of domestic and industrial wastewater comply with state and federal regulations. Public or private facilities that discharge or propose to discharge wastewater to the surface waters of the state²⁹ are required to obtain a valid NPDES permit prior to the wastewater discharge.

The NPDES permit describes:

- What the facility must do to protect water quality
- Limits on how much pollution can be discharged to maintain water quality
- The types of monitoring and reporting the facility must perform

APPLICABILITY

All facilities that meet the definition of a concentrated aquatic animal production (CAAP) facility are required to have an NPDES permit. The definition of a CAAP is divided into two parts: cold water fish species (e.g., trout and salmon) and warm water fish species (e.g., catfish, minnows, and sunfish).

Cold Water Fish Species in Ponds, Flow-Through, and Recirculating Aquaculture Systems

An NPDES permit is required if a facility meets all of the following criteria:

- The discharge to surface waters of the state is at least 30 days per year.
- Produce 20,000 or more pounds of fish per year.
- Feed more than 5,000 pounds of food during the calendar month of maximum feeding.

Warm Water Fish Species in Ponds, Flow-Through, and Recirculating Aquaculture Systems

An NPDES permit is required if a facility meets all of the following criteria:

- The discharge to surface waters of the state is at least 30 days per year.
- The facility is not a closed pond that only discharges during periods of excess runoff.
- Production is more than 100,000 pounds of fish per year.

²⁸ [Section 101\(a\)](#) of the Clean Water Act

²⁹ “surface waters of the state” mean all of the following: The Great Lakes and connecting waters, all inland lakes, rivers, streams, impoundments, open drains, and other surface bodies of water within the confines of the state but does not include drainage ways and ponds used solely for wastewater conveyance, treatment, or control.

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) may also designate any warmwater or coldwater aquatic animal production facility as a CAAP facility if it's determined that it is a significant contributor of pollution to surface waters.

DURATION OF AN NPDES PERMIT

The NPDES permit must be renewed every five years. EGLE has adopted a watershed approach known as the five-year basin plan where each watershed within the state is grouped into one of five separate basins. All of the NPDES permits within a particular watershed come up for renewal in the same basin year. The watershed approach allows EGLE to both reevaluate the cumulative water quality impact of all the permits in a watershed and coordinate permit requirements for the watershed, which facilitates the development and implementation of total maximum daily loads (TMDLs) for impaired waters. This process allows EGLE to allocate load limitations of problem pollutants for all the permitted facilities discharging into the same body of water. For more information about TMDLs, see Chapter 14.

COMPLETING THE NPDES APPLICATION IN MiWATERS

Instructions on how to complete the NPDES application in the web-based permit application referred to as MiWaters can be found in the document, [*“Completing an NPDES Permit Application in MiWaters – Guidance for Aquaculture Facilities.”*](#)

Chapter 14 - National Pollutant Discharge Elimination System: Determination of Effluent Limits, and Reporting and Monitoring Requirements

INTRODUCTION

This chapter will help you understand how the information you provided in the National Pollutant Discharge Elimination System (NPDES) permit application will be used to determine your permit requirements. It is a very technical discussion that will give you the needed background to have a better conversation with your permit writer.

The NPDES permit process establishes the effluent limitations (i.e., numerical limits) and special conditions that you are required to comply with to protect the water body you are discharging to and therefore impacting. The effluent limit tells the permit holder what amount of a parameter is allowed to be in its wastewater prior to being discharged to surface waters of the state.

Generally, permit writers will do the following to determine effluent limits for each permit:

- Determine applicable technology-based standards for effluents based on the federal Clean Water Act and U.S. Environmental Protection Agency's (USEPA) [Effluent Limit Guidelines](#). The technology-based standards are based on the category of the facility. Facilities are placed in categories based on industrial process or on the type of wastewater generated. Technology-based standards are national in scope and require a minimum level of wastewater quality attainable for similar facilities using proven, economically achievable technologies. Michigan has also implemented some statewide standards for some categories of facilities. These standards are based on the performance of treatment and control technologies and not on the impacts of pollutants upon the receiving waters.
- Determine the impact of pollutants on the receiving waters and whether water quality-based effluent limits (WQBELs) are needed by using a reasonable potential analysis to determine whether a discharge to a waterbody could lead to a pollutant concentration above an applicable water quality standard. The Clean Water Act requires that water quality standards be maintained in the waters of the United States. Water quality standards are promulgated by the states and evaluated for each permitted discharge on a site-specific basis. The Michigan standards are designed to not only protect aquatic life (fish, invertebrates, and other animals) and recreation (swimmable), but for all other uses of the receiving waters, including agriculture, public and industrial water supply, and navigation.

The permit writer will complete the permit with final effluent limitations and monitoring and reporting requirements. What follows is a more in depth look at each of these determinations and how they specifically apply to aquaculture facilities.

DETERMINE APPLICABLE NATIONAL TREATMENT TECHNOLOGY-BASED STANDARDS

Treatment technology-based standards set an expected performance level for a particular industry. Effluent limit guidelines (ELGs) are national standards for wastewater discharges to surface waters and to Publicly Owned Treatment Works (POTW). The standards are based on the performance of treatment technologies and practices. The USEPA develops ELGs for categories of existing sources and new sources under the Clean Water Act (CWA). ELG's help create a level playing field for facilities across the country – each facility must achieve these minimum parameter-specific standards no matter where they are located. They also help ensure a consistent level of water quality protection throughout the country.

On June 30, 2004, the USEPA established ELGs for the Concentrated Aquatic Animal Production (CAAP) point source category for both new and existing facilities. The definition of a CAAP facility can be found on Page 25. Unlike most ELGs, the [CAAP ELGs](#) do not contain quantitative numeric technology-based effluent limits (TBELs). Rather they contain narrative Best Management Practices (BMPs). BMPs are various operational and management measures implemented at a facility that reduce the discharge of pollutants. CAAP facilities subject to the ELGs must develop and maintain a BMP plan describing how they will meet the ELG requirements.

In addition to the national ELG standards for CAAP facilities, EGLE has historically required statewide standard effluent limitations for total suspended solids (TSS) in NPDES permits for aquaculture facilities. The statewide standard TSS effluent limitation of six milligrams per liter (mg/l) as a daily maximum will apply to any aquaculture facility with an NPDES permit that discharges wastewater to the surface waters of the state.

What aquaculture facilities are subject to the CAAP ELGs and what areas of the facility do they apply?

CAAP facilities subject to the ELGs are defined as facilities (flow through, recirculating, pond, and net pen) that directly discharge wastewater at least 30 days a year and produce 100,000 pounds or more of aquatic animals per year. An operation may be classified as a CAAP facility and required to have the discharge authorized under a NPDES permit (i.e., 20,000 pounds of cold water fish produced per year), but below the production level (i.e., 100,000 pounds of cold water fish produced each year) where coverage under the ELGs is required.

The CAAP ELGs apply to the production areas of your facility, including:

- Areas where you might grow, maintain, or contain aquatic animals (raceways, tanks, ponds, or net pens.)
- Areas where you store raw materials (feed silos and storage areas designated for feed or drugs)
- Areas where you contain waste (sedimentation basins, quiescent zones, and settling ponds)
- Source water and wastewater conveyance systems (tailraces and headraces).

What are the ELGs for CAAP Facilities?

As stated above, the ELGs for CAAP facilities require you to develop, implement, and maintain a plan onsite that describes how you will manage the following operational and management measures, or BMPs:

Solids Control

- **Feed:** employ feeding practices which optimize the addition of feed to achieve production goals while minimizing the amount of uneaten feed and waste products leaving the rearing unit.
- **Waste:** implement a program of routine cleaning of rearing units and off-line settling basins and procedures for minimizing the discharge of accumulated solids during the movement of aquatic animals within and out of the production system.
- **Mortalities:** meet requirements for the removal and disposal of aquatic animal mortalities on a regular basis to prevent discharge to the waters of the state.

Material Storage

Address material storage to ensure the proper storage of drugs, pesticides, and feed in a manner designed to prevent spills and discharges to the waters of the state, including the procedures for the proper disposal of any spilled materials.

Structural maintenance

Identify a program for the routine inspection and maintenance schedule for the production facility.

Recordkeeping

Maintain records for rearing units documenting the feed amounts and estimates of the number and weight of aquatic animals. Records shall be maintained documenting all cleaning, inspections, and maintenance conducted at the facility.

Training

Train all staff on proper feeding procedures, spill prevention and response, and procedures for cleaning production systems and wastewater treatment systems.

Reporting

- **Report use of any investigational new animal drug (INAD) and extra-label drug that leads to discharge.** Reporting is not required for an INAD or extra label drug use that has been previously approved by the FDA for a different aquatic animal species or diseases if the INAD or extra-label use is at or below the approved dosage and involves similar conditions of use.
- **Failure leading to release:** Report the failure or damage to a structure of an aquatic animal containment system resulting in unanticipated material discharge.
- **Spill:** Report the spill of drugs, pesticides, or feed that results in a discharge to waters of the state.

If your aquaculture facility is subject to the CAAP ELGs, these requirements will be identified in a special condition in your NPDES permit.

DETERMINE APPLICABLE WATER QUALITY STANDARDS³⁰

Water quality standards are developed by each state to protect the water quality of its rivers, lakes, streams, and wetlands. There are three components to the water quality standards: 1) designated uses for the waters, 2) the criteria that set out the minimum protections needed for the designated uses, and 3) the antidegradation policy. NPDES permits include water quality-based effluent limitations as necessary to achieve water quality standards.

1. Designated Uses

In Michigan, there are seven designated uses that must be protected and that apply to all water bodies, all of the time.

- Agriculture
- Navigation
- Industrial water supply
- Warm water fishery
- Other indigenous aquatic life and wildlife
- Partial body contact recreation (year-round)
- Fish consumption

Additionally, all water bodies are protected for total body contact recreation from May 1 to October 31.

Designated uses that apply to certain water bodies include:

- Cold water fisheries (in Great Lakes and connecting channels as well as in cold water streams and lakes named in the [Michigan Fishing Guide](#)).
- Public water supply (in waters named in the “[Public Water Supply Intakes in Michigan](#)” publication, as well as in the Great Lakes and connecting channels).

2. Water Quality Criteria

States adopt criteria, both numeric and narrative (describing desired conditions) sufficient to protect the designated uses.

In accordance with [R 323.1057](#), numeric water quality criteria are developed for specific parameters to protect aquatic life and human health and in some cases wildlife from the deleterious effects of pollutants (e.g., 180 micrograms per liter or parts per billion, of formaldehyde as a monthly average to be protective of aquatic life). Water quality standards also include other criteria for parameters that are not chemical constituents such as the protection of aquatic life through temperature, dissolved oxygen, and pH criteria.

Under [R 323.1057\(4\)](#), human health criteria for toxic pollutants are designed to protect people from exposure, which can result from consumption of fish. Criteria for microorganisms have also been developed for the protection of human health with *E. coli* used as the indicator to protect the body contact recreation designated uses.

³⁰ [Part 4](#). Water Quality Standards, R 323.1041 – 323.117

Narrative criteria can be the basis for limiting specific pollutants for which the state does not have numeric criteria and thus supplement numeric criteria. They are statements that describe the desired water quality conditions such as “the surface waters of the state shall not have any of the physical properties (e.g., turbidity, color, suspended solids, oil films, etc.) in unnatural quantities which are or may become injurious to any designated use ([R 323.1050](#)).” Similarly, Michigan’s narrative nutrient criteria states that “nutrients shall be limited to the extent necessary to prevent stimulation of growths of aquatic rooted, attached, suspended, and floating plants, fungi or bacteria which are or may become injurious to the designated uses of the surface waters of the state ([R 323.1060\(2\)](#)).”

The following table summarizes the water quality criteria and their associated rules. All of the rules in the table are located in the [Michigan Administrative Code’s website](#).

CRITERIA	RULES
Dissolved oxygen	R 323.1064 and R 323.1065
Dissolved solids	R 323.1051
Microorganisms	R 323.1062
Nutrients	R 323.1060
pH	R 323.1053
Physical characteristics	R 323.1050
Temperature	R 323.1069 - 323.1075
Toxic substances	R 323.1057

3. Antidegradation Policy

An antidegradation policy is part of the state’s water quality standards and provides a framework to be used in making decisions about proposed activities that will result in lowering of water quality ([R 323.1098](#)). This ensures decisions to allow reductions in water quality are made in a public manner and serve the public good while remaining protective of designated uses.

- In waters where the designated uses are not attained, the water quality shall not be further lowered by allowing point or nonpoint discharges of the pollutant causing the nonattainment.
- In waters where the water quality is higher than that required by the water quality standards, the high quality should be maintained unless a demonstration is made that important economic or social development requires lowering the water quality, but not below water quality standards.
- In waters determined to be outstanding state resource waters, water quality cannot be lowered ([R 323.1098\(5\)](#)).

WATERS NOT MEETING THE WATER QUALITY STANDARDS

When a lake or stream does not meet water quality standards and fails to support one or more designated uses, mechanisms are in place to address regaining designated use attainment. Occasionally site-specific issues may be remedied through a clean-up or additional controls on a sole pollutant source may address the water quality issue. More commonly, however, causes are more

diffuse and a study must be completed to determine the amount (load) of a pollutant that can be put in a water body from point sources and non-point sources, including a margin of safety, to meet the water quality standards. A [Total Maximum Daily Load \(TMDL\)](#) is the document that describes the process used to determine how much pollutant load a lake or stream can assimilate and how it is partitioned amongst sources.

How is it decided which water bodies need Total Maximum Daily Loads?

The Clean Water Act requires each state to develop a list of water bodies not meeting the water quality standard. The list is public noticed and updated every two years and included in the Integrated Report, a biennial report to the USEPA on the state's water quality. The [Integrated Report](#) satisfies the listing requirements of [Section 303\(d\)](#) and the reporting requirements of Section 305(b) and 314 of the Clean Water Act. The Section 303(d) list includes Michigan water bodies that are not attaining one or more designated use and require the establishment of Total Maximum Daily Loads (TMDLs) to meet and maintain water quality standards.

Each state identifies water bodies within its boundaries, which are not supporting designated uses and the contributing cause(s) (e.g., excess nutrients) as identified through monitoring data. To identify these lakes and streams in Michigan, we rely on recent, reliable water quality data from a variety of sources. Our methods for determining whether a water body supports its designated uses can be found in the Integrated Report. These methods for assessing designated use support are updated every two years in a process that involves review and comment by the public and USEPA.

Who is responsible for developing TMDLs in Michigan and how are they developed?

EGLE's Water Resource Division is responsible for developing TMDLs. A TMDL is developed by determining the maximum daily load of a pollutant that a water body can assimilate and still meet water quality standards. Generally, a TMDL begins by collecting and analyzing water quality data to determine the extent of the issue and the contributing cause(s). EGLE then identifies and determines:

- the pollutant waste load allocations (WLAs), the load from all point sources (discharges to surface waters that hold a National Pollutant Discharge Elimination System (NPDES) permit),
- the load allocations (LAs), those from nonpoint sources (diffuse sources, such as land-applied manure from a small farm),
- and the TMDL must include a margin of safety (MOS) to account for uncertainty, and reserve capacity. Seasonal differences are also considered.

Load Capacity (or TDML) = WLAs + LAs + MOS

Following development of a draft TMDL, it is noticed for public comment. After making any appropriate modifications in response to the public comment, the TMDL is sent to the USEPA for approval. Required pollutant load reductions from point source discharges in a TMDL watershed are implemented through existing programs, such as permits. Non-point sources of pollution are reduced mainly through voluntary programs and the work of local stakeholders. Nonpoint source work in TMDL watersheds can be funded by grants such as federal grants available under [Section 319](#) of the Clean Water Act. The efforts to clean-up nonpoint sources of pollution are often led by local agencies such as conservation districts or watershed councils.

CHARACTERIZING EFFLUENT AND RECEIVING WATER

After determining the most current, approved water quality standards that apply to a waterbody, the permit writer characterizes both the effluent discharge and receiving water. The information from that characterization is used to determine whether water quality-based effluent limits (WQBELs) are required and, if they are required, it is used to calculate the WQBELs for inclusion in a permit.

Characterization occurs in five steps:

1. Identify **pollutants of concern** in effluent. There are five categories of pollutants of concern:
 - Pollutants with technology-based effluent limits (TBELs). The permit writer needs to figure out whether more stringent limitations than the applicable TBELs are needed to prevent an excursion above water quality standards in the receiving waters. The concentrated aquatic animal production (CAAP) effluent limit guidelines (ELGs) do not contain TBELs, but Michigan uses a state-wide standard daily maximum concentration of six mg/l for total suspended solids for aquaculture facilities.
 - Any pollutant for which a waste load allocation has been assigned to the permitted facility through a TMDL.
 - Pollutants that were identified as needing WQBELs in the discharger's previous permit.
 - Pollutants identified as being present in the effluent through effluent monitoring. Effluent monitoring data are reported in the discharger's NPDES permit application, discharge monitoring reports, and special studies. EGLE may collect data through compliance inspection monitoring. Permit writers can match information on which pollutants are present in the effluent to the applicable water quality standards to identify parameters that are candidates for WQBELs.
 - Pollutants otherwise expected to be present in the discharge. This determination may be based on the evaluation of raw materials or water treatment additives. The permit writer will have a strong basis for expecting a pollutant to be present in the discharge.
2. Determine whether water quality standards provide for consideration of a dilution allowance or mixing zone.
3. Select an approach to model effluent and receiving water interactions. There are numerous models and calculations available for evaluating the discharge of pollutants to a receiving water.
4. Identify effluent and receiving water critical conditions for input into the water quality model. Effluent flow is a critical design condition (e.g., maximum daily flow, maximum of the monthly average flows or facility design flow). If a discharge is controlled so that it does not cause water quality criteria to be exceeded in the receiving water during the driest, critical low flow (drought) conditions, the discharge controls will be sufficient to ensure water quality criteria, and thus designated uses are protected under all receiving water flow conditions. Permit writers will also determine background concentrations of pollutants of concern in the receiving water as well as other water conditions.
5. Establish an appropriate dilution allowance or mixing zone. A mixing zone is a limited area or volume of water where the initial dilution of a discharge takes place and within which the water quality standards allow certain water quality criteria to be exceeded. Permit writers establish the maximum dilution allowance or mixing zone allowed by the water quality standards for each pollutant of concern. Some standards may not allow a dilution allowance under any condition.

DETERMINE THE NEED FOR WQBELS

After determining applicable water quality standards and characterizing the effluent and receiving water, the permit writer determines whether WQBELS are needed. The USEPA recommends that monitoring data be generated before effluent limitation development whenever possible. A reasonable potential analysis is used to determine whether a discharge to a waterbody, alone or in combination with other sources of pollutants, and under a set of conditions arrived at by making a series of reasonable assumptions, could lead to a pollutant concentration above an applicable water quality standard.

1. Determine the appropriate water quality model – models may consider the impact of a discharge on a receiving water modeled under critical (drought), seasonal, or steady state conditions.
2. Determine the expected receiving water concentration under critical or ambient conditions.
3. Answer the question, Is there reasonable potential? If the receiving water pollutant concentration projected by the model exceeds the applicable water quality criterion, there is reasonable potential and the writer calculates WQBELS. When a pollutant is part of a waste load allocation from a TMDL, the permit writer must develop WQBELS consistent with the assumptions of the TMDL. The permit writer can conduct the reasonable potential analysis with estimated data.

FINAL EFFLUENT LIMITATIONS

If the permit writer determines that a pollutant is discharged at a level that will cause or have reasonable potential to cause or contribute to an excursion above any state water quality standard, the writer must develop WQBELS for that pollutant parameter.

The process involves a complex set of calculations that are site-specific, and currently there is no “tool” available to commercial operators. Those seeking a permit are required to provide EGLE with their best estimates of discharge quality and loads, which are then entered into the calculations by EGLE.

The permit writer, together with aquatic biologists and stream modelers, decide which parameters require limits. Sometimes a limit is not necessary, but further monitoring is required to gain more information about the quality of the facility's effluent. An effluent limitation is calculated for each parameter by using the standard and discharge flow information for the source. The resulting site-specific limitation is called a WQBEL.

SAMPLE PERMIT³¹

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PART I

Section A. Limitations and Monitoring Requirements

1. Final Effluent Limitations, Monitoring Point 001A

A During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge treated municipal wastewater from Monitoring Point 001A through Outfall 001. Outfall 001 discharges to the Boardman River. Such discharge shall be limited and monitored by the permittee as specified below.

Parameter	Maximum Limits for Quantity or Loading				Maximum Limits for Quality or Concentration				Frequency of Analysis	Sample Type
	Monthly	7-Day	Daily	Units	Monthly	7-Day	Daily	Units		
Flow	(report)	---	(report)	MGD	---	---	---	---	Daily	Report Total Daily Flow
Carbonaceous Biochemical Oxygen Demand (CBOD ₅)	1800	2800	---	lbs/day	25	40	---	mg/l	5/Week	24-Hr Composite
Total Suspended Solids	2100	3200	---	lbs/day	30	45	---	mg/l	5/Week	24-Hr Composite
Ammonia Nitrogen (as N)										

A. This section sets out the authority to discharge under the conditions in the permit, identifies receiving water, and typically identifies the maximum authorized flow rate for the discharge.

B. **Effluent limits** come in two forms: load limits and concentration limits.

Load limits (called maximum limits for quantity or loading in the permit) set the total mass by weight of a parameter that can be released from a facility each month, week, or day. These limits are measured often in pounds per day (lbs./day).

Concentration limits (called Maximum Limits for Quality or Concentration in a permit) define the amount of pollutant by volume in the discharge. The limits are often measured in milligrams per liter (mg/l) or micrograms per liter (µg/l).

Load and concentration limits should relate mathematically. The load limit is equal to the concentration limit multiplied by the flow from the facility and a conversion factor to make the units consistent (sometimes the load limit is set independently from, or in place of, a concentration limit). You can calculate the load limits for parameters into pounds per day from a concentration in milligrams per liter and a flow measured in million gallons per day (MGD) using the following formula.

$$\text{Load (lbs/day)} = \text{Concentration (mg/l)} \times \text{Flow (MGD)} \times 8.34$$

C. **Periods of Time**

The effluent limitations are measured based on monthly, weekly (seven day) or daily time periods. Some limits set absolute maximums during that time period. For example, pH limitations include a daily maximum of 9 and a daily minimum of 6.5. This means that on any given day, the pH cannot be higher than 9 or lower than 6.5.

³¹ From "A Citizen's Guide to Water Quality Permitting," produced by Tip of the Mitt Watershed Council, 2005.

Some limits set the average level of the parameters over a period of time. For example, in this permit, there is a load limit for total suspended solids of 3,200 lbs./day, averaged over a seven-day period. This means that the average amount of TSS discharged during the one-week period cannot exceed 3,200 lbs./day. On any given day, it could be more than 3,200 lbs./day, but over the week it cannot average more than 3,200 lbs./day.

D. Frequency of Analysis

This part of the permit sets how often the permit holder must test to see if the discharge is meeting the effluent limitation. In this permit, the flow must be sampled each day (note: while the design flow is identified in the sentence under the chart of effluent limitations for this example, it will be identified in A above for an aquaculture permit); total phosphorus must be sampled three times a week. Typically, more frequent monitoring will be required for newly authorized discharges or for permits that are expecting to significantly increase production over the term of the permit. Sometimes the frequency of analysis may decrease in a reissued permit if the permit holder has demonstrated long-term, consistent compliance, or amounts of a parameter are below regulated levels.

Likewise, for permit holders who have experienced compliance issues, the required frequency of analysis should reflect that history. More frequent sampling can produce sufficient information about the amounts of a parameter to better categorize the waste stream and reduce the need for a reasonable potential analysis.

E. Sample Types

There are various sample types specified in a permit. This example permit includes composite and grab samples. A composite sample is made up of two or more individual samples taken from the discharge. A grab sample is a single sample collected at a given moment, resulting in a snapshot of the discharge quality. Another sample type used by EGLE is a flow proportional sample, where samples are taken when flow increases and smaller samples when flow decreases. Other sample types include 3-portion composite, reading, calculation, or visual assessments. The sample types required in the permit will be set appropriately given the parameter being monitored and the site-specific conditions of the discharge.

COMMON PARAMETERS MONITORED AT AQUACULTURE FACILITIES

- Total phosphorus
- Total suspended solids
- pH
- Formaldehyde (Formalin)
- Total Residual Chlorine (Chloramine-T)

The permit typically specifies that these parameters shall be monitored regularly during discharge at a specified monitoring frequency. In some cases, the permit may specify that some of these parameters be monitored under a short-term waste characterization study. This is often done to better characterize the discharge or provide confirmation that the parameters in the study are being discharged below levels of concern.

Often, aquaculture permits will include net limitations for total suspended solids or total phosphorus. The use of net limitations is a site-specific determination which is used to not penalize the permittee for that portion of the effluent which originates from the source water. To qualify for net limits, both the source water and receiving water for the discharge must be the same body of water. Also, the permittee is only allowed credit for that portion of the parameter in the intake water which is still present in the discharge. Therefore, intake samples shall be collected after any treatment processes are used on the intake water, and adjustments may also be made to account for removal by the effluent treatment technologies. Intake samples may also be collected to determine background concentrations for certain parameters in the source water.

Some permits contain seasonal average effluent limitations for total phosphorus. These limits may be used to set longer term goals for phosphorus levels which may be more restrictive than the monthly average limitations.

MONITORING AND REPORTING

Permits have provisions for monitoring and reporting. Monitoring is the responsibility of the permit holder. They can conduct their own monitoring and analysis, or they may contract with someone else to provide these services. The permit will identify the minimum monitoring frequency for which each parameter is required to be monitored; the permittee may collect additional samples as desired. Monitoring frequencies will typically be identified as either daily, 3 or 5 times per week, weekly, monthly, quarterly, or annually. The permits also contain standard conditions specifying reporting requirements. The permit holder will be required to submit monitoring reports to EGLE monthly. These reports are submitted electronically through MiWaters on discharge monitoring report (DMR) forms; they include both daily samples and monthly summaries. Failure to submit a monthly report on a timely basis is a permit violation. Permits state that all records must be retained for at least three years.

Permits also require the permit holder to file compliance notifications for every compliance action noted in the permit. Noncompliance that might endanger human health or the environment (including exceeding any maximum daily concentration discharge limitations) must be reported verbally within 24 hours. Any other instance of noncompliance shall be reported with the monthly monitoring reports.

PERMITTING PROCESS

Draft Permit Components

COVER PAGE

This page typically contains the name, owner, and location of the facility, a statement authorizing the discharge, and the specific locations for which a discharge is authorized. It also contains a permit number, permit issuance and expiration dates, annual fee classification, EGLE contact information, and a statement that anyone aggrieved can file a petition to challenge the permit within 60 days of issuance.

PART 1. Section A. Limitations and Monitoring Requirements.

This part identifies the effluent limitations and requirements specific to the permitted facility. This section may include:

- Final Effluent limits and Monitoring – The primary mechanism for controlling discharges of pollutants to receiving waters is setting effluent limits. Permit writers spend a majority of their time deriving appropriate effluent limits based on applicable technology-based and water quality-based standards. Monitoring is used to characterize waste streams and receiving waters, evaluate wastewater treatment efficiency, and determine compliance with permit conditions.
- Request for Discharge of Water Treatment Additives
- Short-Term Waste Characterization Studies
- Best Management Practices Plan for Concentrated Aquatic Animal Production
- Facility Contact Requirements
- Other conditions as needed.

PART 2. Standard Conditions

Pre-established conditions that apply to all NPDES permits and delineate the legal, administrative, and procedural requirements of the permit. Many of the requirements included in this section are not applicable to every facility. This section includes:

Section A. Definitions

Section B. Monitoring Procedures

Section C. Reporting Requirements

Section D. Management Responsibilities

Section E. Activities Not Authorized by This Permit

Final Approval Process

Once the application is deemed complete, EGLE has 180 days to decide to grant or deny the proposed permit. EGLE will develop either a draft permit, or a permit denial, that will be provided for review, first by the applicant and then the public, when it is placed on a 30-day public notice. The draft permit and related documents are posted at the facility (or local public building) and on the MiWaters website: <https://miwaters.deq.state.mi.us/>. Click on public notice search.



Public notice allows 30 days for submittal of comments from interested parties. During public comment, persons can request a public meeting or hearing. After the permit has completed public notice requirement EGLE will evaluate all concerns and comments received during the public notice period. If EGLE determines the necessity to have a public meeting, hearing, or both, it will public notice the event, which may extend the application processing time.

A public meeting provides a forum for the public to ask questions, gain greater understanding, and express concern for the proposed permit and discharge. Public hearings provide a forum in which the public provides comment for the record, but EGLE does not respond to testimony. All comments received are a part of the permanent record for the permit. A responsiveness summary is prepared after the close of the record following a Public Hearing and Public Meeting.

EGLE will evaluate all the comments received on the draft permit or permit denial, make any appropriate revisions, and prepare a proposed permit for issuance or denial. If all issues have been resolved, the decision maker, usually the Permit Section Manager, will decide whether to issue the proposed permit.

For 60 days following the issuance or denial of the permit, any aggrieved party may file a petition for a contested case hearing. If the permittee contests the issued permit, the permit is usually stayed. If a permit is contested by a third party, then the permit will remain in effect as the control document until deemed otherwise by an Administrative Law Judge (ALJ). If an issued permit is contested, the Department may hold informal discussions with the aggrieved parties to resolve the issues. If necessary, an evidentiary contested case hearing may be held in front of an ALJ. Following the hearing, the ALJ evaluates the briefs, reviews the testimony, and issues a Proposal for Decision (PFD) which will include the findings and the conclusions of law. This will be the final decision and order for the department. Any party to the case could seek review of the final decision and order by a three-person Panel selected from the [Environmental Permit Review Commission](#). The Panel's review would be limited to the record established by the administrative law judge. The Panel could adopt, remand, modify, or reverse, in whole or in part, a final decision and order. The Panel's decision would become EGLE's final decision. Judicial review of the FDO is available through appeals to the circuit court.

ADDITIONAL RESOURCES

[A Citizen's Guide to Water Quality Permitting](#) – Produced by the Tip of the Mitt Watershed Council in 2005. Although a little dated, it contains a good overview of the National Pollutant Discharge Elimination System (NPDES) program.

[Aquaculture in Michigan – Roadmap through Regulation](#) – Authored by Originz, LLC in 2012. It contains a “roadmap” for the aquaculture sector to understand the underlying regulatory framework for operation expansion and new farm enterprise development.

[Compliance Guide for the Concentrated Aquatic Animal Production Point Source Category](#) – A U.S. Environmental Protection Agency document created in 2006 that explains the NPDES permit requirements and related effluent guideline regulation for the facilities that produce 100,000 pounds or more of aquatic animals per year.

[Effluent Limitation Guidelines and New Performance Standards for the Concentrated Aquatic Animal Production Point Source Category: Final Rule](#) – This is the regulation as it appears in the Federal Register on August 23, 2004.

[NPDES Permit Writers' Manual](#) – Written by the U.S EPA and released in 2010. This document is a reference for permitting authorities that outlines and explains the core elements of the NPDES program. If you want to learn more about effluent limits, read this manual.

[Water Permitting 101](#) – Produced by the U.S. EPA's Office of Wastewater Management. It is a high-level overview of the NPDES program.

[Water Quality Parameters](#) – A link to EGLE's website containing detailed information about water quality parameters such as Biochemical Oxygen Demand (BOD) and that may require limits in NPDES permits.

[Webinar – Introduction to MiWaters for Facilities Covered under a National Pollutant Discharge Elimination System \(NPDES\) Permit \(recorded 11/18/15, 80 minutes\)](#) – The information contained in this EGLE webinar can help a person navigate through MiWaters.

Appendix 1 - Michigan Department of Natural Resources (DNR) Fish Health Testing Requirements for Importation into Michigan of Aquaculture Destined for Stocking of Fish into Public Waters of Michigan, and Baitfish Certification

SAMPLING AND TESTING

- Sample collection must be conducted by one of the following:
 - A veterinarian who is licensed and U.S. Department of Agriculture accredited
 - A Department of Natural Resources (DNR) Fisheries Division employee approved by the DNR Competent Fish Health Authority or designee
 - A state, federal or tribal fisheries agency employee approved by the DNR Competent Fish Health Authority or designee
 - An American Fisheries Society – Fish Health Section (AFS-FHS) Certified Fish Health Inspector or Fish Pathologist
 - Any other qualified individual acceptable upon consultation with the DNR Competent Fish Health Authority or designee
- Samples should be shipped live whenever possible. Fresh on ice is acceptable if holding time is less than 24 hours from death until arrival to the laboratory for immediate processing. Frozen samples should only be used in consultation with DNR Competent Fish Health Authority or designee.
- Arrange all submissions with the receiving lab prior to fish collection
- Sample processing laboratories should be selected in consultation with DNR Competent Fish Health Authority or designee prior to collecting samples.
- The following laboratories are acceptable and do not need additional consultation:
 - Michigan State University – Aquatic Animal Health Laboratory
 - Kennebec River Biosciences
 - State of Ohio Department of Agriculture – Animal Disease Diagnostic Laboratory
 - Wisconsin Veterinary Diagnostic Laboratory
 - Fish Diseases Diagnostic Laboratory University of Arkansas – Pine Bluff
 - University of Minnesota Veterinary Diagnostic Laboratory
 - Washington Animal Disease Diagnostic Laboratory
 - Fish Vet Group
- Minimum numbers of fish to be sampled are outlined in Table 1.
 - Exception: Minnow collection areas within Michigan with continuous positive Viral Hemorrhagic Septicemia virus (VHSV) sample results will require lot sample sizes of 150 fish. Affected entities in these areas will be notified of the need for the higher sample size. At the time of this writing, the higher sample size is required for waters in Saginaw Bay and the St. Clair River to Lake Erie corridor. **Consult with DNR Competent Fish Health Authority or designee to determine what is needed for your situation at DNR-Fisheries@michigan.gov or call 517-284-5830.**

- The testing strategy for a farm-level certification will depend on the configuration your facility and should be approved by DNR, prior to sampling. Facilities that have been approved for farm-level inspection in the past by DNR’s Fisheries Division can continue to do so using the annual testing listed in the tables below. At minimum, three consecutive years of detailed fish health history will be needed in order for DNR’s Fisheries Division to accept farm-level certifications for facilities that wish to start using farm-level inspections. For further information on whether or not they qualify for farm-level certification, operators should contact the MI DNR Competent Fish Health authority at DNR-Fisheries@michigan.gov or call 517-284-5830.
- All fish health certifications are valid for one year from the date of the fish health inspection results, if no additional fish are added to the inspected lots and adequate biosecurity measures are in place to ensure lot separation at the facility. If new fish are added, new fish health inspections and certifications are required following the guidance in this document.

Table 1: Number of fish required for testing by source.

Source of Fish	Minimum Number to Test by Species (see details below) ¹	Minimum Number to Tested for Farm Level (see details below)
Aquaculture facility with minimum 3 consecutive years health history demonstrating the absence of pathogens that are required for testing (Table 2)	60 fish per species for viruses and bacteria ² with a minimum of 120 fish per facility and 60 fish per species for parasites ³	170, preferably with 60 fish from the species to be imported or stocked in Michigan waters
Aquaculture facility with unknown or incomplete health history over past 3 consecutive years.	150 fish per species for viruses and bacteria ² and 120 fish per species for parasites ³	To Be Determined, consult with DNR fish health staff
Wild fish collections or transfers - Michigan waters or out-of-state waters with a known fish health history	120 fish per species for viruses and bacteria ² and 60 fish per species for parasites ³	N/A
Wild fish from out-of-state waters with an unknown fish health history	150 fish per species for viruses and bacteria ² and 60 fish per species for parasites ³	N/A
Baitfish from Michigan waters or out-of-state waters with a known fish health history, except as noted below*	120 fish per species for viruses and bacteria ² and 60 fish per species for parasites ³	N/A
Baitfish from out-of-state sources with unknown fish health histories	150 fish per species for viruses and bacteria ² and 60 fish per species for parasites ³	N/A

¹ See Table 2 and the Required Pathogen Testing Section for pathogens required by species.

² Viruses include VHSV, Infectious Hepatic Necrosis virus (IHNV), Infectious Pancreatic Necrosis Virus (IPNV), Large Mouth Bass virus (LMBV), and/or Channel Catfish virus (CCV) depending on the species as noted below. No bacterial testing is required at this time.

³ Parasites include Myxobolus cerebralis and/or Heterosporis sp. (HSP).

REQUIRED PATHOGEN TESTING

- Pathogen testing outlined in Table 1 will be completed on all fish submitted.
- Pooling of fish in pools of five fish is acceptable for all pathogens except for *Heterosporis* sp. (e.g. a 120 fish sample for fathead minnows being imported into our state for baitfish will have 24 5-fish pools of samples for virus analysis, and 60 individual fish inspected for *Heterosporis* sp.).
- *Minnows harvested within Michigan waters only need to be tested for Viral Hemorrhagic Septicemia virus using the wild fish sample sizes in Table 1, except in known positive VHSv areas where the sample size will be 150 fish for virology.
- Pathogen testing requirements by species are listed in Table 2, except for the following additional requirements not included in Table 2:
 - All juvenile and adult salmonids originating west of the western borders of Minnesota, Iowa, Missouri, Oklahoma and Texas must also be tested for Proliferative Kidney Disease (PKD) using a minimum sample size of 120 fish per species.
 - All juvenile and adult salmonids originating east of the eastern borders of New York must also be tested for all variants (e.g., HPR0 and HPR-deleted) of Infectious Salmon Anemia virus (ISAv) using a minimum sample size of 150 fish per species.
 - Salmonid eggs originating east of the eastern borders of New York must come from a facility where broodstock fish have tested free of all ISAv variants using a minimum sample size of 150 fish per species for three consecutive years.
 - All minnows originating west of the Minnesota-Wisconsin state line and the Mississippi River must test free for Fathead Minnow Nidovirus (FHMNV) and Golden Shiner Reovirus (GOSv) using a minimum sample size of 120 fish for facilities with known fish health histories and 150 fish for facilities with unknown fish health histories.
- Samples for parasitological analyses can be collected from the same fish examined for viruses and bacteria.
- All testing that follows procedures outlined in the AFS-FHS Blue Book or OIE Manual of Diagnostic Tests will be accepted by DNR's Fisheries Division. Any other testing methodology will require consultation with DNR's Fisheries Division Fish Health staff.
 - For Viral Hemorrhagic Septicemia virus (VHSv) testing:
 - Isolation on cell culture followed by confirmation is accepted by the Michigan DNR Fisheries Division as the primary method of VHSv detection. At minimum, two cell lines should be used along with a positive control. The preferred cell line is EPC, plus FHM or another second susceptible cell line (e.g., CHSE or BF-2) at 15°C. Other cell lines can be used following consultation with and approval by DNR Competent Fish Health Authority or designate. If CPE is detected, confirmation using molecular or serological assays acceptable by the USFWS-AFS-FHS guidelines (Blue book) or the OIE Aquatic manual must be followed.
 - Real-time reverse transcriptase (RT) PCR using the protocol originally developed by Jonstrup et al. (2013) and adopted by the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), National Animal Health Laboratory Network (NAHLN) (Warg et al. 2014 [Initial comparison of protocols](#) and [Diagnostic evaluation of two protocols](#)) is also an acceptable method to the DNR's Fisheries Division. The real-time RT-PCR must use the approved primer sets used in the above references or another agreed

upon primer set and must use appropriate controls. If positive pools are found, the results must then be confirmed using cell culture following the guidance above.

- Testing requirements for any species not listed in Table 2 must be done in consultation with DNR Fisheries Division Fish Health staff.

For further information about disease testing, reference the [Fisheries Order 245.16, Fish Disease Control](#).

Table 2: List of Fish Species and Pathogen Testing Requirements for Importation of Fish Destined for Stocking into Public Waters of Michigan and for Baitfish Certification.

Species	Scientific Name	Species Code	Import	Baitfish	Stock	Pathogen Testing Required
Atlantic Salmon	Salmo salar	ATS	X		X	VHSv, IHNv, IPNv, Mcer, PKD*, ISAv**
Black Bullhead	Ameiurus melas	BLB	X		X	VHSv HSP CCV
Black Crappie	Pomoxis nigromaculatus	BCR	X		X	VHSv LMBv
Bluegill	Lepomis macrochirus	BLG	X		X	VHSv LMBv
Brook Trout	Salvelinus fontinalis	BKT	X		X	VHSv, IHNv, IPNv, Mcer, PKD*, ISAv**
Brown Bullhead	Ameiurus nebulosus	BRB	X		X	VHSv CCV
Brown Trout	Salmo trutta	BNT	X		X	VHSv, IHNv, IPNv, Mcer, PKD*, ISAv**
Channel Catfish	Ictalurus punctatus	CCF	X		X	VHSv CCV
Flathead Catfish	Pylodictis olivaris	FCF	X		X	VHSv CCV
Green Sunfish	Lepomis cyanellus	GSF	X		X	VHSv LMBv
Hybrid Sunfish	Lepomis spp.	HSF	X		X	VHSv LMBv
Lake Herring	Coregonus artedi	LHR	X		X	VHSv IHNv, IPNv, and Mcer HSP

Species	Scientific Name	Species Code	Import	Baitfish	Stock	Pathogen Testing Required
Lake Trout	Salvelinus namaycush	LKT	X		X	VHSv, IHNv, IPNv, Mcer, PKD*, ISAv**
Lake Whitefish	Coregonus clupeaformis	LWF	X		X	VHSv, IHNv, IPNv, Mcer, PKD*, ISAv**
Largemouth Bass	Micropterus salmoides	LMB	X		X	VHSv LMBv
Muskellunge	Esox masquinongy	MUS	X		X	VHSv HSP
Northern Pike	Esox lucius	NOP	X		X	VHSv HSP
Pumpkinseed Sunfish	Lepomis gibbosus	PSF	X		X	VHSv HSP LMBv
Rainbow Trout (Steelhead)	Oncorhynchus mykiss	RBT	X		X	VHSv, IHNv, IPNv, Mcer, PKD*, ISAv**
Redear Sunfish	Lepomis microlophus	RSF	X		X	VHSv LMBv
Rock Bass	Ambloplites rupestris	RKB	X		X	VHSv HSP LMBv
Smallmouth Bass	Micropterus dolomieu	SMB	X		X	VHSv LMBv
Walleye	Sander vitreus	WAE	X		X	VHSv HSP
Warmouth	Lepomis gulosus	WAR	X		X	VHSv
White Bass	Morone chrysops	WHB	X		X	VHSv LMBv
White Crappie	Pomoxis annularis	WCR	X		X	VHSv LMBv
Yellow Bullhead	Ameiurus natalis	YLB	X		X	VHSv CCV
Yellow Perch	Perca flavescens	YEP	X		X	VHSv HSP

Imported Baitfish Species

Species	Scientific Name	Species Code	Import	Baitfish	Stock	Pathogen Testing Required
Bluntnose Minnow	<i>Pimephales notatus</i>	BNM	X	X	X	VHSv HSP
Common Shiner	<i>Luxilus cornutus</i>	CSH	X	X	X	VHSv HSP
Common White Sucker	<i>Catostomus commersonii</i>	CWS	X	X		VHSv HSP
Creek Chub	<i>Semotilus atromaculatus</i>	CRC	X	X		VHSv HSP
Emerald Shiner	<i>Notropis atherinoides</i>	EMS	X	X	X	VHSv HSP
Fathead Minnow	<i>Pimephales promelas</i>	FHM	X	X	X	VHSv HSP
Golden Shiner	<i>Notemigonus crysoleucas</i>	GOS	X	X	X	VHSv HSP
Northern Redbelly Dace	<i>Phoxinus eos</i>	NRD	X	X	X	VHSv HSP
Sand Shiner	<i>Notropis stramineus</i>	SAS	X	X		VHSv HSP
Spotfin Shiner	<i>Cyprinella spiloptera</i>	SFS	X	X		VHSv HSP
Spottail Shiner	<i>Notropis hudsonius</i>	STS	X	X		VHSv HSP

VHSv – Viral Hemorrhagic Septicemia, IHNV – Infectious Hematopoietic Necrosis, IPNV – Infectious Pancreatic Necrosis, ISAv** – Infectious Salmon Anemia, all variants including HPR0, Mcer – *Myxobolus cerebralis*, causative agent of Whirling Disease, HSP – Heterosporis sp, PKD* – Proliferative Kidney Disease, LMBv – Largemouth Bass Virus, CCv – Channel Catfish virus

*PKD testing is only required for adult and juvenile salmonids originating from the west of the western borders of Minnesota, Iowa, Missouri, Oklahoma, and Texas.

**ISAv testing is only required for all juvenile and adult salmonids and broodstock source of eggs originating from the east of the eastern borders of New York and Ontario.

APPENDIX 2 - ACRONYMS

AFS-FHS.....	American Fisheries Society – Fish Health Section
ALJ.....	Administrative Law Judge
APHIS.....	Animal and Plant Health Inspection Service
BMPs.....	Best Management Practices
BOD ₅	Biological Oxygen Demand – five day
CAAP.....	Concentrated Aquatic Animal Production
CBOD ₅	Carbonaceous Biochemical Oxygen Demand
CCv.....	Channel Catfish virus
CFR.....	Code of Federal Regulations
COD.....	Chemical Oxygen Demand
CVI.....	Certification of Veterinary Inspection
CWA.....	Clean Water Act
DMRs.....	Discharge Monitoring Reports
DNR.....	Michigan Department of Natural Resources
EGLE.....	Michigan Department of Environment, Great Lakes, and Energy
ELG.....	Effluent Limit Guidelines
FHMNV.....	Fathead Minnow Nidovirus
FIFRA.....	Federal Insecticide, Fungicide and Rodenticide Act
FDA.....	U.S. Food and Drug Administration
FDO.....	Final Determination and Order
GAAMPs.....	Generally Accepted Animal & Management Practices
GOSv.....	Golden Shiner Reovirus
HSP.....	Heterosporsis sp.
IHNv.....	Infectious Hematopoietic Necrosis virus
INAD.....	Investigational New Animal Drug

IPNV Infectious Pancreatic Necrosis virus
 ISAV Infectious Salmon Anemia virus
 lbs./day pounds per day
 LMBV Large Mouth Bass virus
 LUG Local Unit of Government
 MCer Myxobolus Cerebralis
 MDARD Michigan Department of Agriculture and Rural Development
 mg/l milligrams per liter
 MDF Maximum Design Flow
 MGD Million Gallons per Day
 MOS Margin of Safety
 NAHLN National Animal Health Laboratory Network
 NAICS North American Industry Classification System
 NFIP National Flood Insurance Program
 NPDES National Pollutant Discharge Elimination System
 NREPA Natural Resources and Environmental Protection Act, 1994 PA 451
 OHWM Ordinary High-Water Mark
 PFD Proposal for Decision
 PKD Proliferative Kidney Disease
 POTW Publicly Owned Treatment Works
 PPMD Pesticide and Plant Pest Management Division
 QOL Quality of Life
 RAS Recirculating Aquaculture System
 SESC Soil Erosion and Sedimentation Control
 SIC Standard Industrial Codes
 TBEL Technology-Based Effluent Limitation
 TOC Total Organic Carbon
 TMDL Total Maximum Daily Load

TSS Total Suspended Solids
ug/l micrograms per liter
USACE U.S. Army Corps of Engineers
USDA U.S. Department of Agriculture
USEPA..... U.S. Environmental Protection Agency
VCPR..... veterinarian-client-patient relationship
VFD Veterinary Feed Directive
VHSv Viral Hemorrhagic Septicemia virus
WET Whole Effluent Toxicity
WIP Wetlands Identification Program
WLA Waste Load Allocation
WQBEL Water Quality-Based Effluent Limit
WRD Water Resources Division
WTAs Water Treatment Additives