SAMPLING GUIDANCE

For Concentrated Animal Feeding Operations (CAFOs) and Recipients of CAFO Manifested Waste

The purpose of this document is to provide guidance to properly characterize CAFO waste discharge to surface water.

Introduction

CAFO permits require monitoring, such as in the event of an overflow from a storage structure, discharge from a land application area, or discharges from the production area. The purpose of the monitoring requirements is to determine if CAFO waste is being discharged and if that discharge causes or contributes to exceedances of Michigan Water Quality Standards (WQS).

Michigan's Department of Environment, Great Lakes, and Energy (EGLE) strongly encourages facilities to develop a Sampling Plan (SP), which includes development of a relationship with a contracted laboratory, preparation of a sampling kit, and employee training, to prepare for a discharge event. Please see the Sampling Plan Assistance Document which can be helpful in developing an SP and sampling kit.

Sampling Frequency and Locations

Sampling shall be completed and analyzed in accordance with permit requirements, including, but not limited to, Part II.B. Please review your permit to determine sampling requirements.

Any sampling, measurements, or observations must take place prior to the discharge entering surface waters of the state. If there are multiple points of entry into surface waters, samples for each discharge point may be required. The permittee should review their permit and/or work with CAFO District Compliance Staff to determine if multiple samples should be taken.

Parameters and Analytical Methods

The sample parameters required for CAFO related discharges are generally pollutants associated with agricultural waste, Escherichia coli (*E. coli*), and parameters known to correlate with the presence of agricultural waste. The sample parameters required to be monitored, the sample type, reporting metric (daily average and daily maximum), units, and monitoring frequency during a discharge event are listed in the permit. Parameters, units, and analytical methods for these pollutants are listed in the following Table 1.

Table 1. Parameters to monitor during a discharge/overflow event and the analytical methods.

Parameter	Units	Analytical Methods
Overflow Volume (at storage structure)	Gallons	NA
Discharge to Surface Waters Volume	Gallons	NA
Flow Rate (routine monitoring required in permit)**	Gallons/Sec	NA
5-Day Carbonaceous Biological Oxygen Demand (CBOD5)	mg/L*	USEPA Method 5210
Escherichia coli (E. coli)	cts/100 ml†	USEPA Method 1603
Total Phosphorus (as P)	mg/L	USEPA Method 365.1
Ammonia Nitrogen (as N)	mg/L	USEPA Method 350
Total Suspended Solids (TSS)	mg/L	USEPA Method 2540D

* mg/L = milligrams per liter

** If you do not have a flow meter, measure how many seconds it takes to fill a 1- or 5-gallon bucket. MGD = million gallons per day

† cts/100 mL = count per 100 milliliters

The analytical methods listed are United States Environmental Protection Agency (USEPA) approved methods. Other analytical methods specified in Title 40 of the Code of Federal Regulations (CFR), Part 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants, Section 136.3 (eCFR :: 40 CFR 136.3 -- Identification of test procedures) for pollutant monitoring may be used. Requests to use test procedures not included in Title 40 CFR, Part 136, Section 136.3 must be submitted to EGLE and shall be made in accordance with Title 40 CFR, Part 136, Section 136.4 (eCFR :: 40 CFR 136.4 -- Application for and approval of alternate test procedures for nationwide use). Verification of methods used at the contracted laboratory should be made prior to analysis to confirm compliance with the permit.

Laboratories, Bottles, and Field Supplies

Potential laboratories may be found at the links listed below. Please contact a laboratory prior to delivery of samples to verify they can analyze for the required parameters. The required bottles and field supplies should be obtained from the laboratory contracted to complete the sample analysis.

- Certified Chemistry Laboratories
- Microbial Laboratories
- Michigan Environmental Laboratory Association (Michlabs.org)

Table 2. General sampling, preservation and hold times. Permittees should confirm this information with their contracted laboratory.

Parameter	Sample Bottles	Preservation Chemical	Hold Time
Total Phosphorus	500 mL plastic	Sulfuric acid (H2SO4) Ask the contracted laboratory for preservative amount	28 days
Ammonia Nitrogen (as N)	500 mL plastic	Sulfuric acid (H2SO4) Ask the contracted laboratory for preservative amount	28 days
5-Day Carbonaceous Biological Oxygen Demand (CBOD5)	1 Liter plastic	NA	2 days
Total Suspended Solids (TSS)	500 mL plastic	NA	7 days
Escherichia coli (*E. coli*)	sterile 125 mL	NA	6 hours

All sample bottles should immediately be refrigerated or placed on ice until taken to lab. Contact the contracted laboratory prior to sampling to determine if special labels, different sampling protocols, and preservation techniques are required.

Data Submission

Sampling results must be submitted using the "CAFO Sample Report" form in the MiEnviro Portal. If sampling results are not returned prior to the deadline to submit this form, the form must be submitted by the time specified in the permit and revised when information becomes available.

EGLE Contacts

CAFO District Compliance Staff Map

Questions regarding groundwater discharge sampling and analysis can be directed to the Groundwater Permits Unit, Permits Section, Water Resources Division at 517-284-5570.

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