MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

BIOSOLIDS RESIDUALS MANAGEMENT PROGRAM

Definitions and Appendices

Supplemental to the Biosolids Land Application Site Identification Form

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DEFINITIONS

Act means the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), being §324.101 et seq. of the Michigan Compiled Laws.

Aerobic digestion means the biochemical decomposition of organic matter in biosolids into carbon dioxide and water by microorganisms in the presence of air.

Agricultural land means land on which a food crop, a feed crop, or a fiber crop is grown. The term includes range land and land used as pasture.

Agronomic rate means the calculated biosolids application rate (dry weight basis) which provides the amount of plant available nitrogen (PAN) needed by the crop or vegetation grown on the land; which minimizes the amount of nitrogen that passes below the root zone of the crop or vegetation grown; and which considers the amounts of phosphate (P_2O_5) and potash (K_2O) added by the biosolids as part of the total nutrient management plan.

Biosolids means solid, semisolid, or liquid residues generated during the treatment of sanitary sewage or domestic sewage in a treatment works. The term "biosolids" includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes and a derivative of the removed scum or solids.

Bulk biosolids means biosolids that are not sold or given away in a bag or other container for application to a lawn or home garden.

Class A means biosolids that meet the requirement in R 323.2414(2)(b) and the requirements in R 323.2414(2)(c),(d),(e),(f),(g), or (h) with respect to pathogens.

Class B means biosolids that meet the requirements in R 323.2414 (3)(c),(d), or (e) with respect to pathogens.

Composite Sample is a number of proportional samples collected and mixed so as to be representative of the biosolids to be applied to land and soils that receive biosolids.

Cumulative pollutant loading rate (CPLR) means the maximum amount of an inorganic pollutant that can be applied to an area of land.

Daily Concentration is the sum of the concentrations of the individual samples of a parameter divided by the number of samples taken during any calendar day. If the parameter concentration in any sample is less than the method detection level, regard that value as the detection level when calculating the daily concentration, and indicate that the result is "less than" the value reported.

Department means the director of the Department of Environment, Great Lakes, and Energy (EGLE) or his or her designee.

Derivative means a product for land application derived from biosolids that does not include solid waste or other waste regulated under the act. A derivative does not include materials or treatment chemicals, that is, lime or ferric chloride, integral to wastewater treatment and biosolids unit processes.

Distributor means a person who applies, markets, or distributes, except at retail, a derivative.

Domestic sewage means waste and wastewater from humans or household operations that is discharged to, or otherwise enters, a treatment works.

Dry weight basis means calculated on the basis of having been dried at 105 degrees Celsius until reaching a constant mass that is essentially 100% solids content.

Exceptional quality (EQ) means biosolids or a derivative that meets all of the following criteria:

i. Pollutant ceiling concentrations in R 323.2409(5)(a).
ii. Pollutant concentrations in R 323.2409(5)(c).
iii. One of the vector attraction reduction options in R 323.2415(4)(a)to(h) and one of the class A pathogen reduction alternatives in R 323.2414(2)(a).

Forest means a tract of land that is thick with trees and underbrush.

Generator means a person who generates biosolids that are applied to land.

Grab Sample is a single sample taken at neither a set time nor flow.

Groundwater means water below the land surface in the saturated zone.

Incorporation means the blending of surface-applied biosolids into the soil so that a significant amount of the biosolids is not present on the land surface within 1 hour after land application.

Injection means the placement of biosolids below the land surface so that a significant amount of the biosolids is not present on the land surface within 1 hour after land application.

Land application means spraying or spreading biosolids onto the land surface, injecting biosolids below the land surface, or incorporating biosolids into the soil so that the biosolids can either condition the soil or fertilize crops or vegetation grown in the soil.

Land application plan means the process a generator uses to identify and select land application sites that are not included in a land application site list. At a minimum a plan shall include all of the following:

i. A description of the geographical area covered by the plan.
ii. Identification of the criteria used for site selection.
iii. A description of how the sites are managed.

Land with a low potential for public exposure means land that the public uses infrequently. The term includes, but is not limited to, agricultural land, forest land, and a reclamation site located in an unpopulated area, for example, a strip mine located in a rural area.

Land with a high potential for public exposure means land that the public uses frequently. The term includes, but is not limited to, a public contact site and a reclamation site located in a populated area, for example, a construction site located in a city.

Listed land application site means a site which has been approved by the EGLE and is used for biosolids land application by a generator.

Monthly Concentration is the sum of the daily concentrations determined during a reporting month (or 30 consecutive days), divided by the number of daily concentrations determined. If any daily concentration is less than the method detection level, regard that value as the detection level when calculating the monthly concentration, and indicate that the result is “less than” the value reported.

Permit means 1 of the following:

i. A national pollutant discharge elimination system (NPDES) permit that is issued by EGLE under section 3112(1) of the act to control wastewater discharges to the surface waters and to manage biosolids.

ii. A permit that is issued by EGLE under section 3112(1) of the act to control wastewater discharges to the groundwaters and to manage biosolids.

iii. A biosolids permit issued by EGLE.

Permitting authority means EGLE.

Person means an individual, association, partnership, corporation, local unit, state or federal agency, or an agent or employee of any of the entities specified in this definition.

Person who prepares biosolids means either the person who generates biosolids during the treatment of domestic sewage or sanitary sewage in a treatment works or the person who derives a material from biosolids.

pH means the logarithm of the reciprocal of the hydrogen ion concentration measured at 25 degrees Celsius or measured at another temperature and then converted to an equivalent value at 25 degrees Celsius.

Pollutant means an organic substance, an inorganic substance, a combination of organic and inorganic substances, or a pathogenic organism that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could, on the basis of information available to the administrator of the United States Environmental Protection Agency (USEPA) or EGLE, cause death; disease; behavioral abnormalities; cancer; genetic mutations; physiological malfunctions, including malfunction in reproduction; or physical deformations in either organisms or offspring of the organisms.

Pollutant limit means a numerical value that describes the amount of a pollutant allowed per unit amount of biosolids, for example milligrams per kilogram of total solids; the amount of a pollutant that can be applied to a unit area of land, for example, kilograms per hectare or pounds per acre; or the volume of a material that can be applied to a unit area of land, for example, gallons per acre.

Public contact site means land that has a high potential for contact by the public. The term includes, but is not limited to, any of the following:

i. Public parks.

ii. Ball fields.

iii. Cemeteries.

iv. Plant nurseries.

v. Turf farms.

vi. Golf courses.

Reclamation site means drastically disturbed land that is reclaimed using biosolids. The term includes, but is not limited to, strip mines and construction sites.

Residuals Management Program means a program that is required by a generator's permit and is developed in accordance with R 323.2403(3)(a)to(d).

Retail means EQ biosolids or an EQ derivative sold directly to the consumer or through retail establishments in bags or other containers that have a load capacity of 1 metric ton (2200 pounds) or less of biosolids.

Septage means either liquid or solid material that is removed from any of the following that receive only domestic sewage.

i. A septic tank.
ii. A cesspool.
iii. A portable toilet.
iv. A Type III marine sanitation device.
v. A similar treatment works.

Site means a contiguous tract of land to which biosolids or a derivative are land applied in accordance with the requirements in these rules.

Specific oxygen uptake rate (SOUR) means the mass of oxygen consumed per unit time per unit mass of total solids (dry weight basis) in biosolids.

Surface application means the spraying or spreading of biosolids or derivatives onto the land surface for use as a soil conditioner or as a nutrient source for plant growth.

Surface water means any of the following:

i. Lakes.
ii. Rivers.
iii. Streams.
iv. Wetlands.
v. All other watercourses.
vi. Waters within the jurisdiction of this state.
vii. The Great Lakes bordering this state.

Treatment of" or "to treat", with respect to biosolids, means the preparation of biosolids for final use or disposal. The term includes, but is not limited to, the thickening, stabilization, and dewatering of biosolids. The term does not include the storage of biosolids.

Treatment works means either a federally owned, publicly owned, or privately owned device or system used to treat, including recycling and reclaiming, either domestic sewage or sanitary sewage.

Total solids means the materials in biosolids that remain as residue when biosolids are dried at 103 to 105 degrees Celsius.

Vector attraction means the characteristic of biosolids that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

Volatile solids means the amount of the total solids in biosolids lost when biosolids are combusted at 550 degrees Celsius in the presence of excess air.

Wetlands means areas that are inundated or saturated by surface water or groundwater at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

APPENDIX A: INDUSTRIAL PRETREATMENT PROGRAM

The industrial Pretreatment Program (IPP) regulates industrial discharges to publicly owned treatment works (POTW). Requirements for an IPP are placed in a POTW's NPDES permit when it is determined that they receive non-domestic wastewater which: may cause passthrough; may interfere with POTW operations; or are subject to categorical pretreatment standards. The IPP regulates the discharge of pollutants from industrial users to public sanitary sewers and wastewater treatment plants to protect the environment and the infrastructure. EGLE has assisted local units of government with the development and implementation of formal IPPs.

In 1983, the USEPA formally delegated the state of Michigan to implement the IPP. Regulations governing the program are contained in 40 CFR Part 403, and R 323.2301 – R 323.2317 of the Michigan Administrative Code. Industry specific technology-based treatment requirements are contained in 40 CFR Parts 405-471.

Communities with pretreatment programs are divided into two categories:

1. Federal IPPs – Those POTWs with a design flow greater than 5 million gallons day (MGD).
2. Michigan IPPs (MIPPs) – Those POTWs with a design flow equal to or less than 5 MGD.

While both programs are similar, MIPPs have been provided some regulatory relief from certain Federal requirements including: No requirement for whole effluent testing with the permit application if design flow is under one MGD; RCRA notification to users is not required; only categorical industrial users must be published if in significant noncompliance; slug control plan evaluations are not required; and local limits do not have to be re-evaluated with the permit applications.

Program oversight is conducted by the WRD's Pretreatment Coordinator (Coordinator) and WRD's IPP District Staff. Oversight activities include audits, pretreatment compliance inspections (PCI), and PCI recons. Inspections are scheduled to correspond to the reissuance of the NPDES permits, which are based on a watershed (basin year) approach. Program submittals include sewer use ordinances, interjurisdictional agreements, enforcement response plans, local limits, and procedures for program implementation. The Department Director has delegated all IPP decisions, including final program approvals and modifications to the WRD District Supervisors (Executive Order 2009-45 Delegation Letter, Letter No.: WRD-31-07).

Local limits for toxic pollutants are reviewed by District staff for completeness then forwarded to the Coordinator. The Coordinator determines the maximum amount of pollutants that would be discharged if the proposed local limits were imposed. These are compared to existing NPDES limits, or if not limited theoretical Water Quality Based Effluent limits generated by WRD Permits Section. IPP District Staff will forward their recommendations to the District Supervisor. Should NPDES permit limits become more restrictive, local limits may need to be modified to reduce the amount of pollutants discharged to the POTW by industrial users.

For more information, visit EGLE's IPP Website at Michigan.gov/IPP.

APPENDIX B: MICHIGAN PART 24 RULES SUMMARY-REPORTING / RECORDKEEPING REQUIREMENTS

R 323.2416 Reporting:

Each biosolids generator and distributor shall annually report to EGLE each fiscal year, the number of dry tons of biosolids it generated or the number of dry tons of biosolids in derivatives it distributed that were applied to land in the state of Michigan in the state fiscal year. A biosolids generator located in the state of Michigan that land applies outside the state of Michigan will be assessed only an administrative fee and a fee for biosolids that are land applied in the state of Michigan. The report is due 30 days after the end of the state fiscal year.

A generator or distributor that land applied biosolids or a derivative to land within the state at any time during the previous state fiscal year shall report to EGLE the information required in Record Keeping Requirements, R 323.2413 (3) to (8), except
R 323.2413 (6) (b), (7) (b), and (8) (b), on or before October 30. See summary of record keeping requirements.

R 323.2413 Record Keeping:

A generator shall keep records for a minimum of 5 years unless a longer period is specified by the permitting authority.

A person who generates bulk biosolids or bulk derivatives, including a generator out of state shall keep the following records available for inspection and copying.

1. Site information, of each application site, which includes the following:
    a. Plat map.
    b. Soil survey map, if available.
    c. Name and address of property owner and farm operator if different from owner
    d. Latitude and Longitude.
    e. Written consent from the property owner and the farm operator if different from owner.
    f. Written agreement between the generator and the farmer not to apply biosolids from other sources or septage to a listed land application site.
    g. Biosolids analysis parameters listed in table 1 R 323.2409 at the frequency of analysis stated in table 7 of R 323.2412.
    h. Soil fertility test results for each site.
    i. Summary of all application activity, including:
        i. Site identification.
        ii. Biosolids analysis.
        iii. Total acres on the site.
        iv. Acres used.

v. Application rate in dry tons per acre.

vi. Each nutrient required to be monitored in pounds per acre.

vii. Each pollutant listed in table 3, in pounds per acre.

j. If biosolids have been applied that exceed table three limits than the generator shall keep records documenting the cumulative loading for life.

k. An annual summary, including the following:

i. Biosolids volume generated.

ii. Total dry tons applied.

iii. Total dry tons disposed of by other methods.

iv. Total acres used.

Sites that received biosolids application subject to Table 2 of R 323.2409 (5) (b).

APPENDIX C: LANDOWNER AGREEMENTS

Rule 323.2413(2)(b) and (c) requires written consent from the property owner and the farm operator to apply biosolids and a written agreement not to apply biosolids from other sources or septage to a listed land application site. Beyond these requirements, comprehensive formal agreements with participating landowners covering other aspects of land application are not required by statute or rule, however EGLE recommends that they be developed with each participating landowner. Formal agreements make clear that the owner and/or operator of the land is aware of and agrees with the restrictions that are included in Part 24, Land Application of Biosolids (Part 24 Rules), promulgated pursuant to Part 31, Water Resources Protection, of the NREPA. Past failures to make sure that all parties are aware of their responsibilities have resulted in confusion and in extreme cases, settlements negotiated to avoid litigation.

The agreement should identify the biosolids generator, the application contractor (if used) the landowner, the farm operator (if different from the landowner), the lands on the property that will be involved, and the crops to be grown.

The agreement should also make clear that agents of the generator, federal, state and local regulatory staff might access the land for the purpose of inspecting the site, applying biosolids, obtaining soil samples, and testing.

The agreement should make sure that the land owner and farm operator understand that the biosolids must be applied in accordance with requirements of the Part 24 Rules and the federal Part 503 requirements (40 CFR Part 503). The owner and operator must understand that certain site management criteria must be met for proper utilization of biosolids.

We recommend that the following requirements of the Part 24 Rules be considered when drafting up agreements:

- A landowner shall not harvest food crops that have harvested parts which touch the biosolids/soil mixture and which are totally above the land surface for 14 months after biosolids are applied.
- A landowner shall not harvest food crops that have harvested parts below the surface of the land for 20 months after biosolids are applied if the biosolids remain on the land surface for 4 months or longer before incorporation into the soil.
- A landowner shall not harvest food crops that have harvested parts below the surface of the land for 38 months after biosolids are applied if the biosolids remain on the land surface for less than 4 months before incorporation into the soil.
- A landowner shall not harvest food crops, feed crops, and fiber crops for 30 days after biosolids are applied.
- A landowner shall not graze animals on the land for 30 days after biosolids are applied.
- A land owner shall not harvest turf grown on land where biosolids are applied for 1 year after biosolids are applied if the harvested turf is placed on either land that has a high potential for public exposure or a lawn, unless otherwise specified by the permitting authority.

- A landowner shall restrict public access to land that has a high potential for public exposure for 1 year after biosolids are applied.
- A landowner shall restrict public access to land with a low potential for public exposure for 30 days after biosolids are applied.

The generator could agree to furnish the farmer with the amount of nutrients applied so that the farmer can adjust their fertilizer usage accordingly.

Agreements should consider transfer or sale of the property, where a new owner might want to change the use or cropping of the land. Restrictions on cropping or public access may interfere with new plans until the appropriate amount of time has passed.
It is the responsibility of the generator to ensure that the site restrictions are maintained regardless if the property is transferred or sold and a formal agreement is a good method to help maintain that control.

The generator may wish to make clear that they do not guarantee specific quantities or delivery dates of biosolids, or crop yields.

It is recommended that an attorney review the draft landowner agreement before it is implemented.

APPENDIX D: NOTIFICATION REQUIREMENTS

R323.2408

(4)(a) A generator or distributor shall provide written notification not less than ten days before the initial land application. This notification shall be provided to the Resource Management Division district office, county health department, city, village, or township clerk in the jurisdiction of the land application site (see sample letter on Page 40). The notification shall include a cover letter comprised of the following:

(i) The proposed land application activity

(ii) The site location by latitude and longitude

(iii) A plat map identifying the site

(iv) The name and address of the property owner

(v) The name and address of the farm operator if different than the owner

(vi) A record of biosolids monitoring information containing the following:

(A) The most current monitoring results of the following:

(1) Arsenic

(2) Cadmium

(3) Copper

(4) Lead

(5) Mercury

(6) Molybdenum

(7) Nickel

(8) Selenium

(9) Zinc

(B) Applicable limitations

(C) Name, address, and phone number of the generator or distributor

(c) A person who prepares bulk biosolids that are applied to agricultural land, a forest, a public contact site, or a reclamation site, shall provide the person who applies the bulk biosolids with written notification of the concentration of the total nutrients, on a dry weight basis, in the bulk biosolids required to be monitored.

(d) A person who prepares bulk biosolids and provides the bulk biosolids to another person who prepares *or* applies these biosolids shall provide them with the proper notice and necessary information to comply with requirements in this part.

(e) A person who applies bulk biosolids to the land shall provide the owner or leaseholder of the land on which the bulk biosolids are applied notice and necessary information to comply with all requirements in this part.

(f) A person who land applies bulk biosolids subject to the cumulative pollutant loading rate in R 323.2409(5) (b) shall provide written notice, before the initial application of bulk biosolids to a land application site by the applier, to the permitting authority for the state in which the bulk biosolids will be applied. The permitting authority shall retain, and provide access to, the notice. The notice shall include the following information:

(i) The location, by latitude and longitude, of the land application site.

(ii) The name, address, telephone number, and national pollutant discharge elimination system (NPDES) permit number if appropriate, of the person who will apply the bulk biosolids.

EXAMPLE APPLICATION NOTIFICATION

Facility Letterhead

Date

County Health Department/ Township Clerk
Address

SUBJECT: Biosolids Application Notification

Generator is preparing to apply biosolids (sewage sludge) on land located in township name (See attached plat map), owned by Name/Address of Property owner and operator, if different. This notice is provided in accordance with Michigan Part 24 Biosolids Rules, to inform you of our activities within your area, and to give you a basic understanding of the fertilizer value of this material. Generator will provide you free of charge any additional information as needed including any record created in accordance with State rules pertaining to the actual biosolids application.

The following analytical data represents the average contents of the biosolids that will be applied in your area. The U.S. Environmental Protection Agency has developed the maximum limits from over 20 years of research. These limits represent a *conservative* annual application rate and at no time shall biosolids be applied that exceed any of these maximum values.

Most Recent Biosolids Average Analysis in mg/kg (dry weight basis)

Constituent	Concentration	Max. Allowable Concentration Limit
Arsenic (As)		75
Cadmium (Cd)		85
Copper (Cu)		4300
Lead (Pb)		840
Mercury (Hg)		57
Molybdenum (Mo)		75
Nickel (Ni)		420
Selenium (Se)		100
Zinc (Zn)		7500
Nitrogen (N)		Ag Rate
Phosphorus (P)		Ag Rate
Potassium (K)		Ag Rate

Biosolids are the nutrient-rich organic materials produced during the biological and physical treatment of wastewater. The solids treated during this process produce a stabilized liquid or semi-solid material that contains nutrients required for crop growth, as well as organic matter to condition the soil. Treated biosolids contain the three primary crop nutrients: nitrogen, phosphorus, and potassium. They also contain nutrients that crops need in smaller amounts. These “micronutrients” are not commonly found in commercial fertilizers.

The Michigan Department of Environment, Great Lakes, and Energy’s Water Resources Division regulates the land application of biosolids. The program is endorsed by the Michigan Department of Agriculture and Rural Development, Michigan State University, Michigan Farm Bureau, Michigan Water Environment Association, Michigan Municipal League, U.S. Environmental Protection Agency, U.S. Department of Agriculture, and the U.S. Food and Drug Administration.

For more information, contact:

Generator

Address:

Phone:

Fax:

EXAMPLE PFAS NOTIFICATION

Facility Letterhead

Date:

Farmer Name / Landowner Name:
Address:

SUBJECT: Biosolids Application Notification

(Please add generator name) is preparing to apply biosolids on land you own and/or farm. Recently there has been a lot of information in the news about Per- and polyfluoroalkyl substances (PFAS) in our environment. The intent of this letter is to provide a brief update on what is being done to control these substances in biosolids, our recent biosolids sample results, and where additional information can be obtained.

PFAS are a large group of chemicals used for decades in some industrial, commercial, and domestic settings and are found worldwide. Typical materials or processes that use or contain PFAS include firefighting foam, chrome plating, cookware coatings, waterproofing on clothing and carpet, and even food wrappers. Some PFAS, including Perflurooctanesulfonic acid (PFOS), which is commonly found in biosolids, have been phased out of production in the United States and are no longer approved for use. Even though they have not been used for years, their legacy remains.

Wastewater Treatment Plants (WWTP) do not generate PFAS chemicals, though they may receive discharges from certain industrial or commercial sources who have used PFAS. As a result, PFAS may be found in treated wastewater and biosolids. Some of those PFAS are known to travel through water, can linger in the environment, and have the potential to impact the soil, water, and crops. PFAS has been found to build up in the tissue of fish and deer in Michigan and in some areas led to consumption advisories. Studies are underway to determine the impact of PFAS on animals, animal products, and crops.

Currently, the United States Environmental Protection Agency is conducting a risk-based evaluation of PFAS in biosolids. Until that is completed, Michigan's Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division (which regulates the land application of biosolids) has developed a strategy working with WWTPs to implement an approach, focusing on identifying and reducing significant sources of PFAS entering a WWTP and preventing industrially impacted biosolids from being land applied. As a result of these efforts, several WWTPs have already seen significant reductions of PFAS concentrations in their biosolids.

Should you have additional questions concerning Michigan's strategy to monitor and reduce sources of PFAS in biosolids, please do not hesitate to reach out to one of the EGLE Biosolids staff contacts provided on the on the attached page. More information about the work being done on PFAS in biosolids in Michigan can be obtained by visiting the Landowner/Farmer PFAS section of the PFAS Land Application Workgroup Web page: Michigan.gov/PFASLandApplication.

Our most recent PFOS testing result is: **Result number ppb** Date: **Date**

APPENDIX E: ADDITIONAL RESOURCES

Nutrient and Soil Fertility:

Michigan State University Department of Plant, Soil and Microbial Sciences

Michigan State University Fertilizer Recommendation Program

Using Biosolids as a Plant Nutrient Source | Oklahoma State University

Nutrient Content, Value, and Management of Biosolids (virginiabiosolids.com)

EPA Resources:

Basic Information about Biosolids | US EPA

Biosolids | US EPA

EPA Biosolids Webinar Series | US EPA

Additional resources can be provided upon request. Please contact a biosolids staff person with additional questions. If you need this information in an alternate format, contact EGLE-Accessibility@Michigan.gov or call 800-662-9278.