

Florida Biosolids: Management and Land Application Rules¹

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This article is part of a series entitled *Florida Biosolids*. The rest of the series can be found at https://edis.ifas.ufl.edu/entity/topic/series_florida_biosolids.

Introduction and Purpose

Biosolids are the liquid, semisolid, and solid fractions of the treated waste stream from a domestic wastewater treatment facility (WWTF). Florida biosolids are designated into one of three classes: Class AA, Class A, and Class B. The classes are based, in part, on the degree of pathogen reduction. Although all biosolids classes have been treated to substantially reduce pathogen indicators below levels typically found in manure, Class AA biosolids have the least. For more information on biosolids classes, refer to the series *Florida Biosolids: Rules for Biosolids Classes in Florida*.



Figure 1. Class AA biosolids (black colored granules) land-applied to a corn field prior to planting. Credit: Cheryl L. Mackowiak, UF/IFAS

On August 29, 2010, the Florida Department of Environmental Protection (FDEP) formally adopted its rule for the management of wastewater biosolids,

Chapter 62-640, Florida Administrative Code (F.A.C. 2010). The rule includes new management guidelines and restrictions to biosolids land application. All facilities that land-apply biosolids must use permitted application sites, except for Class AA biosolids that are distributed or marketed as fertilizer (requires state fertilizer license). Under the new rule, all biosolids land application sites (including existing approved sites) were required to be permitted by January 1, 2013. This document reviews biosolids management and land application requirements under the new regulation.

Terms

Biosolids

Biosolids are the liquid, semisolid, and solid fractions of the treated waste stream from a domestic wastewater treatment facility (WWTF). Biosolids may also be known as "sewage sludge" or "domestic wastewater residuals."

Domestic wastewater treatment

The processing of wastewater discharges from residences, commercial, and public facilities.

Nutrient management plan (NMP)

Site-specific plan establishing the rate at which all biosolids, soil amendments, and other nutrient sources can be applied to the land for crop production, while minimizing the amount of nutrients and pollutants discharged into state surface or groundwater.

Pathogens

Disease-causing organisms; including parasites, viruses, bacteria, and any other organisms that cause disease.

Septage

The material removed from onsite sewage treatment and disposal systems (commonly referred to as septic tanks) as an assumed mixture of wastewater, sludge, fatty materials, and human feces.

Vectors

Organisms capable of transporting pathogens, including mosquitoes, flies, and rodents.

WWTF

Any plant installed for the purpose of collecting, pumping, and treating sewage as well as stabilizing, distributing, or disposing of biosolids.

Applicability

The new Chapter 62-640, F.A.C rule applies to the following:

- Domestic WWTFs that generate, treat, or manage biosolids.
- Biosolids management facilities that generate, treat, or manage biosolids.
- Appliers or distributors of biosolids or producers of biosolids-containing products.
- Application sites that receive biosolids.
- Septage management facilities treating more than 10,000 gallons (gal) per day monthly average daily flow or greater than 20,000 gal in a single day.
- FDEP-permitted septage appliers and sites that receive septage from permitted facilities.
- Composting facilities that compost biosolids.
- Biosolids and biosolid products generated outside the state of Florida and used in Florida.

At the adoption of the rule in 2010, all land application sites, regardless of permit expiration date of facilities using the sites, were to be permitted under this rule by January 1, 2013.

Intent of Chapter 62-640, F.A.C.

The intent of the new rule is to ensure the protection of public health and the environment through regulation by the FDEP of the use, management, and land application of biosolids. Florida permitting of WWTFs differs somewhat from federal standards, including specifically addressing WWTF biosolids and requiring facilities to have Nutrient Management Plans (NMPs). Florida also requires some additional reporting, such as inclusion of an application site phosphorus assessment. Although some of Florida's rules and regulations exceed federal requirements, approximately one-third of Florida counties (concentrated in central Florida) have additional biosolids ordinances (requirements and restrictions) beyond what is required at the state level.

Land Application Requirements

Biosolids applied to land application sites must meet the requirements of Class B, A, or AA biosolids with regard to pathogen reduction, vector attraction reduction, and element concentrations, as defined by Chapter 62-640.700 (F.A.C. 2010). Each individual biosolids application site (including agricultural sites) must have a valid FDEP permit as a biosolids management facility and a valid NMP, unless it is Class AA biosolids distributed and marketed as a fertilizer product (see Nutrient Management Plan section). If an application site is used solely by a single treatment facility, the site permit may be included in the treatment facility permit.

Chapter 62-640.700(6) through (12) (F.A.C. 2010) provide additional requirements for land application of Class B, A, and AA biosolids. The techniques and equipment must assure uniform application over the application zone. Alkaline-treated Class B and Class A biosolids must follow best management practices for incorporation or injection and be land-applied within 24 hours. Alkaline-treated biosolids that are surface-applied (not injected or incorporated) require a 1,320-foot (ft) setback from the property line. Class B biosolids sites must post and maintain advisory signs in English and Spanish that identify the nature of the project area and the contact information of the site manager. Spraying of liquid biosolids shall minimize the formation of aerosols, and spray guns cannot be used unless approved by permit. Specific requirements for biosolids storage, cumulative application limits, setback distances, pH, soil depth, and runoff prevention are provided below.

Biosolids Storage

All stockpiling, staging, or storing of biosolids at a land application site must meet the following requirements:

1. Meet the applicable setback requirements for biosolids application sites (see Setback Distances section of this document).
2. Not cause or contribute to biosolids runoff, objectionable odors, or vector attraction.
3. Provide a structure, fencing, or other means to prevent animals and unauthorized persons from gaining access to Class B biosolids.

For storage beyond seven days, the following requirements must be met:

1. Be approved by FDEP.
2. The NMP and site permit application must identify the storage area and facilities.
3. The application site must not store amounts of biosolids that would exceed cumulative loading limits (see Cumulative Application Limits section of this document) or the application rates in the NMP.
4. Storage facilities must be sized to hold biosolids based on the delivery rate.
5. A longer storage period is needed because of agricultural operations or climatic factors at the application site, but it can last no longer than two years.

Cumulative Application Limits

The application of Class A and Class B biosolids must not exceed the cumulative application limits for each element given in Chapter 62-640.700(7)(b), F.A.C. (Table 1). The beginning date for cumulative loading record keeping is the date of the first biosolids application at the site. The total cumulative loading data must be provided to FDEP in the required Biosolids Application Site Annual Summary Report.

Table 1. Cumulative application limits for Class A and B biosolids.

Element	Cumulative Application Limit (lb/acre)
Arsenic	36.6
Cadmium	34.8
Copper	1,340
Lead	268
Mercury	15.2
Molybdenum	Report only *
Nickel	375
Selenium	89.3
Zinc	2,500
* Site permittees that reach cumulative molybdenum loading at or in excess of 37.5 lb/acre must notify landowners and grazing permittees in writing within 30 days of discovery. Grazing permittees must be informed of the potential for molybdenosis (i.e., excessive molybdenum) to occur in their animals. A copy of the notification letter will also be provided to the FDEP.	

Setback Distances

The following restrictions apply to land application of Class A and B biosolids:

1. A 1,000 ft setback from any Class I water body, Outstanding Florida Water, or Outstanding National Resource Water; or a 200 ft setback from any other surface water, which is reduced to a 100 ft setback if biosolids are injected or incorporated into the soil. The setback area must be vegetated. This setback does not apply to waters owned entirely by one person, or to canals or bodies of water used for irrigation or drainage, which are located completely within the application site and do not discharge from the site. More information on surface water quality and classifications can be found at <https://floridadep.gov/dear/water-quality-standards> and in Chapter 62-302, F.A.C: Surface Water Quality Standards.
2. A 300 ft setback from any private drinking water supply well and 500 feet from any public drinking water supply well.
3. The land application site and a 200 ft perimeter must show no evidence of subsurface fractures, solution cavities, sinkholes, excavation core holes, abandoned wells, or any other natural or man-made conduits that could allow direct contamination of groundwater.
4. For stockpiled or stored biosolids, a 1,320 ft setback from buildings occupied by the general public, which can be reduced to 100 ft if written consent is provided by the owner of the building.

Additional setback distances apply to land application sites that accept Class B biosolids, as follows:

1. A 300 ft setback from buildings occupied by the general public, which is reduced to a 100 ft setback if biosolids are injected into the soil or if written permission is obtained from the building owner.
2. A 75 ft setback from property lines, unless applied to the medians or roadway shoulders of restricted public access roads.

pH

Soil pH testing needs to be done at least annually.

Biosolids-soil mixtures must have a pH of 5.0 or greater at the time Class A or B biosolids are applied.

Soil Depth

At least two feet of unsaturated soil depth are required between the depth of biosolids placement and the water level at the time Class A or B biosolids are applied to the soil.

Runoff Prevention

Biosolids cannot be applied during rain events that cause ponding or sheet flow when ponding exists or when surface soils are saturated. Topographic grades must be eight percent or less. For areas with grades greater than three percent, biosolids need to be injected or incorporated into the soil, or the NMP has to demonstrate that the application site can retain runoff from a 10-year recurrence interval of a one-hour duration storm event. Soils with a flooding frequency class of "frequent" or "very frequent," or soils with a flooding duration class of "long" or "very long," as

defined in the National Soil Survey Handbook (NRCS 2014), cannot be used for land application. Local soil characteristics can be identified through the Web Soil Survey:

<http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.

Additional Application Site Restrictions for Class B Biosolids

Additional site restrictions to protect public health and the environment for land application of Class B biosolids are given in Table 2.

Table 2. Additional Class B site restrictions.

Site Restrictions	Description
Public access	The public must be restricted from the application zone for 12 months after the last application of biosolids.
Plant nursery	Plants cannot be sold to the public for 12 months after the last application of biosolids.
Roadway shoulders and medians	Limited to restricted public access roads.
Food crops, feed crops, and fiber crops	Food crops, feed crops, and fiber crops cannot be harvested for at least 30 days after biosolids application.
Food crops that contact biosolids above land surface	Food crops that come into contact with biosolids and are harvested above the surface cannot be harvested for 14 months after application.
Food crops that contact biosolids below land surface	Food crops that come into contact with biosolids and are harvested below the land surface shall not be harvested for: 20 months if biosolids are not incorporated into the soil until after 4 months following application. 38 months if biosolids are incorporated into the soil within 4 months following application.
Animal grazing	Animals cannot be grazed for at least 30 days after biosolids application. Animals found grazing prior to the end of the 30-day restriction must be reported by the site manager to the Florida Department of Agriculture and Consumer Services (FDACS), Bureau of Animal Disease Control within two weeks of discovery.
Sod or soil	Sod or soil distributed or sold to the public or used on unrestricted public access areas shall not be harvested or removed from land for 12 months after the last application.

Nutrient Management Plans

A site-specific NMP must be submitted for permitted land application of Class B, A, and AA biosolids (except where Class AA biosolids are distributed or marketed as a fertilizer) and replaces the former Agricultural Use Plans. An NMP must be prepared and signed by a Natural Resources Conservation Service (NRCS) certified nutrient management planner or by a professional engineer licensed in the state of Florida. The NMP must identify the application zones. Each zone needs to be sized to facilitate accurate accounting of nutrient and pollutant loadings, according to classes of biosolids loaded. The NMP must also include or define the following:

1. Aerial photos or maps and a soil survey map identifying application zones.
2. Guidance for implementation, site operation, maintenance, and record keeping.
3. Results of soil, water, plant tissue, and biosolids analyses, as applicable.
4. A soil fertility test less than one year old.
5. Define an interval for soil fertility testing no greater than five years.
6. Establish specific application rates and procedures for land-applied biosolids and nutrients to each application zone projected for five years. The established rates shall include:
 - o Current and planned crop selection in each application zone for five years.
 - o Realistic annual yield goals for each application zone crop.
 - o Listing and quantification of all nutrient sources used in each zone.
 - o Calcium carbonate equivalency (CCE) of alkaline-treated biosolids and lime application rates in each application zone.
 - o Nitrogen availability in biosolids previously applied and projected to be applied for five years.
 - o Nitrogen and phosphorus application rates for each crop in each application zone.
 - o Specific assessment of potential phosphorus movement.
 - o Land application method.
 - o Application rate calculations.

Special Geographic Areas

For sites located in geographic areas subject to restrictions on phosphorus, the NMP will need to

include application rates based upon the phosphorus needs of the crops. The NMP must also minimize or prevent water quality impacts to surface waters resulting from biosolids applications. These areas include the Everglades Protection Area (373.4592, Florida Statute [F.S.]), the Lake Okeechobee watershed (373.4595, F.S.), Lake Apopka (373.461, F.S.), and the Green Swamp Area (380.0551, F.S.).

The NMPs for sites in the Lake Okeechobee, St. Lucie River, or Caloosahatchee River watersheds must demonstrate no net loading of nutrients to application sites. Nutrients removed from application sites through products generated on-site must be equal to or greater than the nutrient amounts applied to the land (nutrient export should be equal to or greater than nutrient import) (Chapter 62-640.400(11) and (12), F.A.C.).

Summary

On August 29, 2010, the FDEP formally adopted its new rule for the management of wastewater biosolids, Chapter 62-640, Florida Administrative Code (F.A.C. 2010). The land application site permitting requirement due date was January 1, 2013. The new rule includes new management guidelines and restrictions for biosolids land application. Biosolids application requirements cover information on biosolids storage, nutrient management plans, cumulative application limits, setback distances, pH, soil depth, and runoff prevention on Class B, A, and AA biosolids. For the original ruling and phrasing or for additional information, please follow the links under Further Reading.

Further Reading

Code of Federal Regulations (CFR). 1993. Title 40, Code of Federal Regulations, Protection of Environment, 1993, Part 503, "Standards for the Use or Disposal of Sewage Sludge."

<https://www.epa.gov/biosolids/biosolids-laws-and-regulations>

Florida Administrative Code (F.A.C.). 2010. Chapter 62-640 F.A.C., Biosolids. Florida Department of State.

<https://www.flrules.org/gateway/ChapterHome.asp?Chapter=62-640>

Natural Resources Conservation Service (NRCS). 2014. *National Soil Survey Handbook. Part 618 – Soil Properties and Qualities*. U.S. Department of

Agriculture, Natural Resources Conservation Service.
http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_054242

Environmental Protection Agency, Office of Wastewater Management, Washington, D.C.
<https://www3.epa.gov/npdes/pubs/owm0031.pdf>

Residues, biosolids, sludge: What's in a name? An educational infusion unit for biosolids middle-school training developed by the Florida Water Environment Federation (FWEA) and Florida FDEP. Accessed October 10, 2014.
www.lulu.com/content/163583

United States Environmental Protection Agency (USEPA). 1994. *A Plain English Guide to the EPA Part 503 Biosolids Rule, EPA/832/R-93/003.* U.S.

United States Environmental Protection Agency (USEPA). 2000. *Guide to Field Storage of Biosolids and Other Organic By-Products Used in Agriculture and for Soil Resource Management, EPA/832-B-00-007.* U.S. Environmental Protection Agency, Office of Wastewater Management, Washington, D.C.
<https://www.epa.gov/biosolids/guide-field-storage-biosolids>

¹This document is SL421, one of a series of the Department of Soil and Water Sciences, UF/IFAS Extension. Original publication date January 2015. Revised October 2019. Visit the EDIS website at <https://edis.ifas.ufl.edu> for the currently supported version of this publication.

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