GUIDELINES FOR LAND APPLICATION OF SEWAGE SLUDGE (BIOSOLIDS) AT AGRONOMIC RATES

INTRODUCTION

Sludge generated from a treatment works treating domestic sewage may be beneficially used. These solids are nutrient-rich organic materials that contain nitrogen and phosphorus as well as trace amounts of micronutrients. "Biosolids" refers to the treated sewage sludge which meets the pollutant concentration limits, pathogen reduction, and vector attraction reduction requirements found in federal regulations 40 CFR Part 503 and Georgia state rules Chapter 391-3-6-.17.

The Georgia Environmental Protection Division (EPD) encourages the beneficial use of biosolids under controlled conditions. However, even digested or chemically treated biosolids may contain pathogens or metals that could potentially harm plants, animals, or humans if applied at too great a rate. Therefore, the objective of these guidelines is to allow for the utilization of the nutrients and other beneficial properties of biosolids while ensuring that the health and welfare of the population is protected. These Guidelines will allow for the permitting of biosolids application to agricultural or silvicultural land based on the agronomic rate established by the nitrogen uptake of the crop unless limited by other pollutant parameters. Type and condition of cover crop, topography, and other properties of the biosolids will determine the application rate.

A sludge management plan must be prepared by a permittee or their designee and submitted for EPD's review and approval for any proposed disposal method other than co-disposal in a landfill. These land application guidelines refer to the agricultural and silvicultural use of biosolids at agronomic rates. Biosolids may also be used for land reclamation sites for a limited period of time on a case-by-case basis. The Watershed Protection Branch will not permit sites at rates in excess of agronomic.

REQUIRED INFORMATION

Land application proposals must be submitted to the Engineering & Technical Support Program (ETSP) for review. Upon receipt of a sludge management plan, a site inspection to determine the general acceptability of the proposed site will be conducted by ETSP. Once the complete information listed below has been reviewed and found to be acceptable, a Public Notice, prepared by ETSP, will be forwarded to the applicant for publication in the local newspaper. A statewide notice will also be issued by EPD. If no significant negative comments are received during the public notices, the Permitting, Compliance, & Enforcement Program (PCEP) will then amend the NPDES or LAS permit for the wastewater treatment plant generating the biosolids. The draft permit language will be sent to the applicant by the ETSP with the public notice. No land application may begin until the Director has issued the permit amendment.

The following information must be submitted as part of a Sludge Management Plan.

1. Location map with the site(s) clearly shown and a Topographic map with the following features identified:
    a. Boundaries of the application site(s) showing buffer areas

b. On-site access roads
c. Areas of site located in 100-year flood plain
d. Location of habitable structures on or adjacent to site(s)
e. Location of public wells on-site and within 500 feet and private wells within 250 feet of the site
f. Surface water (ponds, lakes, rivers, streams, etc.)
g. Natural or manmade drainage areas, including intermittent streams/ditches
h. Total and useable acreage of the site.
i. GPS coordinates or Latitude and Longitude of the centroid of the proposed site(s)

2. Soils series information. (See the NRCS soils surveys) The information shall include a soils survey map with the site clearly located and soils series descriptions including texture, permeability, slope, drainage, depth to seasonal high water table, and erodibility.

3. The pH of the soil in each proposed field within the site based upon a composite sample of all soil types found in each field. Note that the pH of the biosolids and soil mixture must be maintained at 6.5 or above to prevent metals leaching. If the pH will be less than 6.5, lime addition will be required.

4. A current (performed in the last six months) representative biosolids analysis including the following items. Note that the laboratory results must be on the laboratory's letterhead and the specific analytical method must be shown. The laboratory must be approved.

a. Ammonia as N, %
b. Total Kjeldahl Nitrogen, %
c. Nitrate as N, %
d. % Volatile Solids
e. % Total Solids
f. pH, standard units
g. Total Phosphorus as P, %
h. Total Potassium as K, %
i. Arsenic, mg/kg
j. Cadmium, mg/kg
k. Copper, mg/kg
l. Lead, mg/kg
m. Mercury, mg/kg
n. Molybdenum, mg/kg
o. Nickel, mg/kg
p. Selenium, mg/kg
q. Zinc, mg/kg

5. The name of the wastewater treatment facility generating the biosolids. Note that if multiple treatment plants with the same permittee are to use the same site, all names and permit numbers must be supplied and the biosolids testing shall be done on a weighted sample.

6. Provide the estimated quantity of biosolids to be applied each year. For application of liquid biosolids, the quantity should be reported in gallons per year with the percent solids being specified. For dewatered biosolids, the quantity should be reported in pounds per year on a dry weight basis with the percent solids being specified.

7. A demonstration of compliance with the pathogen and vector attraction reduction requirements must be made and supporting documentation submitted. If compliance requires

a geometric mean result (such as for fecal coliform and specific oxygen uptake (SOUR) rate), the individual (seven) test results as well as the geometric mean must both be provided.

8. Crop(s) to be grown on the site and projected Nitrogen uptake rate(s) of crop(s). Specify whether or not the land will be used for grazing. Note that a crop must be grown on the site. Sites without crops will not be approved.

9. Method of applying the biosolids and description of operational procedures.

10. A letter of agreement between the applicant and the site owner including any site restrictions. The letter must indicate if any portion of their property is currently receiving biosolids and, if so, state the permittee's name and identify that portion of the property.

11. Method that will be used to transport the biosolids to the application site including the distance from the treatment plant site and the likeliest route to the application site from the plant.

12. An evaluation of whether land application is likely to adversely affect a threatened or endangered species listed under Section 4 of the Federal Endangered Species Act or its designated critical habitat. (Chapter 391-3-6-.17(10)(a))

13. Public meeting minutes and proof of advertisement. At least one public meeting must be held prior to the first time the biosolids from a water pollution control plant (WPCP) are proposed to be applied in a county. The purpose of the meeting is to discuss land application of biosolids and inform the public about the proposed project. The meeting must be advertised in the local newspaper at least thirty days prior to the date of the meeting.

The need for additional information will be determined on a case-by-case basis.

PATHOGEN AND VECTOR ATTRACTION REDUCTION

PATHOGENS

Compliance with Class A or Class B pathogen requirements must be demonstrated for the proposed land application of biosolids.

To be Class A with respect to pathogens, the biosolids must either have a density of fecal coliform of less than 1000 MPN per gram of total solids (dry weight basis) or a density of Salmonella bacteria of less than 3 MPN per four grams of total solids (dry weight basis). In addition, one of six alternative processes must be conducted, which include temperature adjustment, pH adjustment, enteric virus analysis, viable helminth ova analysis, or a process to further reduce pathogens. The sludge management plan must include the test results from the individual samples as well as the geometric mean, where required. For further information, see Chapter 391-3-6-.17-(7)(a).

To be Class B with respect to pathogens, the biosolids must either have a fecal coliform

density of 2,000,000 MPN (or CFU) per gram of total solids (based upon a geometric mean of seven samples) or be treated in a process to significantly reduce pathogens. The sludge management plan must include the test results from the individual samples as well as the geometric mean, where required. For further information, see Chapter 391-3-6-.17-(7)(b). See discussion below on the site restrictions for sites receiving Class B biosolids.

VECTORS

Compliance with one of the ten methods of vector attraction reduction must be demonstrated for the proposed land application of biosolids. Detailed descriptions of the methods can be found in Chapter 391-3-6-.17-(8). The methods include volatile solids reduction in three methods, Specific Oxygen Uptake Rate (SOUR) testing, high temperature aerobic digestion, pH adjustment, minimum solids content in two methods, injection of biosolids, and incorporation. Note that for SOUR testing, the results of the seven individual tests as well as their geometric mean must all be included.

SITE RESTRICTIONS

MULTIPLE TREATMENT PLANTS

Biosolids from multiple treatment plants with different permittees cannot be applied to the same site without the landowner first obtaining a biosolids-only land application permit. A location can be segregated into different application sites and used by multiple permittees but no more than one permittee can use an individual site without a biosolids-only permit.

If a permittee wants to apply to one site from multiple treatment plants, all permitted to them; the testing can be done on a weighted average sample of all biosolids to be applied.

SITE ACCESS AND CROP RESTRICTIONS

Details of the restrictions can be found in Chapter 391-3-6-.17-(7)(c).

1. Food crop harvesting restrictions depend upon crop type and biosolids application methods. Feed and fiber crops also have restrictions.
2. No grazing shall be allowed on the site for 30 days after biosolids application.
3. Turf grown on land on which biosolids is applied shall not be harvested for one year after application of biosolids if it is to be placed on a lawn or other land with high potential for public exposure.
4. Following application of the biosolids, public access to the site shall be restricted for 30 days when there is a low potential for public exposure, or for one year when there is a high potential for public exposure.

Additional restrictions may be added at EPD's discretion.

RECHARGE AREAS AND KARST TOPOGRAPHY

If the proposed site contains areas with karst topography or sinkholes, additional reviews will

be required to evaluate the usability of the site. Biosolids can be applied at agronomic rates to "most significant groundwater recharge areas"; however, maximum application rates may be reduced and buffer zones may be increased.

SLOPE

Topography and soil types influence the amount of soil erosion and potential runoff of applied biosolids. Generally, biosolids may be surface applied to slopes of up to 5% with only slight risk of erosion. For slopes of 6 to 12%, injection or incorporation of liquid biosolids is required except in a closed drainage basin or if runoff is controlled. Surface application of dewatered biosolids is generally acceptable for slopes of 6 to 12%. Where slopes are greater than 12%, only sites where the slope length is both short and only a minor part of the application area should be considered for land application. In no case may biosolids be applied in a manner that will allow it to run off-site or into waters of the State. EPD will make a site specific determination for situations that exceed the recommended slope limitations discussed above.

BUFFERS

The following chart shall be used to determine the normal buffer zone requirements depending upon application method. Note that if a biosolids has been demonstrated to be of exceptional quality (Chapter 391-3-6-.17(2)(o)) the buffer zone requirements may be reduced on a case-by-case basis. In no case will the buffers be reduced to less than 35 feet to waters of the State or 100 feet to a well.

	Property Line	Waters of the State* (1)	Wells, Public/ Private (2)	Exterior Roadways	Dwellings
Liquid, Unincorp.	100 feet	100 feet	500/250 feet	100 feet	300 feet
Liquid, Incorp.	50 feet	35 feet	500/250 feet	50 feet	150 feet
Spray Irrigation	150 feet	150 feet	500/250 feet	150 feet	300 feet
Dewatered Incorp.	50 feet	35 feet	500/250 feet	50 feet	150 feet
Dewatered Unincorp.	50 feet	50 feet	500/250 feet	50 feet	150 feet

*Waters of the State are defined (in Chapter 391-3-6-.03) as any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wells, wetlands, and all other bodies of surface or subsurface water, natural or artificial, lying or forming a part of the boundaries of the State which are not entirely confined and retained completely upon the property of a single individual, partnership, or corporation.

(1) Additional buffer, up to a maximum of 150 feet, may be required if in a Watershed Protection Area or Protected River Corridor. If liquid biosolids are applied and not incorporated, in addition to the buffers listed above a 35 foot buffer is to be maintained from intermittent streams or drainage ditches.

(2) All wells within a 500-foot radius of the site must be identified. Additional buffer areas may be required in accordance with the Wellhead Protection Act. Deviations may be approved by EPD on a case-by-case basis. Buffers to individual private wells on the application site may be reduced to as low as 100 feet if the property owner's written consent is obtained.

TRANSPORTATION

Vehicles or containers used for transportation of biosolids shall be loaded in a manner such that the contents will not fall, leak, or spill during transportation. All biosolids will be transported and applied to an approved site or utilized or disposed of in another manner as permitted by EPD. Note that any open loads transported to a site must be covered to comply with DOT requirements.

APPLICATION AND STORAGE

The rate of biosolids application must be adjusted as necessary to prevent run-off of biosolids into buffer areas or waters of the State. Biosolids shall not be applied to a site that is frozen, flooded, or snow-covered. If rain is imminent or if the soil is saturated, then biosolids application should be delayed.

Biosolids shall not be stockpiled on the application site. If the biosolids must be stored due to weather or operational concerns, it may be stored only on the wastewater treatment plant site or, if on the application site, in an enclosed tank or building for a period not to exceed 30 days. Storage must not result in runoff, odor complaints, or other environmental problems. If the stored biosolids have been dewatered, they must be kept dry.

MONITORING AND REPORTING

The required monitoring frequency, which will be specified in the permit modification, depends upon the quantity of biosolids disposed of each year as shown in the following table.

Amount of Sewage Biosolids (dry tons/year)	Monitoring Frequency
0-300	once/year
300-1,600	once/quarter
1,600-16,000	once/two months
$\geq$ 16,000	once/month

The monitoring will be for the following constituents: Arsenic; Cadmium; Copper; Lead; Mercury; Molybdenum; Nickel; Selenium; Zinc; Ammonia Nitrogen; Total Kjeldahl Nitrogen; and Nitrate as well as any other parameters specified in the permit. Monitoring will also be required to demonstrate compliance with vector attraction reduction requirements and pathogen density requirements.

An annual report must be submitted to EPD by January 31 of each year to contain pollutant concentrations, required certification statements, pathogen and vector attraction reduction requirement documentations, annual biosolids application rate, site locations, acreages, and quantity applied to each site. The specific requirements will be included in the permit modification. Failing to submit the annual report by the due date is a permit violation. This report is in addition to the annual report required by the EPA to be submitted to them by February 19 of each year.