DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Water Supply and Wastewater Management

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TITLE: Biosolids Odor Control Plan Guidance

ANTICIPATED EFFECTIVE DATE: January 1, 2003

AUTHORITY: In accordance with 25 Pa. Code Chapter 271, Subchapter J

POLICY: Department of Environmental Protection (DEP) staff and the regulated community will use the guidance in the development, review, and implementation of the Biosolids Odor Control Plan.

PURPOSE: The purpose of this document is to establish the minimum components of a Biosolids Odor Control Plan and provide direction on the development and implementation of these components.

APPLICABILITY: The guidance will apply to all preparers of biosolids and residential septage (permittees) who distribute or land apply within the Commonwealth. The guidance will also be used by the biosolids staff when reviewing the prepared plans.

DISCLAIMER: The policies and procedures outlined in this guidance are intended to supplement existing requirements. Nothing in the policies or procedures shall affect regulatory requirements.

The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of DEP to give the rules in these policies that weight or deference. This document establishes the framework within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this policy statement if circumstances warrant.

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Biosolids Odor Control Plan Guidance

Purpose

The purpose of this document is to provide guidance for developing and implementing a Biosolids Odor Control Plan (BOCP) to persons who operate under a general permit. The plan is designed to function as a working tool for biosolids generators and land appliers to manage and reduce odors generated from biosolids production and land application activities. A comprehensive odor control plan must include four major elements: 1) a description of the processes used to prepare biosolids for land application; 2) strategies to control or manage odors including short-term and long-term components; 3) a public outreach program; and 4) ongoing evaluation of the program.

Implementation Schedule

Persons who apply for coverage after the effective date of the amended general permit shall develop and shall be prepared to implement a BOCP prior to regulatory coverage. Persons who applied for coverage prior to the effective date of the amended general permit and either received coverage or have a pending application for coverage shall develop and be prepared to implement a BOCP within 90 days of the effective date of the amended general permit. Prior to this date persons who already had coverage or who applied for coverage prior to the effective date of the amended general permit may continue to operate under the general permit without a BOCP. Ninety (90) days after the effective date of the amended general permit, no person will be authorized to operate without an acceptable BOCP.

1. Description of Processes to Prepare Biosolids for Land Application

Process description: The Plan should include a description of the processes used to prepare the biosolids for land application under the general permit. The description should identify how long the processes have been used.

2. Strategies to Control Odors

A. Short-Term Product Handling and Disposition Strategies.

Short-term biosolids odor management involves identifying product handling and disposition options to be used depending on severity of product odor. A workable odor management program should minimize the impacts of product odors on the public, reducing odor complaints and improving public acceptability. This program should become an integral part of a facility's standard operating procedures and be continually evaluated and updated as needed.

Product Odor Measurement and Ranking:

The first step in managing biosolids product odors is for the facility to routinely measure and rank product odors just prior to transport and land application. If the product is normally stored at the treatment facility prior to transport or at the land application site prior to application, the odor measurement should be taken as close as practical to the time of actual land application.

Product odor measurement can be as simple or sophisticated as is practical and workable for the generator. The plan must describe when and how the generator will measure odors and how that odor measurement will be used to determine product handling and disposition.

Possible odor measurement methods are listed below:

- Designated employee or third party not normally involved with biosolids
- Odor panel (employees, outside group)
- Analytical instruments
  - Hand held
  - Laboratory
- Trained odor expert

It is important to remember that persons selected to conduct product odor measurements must be readily available to take measurements routinely. Product odor measurement should not be haphazard and, at the same time, should not delay product disposition.

Product odors should be ranked on some scale that measures odor intensity and level of irritation. A simple scale might have four levels:

- Level 1: no discernable odor
- Level 2: some odor, but not objectionable
- Level 3: moderate odor, somewhat objectionable
- Level 4: strong odor; irritating and very objectionable

Application Site Odor Sensitivity Ranking:

The generator or land applier should classify land application sites for odor sensitivity based on factors such as remoteness from residents and other potentially sensitive populations, odor complaint history, ability to incorporate, and topography.

Product Handling and Disposition:

The plan must discuss how the generator/land applier will use product odor measurements to determine how the product will be handled and what disposition option will be chosen. Depending on the product odor level, the generator may decide to immediately land apply or to institute alternate handling options designed to reduce odors prior to land application. The generator/land applier may also institute odor management options at the application site; however, this is not usually the preferred approach. Product odor levels should be used to determine which land application sites are suitable for the product. For example, if the product has a Level 1 or 2 odor using the scale given above, it may be suitable for use on all sites. If the product has a Level 3 odor, it might be suitable for use only on the remote, lower odor sensitivity sites. A landfill option should be available when odor levels are severe enough to be unsuitable for use on land application sites.

Some examples of product handling/management options for higher - level odors:

- At the treatment facility
  - Provide further treatment
  - Mix with odor reducing material such as sawdust or yard waste
  - Store the product to allow odors to dissipate
- During Transport
  - Minimize holding time of material in truck if odors increase over time
- At the land application site
  - Inject/incorporate biosolids
  - Apply masking agents
  - Limit application to favorable weather conditions

Post application odor control strategies:

- The Plan must describe actions that will be taken after biosolids are land applied to resolve odor problems resulting from biosolids that have been already land applied. That action shall include:
  - On-site odor evaluation
  - Odor abatement actions
  - Implementation of selected actions

B. Long-term Odor Source Evaluation/Reduction Strategies.

This part of the odor control plan is the long-range program for permanent odor reduction and involves a detailed evaluation of all aspects of the generator's wastewater treatment and biosolids management programs to determine factors contributing to product odors. This long-range program must be continuous and progressive. The generator must initially develop an implementation schedule and update that schedule periodically.

Odor Source Identification:

All potential sources that may contribute to biosolids product odors should be identified including any process or operation changes within the past 12 months. This source assessment should begin with wastewater treatment plant dischargers and wastewater collection and follow through all steps of the treatment and solids handling processes.

The following is an example of potential sources of odors:

- Wastewater dischargers and collection
  - Industrial/commercial dischargers
  - Retention times at pumping stations
  - Retention times in the collection system

- Wastewater treatment process
  - Primary clarification
  - Loading/wasting rates
  - Wastewater detention time in clarifiers and secondary treatment (i.e. extended aeration, RBCs, gravity thickeners, etc.)

- Solids Handling
  - Primary treatment solids
  - Retention times in holding tanks
  - Residence time and temperature of material in solids digesters (anaerobic/aerobic)
  - Types of chemical treatments and their concentrations used during the process (i.e. ferric chlorides, polymers etc.)
  - Dewatering process (belt filter press vs. centrifuges,)
  - If lime stabilized, the effectiveness of the lime/sludge mixing process
  - Product conveyance (belt vs. screw conveyors)
  - Storage capacity, design and operation at the plant (i.e. aerated, windrowed, no mixing)

- Biosolids Treatment
  - Continuous process
  - Intermittent (i.e. no evenings/weekends)

- Transport
  - Duration of transport

- Land Application Site
  - Duration of storage
  - Storage capacity, design and operation (i.e. aerated, windrowed, no mixing)
  - Method of application

Product Odor Constituent Determination:

This step involves determining major constituents contributing to the product malodor. Odor panels may be somewhat useful, but the most valuable and accurate measurements will be obtained using laboratory analysis (i.e. gas chromatograph, mass spectroscopy). These instruments can measure the relative concentrations of odorous compounds such as dimethyl disulfide, trimethylamine, and ammonia. The plan must explain how the facility intends to measure product odor constituents.

Odor Source Reduction:

The plan must include a product odor source reduction strategy. This strategy should be a long-term approach to reducing product odor over time. Once product odor constituents have been determined, the potential odor sources identified above should be evaluated for likelihood of contribution to production of a major constituent. Odor constituents should be prioritized by significance of contribution to product malodor and, similarly, odor sources most likely to produce the constituents should be given higher priority.

After priority odor sources have been determined, the facility should systematically evaluate the high priority sources to determine their impact on product odor. This is accomplished by making process or operation changes involving the odor source and measuring the effect of those changes in lowering the product odor constituent. For example, if sulfur compounds were determined to be major odor constituents and the facility identified the anaerobic digester as a priority source, digester operation changes such as increasing detention time or temperature, would be made. The effect of each digester operation change on the reduction of the sulfur compounds would be measured until optimal reduction is achieved.

The source reduction strategy should contain a schedule for initiating and progressing with the above steps and updated regularly.

3. Public Outreach

A key component to the plan involves a initiating a proactive program to inform municipal officials and the public about the biosolids program. This section is a two-step approach, which should explain how the facility intends to provide information to the public on biosolids treatment and land application and how the facility intends to respond to odor related complaints. This section should be reassessed periodically to determine the program's effectiveness and updated as appropriate.

Public Education

The public education element should include a proactive program to inform municipal officials and local residents about the facility's wastewater treatment process and biosolids treatment and management program. The information should include a discussion on potential odors associated with land application of the biosolids product and how the facility intends to address odor management and complaint response. This section should describe in detail what methods will be used to facilitate public education.

Some examples of public education tools could include the following:

- Holding an information meeting with municipal officials
- Holding an information meeting with the public
- Visiting one-on-one with adjacent landowners or community members

- Having an open house at the wastewater treatment plant
- Having a field day at a land application site
- Distributing letters, pamphlets, brochures or other sources of information to the public and municipal officials
- Providing information via radio, newspaper, or television

Complaint Management

The complaint management section involves developing and implementing detailed procedures for addressing and responding to complaints. A key component to complaint management is the establishment of a procedure for effective communication between the public, the facility staff, the farmer, outside contractors, or other involved parties.

As part of the communication loop, the plan should address how the complaint management plan will be implemented. This should include such details as the following:

- Phone number where complaints can be directed, possibly a 24-hour hotline
- Complaint logging system
- Who will be responsible for responding to complaints (i.e. chain of command, staff resources)
- Identification of response time
- Action(s) that will be taken in response to complaints

The results of the complaint management program should be used to provide input into the odor management and source evaluation/reduction programs.

4. Ongoing Evaluation of Program

The biosolids odor control plan should be continually evaluated and updated. Plan update documentation must be included with the permit holder's annual report due March 1 of each year. The plan update must document and summarize the odor management and public education programs, as well as progress made on odor source identification and reduction.