

## CHAPTER 1 INTRODUCTION

**S**ewage sludge is the residue generated during the treatment of domestic sewage. This residue can be used as a soil conditioner or fertilizer component if properly treated and utilized in a manner that protects human health and the environment.

Throughout the wastewater industry, the term “sewage sludge” has largely been replaced by the term “biosolids,” which specifically refers to sewage sludge that has undergone treatment and meets federal and state standards for beneficial reuse. Throughout this document the terms “sewage sludge,” “sludge,” “biosolids,” and the generic term “solids” are used interchangeably.

Biosolids have been successfully applied to agricultural land (e.g., pastures, cropland), disturbed areas (e.g., mined land, construction sites), plant nurseries, forests, recreational areas (e.g., parks, golf courses), cemeteries, highway and airport runway medians, and home lawns and gardens.

Operators of publicly owned treatment works (POTWs) where treated sewage sludge is processed for land application are required by state and federal regulations to analyze this material for specific chemical, physical, and biological parameters to ensure that it is in compliance with applicable standards. State biosolids regulators may also wish to collect biosolids samples from both treatment facilities and land application sites prior to spreading.

The purpose of this document is to provide guidance and standard operating procedures for the collection and analysis of municipal sewage sludge or biosolids. The information provided herein will be applicable to sampling both at POTWs and at land application sites where biosolids are stock-piled.

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### The Sampling Program

**M**ost biosolids sampling programs provide a framework for obtaining samples that represent the chemical, physical, and biological characteristics of sludge material that is being land applied. A representative sample depends on a number of factors including the analyses required, the material sampled, the sampling location, and the objective of the sampling program.

## Why Collect Samples?

Most POTW sampling programs are initiated to demonstrate compliance with state and/or federal regulations. As an operator, it is important that you understand exactly what a regulatory entity requires to demonstrate compliance, particularly at the state level. For example, some states regulate biosolids under their solid waste statutes, not their wastewater programs. Accordingly, while a solid waste regulation may require Toxicity Characteristic Leaching Procedure (TCLP) metals analysis, the federal Part 503 regulations call for total metals analysis. In addition, many state regulatory programs have varying target compounds, analytical protocols that are more stringent than federal protocols, and specific detection limits.

Another potential objective of a biosolids sampling effort is to assess the variability of biosolids relative to chemical, physical, and microbial quality. This information can be particularly important in terms of public acceptance and confidence in a beneficial use program. For example, the public needs to know that biosolids are relatively consistent in terms of potential toxic constituents (i.e., heavy metals, polychlorinated biphenyls (PCBs), or dioxins). End users, such as farmers, want to know that they are receiving a consistent product that will perform predictably. Regulators need to be certain that a given quantity of material meets regulatory standards. Elected or appointed officials may also want information confirming safety and efficacy of local government. In addition, POTW operators may want to routinely monitor sludge for information or trends that will assist them in making operational or maintenance decisions within the treatment process.

## Role of the Sampling Plan

The development of a sampling plan is the first step in the implementation of an effective sampling program. While it is understandable that analytical studies, with their sophisticated instrumentation and high cost, are often perceived as the dominant element in a biosolids characterization program, analytical data generated by a scientifically defective sampling plan have limited utility, particularly in regulatory proceedings.

Inappropriately collected samples yield incorrect results. Therefore, it is important to ensure that samples are always collected and handled properly.

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## CHAPTER 1 REFERENCES

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- Sampling/Analysis Work Plan Guidance*. Maine Department of Environmental Protection, 17 State House Station, Augusta, ME. September 16, 2005.
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