NATIONAL LIME ASSOCIATION FACT SHEET: USING LIME TO STABILIZE BIOSOLIDS

YOUR CHALLENGE: To design and operate wastewater treatment plants and biosolids management to comply with state and federal regulations—and make it affordable.

YOUR SOLUTION: LIME STABILIZATION. Lime treatment controls conditions in biosolids that may support the growth of pathogens. It converts sewage sludge into a usable product and is sanctioned by the U.S. Environmental Protection Agency's biosolids regulations. Lime stabilization is a cost-effective option with lower capital costs than other treatment options. Other benefits include reducing hydrogen sulfide generation and reducing metals leachability. Lime treatment also improves biosolids density and physical handling characteristics. It offers great flexibility for operators. More generally, lime stabilization offers a cost-effective, environmentally protective alternative that promotes beneficial use of biosolids.

EPA'S BIOSOLIDS REGULATIONS ENDORSE LIME STABILIZATION: EPA encourages the beneficial use of biosolids – a policy that is based on "years of extensive study and experience." EPA has established federal requirements for the safe treatment, beneficial use, and disposal of biosolids (40 CFR Part 503). For biosolids that are to be beneficially used, lime stabilization is one of the technologies identified to meet the requirements to address pathogens.

More specifically, the Part 503 regulations establish two classes -- Class A and B -- that specify performance goals and the degree of treatment biosolids must receive before beneficial use or disposal:

- Class B biosolids contain higher pathogen concentrations than Class A, but have levels low enough for some beneficial uses, such as land application with restrictions. To meet Class B requirements using lime stabilization, the pH of the biosolids must be elevated to more than 12 for 2 hours and subsequently maintained at more than 11.5 for 22 hours.
- Class A biosolids contain extremely low pathogen concentrations and have few or no use restrictions. To meet Class A requirements using lime stabilization, the Class B elevated pH requirements are combined with elevated temperatures (70^{o}C for 30 minutes) or other EPA-approved time/temperature processes.

In addition to regulating pathogen concentrations, the Part 503 regulations include requirements for reducing the tendency of biosolids to attract disease vectors such as rodents and insects. Lime treatment is one of the methods sanctioned in the regulations. To meet vector attraction reduction requirements using lime, the pH must be raised to 12 or higher for 2 hours and subsequently maintained above pH 11.5 for another 22 hours without further alkali addition. Most lime treatment facilities have the flexibility to produce either Class A or Class B biosolids, thus increasing disposal and recycling options.

LIME IS COST-EFFECTIVE: Lime stabilization is generally more cost-effective than alternative biosolids options. A series of studies comparing lime stabilization to composting, thermal drying, and digestion technologies found that lime stabilization has unit costs as much as 60 percent lower than alternatives. Reduced capital cost requirements of lime stabilization are even more dramatic – particularly important for municipalities with limited capital budgets. Site-specific factors can affect these comparisons.

These studies also compared other characteristics of the treatment systems: Lime stabilization is generally simpler than alternative systems and the quality of the resultant biosolids is often superior. While the addition of lime results in a modest increase in sludge volume, lime stabilization generally requires less space than alternatives. Application of lime-treated biosolids can also benefit acidic soils.

In general, lime stabilization is a non-proprietary process, although patented processes are available. According to the Water Environment Federation, as of 1997, almost 20 percent of all biosolids were processed with lime stabilization.

LIME STABILIZATION IS FLEXIBLE: Lime stabilization may be easily added to processes that have inadequate capacity to meet regulatory requirements (such as overloaded aerobic or anaerobic digesters). Lime stabilization facilities can be started and stopped quickly if the facilities are well maintained and operated. Therefore, lime stabilization can be used to supplement existing solids treatment capacity. It can also substitute for incineration and thermal drying facilities during fuel shortages. In addition, biosolids can be treated with lime when other treatment processes are out of service for cleaning, repair, or preventive maintenance.

LIME-TREATED BIOSOLIDS ARE SAFE AND PROMOTE RECYCLING: As EPA notes, “properly prepared biosolids provide a rich source of the essential fertilizer elements needed by plants to produce food. It seems only natural to return this rich source of nutrients and organic matter back to the soil to perpetuate the cycle of life. . . . Hundreds of studies have been conducted as a basis for the safe use of biosolids. Moreover, thousands of publicly owned treatment works (POTWs) are currently using their biosolids as an organic fertilizer and soil conditioner. . .” Simply put, “years of research and practice have repeatedly demonstrated that biosolids recycling is safe.”

Reuse of lime stabilized biosolids is not limited to use on farmland. These biosolids have also been used as a soil substitute for landfill cover, for example. Exceptional quality biosolids can also be sold to the public for use as a commercial fertilizer or soil conditioner.

LIME STABILIZATION OFFERS
A COST-EFFECTIVE, ENVIRONMENTALLY-PROTECTIVE ALTERNATIVE
THAT PROMOTES BENEFICIAL USE OF BIOSOLIDS

To order reports comparing lime stabilization and other biosolids treatment technologies, or for a list of lime producers, contact the NATIONAL LIME ASSOCIATION at www.lime.org.

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