Chapter 11
Lime Stabilization of Septage Waste

11.1 Lime Stabilization of Septage Waste
Lime stabilization involves mixing septage waste with lime (see Figure 11-1). The pH of the mixture shall be at least 12 and shall remain at 12 or higher for at least one-half hour prior to applying to land. The amount of liming material needed to mix with a known volume of septage waste to achieve the desired pH depends on the type of liming material; form of the liming material, that is, dry (as in quicklime) or slurry; and septage waste characteristics. For beginners in lime stabilization, it is important to start small and perform some trial runs before increasing the amount of lime and septage waste. Please refer to these references: 1, 2, 3, and 4, for additional information.

The lime stabilization process shall be documented for review by regulatory inspector(s) at any time as allowed under the law. Lime stabilization is also a method of pathogen reduction and vector attraction reduction (Table 11-1).

![Figure 11-1. Alkaline Stabilization](image)

Minimum Requirement: pH 12 for at least 30 minutes before land application.

<table>
<thead>
<tr>
<th>Pathogen Reduction</th>
<th>Vector Attraction Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lime stabilization</td>
<td>Lime stabilization</td>
</tr>
<tr>
<td>Site restrictions as per USEPA Part 503</td>
<td>Surface application followed by incorporation within 6 hours</td>
</tr>
<tr>
<td></td>
<td>Subsurface injection</td>
</tr>
</tbody>
</table>

11.2 Equipment, Materials, and Safety
If you lime stabilize septage waste for land application, the following tools are recommended and they should be available at the mixing location, storage site, or land application site:

**pH Testing Tools**
- pH meters
- pH paper
- Sampling container
- Pole for attachment to sampling container when necessary
- Other ____________
Liming Materials
- Hydrated lime (calcium hydroxide)
- Quicklime (calcium oxide)
- Other _______________

Equipment for Lime Preparation and Transportation
- Manual paddle
- Electric Mixer
- Cleaning tools
- Water source
- Appropriate slurry preparation drum and/or tank
- Submersible pump
- Lime stabilization log
- Other _______________

Safety Equipment
Due to the potential danger to safety and health, use appropriate safety equipment at all times during the storage, preparation, and disposal of liming materials. Some of the equipment is listed below:
- Emergency eyewash station
- Carbon dioxide fire extinguisher
- Shoulder-length fully coated neoprene gloves
- Half-mask respirator with appropriate cartridge
- Safety goggles
- Protective clothing

11.3 Septage Waste Lime Stabilization Log
Always use a log to document your operations. The log is subject to review by Septage Waste Program staff, designated representatives of the local health department, or the U.S. Environmental Protection Agency staff. A septage lime stabilization log is available in Appendix G for use by licensees. An example of a completed septage waste lime stabilization log is in Appendix H.

Record Keeping
The following records should be kept in the pump vehicle and/or business office:
- Location of land site.
- Number of acres of the land site/field.
- Quantity (in gallons) of septage applied per day in each field.
- Method of septage waste application.
- Whether septage waste was lime stabilized or not.
- Date of septage waste application.
- Time of septage waste application.
- Time of incorporation, if surface-applied.

See Appendix F for a sample Land Application Volume Record.

11.4 Septage Waste and Lime Stabilization
The treatment discussed in Table 11-2 below summarizes what to do with septage that is lime stabilized and septage that has not been lime stabilized with regard to fallow land and cropped land.
Table 11-2. Land Applying Septage Waste Not Lime Stabilized and Lime Stabilized Septage Waste

<table>
<thead>
<tr>
<th>Septage Waste Not Lime Stabilized</th>
<th>Lime Stabilized Septage Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be: Surface applied on fallow land followed by incorporation within 6 hours.</td>
<td>Can be: Surface applied on fallow land followed by incorporation within 48 hours.</td>
</tr>
<tr>
<td>Cropping to follow within one year after septage application.</td>
<td>Cropping to follow within one year of septage application.</td>
</tr>
<tr>
<td>Can be: Surface applied over scattered weeds or vegetation followed by incorporation within 6 hours.</td>
<td>Can be: Surface applied over actively growing forage crops or vegetation without incorporation.</td>
</tr>
<tr>
<td>Cropping to follow within one year after septage application.</td>
<td>It can also be applied early where row crops are planted without incorporation.</td>
</tr>
<tr>
<td>Can be: Subsurface injected on fallow ground.</td>
<td>Can be: Subsurface injected early where row crops or vegetation are planted.</td>
</tr>
<tr>
<td>Cropping to follow within one year of septage application.</td>
<td></td>
</tr>
</tbody>
</table>

Recommendation: It is always a good practice to keep fallow ground covered, after the end of septage application, with cover crops and/or other control methods to reduce soil erosion before the next cropping year.

11.5 References

