Pipeline

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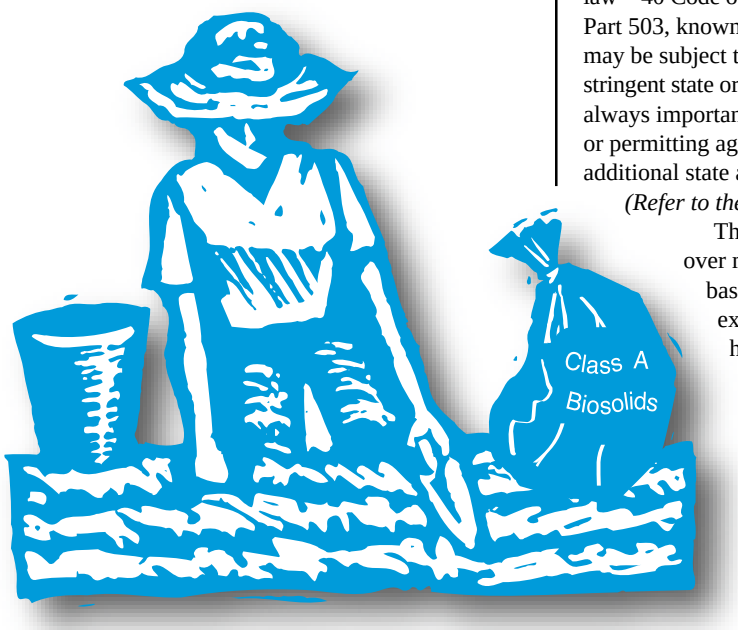
Small Community Wastewater Issues Explained to the Public

MANAGING BIOSOLIDS IN SMALL COMMUNITIES

As the year 2000 approaches and we begin to look back on our achievements this century, no doubt we will find that many advancements have come from our increased awareness and concern for public health and the environment. The environmental movement that began in the 1960s and 1970s is now part of our culture. Even school children know words like *recycle, ozone,* and *ecosystem,* and we all are more aware of how the quality of our environment affects the quality of our lives.

Nowhere are people more concerned about and directly affected by their environment than in small communities and rural areas. This is why the safe handling of residual waste materials from wastewater treatment processes—such as sewage sludge and domestic septage—is such a hot topic in communities. Treating and disposing of these wastes can add significantly to wastewater treatment costs, which also concerns community residents and officials.



Biosolids Are Beneficial

The good news is that small communities have safe and economical options for managing wastewater residuals that also can benefit the environment. There are cost-effective methods for handling or "stabilizing" these wastes to make them safe for disposal or recycling. With proper management and treatment, sludge and septage become biosolids—material that can be applied to land for use as fertilizer or to amend and improve the structure of soil.

The U.S. Environmental Protection Agency (EPA) uses the term *biosolids* to "emphasize the beneficial nature of this recyclable biological resource." Biosolids have a variety of agricultural uses and have helped to rehabilitate land damaged by mining and other industries. In addition, communities sometimes can give away or sell their biosolids to residents or other communities to save disposal costs or help recover some treatment costs.

The treatment, quality, use, and disposal of biosolids are all strictly regulated by federal law—40 Code of Federal Regulations (CFR) Part 503, known as the "Part 503 rule"—and may be subject to additional even more stringent state or local requirements. It is always important to check with local health or permitting agencies for information about additional state and local requirements.

(Refer to the contacts list on page 7.)

The federal law was developed over more than a decade and is based on extensive studies examining potential risks to humans, animals, and the environment. In spite of this careful approach by EPA and the proven safety and benefits of biosolids, proposals to locally recycle or dispose of biosolids often meet with opposition in communities.

Key Terms

domestic septage—all solid and liquid materials removed from a septic tank, cesspool, portable toilet, or similar treatment device receiving only domestic sewage. This does not include restaurant grease traps or septage from systems that treat industrial wastewater. (Domestic septage is regulated as a type of sewage sludge in the Part 503 rule.)

sewage sludge—solid and liquid residues generated during the treatment of domestic sewage in a treatment works. This includes any scum or solids removed in primary, secondary, or advanced wastewater treatment, but not grit, screenings, or the residuals from wastewater streams not normally treated by the plant (for example, certain commercial and industrial wastewater).

biosolids—sewage sludge that meets requirements for recycling or disposal in accordance with the Part 503 regulations. Biosolids have different classifications and restrictions depending on the level of treatment they receive to reduce disease-causing organisms.

This *Pipeline* issue presents a brief overview of the options small communities have for managing biosolids and some of the requirements of the Part 503 regulations. It also includes information about the safety and benefits of biosolids recycling. Readers are encouraged to reprint the articles in local newspapers or include them in flyers, handouts, and educational presentations. Please include the name and phone number of the National Small Flows Clearinghouse (NSFC) on the reprinted materials, and send us a copy for our files.

If you have any questions about reprinting articles or about any of the topics in this newsletter, please contact the NSFC at (800) 624-8301 or (304) 293-4191.

Where do biosolids come from?

All of the wastewater that is flushed down toilets, washed down drains, and produced by washing machines, dishwashers, and other ordinary human activities is domestic sewage. Domestic sewage also may include certain commercial and pretreated industrial wastewaters accepted for treatment by a community wastewater plant. Biosolids originate as the leftover waste materials, domestic septage and sewage sludge, which are generated from domestic sewage treatment.

Domestic Septage

In small communities, it is common for many homes and businesses to be served by individual onsite wastewater systems, such as septic systems. In these systems, grease, scum, and solid materials in wastewater naturally settle out or separate from the rest of the wastewater stream, and bacteria and other microorganisms constantly reduce the volume of the solids in the system through natural processes. However, the solid materials in onsite systems eventually build up and must be pumped out to prevent malfunctions.

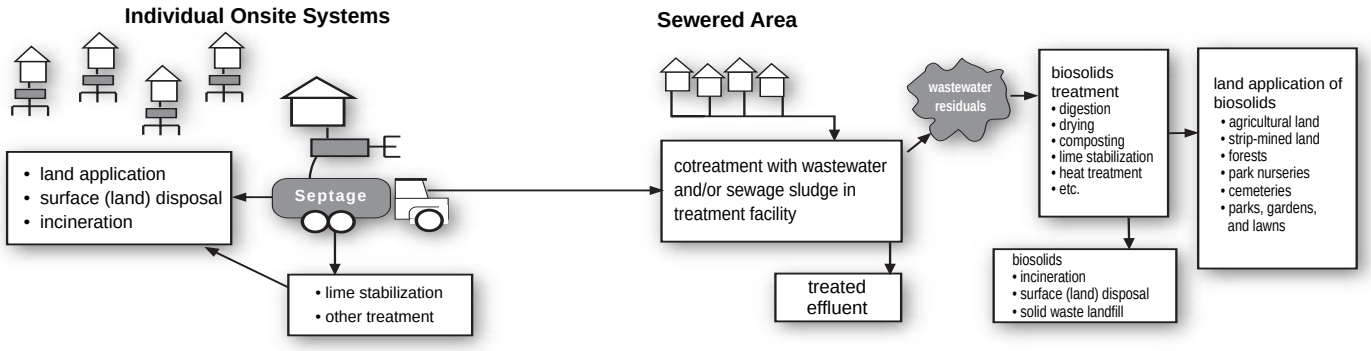
Domestic septage is all of the solid, semisolid, and liquid contents pumped out of onsite systems, such as septic tanks, home aerobic units, cesspools, portable toilets, and other similar systems. Domestic septage is regulated as a type of sewage sludge under the Part 503 rule. However, septage generated by certain businesses (restaurant grease traps, for example) and from onsite systems that receive industrial wastewater are regulated separately.

Sewage Sludge

The term *sewage sludge* also is used to describe the solid materials that settle, separate, or are removed from domestic sewage during various treatment stages in a wastewater treatment plant. This does not include the grit, garbage, and large solids that are removed by screens or filters in the plant. These wastes are not considered to be sewage sludge and normally are collected and disposed of separately.

As is true in onsite systems, sewage sludge in treatment plants is biologically active and is constantly being consumed and reduced through natural treatment processes. But eventually the sewage sludge builds up and must be removed periodically to ensure the plant's smooth and efficient operation.

How do communities manage biosolids?



The figure above illustrates options small communities have for managing domestic septage and sewage sludge as biosolids. These wastewater residuals always must be treated and disposed or recycled as biosolids in accordance with federal Part 503 and any state and local regulations. Under Part 503, biosolids that are disposed in a solid waste landfill, however, must be disposed according to 40 CFR Part 258 requirements.

In most small communities, domestic septage collection is initiated by individual homeowners and performed by private septic contractors called pumper-haulers. These professionals may treat and dispose of the septage themselves, or they may simply transport it to a treatment facility, depending on which options are locally affordable and legally viable. Regardless, septage contractors must follow all federal, state, and local requirements for managing septage, which include keeping records of all service visits, the volume of septage they collect, and how it is treated and disposed.

Under the Part 503 regulations, wastewater residuals sometimes can be applied directly to land as biosolids for final disposal or to improve the quality of the soil at the site. Factors such as the characteristics of the residuals and the soils determine what degree of treatment (stabilization) is required. And specific procedures, site conditions, and restrictions must be satisfied for land application of biosolids to be permitted.

A common option for treating domestic septage is to stabilize it in a facility dedicated only to septage treatment, such as a tank or a lagoon owned by a private contractor or the community. Otherwise, septage may be accepted and treated by a community wastewater treatment plant as additional sewage or as additional sewage sludge. Treatment facilities often have sloped receiving areas where the pumper trucks can empty by gravity, or the septage may be emptied into a manhole upstream from the plant and away from populated areas.

Treating and disposing of the wastewater residuals that are collected or treated at community wastewater treatment plants can be a challenge for small communities. The U.S. Environmental Protection Agency estimates that Americans generate about 47 pounds of sludge per person each year, and managing these wastes can account for as much as 50 percent of a community's total wastewater treatment costs.

Part of what makes managing wastewater residuals such a challenge is the nature of the material itself. Before stabilization, the water content of sludge and septage can exceed 95 percent, which often must be reduced to make transportation more economical. In addition, wastewater residuals contain many disease-causing organisms (pathogens) and emit odors that can attract insects and animals that spread diseases.

By managing, stabilizing, and disposing of wastewater residuals as biosolids, communities not only protect public health and the environment, but they also have a chance to take advantage of the many beneficial properties of biosolids to help the environment.

How are biosolids stabilized?

Part 503 requirements for preparing biosolids differ depending on the characteristics of the residuals and how they will be disposed. Stabilizing biosolids can be a quick and simple one-step process, or it may involve several treatment steps and stages. The goals of stabilization are to reduce or eliminate the amount of dangerous pathogens in the biosolids, to reduce odors, and to inhibit further microbial growth to protect public health and the environment.

The following are a few common methods small communities use to stabilize biosolids:

Lime Stabilization

When lime or other alkaline materials are added to wastewater residuals to raise the pH to 12 for at least two hours, most pathogens in the waste are killed. This simple technique is used often by pumper-haulers to stabilize septage for land placement for final disposal. However, the biosolids that result from lime stabilization have a high pH and are not suitable for land disposal at all sites, and adding lime significantly increases the total volume of waste to be disposed.

The two types of lime used for stabilization are CaO (quicklime) and $Ca(OH)^2$ (hydrated lime), but other alkaline materials, such as flyash, have been used. The amount of lime needed and other procedures are specified in the Part 503 rule and are based on the solids content of the residuals and other factors.

Digestion

Both aerobic and anaerobic digestion are used in communities to stabilize wastewater residuals. With these methods, conditions are made favorable for bacteria and other treatment organisms to reproduce in the wastewater residuals and to provide treatment through natural biological processes.

With aerobic digestion, residuals are aerated in open treatment tanks and with mechanical mixers and aerators to allow aerobic bacteria and other organisms that require oxygen to thrive in the waste. The biological activity in the tanks produces heat, which helps support the treatment process. In cold climates, the tanks may be covered, insulated, or constructed partially below ground to maintain optimal treatment temperatures.

The amount of time the wastewater residuals must remain in the tanks to receive treatment can range from 15 to 40 days. One method called autothermal thermophilic aerobic digestion (ATAD) is increasing in popularity in communities because it requires detention times of less than a week.

Anaerobic stabilization (biological treatment without the presence of oxygen) is less common than aerobic treatment in small communities because specialized facilities often are required. Heat often must be added with anaerobic treatment. However, the process produces methane gas, which sometimes can be captured and used to heat treatment tanks.

Both aerobic and anaerobic digestion reduce the number of pathogens and the volume of wastewater residuals. However, digestion treatment methods are not practical for some smaller communities, especially when costly equipment, energy, personnel, and upkeep are required.

Dewatering

After stabilization, the amount of water in biosolids often must be reduced to make the material more practical to handle, store, and transport. Mechanical belt presses, filter presses and centrifuges dewater biosolids in large communities, but the following simple low-tech methods usually are more practical for small communities:

- *drying beds*—These beds may consist of sand, a paved surface, or wire or polyurethane mesh plates. Biosolids are placed on top of the bed and excess water (the supernatant) collects in drains as the biosolids dry, settle, and thicken with time, evaporation, and gravity (gravity thickening). The supernatant then goes to further treatment or disposal. One design also uses a vacuum to help pull water from the biosolids.
- *reed beds*—Reed beds work similarly to other drying beds but resemble constructed wetlands. Reeds (*Phragmites*) or other wetland vegetation are planted in a lined basin containing a layer of gravel with a layer of sand above it. When the vegetation is well established in the bed, biosolids are added on top, and the supernatant drains through the sand and gravel and collects in underdrains. The plant roots provide additional pathways for the supernatant to drain from the biosolids as it settles and dries.
- *lagoons*—Lagoons are lined excavated basins that can be used to stabilize, store, or dry wastewater residuals. When used for dewatering, biosolids are applied to the lagoon and allowed to dry naturally through gravity thickening and evaporation. As crust forms on top of the biosolids, it is broken up and turned mechanically. This process is repeated until the solids content of the biosolids increases.
- *freezing and thawing*—This low-tech dewatering process is used in cold climates. Biosolids are applied to a bed in shallow layers of about three inches. As one layer freezes another layer is added on top. When the biosolids thaw in spring, their solids content has increased.

Conditioning

Sometimes the characteristics of wastewater residuals are altered through a treatment step called conditioning to make dewatering processes more effective or to make biosolids easier to treat. Conditioning methods include adding organic or inorganic chemicals, such as lime, ferric chloride, and polymers, and heating the biosolids (thermal conditioning). Thermal conditioning also disinfects the biosolids.

Composting

The processes involved in biosolids composting are the same natural processes that take place in a typical backyard compost heap only on a much larger scale. Dewatered biosolids from treatment facilities can be composted to kill pathogens and to produce a humus-like material. Because of the volume of the biosolids material, and the space, time, energy, and equipment required, composting usually is only cost-effective for producing biosolids for reuse. Composting outdoors, rather than in-vessel composting, usually is more practical for small communities.

First, dewatered biosolids are mixed with a bulking agent, such as leaves, finished compost, or sawdust, to increase the solids content. The bulking agent is chosen for its characteristics, such as its carbon content or porosity, as well as its cost and availability.

The compost mixture then is arranged in rows of long piles, called windrows, or in a single large rectangular pile called an aerated static pile. Biological activity causes temperatures to rise in the compost piles to 130 degrees or more to kill pathogens.

To increase aerobic treatment activity in the compost, alternate rows or sections of the pile are turned or mixed with specialized equipment and also may be aerated either by vacuum or forced air. After initial treatment, the compost is allowed to stabilize for an additional period of 30 days or more before it is transported or packaged for recycling.

For more information about various biosolids stabilization options, refer to the resources listed on page 8.

How are biosolids disposed?

Communities have four general ways to dispose of biosolids:

- beneficial land application (recycling),
- surface disposal (land disposal),
- incineration, or
- disposal at a municipal solid waste landfill with other community wastes.

Biosolids that are beneficially applied to land, disposed on land, or incinerated must meet Part 503 rule requirements. Under Part 503, biosolids can only be disposed at a municipal solid waste landfill if the landfill and the biosolids meet 40 CFR Part 258 requirements. Small communities should work with their local health agencies or state biosolids officials to determine which disposal options are locally permitted and best suited to their individual circumstances. *(Refer to the contact information on page 7.)*

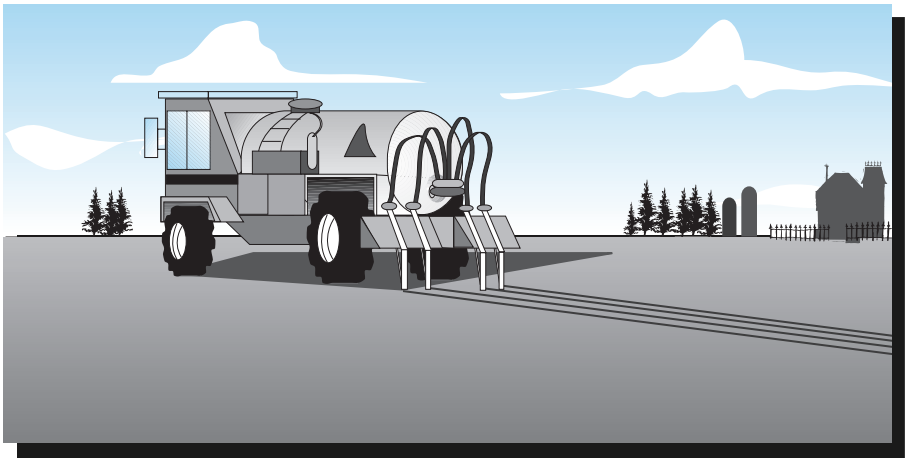
Beneficial Reuse

Communities can choose to beneficially apply biosolids to land to improve site conditions and help the environment. Land application has several advantages for small communities. For example, small communities are more likely than large towns and cities to have access to affordable land close by, making beneficial reuse options more economical.

With treatment, biosolids can be recycled and applied as fertilizers or soil conditioners. Biosolids used for beneficial applications can be applied in bulk to farmland, forested areas, and, in some cases, parks, gardens, and other areas frequented by the public. Some high-quality biosolids even can be placed in containers or bags and sold or distributed to the public for general use.

Recycling biosolids for beneficial applications has obvious environmental advantages for communities. The organic components of biosolids can improve soil structure and its ability to hold water. Nitrogen, phosphorus, potassium, trace nutrients, and lime in biosolids can aid plant growth, and the organic matter in biosolids helps soil to retain the nutrients and make them more available to plants. In addition, biosolids suppress pathogenic soil organisms such as nematodes that damage plant roots and cause certain plant root diseases.

Biosolids that are applied to land for beneficial purposes cannot exceed the maximum ceiling concentration limits for the heavy metals specified in the Part 503 rule *(refer to the article, "What does the Part 503 regulate?" on page 6.)* In addition, biosolids that are land applied must meet the additional pollutant concentration limits or the cumulative or annual pollutant loading rate limits for the site as specified in the rule for these metals. Certain general requirements, site restrictions, and management practices also may be required in the Part 503 rule, depending on the land application option chosen. Additional state and local requirements also may apply.



Application Methods

Biosolids that have not been dewatered and have a high liquid content often can be land applied by being sprayed on the ground surface or injected just below ground surface from specially equipped trucks *(refer to the graphic above)*. The biosolids usually must be stabilized first to reduce pathogens and odors. Then they are incorporated into the soil after placement.

Biosolids with a somewhat higher solids content often can be spread directly from the back of pumper-hauler trucks, farm tank trucks, or tractors pulling a tank wagon. The trucks usually are equipped with a manifold or a splash plate on the back to improve biosolids distribution. The ground may be plowed into ridges and furrows, which are covered over after the biosolids have been placed in the furrows. In some operations, plows precede and follow the tank trucks to create the furrows and then immediately cover them over again after application.

Biosolids cannot be disposed or beneficially applied to land that is saturated, frozen, or covered with snow and ice. They usually must be stored in a lagoon or other facility until site and weather conditions become more favorable.

Public workers, private septic contractors, farmers, land owners, or other individuals or entities charged with applying biosolids to land, whether for final disposal or beneficial purposes, should receive adequate training and be aware of all Part 503 requirements. They often can be held personally liable for improper management practices and unmet regulatory requirements. *(Refer to the article "Who must comply with biosolids regulations?" on page 6.)*

Pathogen Requirements

In addition to the pollutant limits mandated in the Part 503 rule, biosolids intended for land disposal or beneficial application options are categorized as either Class A or B according to the degree of treatment they have received to reduce pathogens, such as viruses, protozoa, parasites, and bacteria. To protect both human and animal health, the Part 503 rule has certain requirements and restrictions governing the land disposal or beneficial application of Class A and B biosolids.

These requirements include stabilization or advanced treatment processes to reduce or eliminate pathogens, treatment to reduce odors and the biosolids' attractiveness to animals and insects, site restrictions to protect ground and surface water sources, and restrictions to minimize human and animal contact with biosolids.

Class A Biosolids

Biosolids that receive advanced treatment to eliminate or reduce pathogens to below detectable levels are categorized as Class A biosolids. The Part 503 rule outlines acceptable alternatives communities can choose to manage and stabilize wastewater residuals to produce Class A biosolids. These include specific monitoring and record keeping requirements and advanced stabilization practices designed to ensure pathogen elimination.

Class A biosolids can be disposed with fewer restrictions than Class B biosolids, which may still contain some pathogens. For

example, there are fewer restrictions when Class A biosolids are used to fertilize crops. However, steps to reduce their odor and attractiveness to insects and animals still are required.

Exceptional quality biosolids meet all of the Class A pathogen reduction limits and also have very low levels of pollutants and the degradeable organic compounds that can attract animals that spread diseases. When these biosolids are beneficially applied to land, pollutants levels do not even need to be tracked at the site. This is because risk assessment studies show that it would take at least 100 years for the potential pollutants in exceptional quality biosolids to accumulate to significant levels. Exceptional quality biosolids can be used or sold in bulk or given away in bags or other containers virtually without restriction.

Class B Biosolids

Class B biosolids receive less advanced treatment for pathogens than Class A biosolids, and, therefore, may still contain pathogens at detectable levels. To protect human and animal health, the Part 503 rule requires that Class B biosolids meet certain site and use restrictions.

For example, under Part 503, crops cannot be planted in soil fertilized with Class B biosolids for a certain period of time to allow for the natural die-off and reduction of pathogens to safe levels. The amount of time required varies depending on the type of crop, how it will be used, and the degree of contact the portions of the plants that will be harvested will have with the biosolids/soil mixture.

Food crops that have harvested parts below land surface (potatoes and carrots, for example) cannot be planted in soil fertilized with Class B biosolids for at least 20 to 38 months. The exact time required depends on how long the biosolids were allowed to remain on the ground surface before being incorporated into the soil. Food crops whose harvested parts are above ground, but which touch the biosolids/soil mixture, cannot be planted for at least 14 months. Other food crops that have harvested parts that do not touch the soil at all or that are used as animal feed or for other purposes, cannot be planted for 30 days or more after the application of biosolids. In addition, after biosolids application, animals cannot graze on land for at least 30 days and turf grown with biosolids cannot be harvested for one year.

Public access to land is restricted for 30 days when Class B biosolids are applied to isolated areas not likely to be frequently visited by the public, such as remote forested areas, and for one year in areas where there is a high potential for public exposure, such as public parks and gardens.

Surface Disposal

In some cases, communities may choose to dispose of biosolids on land without taking advantage of their beneficial properties. When biosolids are placed on land for the sole purpose of final disposal, rather than for beneficial reuse, storage, or treatment, it is referred to as surface disposal. Under the Part 503 rule, biosolids must remain at a site for more than two years to be considered disposal rather than storage.

Appropriate surface disposal sites are selected based on criteria such as slope and soil conditions and required minimum distances to ground and surface water sources. Sites also are restricted based on the potential for human and animal contact with the biosolids.

When biosolids are placed on land solely for final disposal, they often are put in a monofill covered with soil. The soil reduces odors and prevents human and animal contact with the biosolids. Monofills may be a series of excavated trenches, a single large excavated area, a mound, or simply layers of biosolids on the ground surface covered with soil. The biosolids in monofills are always covered with at least enough soil to be below the plow line to limit odors and minimize contact with humans and animals. A final deeper soil cover is added when monofills are closed.

Dewatered biosolids sometimes are disposed on land without a soil cover, either in open waste piles, surface impoundments, or lagoons. These sites may require liners and leachate collection systems to slow or prevent seepage to nearby ground or surface water sources, and they must meet other site restrictions to minimize the potential for human and animal contact with the biosolids.

The Part 503 rule limits the amount of the heavy metals arsenic, chromium, and nickel in biosolids that are to be surface disposed at sites without liners and leachate collection systems. A liner may consist of a layer of dense impermeable soil, such as clay, below the site or a synthetic material. Leachate collection systems collect the liquids above the liner and transport them to treatment or disposal. Biosolids disposed at sites that don't have this type of system must be sampled prior to disposal for levels of the three metals mentioned above.

In addition, the levels of arsenic, chromium, and nickel at active surface disposal sites must be monitored periodically. How often pollutant levels must be monitored at sites depends on the amount of biosolids being applied and the rate of application. Surface disposal sites that are covered with soil also must be monitored for levels of methane gas in the air.

State and local regulations may include additional more stringent requirements for surface disposal. Biosolids preparers, disposers, land owners, and other regulated parties should check with their local permitting authorities for information. *(Refer to the contacts list on page 7.)*

Incineration

Communities sometimes choose to incinerate their biosolids. Although incineration does not have the same environmental advantages as beneficial land application options, the Part 503 rule requires specific management practices and pollutant limitations designed to protect public health and the environment.

Biosolids incineration takes place at high temperatures primarily in multiple-hearth and fluidized-bed furnace systems. These systems must be equipped with one or more air pollution control devices to remove small particles and certain other pollutants from exit gases. Screenings, scum, grit, solid waste, natural gas, and other substances may be used as auxiliary fuels to help the biosolids burn. However, if the mixture contains more than 30 percent municipal solid waste, it is regulated as solid waste under 40 CFR Parts 60 and 61.

The Part 503 regulations include limits for the amount of metals, such as arsenic, beryllium, cadmium, chromium, lead, mercury, nickel, and for the total hydrocarbons that may be emitted from biosolids incinerators. The person firing the biosolids in the incinerator must be trained to monitor and keep records of the combustion temperature in the furnace, amounts of certain metals in the biosolids before incineration, and concentrations of total hydrocarbons, oxygen, and certain metals in the stack exit gases. They also must gather information that is used to calculate the amount of moisture in the exit gases.

The Part 503 rule outlines management practices for biosolids incineration including required intervals for monitoring and equations for determining exact pollutant concentrations being applied and the rate of application.

For a copy of the 40 CFR Part 503 regulations and more detailed information about biosolids beneficial reuse or disposal options, refer to the list of resources from EPA and the National Small Flows Clearinghouse (NSFC) on page 8. For more complete listing, contact the NSFC at (800) 624-8301 or (304) 293-4191 to request a free catalog. Request Item #WWCAT.

What does the Part 503 rule regulate?

Part 503 rule requirements must be met whenever biosolids are:

- beneficially applied to land,
- disposed on land (surface disposal), or
- fired in an incinerator separate from other wastes.

However, if biosolids are to be disposed at a solid waste landfill, they must meet certain 40 CFR Part 258 requirements.

Part 503 Requirements

The Part 503 rule includes requirements or restrictions in the following areas for all types of biosolids (including septage):

- *site requirements*—The rule specifies certain minimum site restrictions for land application of biosolids (for example, minimum distances to surface water and depths to groundwater sources) to protect public health and the environment.
- *monitoring, record keeping, and reporting*—The Part 503 rule specifies how and how often the quality of biosolids and conditions of the disposal sites must be monitored, as well as the records and reports that are required.
- *vector attraction*—The rule requires steps be taken to reduce the chance that insect and animal vectors (disease carriers) will be attracted to or will have access to biosolids. These include practices to minimize odors.

In addition, the Part 503 rule includes the following additional restrictions for sludge generated in wastewater treatment plants and septage treatment facilities.

- *pollutants*—This includes limits on the levels of pollutants in biosolids that are incinerated, applied to the land, disposed on land, or that can exist at the sites where biosolids are applied or disposed. The specific pollutants that are limited include arsenic, beryllium, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc. The quality of the biosolids must be tested prior to application and at the site to ensure the allowed limits for each of these is not exceeded.
- *pathogens*—Biosolids are classified either as class A or B, depending on the level of disease-causing organisms present prior to their use or disposal. Part 503 requirements and restrictions governing the disposal or use of biosolids are different for the two classes. The rule also includes requirements concerning the treatment of biosolids specifically for pathogen reduction.

Not Included in Part 503

The Part 503 rule does not regulate how communities should select from among the available options for treating and disposing of biosolids. It also does not regulate biosolids that are simply stored for two years or less. Industrial sludge, hazardous sludge, incinerator ash, grit and screenings, nondomestic septage *(see "Key Terms" on page 1)*, and drinking water sludge also are outside the scope of the Part 503 regulations.

Some private industries and local governments have used the Part 503 rule as a guidance for managing agricultural wastes, such as animal wastes, and certain industrial wastewater residues, which are beyond the intended scope of the regulations. Adapting the Part 503 rule for other uses may have inherent dangers, because the studies and risk assessments the rule is based on only examine biosolids. Ideally, standards and restrictions for different types of wastewater residuals should be developed individually based on relevant studies, so that risks to the environment and public health are properly evaluated. But the Part 503 rule often can serve as a good reference or starting point for developing standards where none exist.

Who must comply with biosolids regulations?

The Part 503 rules apply to anyone who:

- generates or prepares wastewater residuals or biosolids that are land applied, placed on a surface disposal site, or fired in an incinerator;
- derives a material from wastewater residuals or biosolids;
- applies biosolids to the land or fires biosolids in an incinerator; and
- owns or operates a surface disposal site.

This includes associations, partnerships, corporations, municipalities, and state and federal agencies, as well as individuals.

The Rule Is Self-Implementing

All of the standards designated in the Part 503 regulations are directly enforceable under federal law. This means that everyone the law applies to—all preparers, users, and disposers of sewage sludge and biosolids—are required to meet the standards in the rule whether or not they have a permit.

However, Permits Are Required

Although the Part 503 rule is self-implementing, state and local regulations often require the following parties to apply for a permit:

- any person or facility that treats wastewater residuals or generates biosolids as regulated by Part 503,
- industrial facilities that treat domestic sewage separately from industrial sewage and generates biosolids as regulated by Part 503,
- all operators and owners of land disposal sites,
- all operators and owners of biosolids incinerators, and
- anyone who changes the quality of biosolids as regulated by Part 503.

However, state and local governments may or may not require that persons or entities that store, collect, transport, or land apply septage, sludge, or biosolids apply for permits, if they do not either generate or change the quality of biosolids. Owners of property on which biosolids are applied, domestic septage pumpers-haulers, and biosolids packagers and baggers also may or may not need permits. Anyone not sure about permit requirements should contact their local or state health agency for information. *(Refer to the contacts list on page 7.)*

To obtain a copy of the 40 CFR Part 503 rule and other relevant documents offered by the NSFC, refer to page 8.

EPA honors beneficial use of biosolids

Every year since 1986, outstanding contributions promoting biosolids' beneficial reuse have been recognized through the EPA's Beneficial Use of Biosolids Awards. Among those honored in 1998 was a private septic contractor from Huntsburg, Ohio, Tim Frank, who received a special award for his work to find better, inexpensive, and environmentally-friendly ways to manage the septage he collects.

When Frank began his business in the 1960s, he often had to drive for hours to empty his truck, which in those days meant spreading untreated septage on the ground. Frank soon started innovating effective and affordable ways to treat and apply septage closer to home to protect the environment and to save money for his business and his clients.

Now Frank stabilizes and beneficially applies the septage he collects as biosolids to his own land where he grows animal feed crops. His facility may even begin accepting septage from other area contractors, and he has helped advance his profession by working with EPA to make the Part 503 rule more practical for small septage operators.

To learn more about the biosolids awards program, contact your regional EPA office or visit the EPA's Web page at http://www.epa.gov/owm/nomguid.htm.

Did you know . . . ?

Did you know that biosolids are used to fertilize the grounds of the Washington Monument, the White House, and the lawns at Mount Vernon? Biosolids also are used to maintain grass playing fields, like the Rose Bowl stadium field, and to revegetate highway embankments and median strips. Biosolids also can help reverse land damage from mining and dredging operations and are used in some forests to accelerate tree growth and shorten pulp and lumber production cycles.

The beneficial components and properties of biosolids are so valuable in some areas that exceptional quality biosolids have sold in bulk for as much as $190 per ton. The U.S. Department of Agriculture, the Food and Drug Administration, and the EPA all endorse the use of biosolids for producing fruits and vegetables. Yet, despite their many benefits and proven safety, land application of biosolids still often meets with opposition.

Public education is needed

No doubt part of the public reaction to biosolids originate from our deeply ingrained negative attitudes toward human wastes. Even people who know that their fruits and vegetables are grown with animal fertilizers still may have a hard time accepting biosolids reuse. In truth, under the Part 503 rule, high quality biosolids used with food crops are more closely monitored and at least as safe as animal fertilizers.

In recent years, a few inaccurate sensationalized news stories have added to public misgivings about biosolids safety. The EPA has worked hard to address these concerns, but more public education is needed. Both the EPA and the Water Environment Federation have Web pages that put to rest some of the media controversies surrounding biosolids safety. They can be accessed at http://www.epa.gov/owmitnet/bio and http://www.wef.org/docs/biofact/contents.html.

Community leaders and residents are invited to copy and distribute the articles in this issue of *Pipeline* to help with public education efforts. The source of information for this article is the EPA booklet, *Biosolids Recycling: Beneficial Technology for a Better Environment* (Item #WWBLGN59), which is an excellent public education resource *(refer to page 8 for ordering information).* Page 8 lists additional resources, and some of the contacts listed on this page offer educational information for communities.

CONTACTS

Local Health Agencies

Concerned citizens, local contractors, land owners, land appliers, treatment plant operators, and others who would like to know more about local, state, and federal biosolids regulations and management practices should start by contacting their local health agency or county health department. These agencies are listed in the blue pages of local phone directories.

State and EPA Regional Biosolids Contacts

State or federal biosolids officials usually can assist with biosolids questions that not answered at the local level. The phone numbers of state and federal biosolids contacts often can be obtained from local health agencies, or state biosolids contacts can be reached by calling the main number of the state health agency or department of environmental protection listed in local directories. In addition, state and EPA regional biosolids contacts are included in some of the resources listed on page 8.

Readers who still have trouble finding their state or federal biosolids contacts may wish to visit the National Small Flows Clearinghouse (NSFC) Web site at http://www.nsfc.wvu.edu, or contact Annette Judy at (800) 624-8301 or (304) 293-4191, ext. 5520, for assistance.

National Small Flows Clearinghouse (NSFC)

The NSFC offers technical assistance and free and low-cost information and educational materials on biosolids management and a variety of other wastewater issues for small community residents and officials. Only a few of the NSFC's many resources and services are mentioned in this issue. Contact the NSFC at (800) 624-8301 or (304) 293-4191 for more information or to request a free catalog.

Biosolids Organizations

The following nonprofit organizations promote environmentally-sound biosolids management practices regionally and nationally. They also offer educational materials and a variety of other services and information. Contact them at the numbers provided for information.

National Biosolids Partnership
(703) 684-2438

Northwest Biosolids Management Association
(206) 684-1145

New England Biosolids and Residuals Association
(603) 323-7654

Mid-Atlantic Biosolids Association
(215) 685-6248

NSFC OFFERS FREE BIOSOLIDS INFO

To order any of the following products, call the National Small Flows Clearinghouse (NSFC) at (800) 624-8301 or (304) 293-4191, fax (304) 293-3161, e-mail nsfc_orders@estd.wvu.edu, or write NSFC, West Virginia University, P.O. Box 6064, Morgantown, WV 26506-6064. Be sure to request each item by number and title.
A shipping and handling charge will apply.

Standards for the Use and Disposal of Sewage Sludge—40 CFR Part 503

The NSFC offers free copies of the entire 1992 Part 503 rule, which include standards for biosolids land disposal, pathogen and vector attraction reduction, incineration, stabilization processes, analysis and compliance. Request Item #WWBKRG35.

Domestic Septage Regulatory Guidance: A Guide to the EPA 503 Rule

This free document helps septage users and diposers understand and follow the Part 503 requirements. Topics include land application of septage, discharging septage to treatment facilities, and commercial and industrial septage. Request Item #WWBKRG36.

Guide to the Biosolids Risk Assessments for the EPA Part 503 Rule

This free guide was published by EPA to provide information about biosolids saftey and an explanation of the risk assessment process conducted as a basis for the Part 503 biosolids rule. Request Item #WWBKGN85.

Biosolids Recycling: Beneficial Technology for a Better Environment

This free booklet discusses biosolids safety and explains the many benefits of biosolids reuse and the EPA's policy encouraging reuse. Request Item #WWBLGN59.

Control of Pathogens and Vector Attraction in Sewage Sludge

This free EPA document describes the federal requirements for reducing pathogens and vector attraction in biosolids, and include examples of approaches for meeting requirements and a list of state and EPA contacts. Request Item #WWBKRG30.

Surface Disposal of Sewage Sludge

This free document assists owners and operators of land disposal sites for biosolids in complying with the Part 503 rule. Details are provided on monitoring, record keeping, and reporting requirements for surface disposal. Request Item #WWBKRG45.

Guide to Septage Treatment and Disposal

This free guide presents practical information on the handling, treatment, and disposal of septage in compliance with Part 503 regulations. Request Item #WWBKGN58.

Innovations in Sludge Drying Beds

This free brochure discusses paved beds and reed beds as alternatives to conventional sand drying beds. Request Item #WWBRGN20.

More Free and Low-Cost Info Available

Both the NSFC and the EPA offer more free and low-cost information about septage, sludge, biosolids, and the Part 503 regulations that can be listed here. For a complete listing, contact the NSFC for a copy of its free catalog. Request Item #WWCAT.

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For wastewater information, call the NSFC at (800) 624-8301 or (304) 293-4191.

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