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Biosolids
Frequently Asked Questions

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What are biosolids?
Biosolids is a term that refers to solid, semisolid, or liquid materials removed from municipal sewage and treated to be suitable for recycling as fertilizer. As fertilizer, biosolids are used to improve and maintain productive soils and stimulate plant growth. The use of biosolids is subject to the Virginia Department of Environmental Quality regulatory requirements that exist to help keep rivers, lakes, streams, bays and ground water clean; protect plants; and prevent the transmission of diseases.

What is the difference between biosolids and sewage sludge?
When wastewater arrives at a treatment facility, the solids are separated out and become sewage sludge. Sewage sludge may be sent to a landfill, incinerated or receive additional treatment to become biosolids. This additional treatment must occur for sewage sludge to be called biosolids.

Where do biosolids come from?
Biosolids are created through the treatment of sewage sludge in a municipal wastewater treatment facility. Wastewater treatment facilities receive sewage – the solids and liquids from toilets and drains. If the sewage comes from an industrial location, it must meet certain standards before being sent down the drain. This is called pre-treatment, where specialized processes are used to remove or reduce certain pollutants. In recent years, these processes have dramatically reduced the amount of heavy metals in sewage.

Once the sewage reaches the municipal treatment facility, it goes through physical, chemical and biological process-es to treat the liquids known as wastewater and remove the solids known as sewage sludge. The sewage sludge is broken down and sanitized to control disease-causing organisms and reduce odor. Once the sewage sludge is treated, it is called biosolids. When applied according to DEQ regulations, biosolids are suitable for applying to land as fertilizer to improve and maintain productive soils and stimulate plant growth.

Many processes and techniques exist to treat sewage and they vary by treatment facility. Contact your local wastewater treatment facility for details on treating sewage sludge and generating biosolids in your area.

How are biosolids used?
When processed and applied according to DEQ and federal regulations, biosolids are suitable for applying to land as fertilizer to improve and maintain productive soils and stimulate plant growth. Biosolids may also be used to establish vegetation and reduce soil erosion on land which has been mined, and improve drought resistance because the additional organic matter increases the soil's ability to absorb and hold moisture. Sewage sludge may be sent as waste to landfills or incinerators.

Are there different types of biosolids?
Biosolids that are used as fertilizer are divided into two categories: Class A and Class B. Class A biosolids have received a level of treatment that virtually eliminates disease-causing organisms or pathogens. If the levels of heavy metals are low enough and the treatment includes methods to reduce the possibility that animals will be attracted to the material, Class A biosolids

may be distributed as Exceptional Quality biosolids. Because of the extra treatment, no special distance setbacks from wells or streams are required by the regulations to provide environmental and health protection from pathogens. Exceptional Quality material may be bagged and is often sold alongside commercial fertilizers. Producers of Exceptional Quality biosolids are required to obtain permits from DEQ and register with the Virginia Department of Agriculture and Consumer Services before selling the material.

Class B biosolids have less restrictive standards for content of metals and disease-causing organisms, and thus require more restrictive permit limitations so that specific land application practices are observed and environmental and health impacts are avoided. Class B biosolids standards are considered to protect human health and the environment as well as Class A biosolids standards when coupled with specific application restrictions, such as distance between land with biosolids and any wells and streams, access restrictions for people and livestock, and certain crop exclusions.

How much biosolids is applied to land in Virginia?

From 2008 – 2013, an average of 220,000 dry tons of biosolids were applied annually to approximately 65,000 acres of permitted land application sites in Virginia. There are 7.89 million acres of cropland, pastureland, and woodland on Virginia farms, and biosolids was used on less than 1 percent of this area. In comparison, commercial fertilizer was used on more than 1.9 million acres and animal manure on more than 363,000 acres (2012 U.S. Department of Agriculture Census).

Who determines how and where biosolids are applied?

Wastewater treatment facilities that produce biosolids, and any persons contracting with the facility to apply biosolids on land, must obtain a permit from DEQ before application. DEQ's permit regulations require that only biosolids that meet specific requirements are applied, and only on approved lands with ongoing testing, notification and monitoring.

To determine whether biosolids can be applied to a particular site, an evaluation of the site is first performed by the land applier. The evaluation examines water supplies, soil characteristics, slopes, vegetation, crop needs and the distance to streams, lakes, rivers and groundwater. When DEQ receives a permit application with this initial information, DEQ staff reviews the proposed biosolids sources and proposed land application sites to confirm if they are suitable. DEQ notifies the local government and residents adjacent to the land application sites. For the initial permit in a locality, DEQ also holds a public meeting to discuss the proposed permit. After the public meeting, the staff will assemble a permit with consideration of comments from the public, local government and other state agencies. Once the draft permit is complete, a notice will appear in the local paper. During the following 30 days, the public is encouraged to provide comment on the proposed permit. Members of the public may also request that DEQ host a public hearing. At the end of 30 days, DEQ will consider all comments received and either approve or deny the permit. Before applying biosolids to newly permitted lands, the permit holder must first notify the local government and then wait 100 days.

DEQ has biosolids specialists at its seven offices throughout the state who are dedicated to overseeing the proper management of biosolids. To read more about the regulations for applying biosolids on land, please visit http://www.deq.virginia.gov/Programs/Water/LandApplicationBeneficialReuse/Permits,Fees,Regulations.aspx

How do we know what's in biosolids?

DEQ regulations require sampling on a prescribed schedule to ensure that the regulated parameters are measured and treatment levels are achieved. The nutrient content of the material is measured so that the appropriate rate for the crop to be grown can be determined. The frequency of testing depends upon the amount of biosolids a particular generator produces; more production requires more frequent sampling. At a minimum, the following parameters are analyzed:

Nutrients	Metals	Other
• Total kjeldahl nitrogen • Ammonia nitrogen • Nitrates • Total phosphorus • Total potassium	• Arsenic • Cadmium • Copper • Lead • Mercury • Molybdenum • Nickel • Selenium • Zinc	• Percent solids • Volatile solids • pH • CaCO3 (for lime stabilized biosolids) • Alkalinity as CaCO3 • Additional parameters may be analyzed for screening purposes when approving a new source. For example, analysis for PCBs (poly-chlorinated biphenyls) is required before a new biosolids source will be approved.

The U.S. Environmental Protection Agency has conducted surveys of sewage sludge throughout the United States to evaluate whether there are other constituents found in biosolids that would warrant further testing requirements before land application. Additional research is being conducted to determine not only the amount present, but also whether these amounts pose significant concerns. DEQ monitors the ongoing work of EPA in this respect, and if necessary, will respond to these findings with additions to the list of regulated parameters.

Who can apply biosolids to land?

Anyone who wants to apply biosolids to land must comply with all federal and state regulations. In most cases, a permit is required. Contact the local DEQ office to find out if your land qualifies (see the "Where can I find out more about biosolids in my area?" section).

How much biosolids can be spread as fertilizer and when?

The amount of biosolids that can be applied and when they can be applied is different for each site. Virginia DEQ permits for land application require that a site-specific nutrient management plan be developed to establish the amounts and timing.

The goal of these management plans is to maximize the ability of the plant to use the nutrients in the biosolids so that losses to the environment are minimized. The application rate will be based on the crop type, the varying nutrient content of biosolids and the nutrient content of the soil. In general terms, this will typically equate to approximately one tractor-trailer load of biosolids for every one to two acres of land. Biosolids are applied when a growing crop can best utilize the nutrients, or at some time slightly before that crop is planted. The rates at which biosolids break down and the nutrient become available to the crop are also taken into account in the timing. If biosolids are applied in the fall of the year for a spring crop, a cover crop must be planted to retain the nutrients over the winter months.

A certified land applier knocks off biosolids from the tailgate of truck while a local DEQ biosolids specialist inspects the application of biosolids from the Hampton Roads Sanitation District in Chesapeake City, VA. The DEQ's biosolids specialists work throughout Virginia to ensure proper application of biosolids for the protection of human health and the environment. (DEQ Photo)

What type of crops can be fertilized with biosolids?

In Virginia, biosolids are most often applied to hay, pasture, forests and crops grown for grain such as corn and wheat. In order to prevent bacterial contamination of food crops like vegetables, there are restrictions on when these types of crops can be grown in a field that has received biosolids. In addition, livestock is not allowed to graze pastures where biosolids have been applied for at least 30 days.

Can biosolids be spread near my home?

Buffers, or areas where biosolids cannot be applied, are required between homes and the land applied with biosolids. The buffer can be decreased if the homeowner requests the reduction and signs a waiver. This distance may vary depending upon the location of the resident's well, and in some cases, whether there are occupants in the home with compromised immune systems. There are also mandatory buffers from property lines, roadways, wells, water bodies, streams, and environmentally sensitive areas such as rock outcrops and sinkholes. The buffer distance may vary depending upon whether or not the biosolids are incorporated (worked under the soil), the season of the year and slope conditions. Waivers are permitted only for dwellings and property lines; environmental restrictions such as wells or areas next to streams cannot be waived by the property owner.

How do the biosolids rules protect human health and the environment?

Environmental regulations are designed to reduce concerns about the effects that many activities may have on people's health and the environment. The current biosolids rules address the potential concerns of impacts on surface water and ground water, harmful effects on plants and transmission of disease. These rules include: (1) proper pollutant source control and disposal of household and business hazardous wastes, (2) assessment of biosolids quality, (3) determining appropriate soil, landscape, and crop conditions, (4) monitoring and oversight of transport, storage, application and land use before, during and after application, and (5) limiting access, harvest or grazing until appropriate time periods have elapsed.

These regulations are based on the best information currently available. However, some questions about biosolids do remain, including the presence of pharmaceuticals, personal care products such as antibacterial soaps, and other possible contaminants. As new research emerges on these and other topics, additional protective measures may be added to the regulations.

What has changed about biosolids regulations in Virginia?

Beginning January 1, 2008, the Virginia Department of Environmental Quality assumed regulatory oversight of all land application of biosolids in the state. From 1994 to 2007, the Virginia Department of Health regulated all biosolids applied to land by private contractors. The 2007 General Assembly voted to consolidate the regulatory programs so that all persons applying biosolids to land would be subject to uniform requirements. DEQ was chosen to oversee this because of its existing compliance and enforcement structure. The VDH continues to consult with DEQ and advise the public on health issues related to biosolids applications.

The 2007 General Assembly also added requirements on biosolids to protect human health and the environment. Among these changes, DEQ requires nutrient management plans for all land receiving biosolids, conducts unannounced inspections of the land application sites, ensures certification of persons applying biosolids to land, and requires payment of a $7.50 fee per dry ton of biosolids land applied. The fee is paid to DEQ by the producer of the biosolids. The fee helps fund the biosolids regulatory functions of DEQ and the Department of Conservation and Recreation, as well as local government monitoring programs.

Who checks to see if the biosolids regulations are followed?

DEQ employs biosolids specialists at its seven regional offices located throughout Virginia who are responsible for monitoring and enforcing biosolids regulations. The specialists evaluate sites before, during and after application of biosolids. There is a particular emphasis on being present as many times as possible when biosolids spreading is actually occurring. These field experts are equipped with specialized tools to determine compliance with location of application. An inspection report is prepared for each visit to a land application site. The inspection report documents numerous aspects of the activity and conditions observed. The biosolids specialists are also available to answer questions from the public.

What is a local monitor?

Localities are empowered by state law with the ability to employ an individual that monitors the use of biosolids to ensure state and federal requirements are met, just like a Virginia Department of Environmental Quality biosolids specialist. DEQ encourages local governments to exercise this ability to supplement oversight and provide a familiar, local presence where these activities occur. The local monitor can also require that any activity that is in violation of the regulations be stopped. DEQ can reimburse the locality for costs incurred in implementing a local monitoring program, provided the local monitor has met training requirements and prescribed procedures are followed.

Where can I find out more about biosolids in my area?

To find out more about biosolids in your area, contact a Virginia Department of Environmental Quality biosolids specialist from the nearest regional office.

Blue Ridge Regional Office
(434) 582-5120
7705 Timberlake Road
Lynchburg, VA 24502

Piedmont Regional Office
(804) 527-5020
4949-A Cox Road
Glen Allen, VA 23060

Tidewater Regional Office
(757) 518-2000
5636 Southern Blvd.
Virginia Beach, VA 23462

Northern Virginia Regional Office (703) 583-3800
13901 Crown Court
Woodbridge, VA 22193

Southwest Regional Office
(276) 676-4800
P.O. Box 1688
355-A Deadmore Street
Abingdon, VA 24210

Valley Regional Office
(540) 574-7800
P.O. Box 3000
4411 Early Road
Harrisonburg, VA 22801