

Biosolids Facts

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What are biosolids?

Biosolids are mostly organic solids resulting from the treatment of wastewater that have undergone additional treatment to kill pathogens and that have been approved by the U.S. Environmental Protection Agency (EPA) for land application as a fertilizer and soil amendment. Biosolids are rich in such nutrients as nitrogen and phosphorus and contain other micronutrients for plant growth.

What are the different kinds of biosolids?

The federal Clean Water Act Part 503 regulations identify two classes of pathogen reduction for biosolids that are to be land applied or composted:

Class B biosolids undergo a “Process to Significantly Reduce Pathogens” (PSRP). Digesters and other forms of treatment, such as lime stabilization, kill from 90 to 99.5 percent of the pathogens originally found in wastewater solids. This means that pathogens are reduced to levels that are well below those found in animal manures. As an added layer of public protection, additional best management practices (BMPs) are required at the site where biosolids are applied, such as buffers and restrictions on access immediately after application. The natural environment of sunlight and existing organisms in the soil break down remaining pathogens. In Pennsylvania, Class B biosolids are used in bulk as fertilizers in agriculture and to reclaim barren lands. Permits from the Pennsylvania Department of Environmental Protection are required for Class B biosolids use.

Class A biosolids undergo a “Process to Further Reduce Pathogens (PFRP).” Pathogens are reduced to basically non-detectable levels. Class A biosolids products can be used on home lawns and gardens, parks and golf courses, and other places where public contact is likely without further regulation or site permits. Class A biosolids products include composted biosolids, digested and lime pasteurized biosolids and heat dried pellets. Class A biosolids products are sometimes ingredients in soil amendments, potting soils and slow-release fertilizers available at lawn and garden centers.

How do we know that biosolids are safe?

Long-term scientific studies have consistently demonstrated that biosolids recycling is safe and beneficial when performed in accordance with federal and Pennsylvania regulations.

The management of biosolids to minimize environmental and health risks has been the focus of hundreds of university research studies. The results of this extensive research show that biosolids can be managed so that the risk of adverse effects to the environment or public health from land application of biosolids is extremely low.

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Are there heavy metals in biosolids?

Biosolids contain trace amounts of heavy metals, or “trace elements,” as do natural soils, manures and commercial fertilizers. These trace elements come from human wastes, household plumbing systems, household products, businesses and industries. The EPA thoroughly studied the potential risks from these and many other elements and set strict maximum levels in biosolids to protect public health and the environment. Because of required industrial pretreatment and the risk-based standards for biosolids recycling, the risks posed by trace elements in biosolids are minimal.

A study by Penn State College of Agricultural Sciences demonstrated that the amount of heavy metals in biosolids in Pennsylvania has declined dramatically over the years and that levels are well below Pennsylvania’s stringent regulatory requirements.

Many of the regulated elements in biosolids are beneficial in correct amounts. Chromium, copper, iron, manganese, selenium and zinc are micronutrients for plants, animals and humans (look at the contents of a multi-vitamin tablet). The presence of these micronutrients actually enhances the value of biosolids as fertilizer when compared to traditional chemical fertilizers.

How are biosolids protected from industrial chemicals and medical wastes?

Certain industries create wastewater that contains unacceptable levels of chemicals or other pollutants. By federal law, these industries must pre-treat their wastewater before sending it to the community wastewater treatment facility. Pretreatment regulations were developed under the Clean Water Act. These regulations ban the discharge of any hazardous substance at rates that might:

- Harm wastewater treatment plant workers
- Damage sewers or hinder the wastewater treatment process
- Pass through the wastewater treatment plant and contaminate the plant’s receiving waters, or
- Concentrate in the biosolids to levels of concern

States and localities set additional local standards for pollutants allowed in industrial and medical facility discharges to their wastewater treatment facilities. The treatment plants issue permits to certain plants and medical facilities within their service area and require them to treat their wastewater before sending it to sewers, require testing and monitoring of discharges and conduct inspections and enforcement actions. Hospitals, for example, typically incinerate infectious and other regulated materials rather than discharging them into the sewer system.

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Can disease-causing organisms be spread through the air during land application?

Science says no. Extensive studies to determine whether biosolids could spread disease through the air were reported by researchers at the University of Arizona's Department of Microbiology and Immunology, and supported by the National Science Foundation Water Quality Center. Their conclusion: "...aerosolized microorganisms were not detectable during land application of liquid class B biosolids..."

Is Staph aureus transmitted by biosolids?

The latest research says no. A study reported in 2003 by scientists at the University of Arizona in Tucson has produced convincing evidence that Staph aureus is not present in biosolids. The report appeared in the October 2003 issue of the *Journal of Environmental Science and Technology*.

Can biosolids harm streams and groundwater?

Federal and state regulations, agricultural best management practices and nature provide multiple layers of protection for streams and groundwater. Studies show that biosolids, properly applied, can help reduce runoff into our streams and leaching into groundwater. Pennsylvania regulates how biosolids are applied in order to prevent runoff or leaching. Studies have demonstrated that biosolids applied according to current EPA and Pennsylvania standards pose no more risk to the Commonwealth's water than any other type of fertilizer or soil amendment.

Who regulates biosolids in Pennsylvania?

The EPA and the Pennsylvania Department of Environmental Protection (DEP) enforce clearly defined regulations that are designed to protect human health and the environment. The comprehensive regulatory program is based on decades of research that examined all aspects of protecting public health and the environment. These agencies maintain websites that provide an overview of their programs and describe the regulations that they administer.

Environmental Protection Agency:

<http://www.epa.gov/OW-OWM.html/mtb/biosolids>

Pennsylvania Department of Environmental Protection:

<http://www.depweb.state.pa.us/biosolids/site/default.asp>

How do other states and countries handle biosolids?

The recycling of biosolids is a widespread and accepted practice throughout the United States and the world. According to the EPA, all 50 states have biosolids management programs. According to a United Nations report, the land application of biosolids is in wide use throughout most western nations, including Europe, Canada and Australia. The most recent study by a U.N. commission endorses the recycling of biosolids through land application.

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How much land in our area is receiving biosolids?

In **York County**, there are currently 52 farms that are approved by DEP to receive biosolids, which account for approximately 4,600 acres. The most recent farm census by the U.S. department of Agriculture reports that there are 2,546 farms in the county, which total 285,336 acres.

In **Berks County**, there are currently 64 farms that are approved by DEP to receive biosolids, which account for approximately 6,200 acres. The most recent farm census by the U.S. department of Agriculture reports that there are 1,791 farms in the county, which total 215,679 acres.

In **Lancaster County**, there are currently 62 farms that are approved by DEP to receive biosolids, which account for an estimated 5,000 acres. The most recent farm census by the U.S. department of Agriculture reports that there are 5,293 farms in the county, which total 411,848 acres.

This means that less than 2% of the available farmland in the three county area can receive biosolids. And since biosolids are typically not land applied on the same parcel each year, the actual amount of land receiving biosolids in any one year is very small.

Where can I find more information?

Penn State Department of Crop & Soil Sciences

<http://cropsoil.psu.edu/extension/esi.cfm>

Pennsylvania Department of Environmental Protection

<http://www.depweb.state.pa.us/biosolids/site/default.asp>

The National Biosolids Partnership

<http://www.biosolids.org>

Water Environment Federation

<http://www.wef.org>