

**ENVIRONMENTAL  
AND  
OCCUPATIONAL  
HEALTH SCIENCES  
SCHOOL OF  
PUBLIC HEALTH**



## **Occupational Health Risks from Class B Biosolids**

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**Illinois Injury  
Prevention Center**

## ABOUT THIS REPORT

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This report summarizes information about the hazards associated with the production and use of biosolids. Biosolids are the remains of organic debris and residues resulting from treatment of municipal, commercial, and industrial wastewater (sewage including toilet waste). In a typical wastewater treatment plant (WWTP), biosolids do not undergo tertiary treatment. Instead, biosolids are separated from wastewater. Biosolids are sold for agricultural purposes and energy production. This report discusses the sources and hazards associated with biosolids, identifies workers that are at risk of exposure, the health risks associated with exposure to biosolids, and workplace controls that can be used to reduce exposure.

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## EXECUTIVE SUMMARY

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Biosolids are the remains of organic debris and residues resulting from treatment of municipal, commercial, and industrial wastewater (sewage including toilet waste). In a typical wastewater treatment plant (WWTP), biosolids do not undergo tertiary treatment. Instead, biosolids are separated from wastewater. Biosolids frequently contain significant amounts of disease-causing organisms (pathogens) which can be treated to reduce pathogenic loads.

The United States Environmental Protection Agency (USEPA) classifies biosolids into two classes: (1) Class A Biosolids have undergone approved processes to further reduce pathogens below detectable limits which can be distributed and sold publicly without additional restrictions, and (2) Class B Biosolids are permitted to have an acceptable level of pathogenic microorganisms present but have site restrictions on where they can be applied in order to prevent potential exposures to pathogenic microorganisms.

In the United States, a total of 13.84 million tons per year (MT/y) are produced annually. Biosolids are most commonly used for agricultural production, forest reclamation, and landscaping. Consumer level use is typically restricted to Class A Biosolids, as Class B Biosolids require permitting and restrictions to public access in the applied area.

Working with biosolids and the biosolid material involve various physical, chemical, and biologic hazards. Workers who process, transport and apply biosolids are at risk of various physical hazards including slips, trips and falls (during all phases of production), motor vehicle crashes (during transport), respiratory and dermal irritation, burns from incineration or gas capture/production, illness caused by exposure to an array of household and industrial chemicals that are disposed into the wastewater system, and infection caused by bacteria, viruses, protozoa, and helminth worms contained within the biosolids. The presence of these organisms are detectable for up to a year. However, heavy metals commonly found in biosolids take longer to reduce to pre-application levels at application sites and continued application of biosolids does increase the concentration of heavy metals within the soil above natural levels.

Care should be taken to limit secondary environmental impacts, such as surface draining into water sources, as nutrient loading could contribute to eutrophication. In addition, wastewater treatment plants are a major source of antibiotic resistance in bacteria as they serve as a meeting place and a melting pot of bacteria. Because Class B Biosolids do not require the same level of treatment as Class A, Class B Biosolids present a greater risk of containing antibiotic resistant pathogenic bacteria such as *Clostridium difficile* or *Salmonella*.

The water treatment workers, applicators and agricultural workers are at the greatest risk of exposure to the hazards associated with biosolids. To meet the requirements of part 503 CFR 40, biosolids must meet bacteriological, chemical, and metal requirements. The USEPA has the legal authority to establish methods for the identification and remediation of pollutants through the Clean Water Act, which includes sewage sludge.

There are various engineering, administrative and personal protection strategies to limit exposure to the hazards associated with the production and application of biosolids. The most critical controls include (1) maintaining worker hygiene to limit dermal and respiratory exposure, (2) use of personal protective equipment to create a physical barrier with the workers skin and breathing zones (e.g. masks, face shields, waterproof clothing, gloves, boots), (3) modifications to equipment and practices to prevent unnecessary aerosolization of biosolids in wet or dry forms, (4) provide sealed, positive pressure, and air conditioned environments that contain filtered air recirculation units to workers whenever biosolids are being applied, and (5) substitution of Class B Biosolids with Class A Biosolids.

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## I. INTRODUCTION

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Biosolids are the remains of organic debris and residues resulting from treatment of municipal, commercial, and industrial wastewater (sewage including toilet waste). In a typical wastewater treatment plant (WWTP) setup in the United States, biosolids do not undergo tertiary treatment. Instead, biosolids are separated from wastewater in the primary and secondary stages during clarification steps and sometimes the tertiary stage as well. Biosolids frequently contain significant amounts of disease-causing organisms (pathogens) which can be treated to reduce pathogenic loads.

The United States Environmental Protection Agency (USEPA) classifies biosolids into two classes based on the presence or absence of pathogens (US Environmental Protection Agency, 1994).

**Class A Biosolids** have undergone approved processes to further reduce pathogens (PFRP), such as thermally treating biosolids, which adhere to the code of federal regulations (CFR) 40 part 503. Pathogenic bacteria such as Salmonella and enteric viruses must be below detectable limits. Once PFRP criteria is met, Class A Biosolids can be treated further to meet metal content requirements to achieve exceptional quality where they can be distributed and sold publicly without additional restrictions.

**Class B Biosolids** unlike Class A need only to be processed to significantly reduce pathogens (PSRP) but are permitted to have an acceptable level of pathogenic microorganisms present. This is confirmed by using a test for fecal coliform density of less than 2 million colony forming units (CFU) per gram of total solids at time of use or disposal. This is typically achieved by lime stabilization to raise the pH of the biosolids or by some combination of digestion, composting, or air drying. The USEPA does not require Class B Biosolids to be PFRP; instead Class B Biosolids have site restrictions that should prevent potential exposures to pathogenic microorganisms.

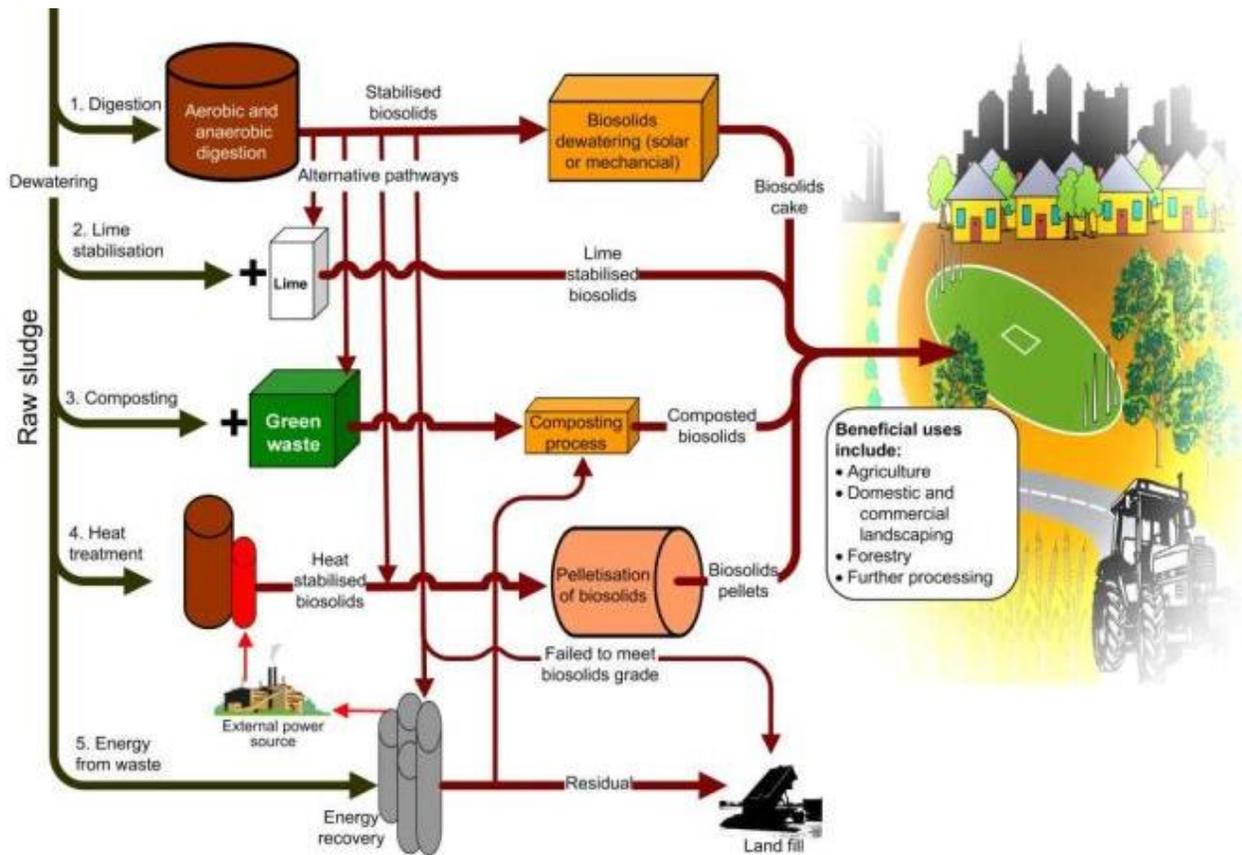


Figure 1. Process map of raw sludge (Image Source: <https://www.biosolids.com.au/info/what-are-biosolids/>).

### A. Production of Biosolids in the United States

The most recent estimate of biosolids production in the United States puts total domestic production at 13.84 million tons per year (MT/y), and 6.87 MT/y for beneficial use such as land application (Seiple, Coleman, & Skaggs, 2017). Due to the availability of biosolids domestically, Class A and B are not imported to the United States nor are there records of any significant exporting of biosolids internationally. However, there is significant importing and exporting of biosolids across state lines especially for Class B Biosolids.

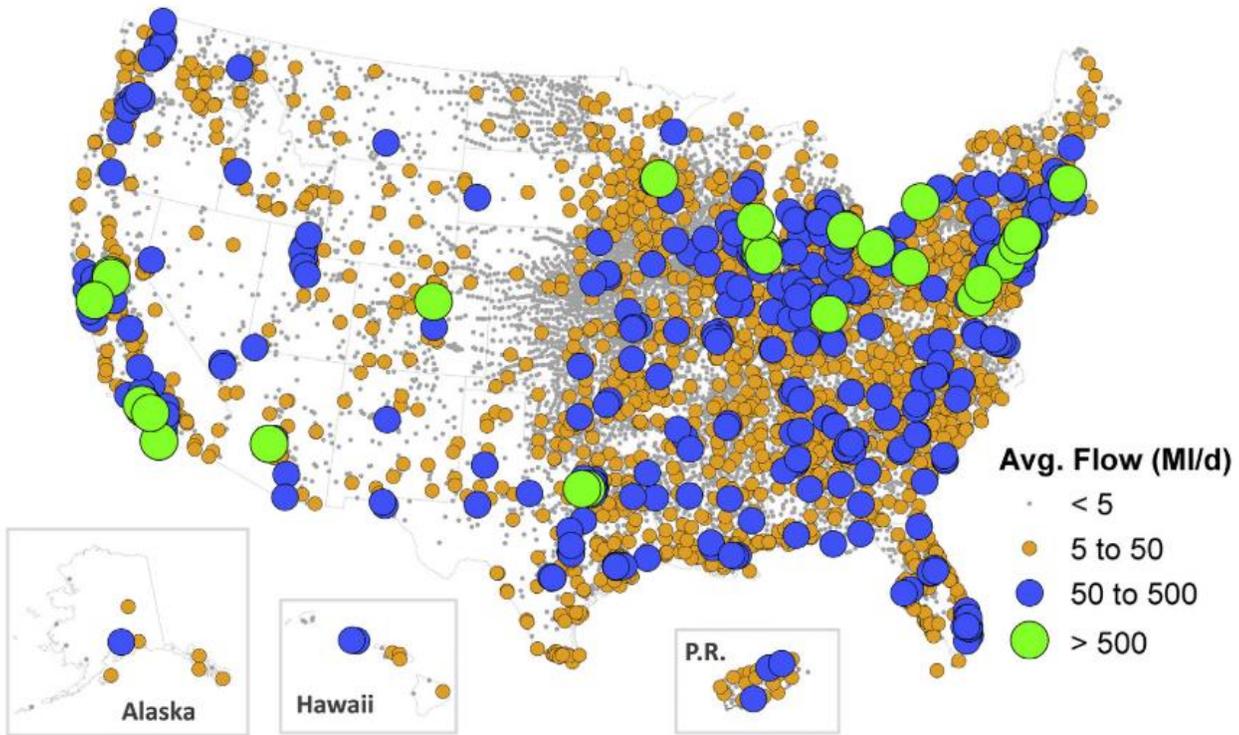


Figure 2. Spatial distribution of publicly owned wastewater treatment plants classified by the daily average influent flow in million liters per day (ML/d) (Seiple et al., 2017).

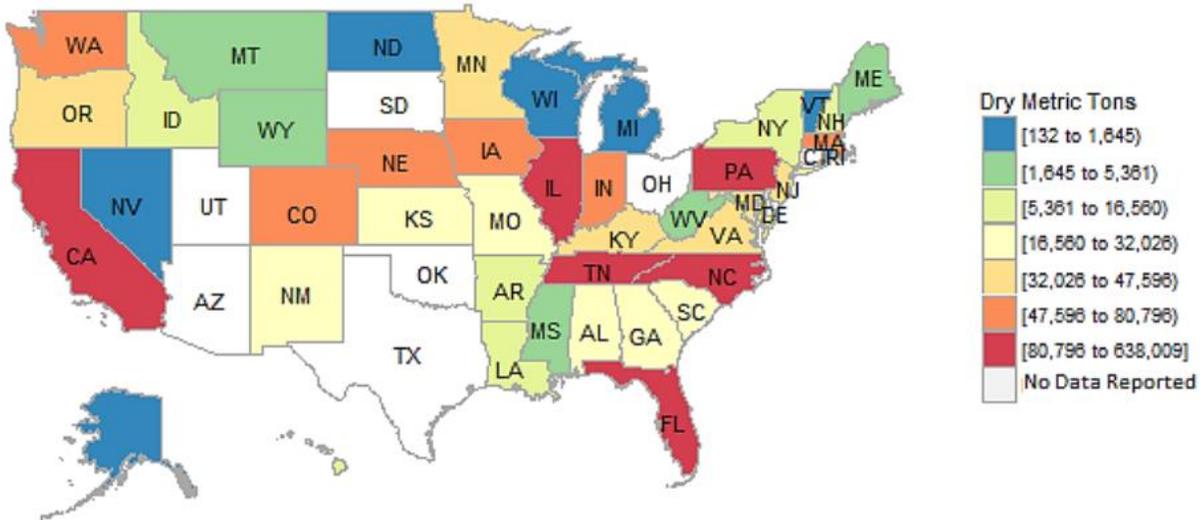


Figure 3. Distribution of biosolids generation in dry metric tons in the United States (USEPA-OIG, 2018).

## B. How are Class B Biosolids Used?

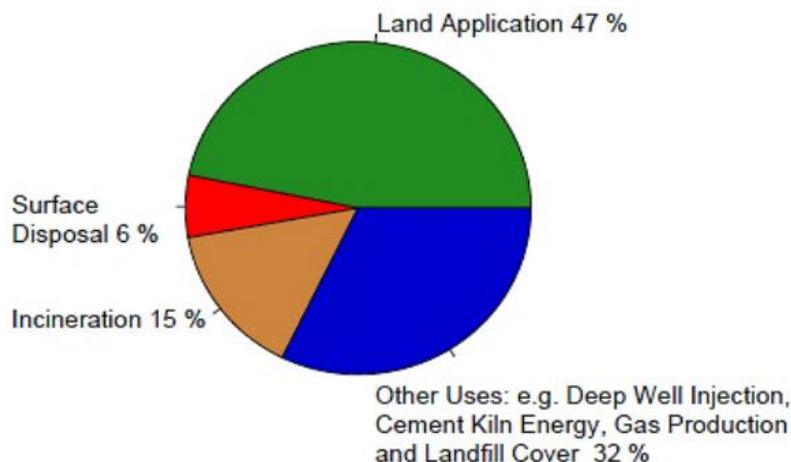
The most common use of Class B Biosolids in the United States is land application either to condition soil or fertilize crops. These biosolids can be used as either a dried or dewatered form or in a liquid state to irrigate (US Environmental Protection Agency, 1994). About half of Class A and B Biosolids produced domestically are used for this purpose (NIOSH, 2002; USEPA, 1999). Aside from use in agricultural production, biosolids can often be found used in the production of forests, at reclamation sites, golf courses, parks and roadsides, or used by individual consumers. Consumer level use is typically restricted to Class A Biosolids, as Class B Biosolids require permitting and restrict public access to the applied area.



Figure 4. Image of liquid biosolids distribution.

(Source: <http://gracebioblog.blogspot.com/2010/07/cheapest-fertilizer.html>)

Figure 5. Biosolids use from major wastewater treatment plants in 2016 (USEPA-OIG, 2018).



## II. WHAT ARE THE HAZARDS ASSOCIATED WITH BIOSOLIDS?

Working with biosolids and the biosolid material involve various physical, chemical, and biologic hazards. Workers who process, transport, and apply biosolids are at risk of various physical hazards including slips, trips and falls (during all phases of production), motor vehicle crashes (during transport), respiratory and dermal irritation, and burns from incineration or gas capture/production. Because biosolids are composed of fecal matter and other organic and inorganic material that undergo varied decontamination processes, studies have reported a wide array of heavy metals, pharmaceuticals and detergents in biosolids. However, biosolids likely contain an additional array of household and industrial chemicals that are disposed into the wastewater system. The main concern from biosolids are biologic hazards. Biosolids have been shown to contain bacteria, viruses, protozoa, and helminth worms.

### A. How Long do the Hazards in the Biosolids Persist?

The regulations for the application of Class B Biosolids require that the sites must restrict public access for one year if there is a high potential for exposure (40 CFR Part 503). This rule is intended to reduce exposure risk to the public when followed, as it allows natural processes to further disinfect biosolids. A study by Zerzghi, Gerba, Brooks, & Pepper in 2010 investigated the persistence of pathogens in Class B Biosolids on an application site receiving anaerobically digested liquid Class B Biosolids annually for 20 years. Their study concluded that after 10 months since the last application, *Salmonella* and enteroviruses were undetectable from any of the plots despite being present during application. Total and fecal coliforms from the application site during initial application contained  $10^9$  most probable number (MPN) per  $\text{kg}^{-1}$ . When testing the application site 10 months after, this concentration fell to  $<6$  MPN per  $\text{g}^{-1}$ .

These findings are consistent with pathogen risk assessments that show a significant reduction of microorganisms one year after application. Using the USEPA pica-child definition of a one-time ingestion of 10g of soil, *Salmonella* spp. became undetectable at 14 months following application (Brooks, McLaughlin, Gerba, & Pepper, 2012). Other pathogens also remain detectable up to a year following application, such as enteroviruses with a onetime exposure infection risk of  $10^{-8}$ , norovirus ( $10^{-9}$ ), and *Cryptosporidium parvum* ( $10^{-11}$ ) (Brooks et al., 2012).

Heavy metals commonly found in biosolids take longer to reduce to pre-application levels at application sites. The rate of change is dependent on multiple environmental factors such as exposure to sunlight, soil temperature, precipitation, runoff potential, soil pH, and presence of ions (Gaskin et al., 2012). However, continued application of biosolids does increase the concentration of heavy metals within the soil above natural levels (Gaskin et al., 2012). The USEPA's 40 CFR Part 503 does regulate the concentration of individual metals at application sites and metal testing is required for

permitting and continued application. Care should be taken to limit secondary environmental impacts, such as surface draining into water sources, as nutrient loading could contribute to eutrophication (Pepper et al., 2008). No data is available on the bioavailability of other chemical hazards.

### III. WHAT ARE THE ANTIBIOTIC RESISTANT BACTERIAL RISKS IN CLASS B BIOSOLIDS?

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According to the Centers for Disease Control and Prevention (CDC) in 2013, more than two million people per year are sickened with an antibiotic resistant bacterium. Due to continued misuse of antibiotics, this number is expected to climb dramatically. Infections by an antibiotic resistant bacterium presents a significant risk to health as these infections are often more severe, longer lasting, and are more difficult to treat (U.S. Department of Health and Human Services, 2013). Antibiotic resistance originates by the misuse of antibiotics which allows for bacteria to develop defenses against common drugs. Although we usually think of this happening in the human body this also occurs in wastewater treatment plants. Flushed antibiotics are present in the wastewater supply and these drugs act on the bacteria present in wastewater selecting them for resistance as they would in the human body (Rizzo et al., 2013). Over time, as more bacteria become resistant in wastewater they continue to acquire and share this information with other species or strains of bacteria, spreading their resistance (Rizzo et al., 2013).

Wastewater treatment plants are a major source of antibiotic resistance in bacteria as they serve as a meeting place and a melting pot of bacteria. The practice of using activated sludge to dope incoming wastewater for digestion contributes to this issue. Bacteria are recycled allowing for at least some bacteria to live on from the previous cycle and carry over their genes (Rizzo et al., 2013). Because Class B Biosolids do not require the same level of treatment as Class A, Class B Biosolids present a greater risk of containing antibiotic resistant pathogenic bacteria such as *Clostridium difficile* or *Salmonella* (Gerba, Castro-del Campo, Brooks, & Pepper, 2008).

In a study by Rosenberg, Goldstein et al. (2014) vancomycin resistant enterococci (VRE), an extremely resistant bacteria commonly found in hospital outbreaks, was found in 27% of all samples obtained at WWTP that reused effluents. Their study highlights the risks of exposure to VRE to WWTP workers and those potentially exposed at the reuse application sites. One mid-Atlantic WWTP in the Rosenberg study contained enterococci of which 40% were vancomycin resistant (Rosenberg Goldstein et al., 2014). This sludge is reused within the system and greatly increases the opportunity for vancomycin resistance to proliferate to other bacteria during the treatment process. This activated sludge is also a stepping off point for the production of biosolids for land applications.

### IV. WHICH OCCUPATIONS ARE AT RISK?

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Defined by USEPA Part 503 rules, the preparer and the applier are at the greatest risk of exposure to pathogens in biosolids and injury as they come into direct contact with biosolids (US Environmental Protection Agency, 1994). The land restriction requirements of Class B Biosolids, if followed, significantly reduces the health risk to the public (NIOSH, 2002). This rule, 40 CFR Part 503, restricts public access to application areas for at least one year to allow for natural degradation of potential pathogens in the area. However, this rule does not apply to workers who may come into contact with the applied area repeatedly (NIOSH, 2002). Thus, the risks to workers is greatest prior to, during, and

immediately following the application of Class B Biosolids as the pathogenic concentrations are the highest during these periods.

Water treatment plant operators and preparers have prolonged contact with pre-treatment and post-treatment biosolids every day. In larger operations, operators may specifically handle the biosolids operations arm of the facility. However, the majority of water treatment plants in the United States are small municipalities where plant operators are tasked with all aspects of plant operations. These smaller operators will have contact with biosolids throughout the day. Currently, there are an estimated 117,450 employed wastewater treatment plant operators in the United States with 77% being employed at the local government level (Bureau of Labor Statistics, 2017). In 1998, NIOSH conducted a health hazards evaluation of wastewater plant employees in the biosolids program reporting intermittent episodes of gastrointestinal illness (Burton & Trout, 1999). Although NIOSH report was unable to determine the direct route of exposure from the biosolids, it was determined that due to the lack of personal protective equipment and hygiene practice of the workers, biosolids were the most likely source of infection (Burton & Trout, 1999).

#### Occupations at Risk

- Wastewater Treatment Plant Operators
- Wastewater Treatment Plant Technicians
- CDL Class A & B Truck Drivers
  - Biosolids Loaders, Unloaders, and Appliers
- Equipment Operators of Biosolids Equipment
- Agricultural Workers at the Application Sites

Commercial drivers (CDL) and appliers, are responsible for the loading and unloading of biosolids from the treatment plant to the land application site. Generally, trucks are filled with dried or liquid biosolids and are applied to the application site using a spray attachment that will dispense the material. Many treatment plants also employ additional drivers to operate heavy equipment, such as bulldozers, to apply and spread the biosolids on the land application area. Manipulation of biosolids can suspend particles in the air in dry or wet biosolids. These particles can then be respired or deposited on mucus membranes of the employees.

Agricultural workers on the land application site who are neither a preparer or applier are at risk following the application of biosolids. Because rule 40 CFR Part 503 does not apply to workers, a loophole exists where workers are not explicitly restricted from entering the application area. During the first three days following application, the risk of infection is very high as natural attenuation has not occurred (Brooks et al., 2012). The greatest risk is that of viral pathogens such as adenovirus, enteroviruses, and norovirus with risks ranging from  $5 \times 10^{-2}$  to  $9 \times 10^{-1}$  on the date of application assuming an accidental ingestion of 0.1g (Brooks et al., 2012). Longer term risk is greatest with *Cryptosporidium parvum* which undergoes little natural attenuation during the first 30 days following application, maintaining a risk level of up to  $5 \times 10^{-3}$  (Brooks et al., 2012).

## Employment of water and wastewater treatment plant and system operators by area, May 2017

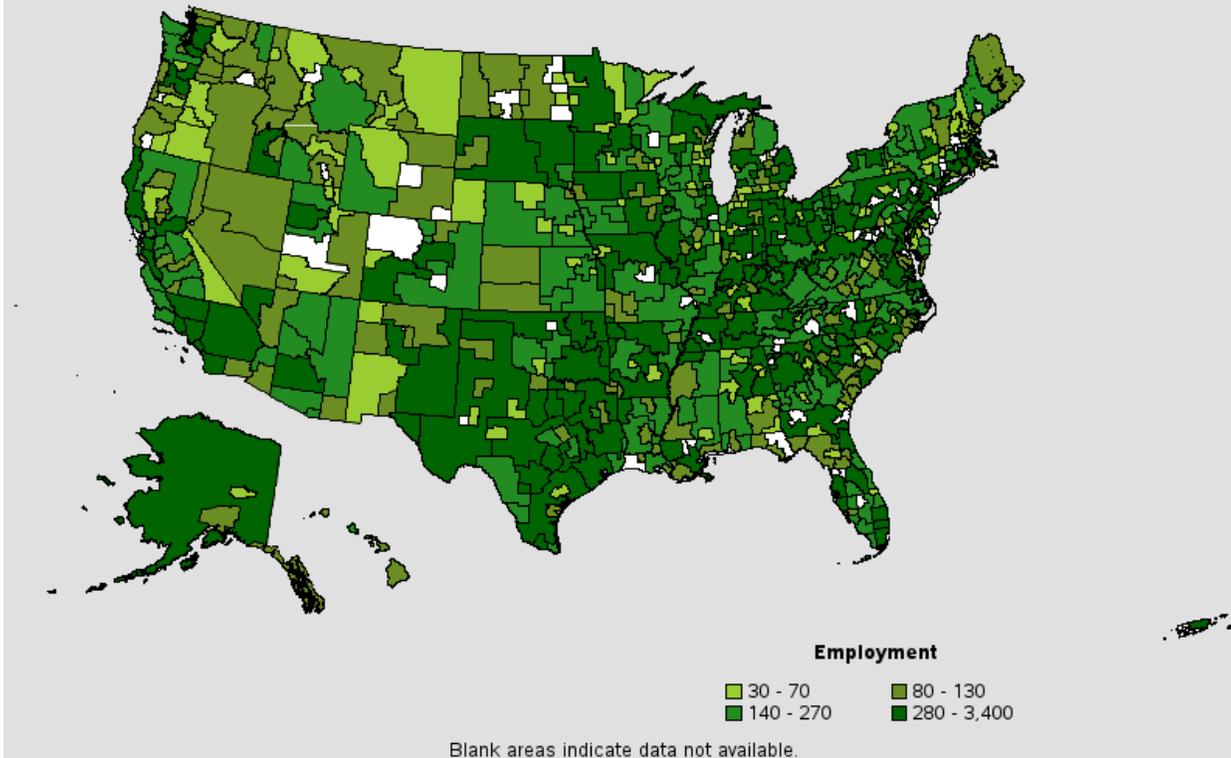


Figure 6. Employment distribution of wastewater treatment plant and system operators by area May, 2017 (Bureau of Labor Statistics, 2017).

### A. Pathways to Exposure from Class B Biosolids

In accordance with part 503 CFR 40 site restrictions for class B Biosolid application, sites are required to restrict public access for at least a year following application of Class B Biosolids. However, this restriction does not apply to workers. Employees have the greatest potential for exposure due to the unrestricted site access (US Environmental Protection Agency, 1994). Potential pathways can be categorized in two ways: direct contact and indirect contact. The potential pathways for each category are presented below (USEPA, 2003):

#### Direct Contact

- Touching biosolids (liquid or dried).
- Traversing across a recent application site via bodily or vehicular means.
- Handling and manipulation of soils where biosolids have been applied.
- Inhalation of airborne particles from manipulation of soils at the application sites (examples include, dust suspended by strong winds, plowing, or cultivation following application).

#### Indirect Contact

- Consumption of pathogen contaminated crops grown in biosolid-amended soil or food items contaminated by contact with these crops or field workers.
- Consumption of animal products that have been contaminated by animal feed or grazing on biosolid-amended soil.

- Ingestion of drinking water or recreational water contaminated from the application site by runoff or contamination of groundwater.
- Consumption of inadequately cooked contaminated fish from impacted water adjacent to the application site.
- Contact with biosolids or pathogens transported from the application site by grazing animals, pets, rodents, insects, or other animal vectors that have contact with the application site.

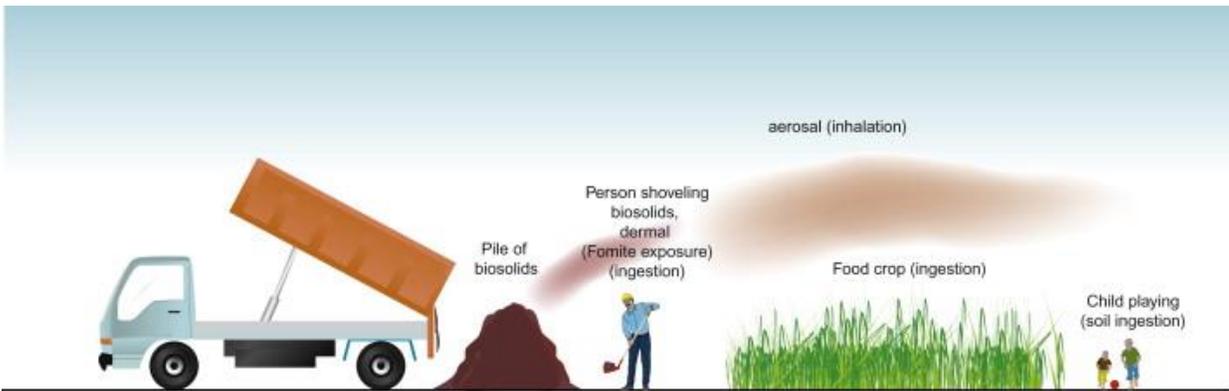


Figure 7. Pathways of exposure to biosolids (Pepper et al, 2011).

## V. WHAT ARE THE HEALTH EFFECTS FROM BIOLOGIC HAZARDS?

Class B Biosolids contain many human pathogens with varying concentrations and survival times. The most common of these pathogens can be placed into four major categories: bacteria, viruses, protozoa, and helminth worms. For example, some principal pathogens of concern are *Salmonella* sp. pathogenic *Escherichia coli*, *Norovirus*, enteroviruses, *Cryptosporidium*, and *Giardia lamblia* (USEPA, 2003). The majority of bacterial pathogens of interest cause varying forms of gastroenteritis or severe diarrhea. However, enteroviruses, such as coxsackievirus or echoviruses, have the potential to cause meningitis, pneumonia, hepatitis, fever, cold like symptoms, etc. (USEPA, 2003). Parasitic infections by pathogens such as *Cryptosporidium*, *Giardia lamblia*, or helminth worms can cause more severe forms of gastrointestinal distress, weight loss, or neurological problems depending on the pathogen and exposure route (USEPA, 2003).

Some of the more common symptoms arising from irregular or non-use of personal protective equipment during contact with biosolids include sore throat, coughing, nasal congestion, postnasal drip, sinus pain or pressure, flu-like symptoms, diarrhea, abdominal cramps, burning eyes, excess tearing, headache, nausea, or fatigue (Robinson et al., 2006).

Metal concentrations such as lead, arsenic, and cadmium at biosolids application sites are shown to increase with concentration with longer durations of applications (Gaskin, Brobst, Miller, & Tollner, 2012). However, these metal concentrations are comparable to agricultural field applications of fertilizers and may result in adverse health conditions after prolonged exposures (Gaskin et al., 2012).

### A. Who is Most Susceptible to Adverse Health Outcomes?

Anyone with exposure to the production of biosolids, industrial use of biosolids, or the application site is at risk of developing adverse health outcomes. During and immediately after the production/application of Class B Biosolids, the concentration of pathogens is at its highest and slowly decreases over time. The groups most susceptible to infections

from biosolids are young children, older adults, and individuals with open skin wounds, compromised respiratory tracts, and weakened immune systems. Occupational workers who are not required to abide by the part 503 CFR 40 regulation for site restriction are at a higher risk than the general public. Child exposures can also occur in the workplace since many states allow children as young as 10 years old to work in agriculture.

## VI. WHAT TESTS CAN BE CONDUCTED TO EVALUATE THE PRESENCE OF HAZARDS IN CLASS B BIOSOLIDS?

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To meet the requirements of part 503 CFR 40, biosolids must meet bacteriological, chemical, and metal requirements. The USEPA has the legal authority to establish methods for pollutants in the Clean Water Act which includes sewage sludge. These approved methods are contained within CFR at Title 40 Part 136.

Major\* approved methods are:

- EPA Method 1680 Fecal Coliforms
- EPA Method 1681 Fecal Coliforms
- EPA Method 1682 Salmonella
- EPA Method 1684 Volatile Solids
- Effects of Holding Time on Fecal Coliforms and Salmonella Concentration in Biosolids

\*For a full list, please see CFR Title 40 Part 136

(Electronic Code of Federal Regulations, 2019)

Available at: <https://www.ecfr.gov/cgi-bin/text->

[idx?SID=272db375aeefac14f1b7c5a661f5365&mc=true&tpl=/ecfrbrowse/Title40/40cfr136\\_main\\_02.tpl](https://www.ecfr.gov/cgi-bin/text-idx?SID=272db375aeefac14f1b7c5a661f5365&mc=true&tpl=/ecfrbrowse/Title40/40cfr136_main_02.tpl)

## VII. HOW TO REDUCE OR ELIMINATE RISK OF EXPOSURE?

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There are several recommendations provided by NIOSH and the USEPA on protecting worker health (Burton & Trout, 1999; NIOSH, 2001, 2002).

### Hygiene Recommendations:

- Periodic education/reeducation of handwashing techniques.
- Thoroughly washing hands with soap after contact with biosolids. This is considered one of the most valuable personal safeguards of preventing infection by agents in Class B Biosolids.
- While working with biosolids, avoid contact with the face, hands, mouth, eyes, nose, ears, genitalia, open cuts, and sores.
- Wash hands before eating, drinking, smoking, and before and after using the bathroom.
- Eat, drink, and smoke in designated areas away from biosolids-handling areas.
- Use onsite facilities for showering and laundry whenever possible and avoid wearing or taking work clothing home.
- Bandage, seal, and inform onsite occupational health of any open cuts or wounds.
- Always seek immediate first aid for any injury occurring during work, no matter how minor due to the risks from biosolids.
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**Personal Protective Equipment (PPE):**

- Training on proper PPE use, storage, and maintenance.
- Appropriate PPE should be required for all job duties likely to result in exposure to sewage, wastewater, and sludge. PPE includes goggles, face shields, liquid repellent coveralls, and gloves. PPE should also include a mask for any environment which has the potential of aerosolization.
- Always maintain a physical barrier between skin and biosolids by using PPE such as gloves, safety goggles, face shields, and disposable suits.
- Have a separate pair of footwear for use in and around the biosolids worksite.
- Remove excess biosolids from footwear when entering a building or vehicle.
- Removing soiled PPE and the proper disposal of PPE to avoid cross contamination of other parts/areas of a facility/home.

**Engineered Controls:**

- Installation or temporary placement of handwashing stations with soap wherever contact with Class B Biosolids will occur in the wastewater facility or during field applications.
- Provide onsite laundry, showers, and locker storage for workers.
- Make feasible modifications to equipment and practices to prevent unnecessary aerosolization of biosolids in wet or dry forms.
- Avoid high pressure spraying of biosolids when alternative options to prevent aerosolization are feasible.
- Provide sealed, positive pressure, and air conditioned environments that contain filtered air recirculation units to workers whenever biosolids are being applied.

**Administrative Controls:**

- Wherever feasible, substitute Class B Biosolids with Class A Biosolids.
- Monitor source material coming from wastewater treatment plants and verify compliance with CFR 40 Part 503.
- Sludge should not be stored prior to land application and should be applied as soon as feasible after production.
- Where local conditions permit, inject biosolids below the soil or incorporate into a solid mix to minimize post application exposure risk.
- On windy days avoid applying dry biosolids or using high pressure spray.
- Avoid any unnecessary mechanical contact with the application site (e.g. limit access of vehicles or farm equipment to the application sites).
- Procedures for controlling exposures to biosolids from resuspension into the air following periods of dryness.
- Only use heavy equipment with sealed, positive pressure, and air-conditioned cabs that contain filtered air recirculation units.
- Heavy equipment used in the biosolids process should be properly maintained and cleaned on a regular basis to prevent exposure.
- Using an occupational health professional to proactively monitor worker health.
- All employees should be up to date on their immunizations.

## VIII. ADDITIONAL RESOURCES

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United States Environmental Protection Agency (USEPA) Biosolids Program:

<https://www.epa.gov/biosolids>

United States Environmental Protection Agency (USEPA) Biosolids Laws and Regulations:

<https://www.epa.gov/biosolids/biosolids-laws-and-regulations>

The National Institute for Occupational Safety and Health (NIOSH):

<https://www.cdc.gov/niosh/index.htm>

To obtain more free information about this hazard or other occupational safety and health issues: call NIOSH at 1-800-35-NIOSH (1-800-356-4674) or visit the NIOSH Web site at: <http://www.cdc.gov/niosh.html>

Code of Federal Regulations Title 40 Part 136 Available at: [https://www.ecfr.gov/cgi-bin/text-idx?SID=272db375aeefac14f1b7c5a661f5365&mc=true&tpl=/ecfrbrowse/Title40/4ocfr136\\_main\\_02.tpl](https://www.ecfr.gov/cgi-bin/text-idx?SID=272db375aeefac14f1b7c5a661f5365&mc=true&tpl=/ecfrbrowse/Title40/4ocfr136_main_02.tpl)

For local issues, please contact your public health department's environmental health division. You can locate your local health department using this website provided by the National Association of County and City Health Officials (NACCHO): <https://www.naccho.org/membership/lhd-directory>

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