

Calgary Biosolids: the basics

What are biosolids?

Biosolids are a nutrient-rich organic material recovered through our advanced wastewater treatment process. Biosolids contain nitrogen, phosphorus (a finite resource), potassium and essential micro-nutrients. These properties make them a valuable natural nutrient source, soil conditioner for agricultural lands and a high-quality component of compost. By returning these nutrients to the soil and increasing the organic carbon, moisture and organic matter in soil, biosolids are helping to sequester carbon which helps to fight climate change.

What do biosolids look like?

The City of Calgary produces biosolids at our advanced wastewater treatment plants. A portion of produced biosolids is thickened at the Shepard Lagoons and have a similar consistency to ketchup. Another portion is dewatered at the Bonnybrook Dewatering Facility and is initially almost jelly-like, with a surface texture like wet coffee grounds or moist cookie crumbs.

How are biosolids produced?

Biosolids are produced through an approximately month-long, multi-step advanced wastewater treatment process. During this time, wastewater solids are microbially digested, settled and thickened/dewatered resulting in biosolids.

What is the difference between biosolids and sewage sludge?

Sewage sludge is an untreated semi-solid waste not suitable for reuse without treatment.

At The City of Calgary, biosolids are created when sewage sludge undergoes advanced treatment to convert complex organic material in the sludge into methane, carbon dioxide and biomass, and to

reduce solids. During this process, disease-causing microorganisms are also reduced, and what remains is a safe, nutrient-rich organic material suitable for recycling on agricultural lands.

Do biosolids have an odour?

Not all biosolids are the same. The odour from biosolids can vary depending upon the type of treatment employed and the way biosolids are delivered and applied.

For stockpiled and surface applied dewatered biosolids, a faint initial musty, ammonia odour may be noted. Odour generation is strongest during two times: when biosolids are delivered and stockpiled (before the biosolids have formed a dry crust layer), and during applications to the project site. Biosolids that are subsurface injected have little to no odour throughout the application process.

How does industrial wastewater impact our biosolids?

The City's Wastewater Bylaw defines substances that are prohibited from release and identifies substances with concentration limits (must not exceed) if released into the wastewater system. Prohibited substances include, but are not limited to, any substance that will interfere with the beneficial reuse of biosolids.

The City can request a wastewater report and may require a wastewater agreement, wastewater pre-treatment system and/or control of the composition and/or flow rate of a release from/by a specific industry member. The City's Industrial Monitoring Group (IMG) assesses wastewater quality at specific access points throughout the city to monitor bylaw compliance. The chemical and physical properties of the biosolids produced by The City are monitored to ensure that regulatory requirements are met prior to land application or composting.

Are biosolids safe?

When biosolids are applied in accordance with strict governmental guidelines, they pose negligible risk to the public and environment. The City collects samples at all stages of the almost month-long advanced wastewater treatment process, including monitoring the application of biosolids to make sure we meet or improve the quality specified in the Alberta Environment and Protected Areas (AEPA) land application guidelines.

Today's technological advancements allow for detection of trace amounts of organic and inorganic constituents within biosolids; however, it is important to understand that concentrations levels are minute (parts per billion or trillion). While advanced technologies allow for detection, it does not indicate they pose a risk to human health or the environment.

Is biosolids land application regulated?

The land application of biosolids in Canada is regulated by the provinces, and our regulator is Alberta Environment and Protected Areas (AEPA).

The federal government (Canadian Council of Ministers of the Environment) has a Canada-wide approach that supports the beneficial use of biosolids.