Background facts on WLSSD Field Green® biosolids

Biosolids are a nutrient-rich product of wastewater treatment used as a fertilizer and soil amendment.

Using biosolids as fertilizer is common nationwide, in Canada and the world. In the United States, wastewater treatment plants produce about 7 million tons of biosolids daily (source: U.S. Environmental Protection Agency).

WLSSD distributes biosolids produced at its regional wastewater treatment plant under the name **Field Green®, The wiser fertilizer. Field biosolids** are produced by the Western Lake Superior Sanitary District. WLSSD uses an effective, two-stage microbial process to produce Field Green®. Frequent laboratory tests confirm Field Green® far surpasses the strictest requirements set by the EPA.

Biosolids are a natural, renewable resource that reduces the need for commercial fertilizers, keeps a useful resource out of landfills, and helps local economies. Field Green® biosolids are produced using anaerobic digestion, which is the second stage of solids processing at WLSSD:

First, wastewater is mixed with aerobic (oxygen-loving) bacteria that consume solids and are settled out of the wastewater stream.

- Those bacteria, called sludge, are taken to anaerobic digesters where bacteria that thrive in low-oxygen environments further break down pollutants, kill pathogens, reduce odor, and reduce the volume of solids. The result is a product that looks like black dirt.
- The four, 1-million gallon digesters are operated in stages. In the first stage, the biosolids are heated to approximately 130 degrees Fahrenheit for about 10-12 days. In the second stage, biosolids are held at approximately 100 degrees Fahrenheit for another 10-12 days.
- The digesters also produce methane, which is used to produce heat for WLSSD's plant. WLSSD also has plans to produce electricity with the methane.

Because plant nutrients are locked in organic matter, fertilizer nutrients are released slowly and soil organic matter is replenished. That protects local waterways and makes soils healthier.

Field Green® biosolids are distributed to farmers in Carlton, Pine, southern St. Louis counties in Minnesota, and to Douglas County in Wisconsin. In addition, taconite mines on the Iron Range utilize biosolids to reclaim tailings basins and stabilize tailings dikes.

Here are some facts on WLSSD's Field Green® program:

- Production: About 30,000 tons of wet biosolids, which is equivalent to about 9,000 dry tons.
- Acreage: About 2,000 acres a year. Between 30-40 percent of the acreage is on taconite tailings basins.
- Staff and equipment: All work is performed by WLSSD employees, using standard farm equipment.
- Oversight: The U.S. Environmental Protection Agency, the Minnesota Pollution Control Agency, and the Wisconsin Department of Natural Resources regulate biosolids use. WLSSD must comply with regulations or lose the right to apply biosolids.
- History: WLSSD incinerated its biosolids until the mid-1990s. In the late 1990s, WLSSD started the Field Green® program by mixing biosolids with lime. Anaerobic digesters came on line in 2001.

Each field is permitted separately:

- Farmers start the process by providing maps and permission to enroll individual fields.
- WLSSD screens fields for soil type, slopes, distance to water bodies, such as creeks, rivers, wetlands and lakes.
- Each field is mapped using computer software to determine precise acreages and buffer zones for wetlands, residences and drinking water wells.
- A soil scientist samples soils and verifies soil types and water features.
- The information is collected and provided to state regulatory agencies. Local governments have the opportunity to comment on each field.

WLSSD follows strict procedures in the field, in line with agricultural best practices:

- Farmers must request an application in accordance with their cropping needs.
- Computerized maps are used to determine the precise acreage that will be spread with biosolids.
- The acreage is used to calculate the amount of biosolids to be delivered to the field, in order to ensure only enough nutrients are provided for the crop being grown.
- Operators in the field use GPS units to mark buffer zones from water and residential uses.
- All trucks are weighed to make sure only the correct amount of biosolids are delivered to the field.

Follow-up inspections ensure all regulations are followed:

- Annual reports on each biosolids event, with information on the amount delivered and maps of the fields, are provided to state regulatory agencies and the U.S. Environmental Protection Agency.
- All biosolids produced must be accounted for in the reports, and reconciled with the amount delivered to each field.

- Soils in each field are re-tested regularly to make sure nutrient levels are within environmentally protective ranges.

Corn in the background was fertilized with Field Green® biosolids. Corn in the foreground wasn't fertilized, showing the effectiveness of Field Green®.

Certified operators use high-tech GPS technology to spread biosolids, enabling precise nutrient applications and ensuring appropriate setbacks from water and other sensitive features are followed.