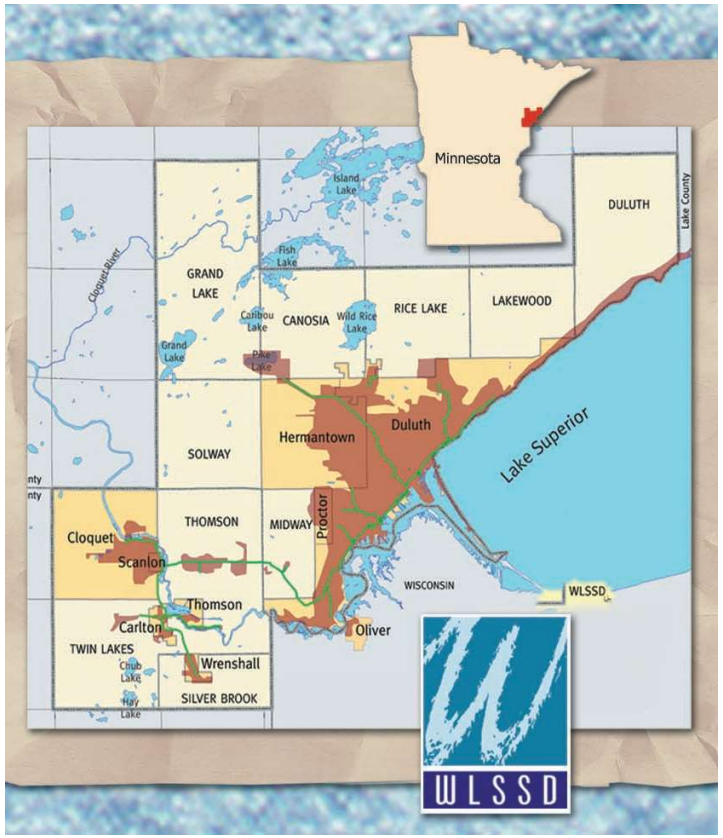
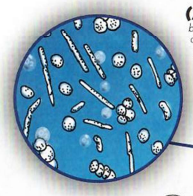
WLSSD



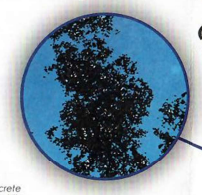
- Created by the Minnesota legislature in 1971 to protect and improve the waters of the St. Louis River Basin.
- A regional wastewater system serving 17 communities.
- Award-winning wastewater treatment.
- Nationally recognized leader in pollution prevention.

A streamlined process inspired by the river

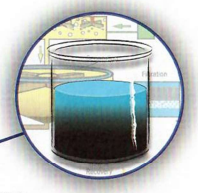
Thousands of miles of city sewer pipes connect to WLSSD's 75 miles of interceptor sewers to bring sewage, or wastewater, from homes and businesses to the treatment plant. Industries and residents each contribute about half of the wastewater treated by WLSSD, totaling about 40 million gallons each day.



(A) *Wastewater treatment begins by screening out large objects such as rags and sticks. Sand, gravel and grit are settled out and taken to a landfill. Wastewater then flows into deep, concrete channels, where it is stirred by large paddles and injected with pure oxygen. The channels are an ideal environment for oxygen-loving, aerobic bacteria to thrive and digest the waste that would otherwise pollute the river.*

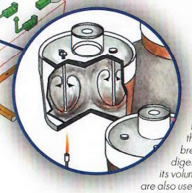


(B) *The wastewater then flows into large, domed clarifier tanks where the naturally-sticky clumps of bacteria settle out as sludge. Most of the sludge is returned to the channels to provide an ample supply of microorganisms for the treatment process. Remaining sludge is removed and treated further to make a valuable fertilizer product.*

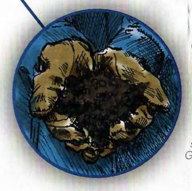


(C) *Next, the water is filtered through several layers of sand, gravel and coal to trap small bits of solid material. If necessary, the water is disinfected with a strong bleach solution.*

(D) *This entire water-cleaning process takes about 10 hours. The water is then safely returned to the St. Louis River.*



(E) *The sludge continues its path through the treatment system. It is piped to tanks called digesters. Within these tanks, anaerobic bacteria thrive without oxygen, breaking down the sludge, digesting it and reducing its volume. High temperatures are also used to kill pathogens — microorganisms that can cause disease.*



(F) *The bacteria produce methane-rich biogas as they digest waste. WLSSD captures this methane and burns it to heat the digesters and generate electricity used in the treatment plant. After about 30 days, the sludge is removed from the digesters and spun in centrifuges to remove water. The resulting product looks and feels like damp soil. This nutrient-rich fertilizer is called Field Green® biosolids.*

(G) *Field Green® biosolids are spread on farm fields and mine reclamation projects as a valuable fertilizer and soil amendment. The water-treatment process is now complete. It's an efficient, living system that delivers three useful products: clean water, biosolids and biogas.*

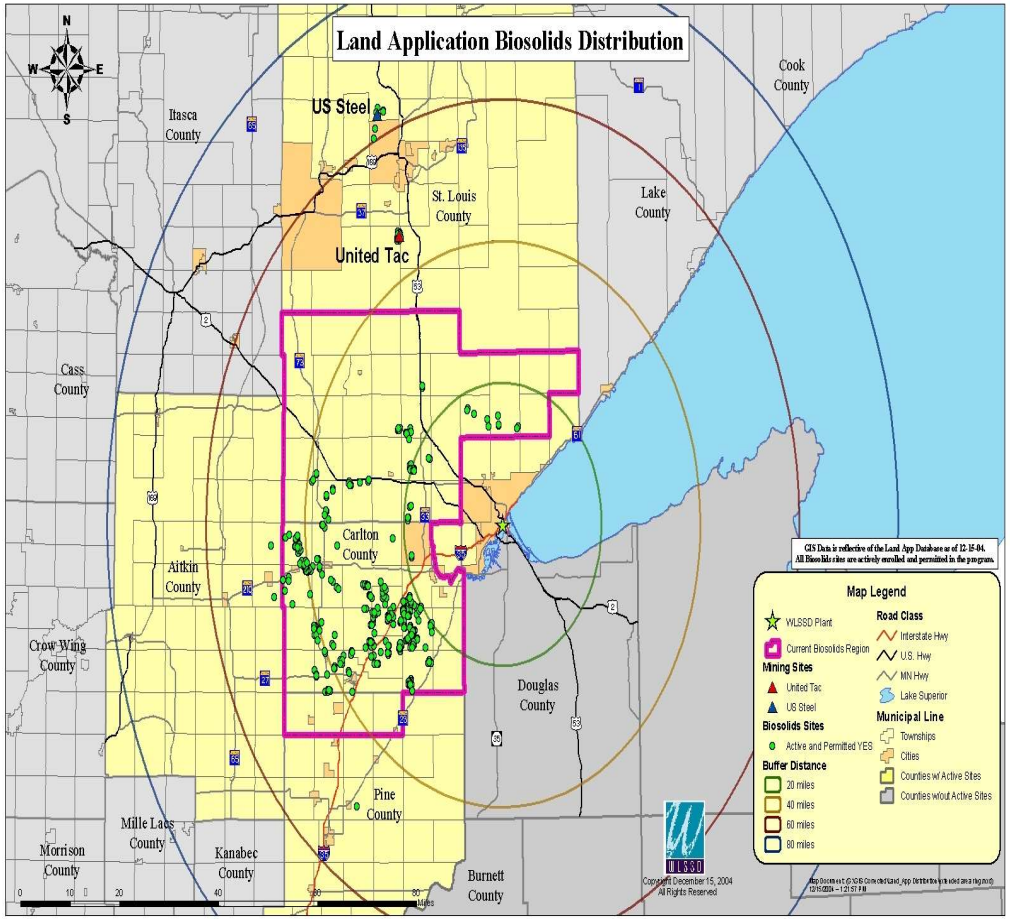
Biosolids

- Field Green® biosolids are one of the products of WLSSD's process
- Used as a fertilizer and soil amendment for agriculture and mine tailings
- WLSSD employees do the work

Biosolids Overview

- History
  - Moved from incineration to land application in the 1990s
  - Started with lime stabilization and converted to anaerobic digestion in 2001
  - By charging a service fee and emphasizing benefits, economic value of biosolids is recognized
  - Douglas County expansion brought all nearby farm markets into distribution area
- Agriculture
  - About 80 percent of distribution in Carlton, southern St. Louis, Douglas and Pine counties
- Mine land
  - About 20 percent of distribution.

2008


Land Application Biosolids Distribution
US Steel
United Tac
Itasca County
St. Louis County
Cook County
Lake County
Cass County
Carlton County
Aitkin County
Crow Wing County
Douglas County
Pine County
Mille Lacs County
Morrison County
Kanabec County
Burnett County
GIS Data is reflective of the Land App Database as of 12-15-04.
All Biosolids sites are actively enrolled and permitted in the program.
Map Legend
WLSSD Plant
Current Biosolids Region
Mining Sites
United Tac
US Steel
Biosolids Sites
Active and Permitted YES
Buffer Distance
20 miles
40 miles
60 miles
80 miles
Road Class
Interstate Hwy
U.S. Hwy
MN Hwy
Lake Superior
Municipal Line
Townships
Cities
Counties w/ Active Sites
Counties w/out Active Sites
WLSSD
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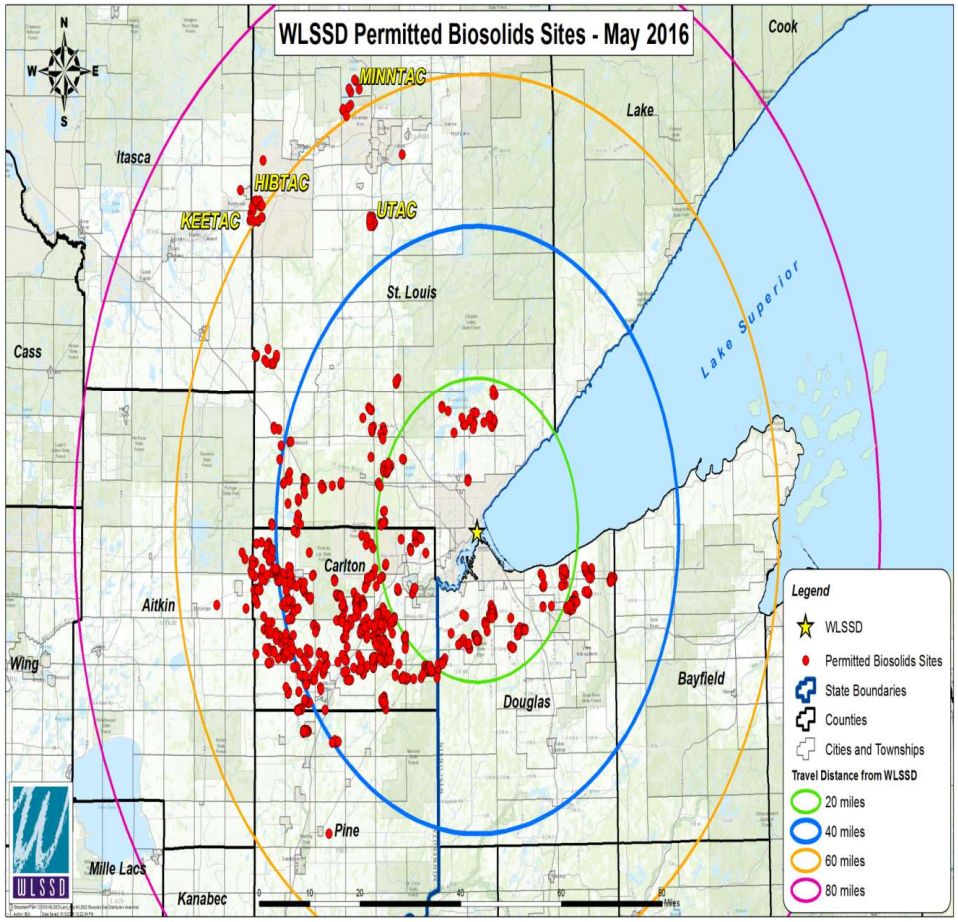
2016


WLSSD Permitted Biosolids Sites - May 2016
MINNTAC
HIBTAC
KEETAC
UTAC
Itasca
Lake
Cook
St. Louis
Lake Superior
Cass
Carlton
Aitkin
Wing
Douglas
Bayfield
Pine
Mille Lacs
Kanabec
WLSSD
Legend
WLSSD
Permitted Biosolids Sites
State Boundaries
Counties
Cities and Townships
Travel Distance from WLSSD
20 miles
40 miles
60 miles
80 miles


JRNE
JRNE
JRNE
303
303c
State Hwy 23

Questions?

Craig Lincoln
(218) 740-4808, craig.lincoln@wlssd.com
www.wlssd.com