

Biosolids Reuse Monthly Report


NUTRIENTS and CARBON RECYCLING


FARMING


Provides carbon and nutrients valued at \$300.00 per acre.

SILVICULTURE

Increases yield and improves undergrowth.

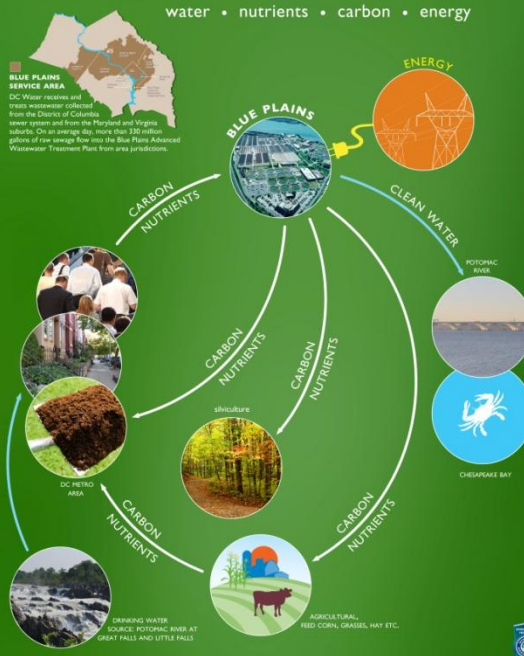
RECLAMATION

Restoring miles to their natural state and providing wildlife habitats.

URBAN RESTORATION

Grow trees and reduce runoff.





BLUE PLAINS SERVICE AREA
DC Water receives and treats wastewater collected from the District of Columbia sewer system and from the Maryland and Virginia suburbs. On an average day, more than 300 million gallons of raw sewage flow into the Blue Plains Advanced Wastewater Treatment Plant from area jurisdictions.

BLUE PLAINS
water • nutrients • carbon • energy



GREEN ENERGY BIORENEWABLES

POWER FROM THE PEOPLE

THERMAL HYDROLYSIS PROCESS (THP) AND DIGESTION FACILITY

DC Water will be the first in North America to use thermal hydrolysis for wastewater treatment. When completed, this facility will be the largest plant of its kind in the world.

GREEN BENEFITS:

- Produce combined heat and power, generating 13 MW of electricity
- Save DC Water \$10 million annually cutting grid demand by a third (DC Water is the largest consumer of electricity in the District)
- Reduce carbon emissions by approximately 50,000 metric tons of CO₂e per year.
- Reduce trucking by 1.7 million miles per year.
- Save \$10 million in biosolids trucking costs
- Produce Class A biosolids to grow trees, sequester carbon and reduce runoff.

dcwater.com/biosolids

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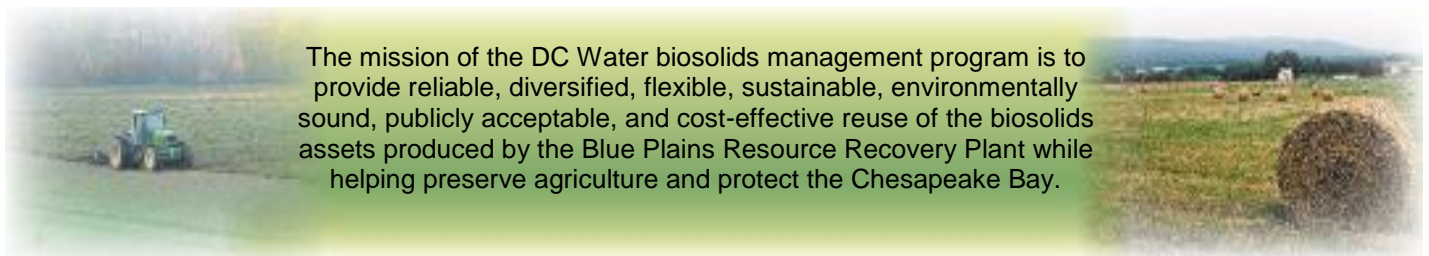
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DC Water

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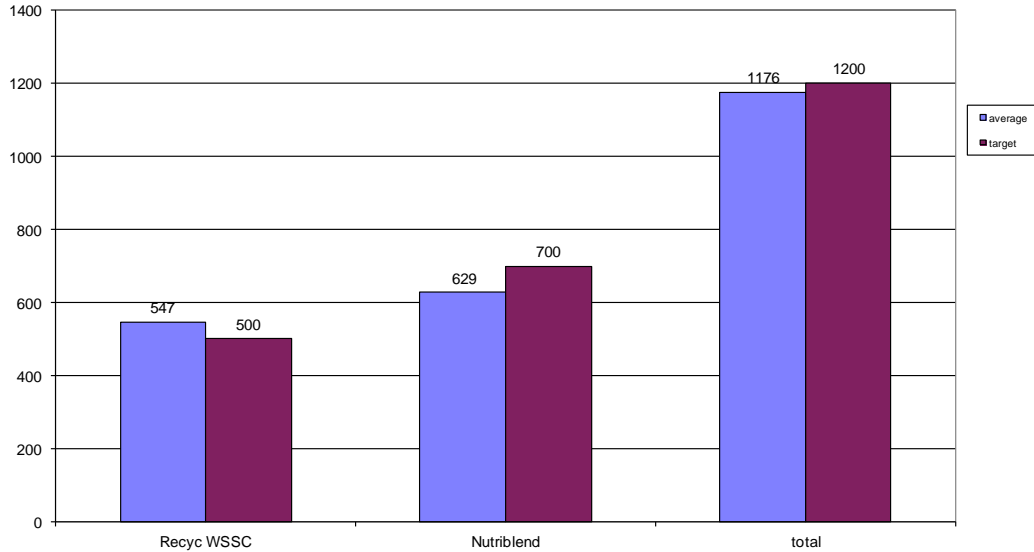


The mission of the DC Water biosolids management program is to provide reliable, diversified, flexible, sustainable, environmentally sound, publicly acceptable, and cost-effective reuse of the biosolids assets produced by the Blue Plains Resource Recovery Plant while helping preserve agriculture and protect the Chesapeake Bay.

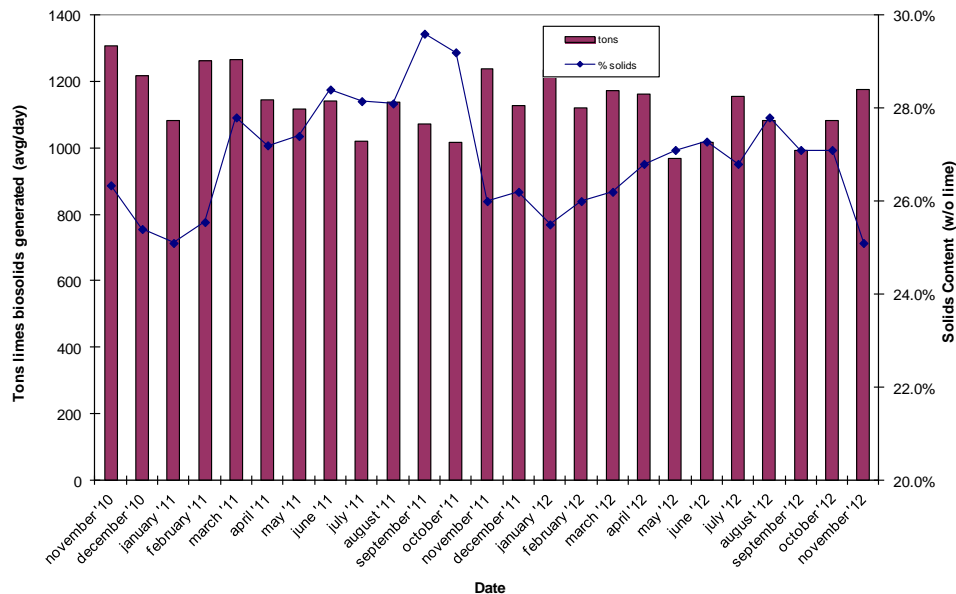
November 2012 Biosolids Division Report

In November, biosolids hauling averaged 1176 wet tons per day. The graph below shows the hauling by contractor for the month of November. Average % solids for the unlimed cake was 25.1%. Average lime dose for the month was 19.9%. Nutriblend took 946 tons of biosolids to the Spottsylvania County compost facility. At the end of November the Cumberland County storage pad had 6154 tons (~25,000 tons capacity), and the Cedarville lagoon had 3121 tons (~30,000 tons capacity).

Average Daily Hauling by Contractor for November 2012

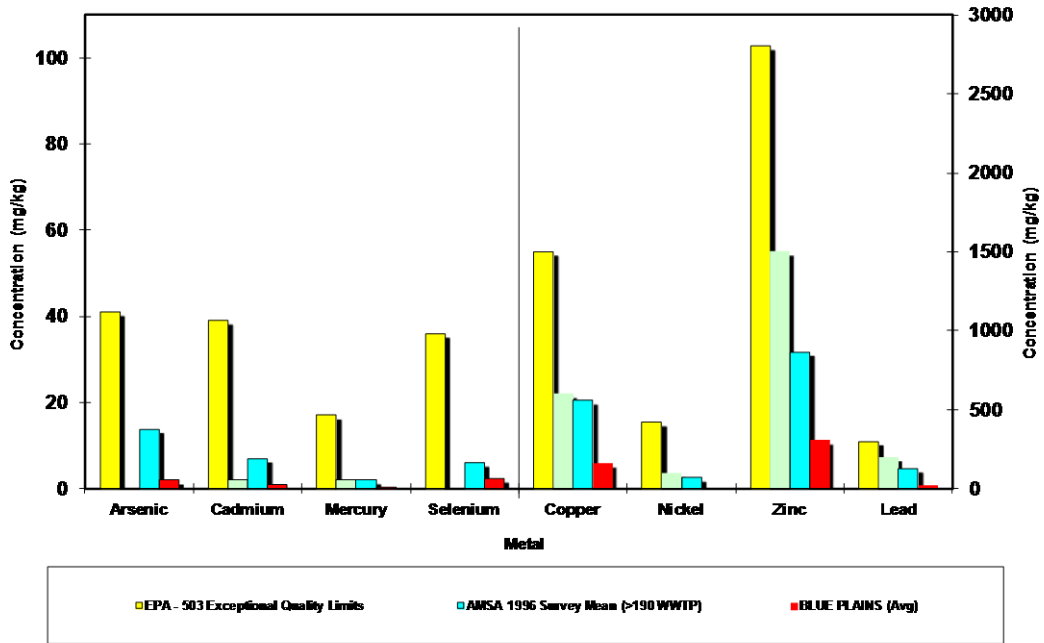


Average Daily Biosolids Production and Solids Content



The graphs below show the EPA regulated heavy metals in the Blue Plains biosolids for the month of July 2012. As can be seen in the graphs, the Blue Plains levels are considerably below the regulated exceptional quality limits, the national average levels surveyed in 1996, and the European Union (EU) limits. The EU limits are more conservative than the USEPA limits, and Blue Plains biosolids metals content is lower than the EU standards as well.

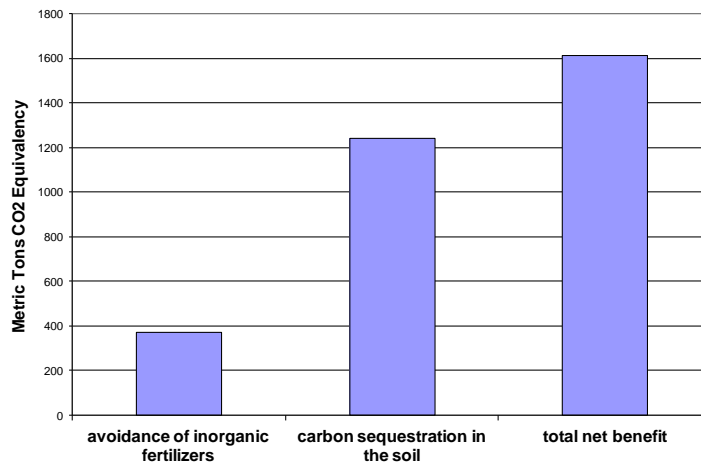
**BLUE PLAINS BIOSOLIDS METALS COMPARISON
October 2012**



Environmental Benefits

The quantity land applied coming directly from the plant and from storage facilities equaled 27,996 tons. Taking into account the fuel required to transport biosolids to the field, the net benefit of the land applied material is 1612 metric tons CO₂ equivalent avoided emissions. This is equivalent to taking 3,283,408 car miles off the road in the month of October (assumes 20 mpg, 19.4 lb CO₂ equivalent emissions/gallon gas – EPA estimate). The cumulative total avoided carbon emission since December, 2006 is 110,186 metric tons CO₂ equivalent.

**DCWASA Biosolids Recycling Program
Greenhouse Gas Balance Benefits
October 2012 Totals**

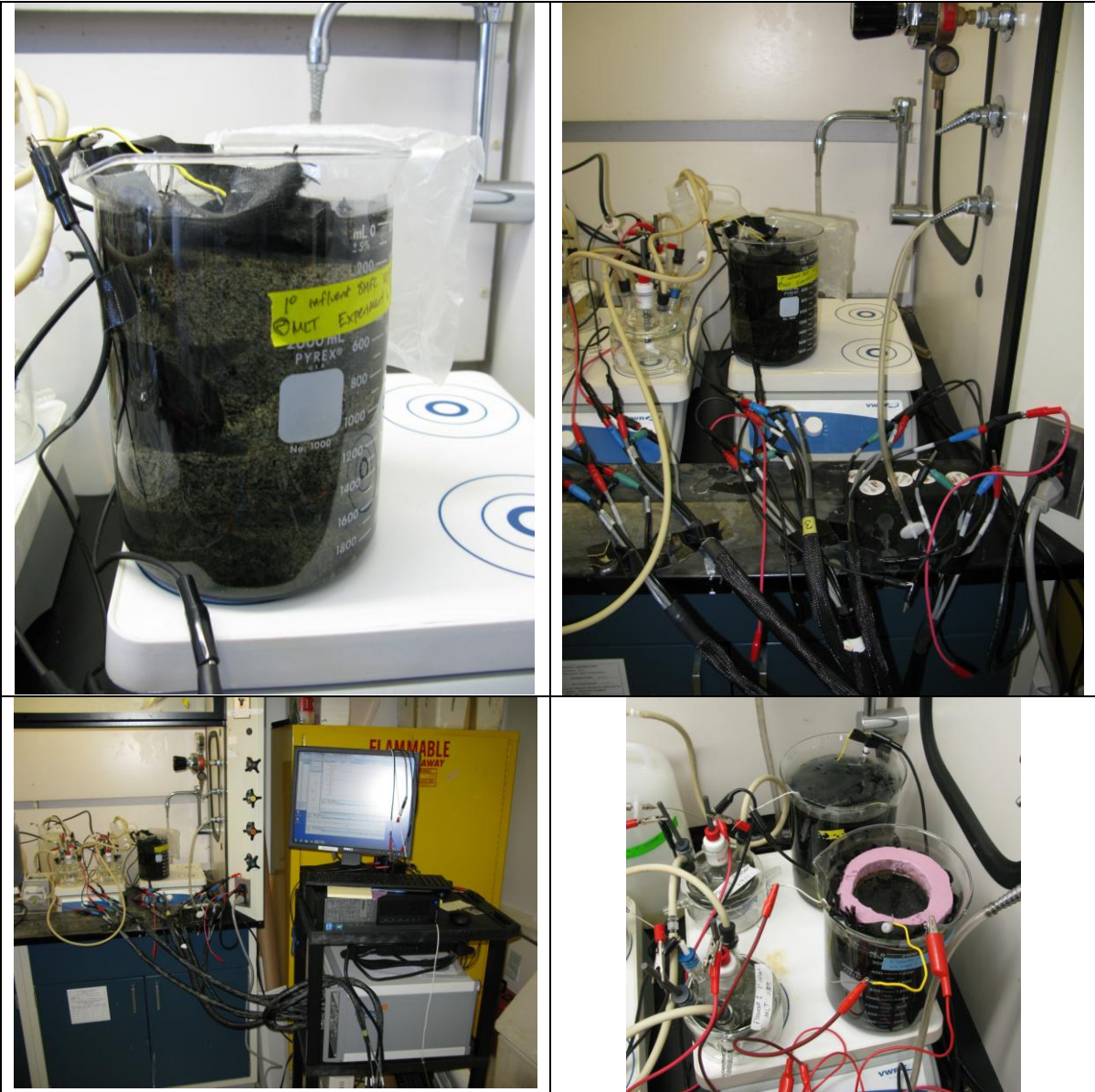


November Highlights

Staff visited with researchers from University of Maryland and the Naval Research Lab (NRL) at the NRL site across the fence from Blue Plains. Researchers at NRL are looking at using the bacteria in the wastewater in a sediment microbial fuel cell (SMFC). Microbial Fuel Cells (MFC) are devices that convert chemical energy stored in organic carbon to electrical energy through substrate oxidation by microorganisms. While still in the “research and development” stage, many researchers are addressing issues related to their optimization for the treatment of wastewater and as a source of energy.

The SMFC is comprised of a non-corrosive anode embedded in organic-rich sediment electrically connected to a non-corrosive cathode positioned in overlying water. Microorganisms in the media oxidize the organic matter using the anode as their metabolic electron acceptor. At the cathode, electrons are donated to reduce oxygen. Since the net reaction (oxidation of organics with oxygen) is thermodynamically favorable, both electrode reactions can occur spontaneously, generating an electrical current in the connecting circuit that can be used as a power source. The SMFC has been demonstrated successfully to power oceanographic devices utilizing marine sediment. There are three ways to operate a SMFC: 1) in power generating mode in which the rate of organic matter oxidation is relatively low; 2) in power neutral mode in which energy released by the net reaction is utilized internally to accelerate the rate of organic matter

oxidation, and 3) in power consuming power mode in which additional energy is externally supplied to maximize the rate of organic matter oxidation. While in the very early stages of research, this technology has potential to produce electricity and reduce organic matter, thereby potentially reducing the power needed treat in the secondary reactors.



Map of Blue Plains Biosolids Applications and Agricultural \$'s for October 2012

