

## Wastewater Treatment and Biosolids Production Overview

Chris Peot, P.E., Biosolids Manager  
District of Columbia Water and Sewer Authority

## Why do we recycle biosolids? By doing so we help:

- Recover nutrients from the WWT process (and keep them out of the Chesapeake Bay), completing the cycle back to farmland and forest
- Further protect the Bay by recycling these nutrients in a manner to minimize runoff (buffers, agronomic loading, etc.)
- Preserve farming in the Mid-Atlantic region

## National Biosolids Use Survey

- Uses 2004 data, compiled from a variety of sources, primarily state regulatory agencies
- Total U.S. biosolids production = 7.18 million U.S. tons on a dry weight basis
  - 55% is land applied
    - of the 55% which is land applied -- about ¾ is land applied to farmland; Class A uses account for almost one-quarter and mine reclamation and silviculture account for less than 5%.
  - 45 % is not beneficially used,
    - of this 45%, about 2/3 is landfilled and 1/3 is incinerated.

## DCWASA Blue Plains Advanced Wastewater Treatment Plant

- 370 MGD, 43% DC, 40% MD, 17% VA
- EPA certified industrial pre-treatment program
- Influent screening to ¼"
- Primary treatment and settling
- Activated sludge secondary treatment and settling
- Biological nutrient removal nitrification
- Filtration, disinfection

## Industrial Flow

- 6.5% of flow to Blue Plains is industrial
- EPA certified pretreatment program
- DCWASA writes discharge permits
- Inspection of all industrial dischargers
- Violators have permits revoked and sewers capped

## Industrial Dischargers cont.

- Extremely small trace amounts of pollutants end up in biosolids
- Often thousands of times less than in the products we use every day
  - Heavy metals
  - Triclosan (antimicrobial)
  - Polybrominated Diphenyl Ether (PBDE)

## Heavy Metals or Micronutrients?

Centrum vitamins contain:

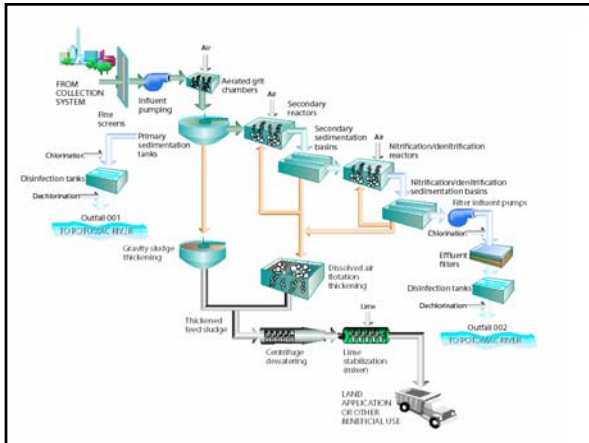
Selenium	20 ug	29% RDV
Copper	2 mg	100% RDV
Chromium	120 ug	100% RDV
Molybdenum	75 ug	100% RDV
Nickel	5 ug	*

\*RDV (recommended daily value) not established

## RDA of Essential Micronutrients

In order to obtain these levels of essential micronutrients, an individual would need to eat the following quantities of Blue Plains biosolids:

Micronutrient	weight (lb/yr)	volume (cups/yr)
Chromium	4.9	9.3
Copper	20.1	38.1
Molybdenum	13.8	26.2
Nickel	0.5	0.8
Selenium	194.0	368.0
Zinc	113.0	214.0



## DC Water and Sewer Authority Biosolids Reuse Program

- 1200 wtpd lime stabilized biosolids
- Agriculture – 39 counties in two states
- Silviculture – 40,000 acres permitted in 8 Virginia counties
- Poplar Plantation on Gravel Mine
- Reclamation Projects – three sites to date

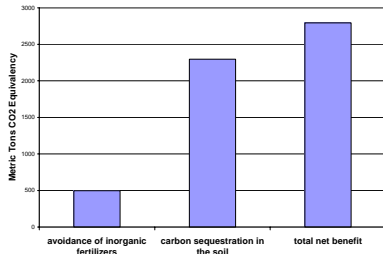
## Biosolids Reuse Program Options

- DCWASA recycles a Class B biosolids product (pathogens reduced to an acceptable level)
  - Lime stabilized – raise the pH to 12.0
  - Others use heat (digestion) to achieve pathogen reduction
  - Remaining pathogens eliminated through exposure to the elements
  - Requires a waiting period – not for home use
- Class A (pathogens eliminated) can be achieved with further processing or higher heat – can be used in homes



Blue Plains: net positive benefit of approx. 3000 metric tons CO2 avoided each month, the equivalent of 6,000,000 car miles

DCWASA Biosolids Recycling Program  
Greenhouse Gas Balance Benefits  
February 2007 Hauling Totals



Why do we recycle biosolids?  
By doing so we help:

- Recover nutrients from the WWT process (and keep them out of the Chesapeake Bay), completing the cycle back to farmland
- Further protect the Bay by recycling these nutrients in a manner to minimize runoff (buffers, agronomic loading, etc.)
- Preserve farming in the Mid-Atlantic region

Questions?

Research into relationship between process parameters and odors

- MABA Phase I – Bucknell, Matt Higgins
- Lime Mixing – U of Maryland, Jason North
- TMA, Lime, ORP, and Polymer – USDA, Kim and McConnell
- Blanket Depth and Reduced Sulfur – U of MD, Sekymiah
- Digestion Odors - Va Tech, Novak; WERF study

Actual vs. Predicted Odor Levels, Inspector P, Winter

