



# Collection and Reuse of Carbon in a Large Urban Sewer System

American Biogas Council Briefing

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District of Columbia Water and Sewer Authority



# NUTRIENTS and CARBON RECYCLING



# BLUE PLAINS ADVANCED WASTEWATER TREATMENT PLANT: A RESOURCE RECOVERY FACILITY

# GREEN ENERGY BIORENEWABLES

## FARMING



Provides carbon and nutrients valued at \$100.00 per acre.

## SILVICULTURE



## RECLAMATION

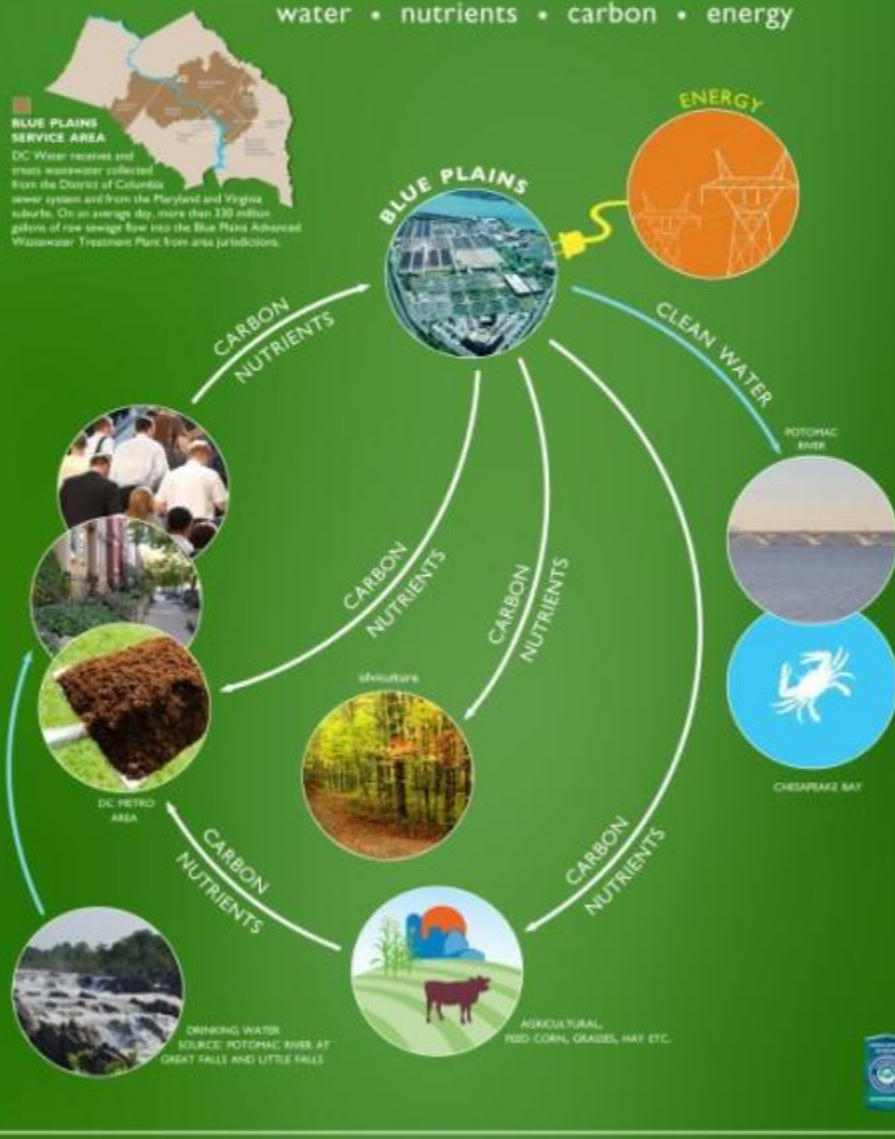


Restoring rivers to their natural state and providing wildlife habitat.

## URBAN RESTORATION



Grow trees and reduce runoff.



## THERMAL HYDROLYSIS PROCESS (THP) AND DIGESTION FACILITY



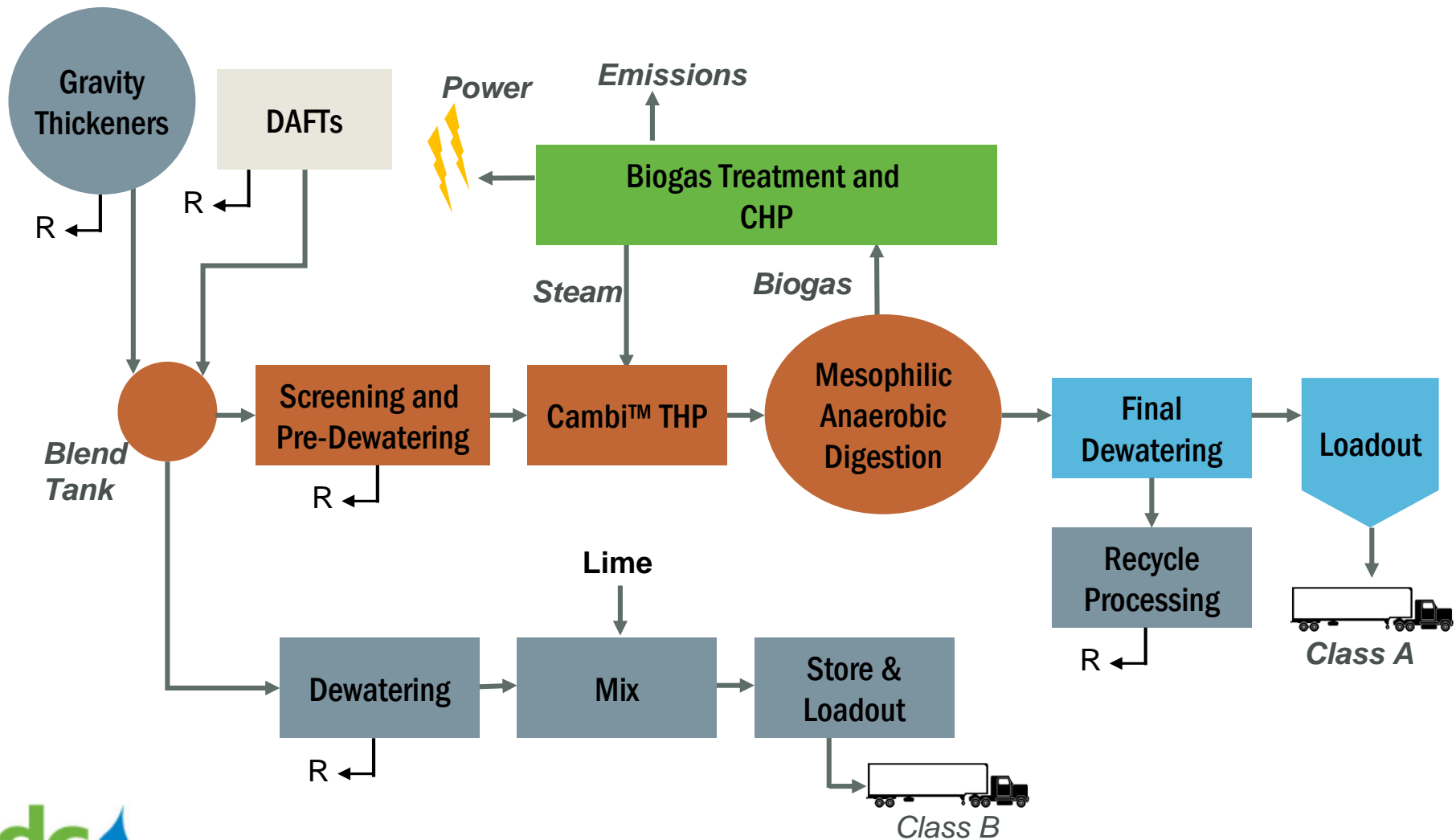
DC Water will be the first in North America to use thermal hydrolysis for wastewater treatment. When completed, this facility will be the largest plant of its kind in the world.

- 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 CO<sub>2</sub>e 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.

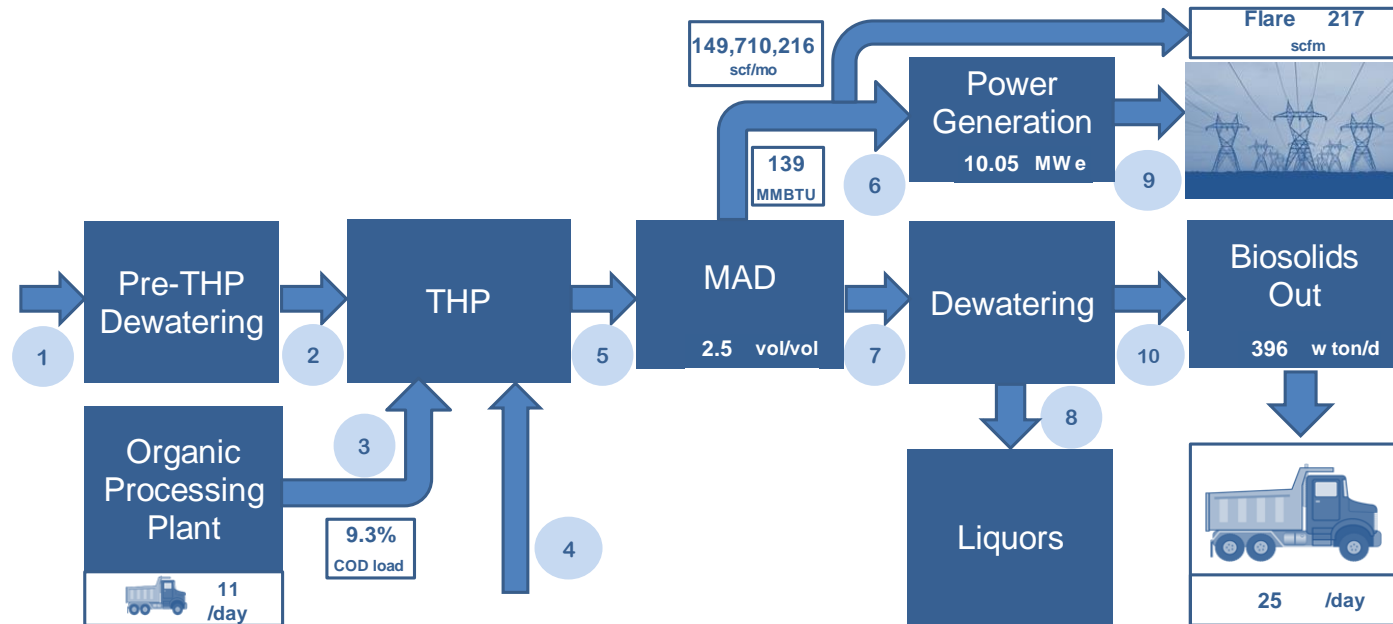
# Anaerobic Digestion / Thermal Hydrolysis



# Process Schematic



# Co-digestion Potential



Stream		1	2	3	4	5	6	7	8	9	10
Name		Raw sludge	THP sludge feed	Organic Waste	Trim Water	MAD feed	Biogas	DW feed	Liquors	Power output	Biosolids output
TDSd	tDS.d [US]	290	284	28		312		133			131
%DS	%	5%	17%	14%		10%		4.3%			33%
%VS	%	75%	75%	80%		75%		48%			48%
Wet	m3/hr	242	72	8		130		130	114		16
DS	lbs/d	580000	568400	56000		624400		266624	5332		261291
VS	lbs/d	435000	426300	44800		471100		128219	2564		5236
COD	kgs/hr	14234		1500		15734			5413		
Trim Water	gpm				106						
Ammonia	lbs/d	3424	3424	204		3628		18486	18486		
Ammonia	mg/l	267	899	462		526		2775	2775		
Biogas	scfm						3418				
Biogas	MMBTU						139				
Power output	MW e									10.05	

Capacity	
Pre TH DW	50%
Turbines	82%
MAD	70%
THP	64%
DW	43%



**Reduce biosolids costs** by more than 50%



**Improve product quality** (Class A and more)



**Generate 8-10 MW** of clean, renewable power



**Cut GHG emissions** dramatically



**Save millions of dollars** annually

# Agriculture



# Community Gardens and Tree Planting





# Highway Construction Projects





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# National Potential for Green Energy

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- 7.1 million dry tons/yr of biosolids
- Potential generation of 4.9 billion kwhr/yr
  - enough to power 450,000 average American homes (10,932 kwhr/yr average use).
  - At \$0.10/kwhr, this green energy is valued at nearly \$500 million/yr.
- \$25M – \$1B/yr for renewable energy or renewable fuel credits
- 15.7 billion lbs steam at 150 psi for building heat, evaporation towers, etc.

**There is no such thing as waste,  
only wasted resources.**

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[www.dewater.com](http://www.dewater.com)**

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