





*Comprehensive Review on Co-Digestion Program
at the MWRA*



June 25, 2014



Goal / Current Status - Co-Digestion

- **Goal:** To enhance MWRA's operation, increase green energy production and offset MWRA operating costs
- **Current Status:**
 - Feasibility & Bench Scale Study Complete
 - Pilot facilities (barge) under design

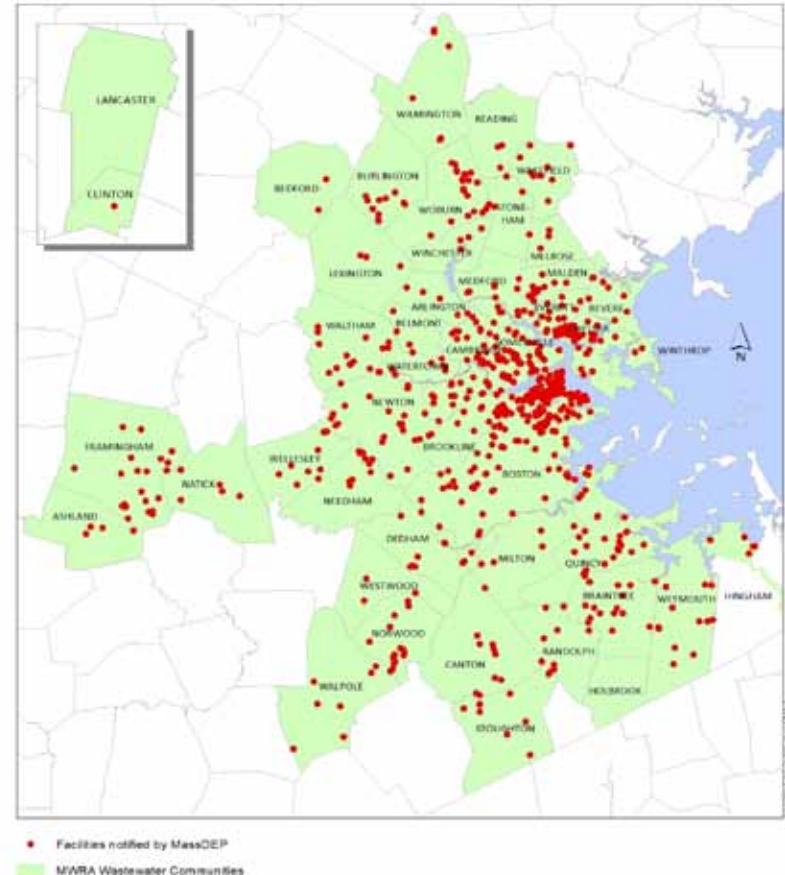




MaDEP Ban & Impacted Commercial/Industrial Institutions

- MaDEP ban - October 1, 2014
- Impacts Commercial / Industrial Institutions > 1 wtpw
- MaDEP notified 2,070 business state-wide (1,700 impacted)
- MWRA service area impact:
 - 985 (48%) in MWRA area
 - 858 (41%) in sewer area
- At 70 dtpd, DITP could handle 30% of MaDEP 2020 Goal

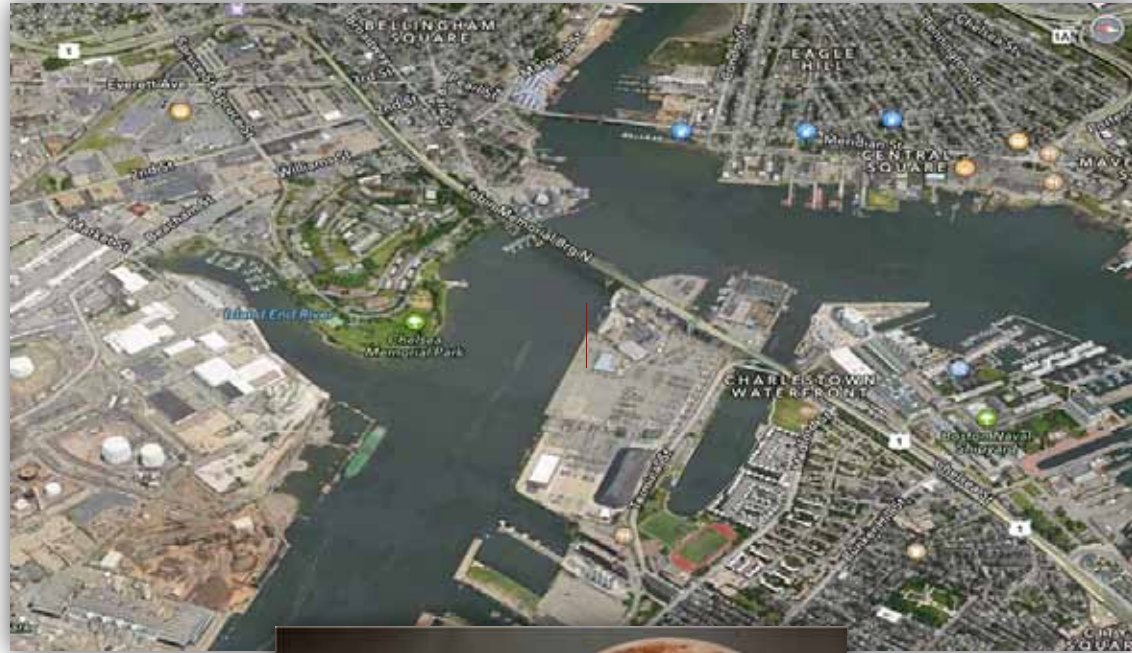
Figure 1
Food Waste Ban - MWRA Wastewater Communities





Waste Management Pre-processing Facility

- Located in industrial district
- Inbound Truck Impact: Pilot
 - Phase I – 5-7 weekdays
 - Phase III – 15-20
- Received all permits
- Must meet strict MWRA quality standards
 - permitted by TRAC
 - Comply with MWRA Sewer Use Regulations





Co-Digestion - Pilot

- Receive Pre-processed Source Separated Organics (“PSSO”) via Barge (formerly by truck)
- Pilot operational plan Year 1:



<u>Time</u>	<u>Quantity</u>	<u>Digas</u>	<u>Sludge to FRSA</u>
Baseline	246 dtpd to digestion	186 kscfh	102 dtpd
Month 1	Phase in up to 7 dtpd	0 to +4.2%	0 to +1.4%
Month 1-4	7 dtpd (+2.8%, 20% to 1 dig)	+4.2%	+1.4% (+1.5 dtpd)
Months 5-7	14 dtpd (+5.7%, 40% to 1 dig)	+8.5%	+2.9% (+3.0 dtpd)
Months 8-9	14 dtpd (20% to 2 dig)	same	same
Months 10-12	21 dtpd (+8.5%, 30% to 2 dig)	+12.7%	+4.3% (+4.5 dtpd)



Co-Digestion – Pilot Barging Plan

- Pier: Berth 3
- Buried Piping
- In-house installation
- Use of Gravity Thickener as storage
- Pump to Test Digesters
- Est. MWRA cost impact - \$2.3M (early planning)
- Est. Waste Management cost impact - \$2.5 M





What does cost model show?

<u>Line Item</u>	<u>Pilot Year 1</u>	<u>Pilot Year 2, 3*</u>
Heat Value Benefit	+\$496K	+\$955K
Electricity value including RPS	+\$256K	+\$385
Cost to Pellet Operation	-\$335K	-\$504K
Total Benefit**	+\$417K	+\$835K

** Capital costs not included in line item.

Current MWRA capital expenses (pilot, trucking) - \$500K (\$650K-\$700K est.) less \$360K in grants.





What does cost model show? (cont.)

- Full Scale Operation:

<u>Time</u>	<u>Quantity</u>	<u>Digas</u>	<u>Sludge to FRSA</u>
Baseline	246 dtpd to digestion	186 kscfh	102 dtpd
Full Scale Operation	+70 dtpd	+78 kscfh (+42%)	+16 dtpd (+16%)

<u>Line Item</u>	<u>Full Scale Operation</u>
Heat Value Benefit	+\$1.1M
Electricity value including RPS	+\$5.0M*
Est. Tipping Fee Revenue (\$0.062/gal)	+\$2.7M
Subtotal Benefit	\$8.8M

O&M Costs (includes pelletization) -\$1.9M	
<u>Annual Capital Expenses</u>	<u>-\$1.9M</u>
Subtotal Expenses	\$3.8M

Total Benefit **\$5.0M**

* Assumes increased generation efficiencies with new CHP



What does cost model show? (cont.)

Updated Co-Digestion Cost/Benefit Analysis (Revised Model)

Category	150 wtpd case Pilot	500 wtpd case Permanent Program
Estimated Capital Costs		
On-Island Receiving, Storage	\$500K + \$2.3M ¹	\$2.4M
Digester Modification		\$2.0M
Combined Heat & Power		\$25 M
Total Estimated Capital	\$2.8M	\$29.4M
Estimated Annual Costs		
Annual Debt Service on Capital (20-yrs)	\$180K	\$1.9M
Total O&M (including pellets)	\$575K	\$1.9M
Total Annual Cost	\$755K	\$3.8M
Estimated Offsetting Annual Savings		
Savings for Value of Additional Biogas ^{**}	\$1.3M ²	\$6.1M ³
Net Annual Savings:	\$585k	\$2.3M
Potential Additional Revenues (Post Pilot)		
<i>Industry Standard Tipping Fee</i>		<i>\$0.09-0.12/gal</i>
Suggested Tipping Tee		\$0.062/gal
Estimated Annual Revenue from Tipping Fee		\$2.7M
Estimated Total Net Annual Benefit:	\$585K	\$5.0M

1. \$2.3M capital costs associated with change from trucking to barging option.
2. Value of additional biogas includes heat value, electrical value and RPS credits.
3. Value of additional biogas includes heat value, electrical value and RPS credits and is based on output from new Combined Heat and Power Facility (CHP) option.

(Above costs do not include Waste Management's cost impact and benefit from MaDEP and MaCEC grants.)





*I/I Local Financial Assistance Program
Guideline Revisions*

June 25, 2014



Approval Recommended in the Final FY15 CIP Staff Summary

- \$80 Million for Phase 9 to be distributed beginning in FY15
- \$80 Million for Phase 10 to be distributed based on community-by-community “trigger”



Approval Recommended in this Staff Summary

- **Community-by-Community “trigger” for Phase 10 funds:**
 - When MWRA has distributed 50% of a community’s Phase 9 allocation, its Phase 10 allocation automatically becomes approved for distribution beginning the next fiscal year
- **Phase 9 and 10 funds distributed at a 75% grant and 25% loan split**
(currently 45% grant and 55% loan)
- **Loan repayment over 10 years**
(currently 5 years)



Revisions to I/I Program Guidelines - Continued

- Remaining prior phase funds must be used before Phase 9/10 funds
- Community applications exceeding \$2.0 million subject to a 90-day notification
(currently 30-day notification)
- Executive Director can waive the 90-day notification rule on a case-by-case basis



Projected Spending Plan for I/I Program

- Beginning in March 2015, annually staff will survey the communities to develop 3-year rolling projected spending plan
(Advisory Board will assist Staff)
- Community projections for the first year should be as close to actual as possible; second and third year will be planning estimates
- Goal is best available information to assist in finalizing MWRA's annual CIP



Additional Information for I/I Program

- **As in prior Phases, community allocations will be based on each community's percent share of sewer charges**
- **Both Phase 9 and 10 allocations will be based on Final FY15 percent share of sewer charges**
- **Guidelines for distribution of existing funds will remain unchanged (total of about \$40 million remaining from Phases 6/7/8)**

