Urban-Agricultural Community Digester Project

Briefing to Joint Committee on Energy Supply and Energy Conservation
December 4th, 2008
By
Mason Conservation District
Purpose

➢ To provide information on:
  ● Urban-Agricultural Community Digester Concept (UAC Digester)
  ● Mason Conservation District Digester Project
  ● Public Benefits of an Urban-Ag Community Digester Operation to recycle Organic Solid Wastes
Processing Urban and Agricultural Organic Waste in a Community Anaerobic Digester can do the following:

- Reduce Water Pollution in Puget Sound
- Reduce Waste Volume shipped to Landfills
- Locally produce Renewable Energy
- Convert Waste to Fertilizer for Washington Farms
- Produce Revenue instead of just Consuming Cash for organic waste disposal and environmental clean-up

WASHINGTON COMMUNITIES & AGRICULTURE CAN NOW SUPPORT AND SUSTAIN EACH OTHER WITH COMMUNITY ANAEROBIC DIGESTERS.
Agenda

- Background: How Hood Canal Low-Dissolved Oxygen Problem inspired the Urban-Ag Community Digester Concept

- Mason CD Digester Project:
  - Project History
  - Current Status

- Describe how the Urban-Ag Digester Operation will divert and recycle Organic Wastes

- Describe how Urban-Ag Digesters can sustain Washington Communities, Agriculture, and the Environment
Background

- **Hood Canal Low Dissolved Oxygen:**
  - Excess Nutrients $\rightarrow$ Large algae blooms
  - Algae blooms die off $\rightarrow$ Bacteria consumes algae
  - Bacterial process consumes Dissolved Oxygen
  - Result: Massive fish kills

- **Shellfish Contamination is Major Problem!**
  - Shellfish are filter-feeders that consume dissolved nutrients
  - Large Shellfish Areas in Hood Canal LDO Area closed due to bacterial contamination
  - Reduced Shellfish Farming $=$ Reduced Nutrient Removal
Man-Made Nutrient Sources in Hood Canal

- 60%: Septic Systems
- 14%: Agricultural Animal Manure
- 13%: Salmon Carcasses
- 11%: Storm Runoff, incl. Fertilizer
- 1%: Forestry Fertilizer
- >1%: Point Source Discharge

Evolution of Urban-Ag Community Digester Concept

First: Digest Livestock & Fishery Wastes
- Reduce Hood Canal Nutrients by 27%
- Eliminates bacterial contamination
- Reduces imported Farm Fertilizer

Second: Include Food & Yard Waste
- Hood Canal Nutrient Reduction increased to 38%+

Third: Divert Municipal Organic Wastes from Landfills to Digester
- Service Area now includes Oakland Bay Shellfish Protection District & other Sensitive Areas
- More Participants = More Economical
- Integrate into Existing Solid Waste System
Mason CD Urban-Ag Community Digester Project

- PSAT Innovative Approach Grant to analyze Anaerobic Digester benefits to Hood Canal – Final Report, 2006

- $500,000 grant from Washington Conservation Commission to develop project

- Request for proposal issued for Feasibility Analysis & Preliminary Design
Mason CD UAC Digester Project: Current Status

- Digester Operation is economically feasible
- Cost to Build: $3.5M
- Building site: Co-Located with Mason County Solid Waste Transfer Site
- Financing is nearly complete:
  - Existing $500K Grant
  - $2M+ committed from Private Lender
  - Requested Funding from Energy Freedom Program to form unique public-private partnership w/ Equity Investors
- Permitting discussions underway w/ DOE
- Planned Construction Date: Summer, 2009
Mason CD Urban-Agricultural Community Digester Operation

- Hood Canal farm & fishery wastes collected, shipped to Digester (<10 miles)
- Municipal waste collectors shift to 2-container pickup, organic waste delivered to Digester
- Digester destroys pathogens & produces solid or liquid fertilizer, clean organic fiber, and pipeline-quality biogas
- Fertilizers → Hood Canal Farms
- All other Fertilizer & Fiber → Top-Soil Producer
- Biogas Fuel pipeline to State Prison Boiler Plant
- Greenhouse Gas Credits also produce Revenue
- $ Revenue pays for Construction & Operations
Project Layout Views

DIGESTER SITE ENLARGEMENT

BOILER CONNECTION ENLARGEMENT

CONNECT PROpane Line in Rear of Boiler Building

Mason County landfill Site

State Prison @ Shelton, WA

DIGESTER SITE AND GAS CONNECTION @ STATE PRISON
Mason Conservation District
Community Digester and Nutrient Recovery Facility

Environmental Energy & Engineering Co.
Public Benefits –
Some, but not all!

- Protects Hood Canal now & Puget Sound in the future
- Sustain Ag & Shellfish Farms by eliminating pathogens & recycling farm waste to fertilizer
- Reduces organic waste shipments to landfills
- Reduces sanitary sewer loading from food waste
- Community digester revenues offset operating costs at a savings to the public & fund other conservation efforts
- Locally-produced renewable energy reduces dependency on imported fossil fuels
- New Energy Jobs promote Rural Development
Cost Effectiveness: Sewer vs. Community Digester

- **Sanitary Sewer for Hood Canal:**
  - $60M (est.) to remove 60% of man-made nutrients
  - Unit Cost: **$1,000K per 1% Reduction**
  - Built at Taxpayer Cost, supported by fees

- **Community Digester for Hood Canal**
  - $3.5M to remove 38% of man-made nutrients
  - Unit Cost: **$92.1K per 1% Reduction**
  - Generates Revenue for operation and to pay back construction costs

*This does not account for additional benefits to areas served outside of Hood Canal.*
Conclusion

- Mason CD Digester ready for construction
- Project will demonstrate Urban-Ag Community Digester benefits for Puget Sound
- Project will be truly successful when more Urban-Ag Community Digesters are put into operation