Welcome

Daniel K. Moon

Executive Director & President
Environmental Business Council
Welcome to E.L. Harvey & Sons

Doug Harvey

Executive Vice President
E.L. Harvey & Sons
Program Introduction & Overview

David Adams, P.E.

Program Chair & Moderator

Senior Vice President, Sanborn Head

Environmental Business Council of New England
Energy Environment Economy
Solid Waste Management Issues for Massachusetts

John Fischer

Branch Chief
Commercial Waste Reduction & Waste Planning
Massachusetts Department of Environmental Protection

Environmental Business Council of New England
Energy Environment Economy
Solid Waste Management Issues for Massachusetts

John Fischer, MassDEP
EBC Solid Waste Program
May 1, 2018
Solid Waste Master Plan
Disposal Reduction Goals and Progress

GOALS

• 30% reduction by 2020 from 2008 baseline
  • 6,550,000 to 4,550,000 tons
• 80% reduction by 2050 (to 1,310,000 tons)

PROGRESS

• 2016 disposal = 5,610,000 tons
• 14% reduction from 2008 to 2016

MassDEP did not calculate disposal data for 2013.
2030 Solid Waste Master Plan

- 2018 – focused on stakeholder discussions and input
- 2019 – develop and issue draft plan
- 2020 – publish final 2030 Plan
- Primary forum - MassDEP Solid Waste Advisory Committee (SWAC) and subcommittees
Top 5 Issues to Discuss

- Improving Recycling Quality & Reducing Contamination
- Addressing Materials Management Capacity Need
- Increasing Waste Ban Compliance
- Construction Materials Reuse & Recycling
- Ensuring Sound Landfill Post Closure Monitoring & Maintenance
Recycling Markets Issues

- Global market dynamics affecting Massachusetts
- Especially for mixed paper and plastic
- Also working to address local glass market shortfall
- Key is to reduce contamination in recycling & improve quality
- Also improving infrastructure and local markets
Improving Recycling Quality/Reducing Contamination

- Collaborative effort with recycling industry (haulers & MRFs), municipalities & The Recycling Parternship
- Recycling IQ Kit – on MassDEP website
- Develop standard list of MRF materials accepted
- PR firm to help develop recycling education campaign
- Education to commercial and institutional sector
- Recycling Business Development Grants
  - Glass, mixed curbside recyclables, mixed 3-7 and bulky rigid plastics
Materials Management Capacity

- In-state landfill capacity projected to drop >500K tons by 2022
- Projected net export between 250K and 1.75 million tons/year
- No new disposal capacity being developed
- Some new and expanded transfer or disposal capacity
- MassDEP limited ability to influence new disposal capacity – & limited local willingness to accept
Materials Management Capacity

• More success in leveraging other capacity
• Organics example
  • Compost capacity about 150K tons
  • AD capacity of >300K tons currently
  • Facilities under development will increase to 570K tons
  • 6 depackaging facilities, 2 more under development
  • Troiano Trucking animal feed production up to 140K tons
  • Plus reduction (50% in some cases), donation and food rescue, and other animal feed
Materials Management Study

- Ongoing now
- Initial outline in May/June and scheduled to be completed in October
- Will examine all capacity
  - disposal, transfer, processing, recycling, composting, AD, animal feed, donation and reuse
- Goal – comprehensive capacity assessment to inform Master Plan policies
Waste Ban Compliance

- 2017 – seeing failed load rates > 20% - 1 of 5 loads
- Especially cardboard from businesses
- 2016 waste characterization data 40% of MSW = banned materials
Enforcement by Material Type

- Paper/Cardboard: 404
- Commercial Food Waste: 12
- Bottles & Cans: 21
- Whole Tires: 1
- Wood: 13
- Glass Containers: 2
- Leaf & Yard Waste: 10
- Metal: 9
- Plastic Containers: 1
- Clean Gypsum Wallboard: 8
- Cathode Ray Tubes (CRTs): 6
- Failing to provide information: 2
Enforcement by Sector

- Utility Service: 12
- Supermarket: 20
- College/University: 19
- Construction/Demolition: 10
- Distribution: 49
- Food Processor: 20
- Government/Municipality: 21
- Hauler: 34
- Healthcare: 21
- Hospitality: 22
- Landscaper: 1
- Manufacturing/Research: 53
- Other: 6
- Retail: 78
- Restaurant: 18
- Property Management/Office Building: 61
Construction Materials
Reuse & Recycling

- C&D processor recycling rates hovering around 25%
- MassDEP’s current goal to increase to 50% by 2020
- Reassessing goal and strategies in 2030 Master Plan
- Focusing on 3 themes
C&D – Key Initiatives

- Jobsite waste management
  - Reduction, reuse and source separation
- Enhance C&D facility performance
  - Improve recovery rates
- Develop end markets
  - Wood
  - C&D fines
  - Inter-agency cooperation – DCAM, MassDOT
Post Closure Landfill Management

- Hundreds of landfills approaching end of initial 30 year post closure monitoring and maintenance period
- Most, if not all, will continue to need cap and slope maintenance
- Most will continue to show need for some landfill of groundwater monitoring
- Also need for continued financial assurance mechanisms (FAMs)
Contact Information

John Fischer

John.fischer@state.ma.us
Dep.swmp@state.ma.us
Solid Waste Management Issues for Maine

Paula Clark

Director, Division of Materials Management
Bureau of Remediation & Waste Management
Maine Department of Environmental Protection
Solid Waste Management Issues in Maine

Paula Clark, Director
Division of Materials Management
Bureau of Remediation and Waste Management
Issues for Maine

• Current Solid Waste Management Landscape in Maine
• 2019 Maine Materials Management Plan
• Beneficial Use of Solid Waste
• Recycling Infrastructure
• Organics Management
Current Solid Waste Management Landscape

- Maine landfills and incinerators
- New MSW processing facility under construction
- Shifts in municipal disposal contracts
- Changes going forward
2019 Maine Materials Management Plan

• Authorized through Maine statute
• Revised every 5 years
• Based on the Maine solid waste management hierarchy and recycling goal
• Provides guidance and direction to municipalities
• Stakeholder and public input
Beneficial Use of Solid Waste

- Comprehensive revisions to rule (*Beneficial Use of Solid Wastes, 06-096 C.M.R. ch. 418*)
- “Major substantive” process
- Topics of interest
- Related interstate issues
Recycling Infrastructure

- Volume and transportation constraints
- Collection and processing challenges
- Maine Solid Waste Diversion Grant Program
Organics Management

• Priority in Maine’s current state plan
• Focus on technical assistance, training and guidance
• Collection systems, composting and digesters
• Food scrap composting pilot program
• Food recovery hierarchy established in statute
Maine’s Food Recovery Hierarchy
Adopted in 2016 by Maine Legislature

Reduce Unwanted Food
- Inventory grocery stock/pantry
- Buy and cook only what you need
- Conduct a food waste audit
- Use leftovers

Feed People
- Donate to food banks
- Partner with organizations that collect and distribute perishable food.

Feed Animals
Contact local farms to see if they can use scraps

Compost or convert to fuel

Disposal
Less Desirable

More Desirable
Contact:
Paula M. Clark
paula.m.clark@maine.gov
207-287-7718

www.maine.gov/dep
SOLID WASTE UPDATES FOR Rhode Island

- Mark Dennen, CPG-Supervising Environmental Scientist
- RIDEM/Office of Waste Management
5 Solid Waste Topics

- Anaerobic Digester
- C&D Processing Facilities
- E-Waste
- Medical Waste Operations
- Glass
Overview of Waste Management in Rhode Island

- 1 Large Active Landfill run by Rhode Island Resource Recovery Corp. (pseudo-state Corporation)
  - Also runs large scale composting and recycling program
  - Incineration discouraged by statute
  - Slated to close after current 2 phases (2032?)
- 1 small municipal landfill (closing)
- 1 Large C&D Processing Facility (2000 tons/day)
- 1 Large Anaerobic Digester (in construction- 200 tons/day)
- 1 Large Medical Waste processing facility
- No reasonable expectation of truly NEW landfills
- Incinerators?
RIRRC Corporation Facility Plan

Source: RI Solid Waste Management Plan
E-WASTE
The date for registration and plan submittal has been moved up from December 15th to October 15th

Manufactures may carry over a credit (or deficit) of 10% of their allotment to the following year

Television Manufacturers with less than 5% of the Market Share will automatically be assigned to the State Program.

Quarterly reporting on a template provided by the DEM is mandatory. Must report lbs from each location
Food Waste Ban RIGL 23-19.9-17

- Effective 1/1/2016
- Commercial and Various Institutional Organic Waste Generators
- >104 tons/yr organic waste
  - Food scraps
  - Food processing waste
  - Soiled paper
  - Non-recyclable paper
- >52 tons/yr in 2018
Food Waste Ban RIGL 23-19.9-17 (continued)

- If within 15 miles of compost or A.D. Facility
- Waste Handling Options
  - Send to compost facility
  - Send to A.D. facility
- For agricultural use (animal feed)
- Recycle or treat on-site
- Waiver option: facility fee > RIRRC non-contract commercial tipping fee
RI composting facility regulations

- 1 Large Anaerobic Digester
- 1 Agricultural Compost Operations
- 2 Smaller Putrescible Waste Operations
- Leaf and Yard Composting at 17 other sites
Anaerobic Digester
# Composting Facility Comparison

<table>
<thead>
<tr>
<th></th>
<th>Small-scale</th>
<th>Medium-scale</th>
<th>Large-scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Quantity (yds³)</td>
<td>0-25</td>
<td>25-600</td>
<td>&gt;600</td>
</tr>
<tr>
<td><strong>Waste Types</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registration Requirement</td>
<td>No</td>
<td>Yes (at start)</td>
<td>Yes (every 3 years) $3,000</td>
</tr>
<tr>
<td>Putrescible Wastes</td>
<td>Limited types</td>
<td>More types (pilot program)</td>
<td>Extensive types</td>
</tr>
<tr>
<td>Buffer zone requirements</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Operating standards</td>
<td>No*</td>
<td>No*</td>
<td>Yes</td>
</tr>
<tr>
<td>Finished compost quality</td>
<td>Class A</td>
<td>Class A</td>
<td>Class A, B or C per defined markets</td>
</tr>
</tbody>
</table>

*no adverse effects - surface groundwater, wetlands, odors, vectors, dust, litter
ORBIT ENERGY ANAEROBIC DIGESTER

- Approx. 200 tons/day organic input
- Wet digestion process
- Methane- 3.2 MW combined with power production
- Solid digestate- compost facility input
ORBIT ENERGY ANAEROBIC DIGESTER

- Began accepting fats, oils and grease (FOG) in September 2017
- Still accepting FOG Waste
- Issues with startup:
  - Lack of winterization
    - Lots of equipment with piping outside with no weather protection
    - Forced shut down scrubber
    - Flaring methane and buying propane and diesel to heat units
  - Issues with food shredding units running reliably
  - Incapability issues between European and American Specifications
  - Will pursue a Beneficial Use Determination to land apply digestate
  - An additional 16 month delay to full operation anticipated
1 Large Facility (Stericycle) handles most of New England’s Waste

Tonight holding public hearing to increase capacity from 90-153 tons/day

Waste treated in 2 large Autoclaves and 1 sharps autoclave
STERICYCLE CONTINUED

- BUD for treated needles

- Consolidated operations with Philips and Better Shred
Technologies on the Horizon

- Thermal Digesters
- Used for pathogenic waste
- Heat, agitation and caustic
- Breaks down proteins into components
- Liquefies material
- Reduce disposal volume
- Sterilize all materials

Approved in Principal but not yet permitted for a site

Source = PRI Bio
Pyrolysis

- Anaerobic Heating
- Considered “incineration” under RI Regulations
- Proposed by Sun Pacific Power in Rhode Island
- Application not yet submitted
For More Information:

Mark Dennen, CPG Supervising Environmental Scientist
RIDEM/Office of Waste Management
235 Promenade St.
Providence, RI 02908
tel. 401.222.2797 ext. 7502
fax 401.222.3812
e-mail: mark.Dennen@dem.ri.gov
5 Priorities for Vermont Solid Waste

2018
Universal Recycling law summary: Act 148

- Bans disposal of:
  - mandated recyclables by 2015,
  - leaf & yard debris and clean wood by 2016,
  - food scraps beginning with largest generators in 2014 and phased in to a full ban by 2020

- Mandates parallel collection by facilities/haulers that collect trash:
  - mandated recyclables by 2014/2015
    (at no additional charge for residential recyclables),
  - leaf & yard debris by 2015/2016, and
  - food scraps by 2017
### Timing & pending legislation S.285

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>FACILITIES</th>
<th>HAULERS</th>
<th>BANNED</th>
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<tbody>
<tr>
<td>Recyclables</td>
<td>2014</td>
<td>2015</td>
<td>2015</td>
</tr>
<tr>
<td>Leaf &amp; Yard</td>
<td>(Seasonal TBD) 2015</td>
<td>(TBD) 2016</td>
<td>2016</td>
</tr>
<tr>
<td>Food Scraps</td>
<td>2017</td>
<td>(TBD) 2018</td>
<td>2014-2020</td>
</tr>
<tr>
<td>Clean Wood</td>
<td></td>
<td></td>
<td>2016</td>
</tr>
</tbody>
</table>

All dates are July 1st.
Food Scraps for compost/AD

Digester at VT Technical College

Green Mountain Compost
Per- and Polyfluoroalkyl Substances
Groundwater Impacts and Landfill Leachate Considerations
# Results from Closed Landfills: Groundwater Monitoring Wells

<table>
<thead>
<tr>
<th>ppt</th>
<th>Shaftsbury Municipal MSW</th>
<th>Halifax Municipal MSW</th>
<th>Dover Municipal MSW</th>
<th>Pownal Municipal MSW</th>
<th>Sunderland Municipal MSW</th>
<th>WSWMD Regional MSW</th>
<th>Putney Paper Paper Sludge</th>
<th>Burgess Brothers C&amp;D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Date</td>
<td>10/17</td>
<td>10/17</td>
<td>9/16</td>
<td>9/16</td>
<td>10/16</td>
<td>12/16</td>
<td>10/16</td>
<td>10/16</td>
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<tr>
<td>PFOA</td>
<td>11.3</td>
<td>44.9</td>
<td>8.43</td>
<td>14</td>
<td>2</td>
<td>8.99</td>
<td>18</td>
<td>900</td>
</tr>
<tr>
<td>PFOS</td>
<td>ND</td>
<td>37</td>
<td>4.98</td>
<td>5</td>
<td>ND</td>
<td>ND</td>
<td>11</td>
<td>140</td>
</tr>
<tr>
<td>TOTAL</td>
<td>11.3</td>
<td>81.9</td>
<td>13.41</td>
<td>19</td>
<td>2</td>
<td>8.99</td>
<td>29</td>
<td>1040</td>
</tr>
</tbody>
</table>

Ongoing monitoring indicates some significant fluctuations in monitoring wells.
# Landfill Leachate Discharge Guideline Levels

<table>
<thead>
<tr>
<th>PFAS Analyte:</th>
<th>Landfill Leachate concentration requiring no restrictions</th>
<th>Landfill Leachate concentration which may require restrictions</th>
<th>Landfill Leachate concentration requiring pretreatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFOA</td>
<td>0.120 mg/L (120,000 ppt)</td>
<td>0.120 mg/L to 1.2 mg/L</td>
<td>&gt;1.2 mg/L</td>
</tr>
<tr>
<td>PFOS</td>
<td>0.001 mg/L (1,000 ppt)</td>
<td>0.001 mg/L to 0.010 mg/L</td>
<td>&gt;0.010 mg/L</td>
</tr>
</tbody>
</table>
Landfill Leachate

Two Analytical Methods
- MLA 110
- Modified EPA 537

**PFOA**
- High - 2,800 ppt
- Low - 80 ppt

**PFOS**
- High - 300 ppt
- Low - Non-detect
Development Soils

- **What:** Soil contaminated with Polycyclic aromatic hydrocarbons (PAHs), Arsenic, Lead above a standard (health based or VT background).

- **Why:** PAH, Arsenic, Lead are ubiquitous in the environment due to atmospheric deposition from incomplete combustion of hydrocarbons and high levels of naturally occurring compounds (arsenic). ACT 52(2015)

- **Outcome:** Development Soils Legislation directing VTDEC to conduct a background study of PAH, Arsenic and Lead AND develop alternative ways to dispose of Development Soils.
Procedure for an IWMEA Request for Storage or Use of Development Soils in State and Local highway Projects
Landfill Expansion Proposal

- NEWSVT Inc. - Currently the only permitted landfill in Vermont
- Permitted for 600,000 tons per year
- Averages ~1,600 tons per day
- Application currently technically complete
- Proposed expansion would provide 22 years of additional capacity at current disposal rates
Open Discussion

Moderator: Dave Adams, Sanborn Head

Panelists:

- Paula Clark, Maine
- Mark Dennen, Rhode Island
- John Fischer, Massachusetts
- Dennis Fekert, Vermont