SEPTIC SYSTEM REPAIR & REPLACEMENT DECISION STRATEGY POST TROPICAL CYCLONE SANDY

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Office of Water Resources
Rhode Island DEM
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Post Tropical Cyclone Sandy Onsite Wastewater in Critical Erosion Areas

- Sandy - impact in RI
- Types of damage to OWTS
- OWTS repair requirements based on extent of damage to OWTS and building structure
- Replacement policy: Risk based
- Lessons from Sandy

Raw Wastewater Characteristics

- Pathogens
  - Bacteria, Protozoa, Viruses
- Biological Oxygen Demand (BOD)
- Total Suspended Solids (TSS)
- Oil, Grease and other floatables
- Nutrients
- Inorganic and Organic Chemicals

Septic Tank Function
- Settling
- Separation of floatables
- Ammonification
- Anaerobic digestion of organics
- Gas Venting

Leachfield Function
- Distribution to biomat and soil
- Slow wastewater movement
- Cause unsaturated flow
- Filtration of suspended solids
- Biological treatment of organics
- Pathogen reduction by biological oxidation, adsorption, and/or filtration
- Nitrification
Super Storm Sandy  RI Storm Tides

Providence - 9.37 feet  
Newport - 8.17 feet

CT Style Galley
Misquamicut Flood line 11-1-12
Initial Storm Damage Assessments

<table>
<thead>
<tr>
<th>Town</th>
<th>Substantially Damaged Structures</th>
<th>Vanished</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narragansett</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>S. Kingstown</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Charlestown</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Westerly</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td></td>
</tr>
</tbody>
</table>

Data provided by J. Boyd, RICRMC
Policy for OWTS Repairs in Critical Erosion Areas

Amended standing policy in response to issues raised specific to the storm

Developed in conjunction with RI CRMC

Three-tiered structure based on the extent of damage to the OWTS and structure

Considerations
- Location of the coastal feature
- OWTS condition and location
- Risk associated with future incremental erosion
- Shoreline Change Maps
- Storms
- Available setback options
- Available technologies to manage risks

Filing fees waived for the critical period of reconstruction

Full policy applies 10/30/2012 through 5/31/13

Photo: RIDOT

Setbacks in Post-Storm Reality

Property line extent abutting town road

- Less than 50 feet!

Inland edge of coastal feature

Coastal Feature - Beach

Chalk provided by J. Boyd
RI CRMC
Structural Building Damage 50% or less **WITH** subsurface OWTS damage

Structural Building Damage > 50% **REGARDLESS** of OWTS damage

**Distance from the Actively Eroding Edge of the Coastal Feature to Any OWTS Component**  
**OWTS Requirement for systems < 500 gpd**

<table>
<thead>
<tr>
<th>Distance from the Edge</th>
<th>OWTS Requirement</th>
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<tbody>
<tr>
<td>Less than or equal to 50 feet</td>
<td>Zero Discharge System required.</td>
</tr>
<tr>
<td>Between 50 and 100 feet</td>
<td>Zero Discharge System or an advanced alternative experimental system.</td>
</tr>
<tr>
<td>Beyond 100 feet</td>
<td>Any system that fully complies with applicable regulations (DEM, CRMC, etc.).</td>
</tr>
</tbody>
</table>

Lessons from Sandy

- In areas with evidence of continued coastal erosion, one must balance reducing risks associated with various OWTS control strategies with capital and operational costs associated with those strategies.

- State/local agencies should quickly identify properties with OWTS damage from coastal storms; this helps with decision making on response policy and individual repairs needs; also FEMA is interested so that they can reach out to owners about available assistance.

- Homes/businesses with year-round usage have the most timely need for response.

- Policies should be in place beforehand; policy statements can be refined depending on the nature of the storm event and the types and locations of damage.

- Coordination between coastal zone agencies, building officials and OWTS departments is critical for determining an efficient, proper response that meets all agencies rules and regulations.

- Expertise and involvement of coastal geologist from coastal agency important.
Debris Removal from Overwash Sand

Slide provided by J. Boyd, RICRM

Mary Carpenter’s New septic tank ready for install 12-21-12