RI Regulatory Setbacks & Buffers: Coastal Management Issues

New England Onsite Wastewater Training Program @ URI
OWT 155 - November 29, 2012

James Boyd - Coastal Policy Analyst

Photo: October 30, 2012
Goals for Today

• Understand the impacts of storms, coastal erosion and sea level rise and the consequences for coastal OWTS

• Importance of OWTS design and siting for adapting to seas level rise and storm flooding impacts

• Importance of coastal setbacks/buffers for OWTS

• Be able to determine the required CRMC setback/buffer
Why Worry About Coastal Setbacks?

GONE!

CRMC
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Why Worry About Coastal Setbacks?
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October 30, 2012
Coastal Erosion Happens During Storms!

Tropical Storms (Hurricanes)
Extra-tropical storms (Nor’easters)
Atlantic Basin Tropical Storm Tracks 1851-2000

Graphic: USGS
Atlantic Basin Tropical Storm Tracks 2012

Graphic: Weather Underground
East Beach Barrier after Hurricane Carol in 1954
Misquamicut 2012

Photo: RIDOT October 30, 2012
Coastal Erosion from Storms

Hurricane Sandy October 2012
The Ocean Mist – Matunuck

December 9, 2009
Now What?

Abandoned Cesspools

April 1, 2010
HISTORIC SEA-LEVEL RISE - Newport, RI

Adapted from: http://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?stnid=8452660%20Newport,%20RI

Rate 1931-2009
25.6 cm +/- 2.5 cm/100 yr

Rate 1990-2009
36.2 cm +/- 2.7 cm/100 yr
Higher sea levels = more property at risk
Rising sea levels will impact shoreline OWTS!
OWTS Site Considerations for Storms

Photos: October 30, 2012
Sea Level Rise Influence on Groundwater

Problem!

Conventional drainfields are of limited use in high groundwater areas.

Source: RIDEM OWTS Rules, June 2011

Minimum Separation
Distance to GW = 2 - 4 ft
OWTS designs to overcome elevated water tables

Figure 5: Bottomless Sand Filter Installed Above Grade (Cross Section)

Textile filter to BSF installed in Jamestown on a lot adjacent to Narragansett Bay

Photo: New England Onsite Wastewater Training Center @ URI
Pressurized Shallow Narrow Drainfield

Installed on sloping terrain following the natural contours

Photo: New England Onsite Wastewater Training Center @ URI
OWTS designs to overcome elevated water tables

Source: RIDEM “Guidelines for the Design and Use of Sand Filters and Pressurized Shallow-Narrow Drainfields” April 2000, revised June 2011
What to expect in the future

• Shorelines will continue to erode
• Higher storm surges due to higher sea levels
• Storm surge impacts will be felt farther inland
• Coastal OWTS will be impacted by rising water tables and exposure and flooding during storm events
Where are the Critical Natural Areas?

- Coastal Zone
  - Tidal Waters (to 3 miles offshore)
  - Shoreline Features
    - 200 foot coastal feature contiguous area
- SAMP Waters
- Freshwater Wetlands in the Vicinity of the Coast
- Statewide (Inland activities CRMP Section 320)
CRMP Section 140: Setbacks

- Always measured from the inland edge of a shoreline feature
- Minimum of 50 feet!
- Shoreline Change Maps (See CRMC website)
  - 30 or 60 times the erosion rate for that area
- 25 feet from inland edge of Coastal Buffer Zone
Coastal Shoreline Features

- Beaches (§ 210.1)
- Barriers and Spits (§ 210.2)
- Coastal Wetlands (§ 210.3)
- Headlands, Bluffs, and Cliffs (§ 210.4)
- Rocky Shores (§ 210.5)
- Manmade Shorelines (§ 210.6)
- Dunes (§ 210.7)
Coastal Beaches (§ 210.1)
Barriers and Spits (§ 210.2)

Quonochontaug Pond

Ninigret Pond

Block Island Sound
Coastal Wetlands (§ 210.3)

Setbacks are always measured from the most inland edge of the coastal wetland, including any contiguous freshwater wetlands!
Coastal Headlands, Bluffs, and Cliffs (§ 210.4)
Coastal Headlands, Bluffs, and Cliffs (§ 210.4)

Bonnet Shores
A football-size landslide, some 100-feet by 250-feet, juts into the ocean from Mohegan Bluffs — the largest landslide in the state’s recorded history. This image taken two hours after the event on April 10, 2001.
Rocky Shores (§ 210.5)
Manmade Shorelines (§ 210.6)
Manmade Shorelines (§ 210.6)

Inland edge of the shoreline feature

Seawall
CRMP Section 140: Setbacks

Setbacks are required for:

- Fill, removal or grading activities
- Residential buildings and garages
  - Excludes associated structures, such as attached decks; porches; tool sheds; fences, etc.
- New Onsite Wastewater Treatment Systems
  - Flexibility in setback standard for repair of existing OWTS and replacement of cesspools (pre-existing use)
- Commercial and other non-water dependent uses
Setbacks: Prohibitions

- **Barriers** (§210.2) and **Dunes** (§210.7)
  - Minimum of 50 feet from inland edge of either the beach or the dune
  - Applies to Residential and Commercial construction and new OWTS
  - A Special Exception is required for relief from the 50 foot setback requirement
CRMP Section 130: Special Exceptions

- The proposed activity must serve a compelling public purpose which provides benefits to the public as a whole as opposed to individual or private interests*

* Only the Council can grant a special exception, provided the project meets the above burden of proof
CRMC Dune Setback Requirements

If the annual erosions rate were 2.1 ft./yr in this area, then the required setback for a single-family home would be:

2.1 ft/yr X 30 = **63 feet** (measured from the inland edge of the dune)

Determine erosion rate from CRMC shoreline change maps
October 2005
Reflective profile

Beach erosion causes walkway and foundation collapse

Relocation inland

Setback buys time
## OWTS Repair Guidance in Critical Erosion Areas – November 2012

<table>
<thead>
<tr>
<th>Distance from the Actively Eroding Edge of the Coastal Feature to Any OWTS Component</th>
<th>OWTS Requirement</th>
</tr>
</thead>
<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 approved Alternative or Experimental (A/E) system.</td>
</tr>
<tr>
<td>Beyond 100 feet</td>
<td>Any system that fully complies with all other applicable (DEM, CRMC, zoning, etc.) regulations.</td>
</tr>
</tbody>
</table>

[Image: Showing a collapsed foundation and an exposed OWTS]
What is a Coastal Buffer Zone?

It’s a contiguous area of vegetation bordering a coastal shoreline feature

Buffer zones are designed to:

• Slow & spread runoff
• Filter sediment, nutrients, & pollutants
• Stabilize the shoreline & prevent erosion
• Provide food & habitat for wildlife (species diversity)
• Add visual aesthetics
• Help moderate flooding impacts
- Type 1: Conservation Areas
- Type 2: Low Intensity Uses
- Type 3: High Intensity Boating
- Type 4: Multipurpose Waters
- Type 5: Recreational and Commercial Harbors
- Type 6: Industrial and Institutional Ponds
Coastal Buffer Zone Designations for Residential Development

<table>
<thead>
<tr>
<th>Water Use Category</th>
<th>Residential Lot Size (Sq. ft)</th>
<th>Required Buffer (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 3, 4, 5 &amp; 6</td>
<td>&lt;10,000</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>10,000 – 20,000</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>20,001 – 40,000</td>
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<td>40,001 – 60,000</td>
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<td>&gt;200,000</td>
<td>150</td>
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<tr>
<td>Type 1 &amp; 2</td>
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<td>25</td>
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<td>50</td>
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<td>150</td>
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</tbody>
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CRMP Section 150: Coastal Buffers

- Boundary of Construction Area
- Inland Edge of the Coastal feature
- 50' Vegetated Buffer
- 75' CRMC Setback
- 200' CRMC Jurisdiction
Don’t do this to your buffer!
Coastal Buffer Zone Management Guidance

www.crmc.ri.gov Coastal Landscapes Program

Figure 1: Example of an adequate buffer zone management plan drawn by the owner.
CRMC Setback and Buffer Summary

- First, determine the coastal shoreline feature and its inland edge (See CRMP Section 210)

- Determine whether the shoreline erosion setback is greater than the minimum 50 foot setback (see CRMP Section 140).


- Determine the coastal buffer width required by CRMP Section 150 – Table 2a

- If variance is necessary, make sure you meet ALL five variance criteria requirements in CRMP Section 120
Setback and Buffer Example

Shoreline feature is a coastal beach backed by low 2 ft. bluff abutting CRMC Type 2 waters

15,000 sq.ft. lot (150’ x 100’)

Table 2a – Buffer = 50 ft.

Final setback is: 50ft. buffer + 25ft. setback = 75 feet

Annual erosion rate = 0.36 ft/yr
Thus, erosion setback is 30 X 0.36 = 10.8 feet < 50 ft. minimum setback