Jamestown

High Groundwater Table Ordinance

June 2001

Stated purpose: to provide local jurisdiction over development on lots where subsurface water table is less than three (3) feet.

Main Goal:

- Reduce impacts from development to non-sewered areas that have a significant amount of undersized lots
  - Protect groundwater quality
  - Address stormwater management/drainage concerns
  - Protect Wetlands
Jamestown
High Groundwater Table Ordinance

Action Taken - Amend the Zoning Ordinance

- New Section 314 - High ground water table and shallow impervious layer overlay district.
  Provide standards for development in areas of high groundwater table and shallow impervious layer
  
- Amend Section 308 – Setback from Freshwater Wetlands
  Provide minimum development standards for development within 150 feet of a wetland
Jamestown
High Groundwater Table Ordinance

Main Areas of Regulation:
- Protecting groundwater by denitrification, pathogen or microbiological treatment
- Impervious surface coverage
- Stormwater Control
- Not impeding groundwater flow
Jamestown
High Groundwater Table Ordinance

Main Areas of Regulation:

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Estimated Percent Contribution of Nitrogen to Groundwater from Different Sources

Jamestown Shores

- Septic Systems: 82%
- Lawn Fertilizer: 11%
- Agricultural Fertilizers: 0%
- Pet Waste: 5%
- Other: 2%

Estimated Percent Contribution of Nitrogen to Groundwater from Different Sources

Jamestown, RI

- Septic Systems: 48%
- Lawn Fertilizer: 18%
- Agricultural Fertilizers: 25%
- Pet Waste: 3%
- Other: 6%
Estimated Nitrate Loading to Groundwater Recharge mg/l

**Jamestown, RI**

<table>
<thead>
<tr>
<th>Location</th>
<th>Current</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jamestown</td>
<td>2.6</td>
<td>3.4</td>
</tr>
<tr>
<td>Jamestown Shores</td>
<td>7.1</td>
<td>10.3</td>
</tr>
<tr>
<td>Carr Pond Basin</td>
<td>2.4</td>
<td>2.7</td>
</tr>
<tr>
<td>Watson Pond Basin</td>
<td>1.9</td>
<td>1.6</td>
</tr>
<tr>
<td>Jamestown Wellhead</td>
<td>1.9</td>
<td>2.4</td>
</tr>
</tbody>
</table>

0.2 mg/l natural concentration of nitrogen in groundwater in forested areas.
Jamestown Shores
Estimated Nitrate-N loading to Groundwater recharge mg/l
with Future Use of Nitrogen-Reducing Septic Systems

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Nitrate-N Loading (mg/l)</th>
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<tbody>
<tr>
<td>Future build all lots</td>
<td>10.4</td>
</tr>
<tr>
<td>Future - All N reducing septic systems</td>
<td>6.5</td>
</tr>
<tr>
<td>No build water table 18&quot;</td>
<td>9.7</td>
</tr>
<tr>
<td>No build water table 18&quot; and N reducing septic systems NEW lots 18&quot;-3.5'</td>
<td>9.3</td>
</tr>
<tr>
<td>No build water table 18&quot; and N reducing septic systems ALL lots 18&quot;-3.5'</td>
<td>8.3</td>
</tr>
</tbody>
</table>

Current: 7.1
Jamestown High Groundwater Table Ordinance

Main Areas of Regulation:
- Protecting groundwater by denitrification, pathogen or microbiological treatment
- Impervious surface coverage
- Stormwater Control
- Not impeding groundwater flow
### Estimated % Impervious Surface Area

**Jamestown Study Areas**

<table>
<thead>
<tr>
<th>Area</th>
<th>Current</th>
<th>Future</th>
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</thead>
<tbody>
<tr>
<td>Jamestown</td>
<td>13%</td>
<td>9%</td>
</tr>
<tr>
<td>Jamestown Shores</td>
<td>21%</td>
<td>24%</td>
</tr>
<tr>
<td>Carr Pond Basin</td>
<td>6%</td>
<td>8%</td>
</tr>
<tr>
<td>Watson Pond Basin</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>Jamestown WHPA</td>
<td>8%</td>
<td>9%</td>
</tr>
</tbody>
</table>

**Water Quality Risk**

- EXTREME
- HIGH
- MEDIUM
- LOW
Estimated Impervious Cover and Average Annual Runoff vs. Groundwater Recharge

Jamestown, RI

Increasing impervious, reduced groundwater recharge
Jamestown
High Groundwater Table Ordinance

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Jamestown
High Groundwater Table Ordinance

Grading and Filling due to High Groundwater Table
Jamestown High Groundwater Table Ordinance
Jamestown
High Groundwater Table Ordinance
Jamestown
High Groundwater Table Ordinance
Jamestown

High Groundwater Table Ordinance

Adopted February 10, 2003

- Ensure proper septic system operation and provide adequate pathogen treatment
- Maintain groundwater nitrogen at safe concentrations for private wells
- Control volume of stormwater runoff through on-site infiltration to recharge groundwater supplies, promote natural pollutant removal processes, and dilute wastewater effluent and other contaminants entering groundwater
- Protect and restore wetland buffers to maintain their water quality function, filtering sediment, other pollutants in surface runoff, and promoting denitrification of shallow groundwater
- Provide for use of advanced treatment systems where necessary and provide for their adequate maintenance
Jamestown

High Groundwater Table Ordinance

- July 2002 - Draft Ordinance presented to Town Council
- February 10, 2003 – Adopted by Town Council
- March 22, 2004 – Ordinance Amended
- April 6, 2005 – Ordinance Amended
- January 8, 2007 – Ordinance Amended
- Currently preparing amendment
Next Steps: Winter of 2011

Detailed Performance Evaluation of Ordinance to include:

- GIS Mapping of Impervious Coverage in the “shores”
- Pre vs. Post Ordinance impervious cover analysis & OWTS analysis
- Effectiveness of Stormwater mitigation measures & % of retained runoff analysis
- Summary of Lessons Learned and recommended amendments to Ordinance