WIP Impact, Implications for Trading and Accounting

SEWER EXTENSION WORKSHOP

WEDNESDAY, DECEMBER 14, 2016

Chesapeake College
Overview

• WIP Impact

• Trading

• Accounting for Connections
  – How does it work
Septic System Load in Context

- Agriculture
- Wastewater
- Urban Stormwater
- Forest
- Septic

Nitrogen - Million Pounds/Year

Year

## Nitrogen Loads to the Bay

<table>
<thead>
<tr>
<th>Source Sector</th>
<th>2010 Progress Million Lbs/Yr</th>
<th>Final Target Million Lbs/Yr</th>
<th>Reduction Million Lbs/Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>19.95</td>
<td>15.22</td>
<td>4.73</td>
</tr>
<tr>
<td>Forest</td>
<td>5.29</td>
<td>5.31</td>
<td>0</td>
</tr>
<tr>
<td>Non-Tidal Atm</td>
<td>0.66</td>
<td>0.66</td>
<td>0</td>
</tr>
<tr>
<td>Septic</td>
<td>3.00</td>
<td>1.85</td>
<td>1.15</td>
</tr>
<tr>
<td>Stormwater</td>
<td>9.48</td>
<td>7.55</td>
<td>1.93</td>
</tr>
<tr>
<td>Wastewater</td>
<td>14.37</td>
<td>10.58</td>
<td>3.79</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>52.76</strong></td>
<td><strong>41.17</strong></td>
<td><strong>11.59</strong></td>
</tr>
</tbody>
</table>

Relative Impact of Septic Systems: ~10%
# Relative Impact of Septic Systems

<table>
<thead>
<tr>
<th>County</th>
<th>OSDS Load as Percent of County TN Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calvert</td>
<td>31%</td>
</tr>
<tr>
<td>St. Mary’s</td>
<td>18%</td>
</tr>
<tr>
<td>Anne Arundel</td>
<td>16%</td>
</tr>
<tr>
<td>Charles</td>
<td>13%</td>
</tr>
<tr>
<td>Cecil</td>
<td>10%</td>
</tr>
<tr>
<td>Harford</td>
<td>9%</td>
</tr>
<tr>
<td>Howard</td>
<td>8%</td>
</tr>
<tr>
<td>Queen Anne’s</td>
<td>6%</td>
</tr>
<tr>
<td>Wicomico</td>
<td>6%</td>
</tr>
<tr>
<td>Remaining Counties</td>
<td>5% or Less</td>
</tr>
</tbody>
</table>
Implications for Trading

• Sector reduction responsibility does *not* equate solely to explicit reductions from that sector.

• Phase II WIP Underlying Strategy:

“.. sectors facing higher costs may pay for reductions from other sectors that have lower costs.”

• Septic responsibility will be met by a combination of explicit reductions and credit purchases.

• Septic ultimate target will likely be met sometime after 2025, TBD by Phase III WIP process.
Implications for Trading

Evolving Trading Policy Elements:


• MS4 Accounting Guidance: Accounting rules for crediting septic upgrades towards meeting MS4 permit treatment requirements.

• Trading-in-Time Concept: WWTP reduction surpluses at 2025 may cover septic reduction shortfalls temporarily.
Implications for Trading

Evolving Trading Policy Elements:

• Bay Restoration Fund Credit Purchase Initiative: Amend statute to allow the purchase of nutrient reduction credits. Reduction credit may be assigned to the septic system sector.

• Aligning for Growth Policy: Ensure existing allocations for land that is developed is reassigned to new septic systems or those new septic loads are offset.
Accounting for Septic Connections

Basic Concepts (may change a little when the new Phase 6 model is done).

23.2 lbs/yr TN
Edge of Drain field Load (EOF)

E.g, For Critical Area:
0.8 x 23.2 = 18.56 = ~ 18.6

Three Cases for Edge of Stream Load (EOS):

1. Critical Area → 18.6 lbs/yr (80% Transport)
2. 1,000’ from Stream → 11.6 lbs/yr* (50% Transport)
3. All Other → 7.0 lbs/yr* (30% Transport)

* Apply a delivery factor of about 0.94 for the E. Shore for estimated load to the Bay
Basic Concepts: ENR Load per household: 2.4 lbs/year TN

\[
(200 \text{ gpd} \times 4 \text{ mg/l} \times 365 \text{ days/yr} \times 8.34) / 1,000,000 = 2.435
\]
Basic Concepts: Estimated Nitrogen Reduction to the Bay from one Septic Connection to an ENR Plant (Uses 2.4 lbs of plant nutrient capacity)

1. Critical Area
   \[18.6 - 2.4 = 16.2 \text{ lbs/yr}\]
2. 1,000’ from Stream
   \[11.6 \times 0.94 - 2.4 = 8.5 \text{ lbs/yr}\]
3. All Other
   \[7.0 \times 0.94 - 2.4 = 4.2 \text{ lbs/yr}\]
**Basic Concepts:** Estimated *Phosphorus Increase* to the Bay from one Septic Connection to an ENR Plant

Septic systems are estimated to have zero phosphorus load, due to the presumption that TP binds with soils. When Connected to a WWTP the phosphorus goes to the treatment plant and is discharged.

\[
200 \text{ gpd} \times 0.3 \text{ mg/l} \times 365 \text{ days/yr} \times 8.34)/1,000,000 = 0.18 \text{ lbs/yr}
\]

(0.23 lbs/yr per EDU is used when shifting allocation from the Septic to WWTP)
### Accounting for Septic Connections

#### Basic Concepts: Estimated Nitrogen Credit Transfer to ENR Plant from one Septic Connection

<table>
<thead>
<tr>
<th>Geographic Zone of the Septic System</th>
<th>(A) Drain Field Load lbs/yr</th>
<th>(B) Delivery Factor to Stream</th>
<th>(C) Original OSDS Load lbs/yr (EOS)</th>
<th>(D) Increased WWTP Capacity lbs/Yr (EOS)*</th>
<th>(E) ENR EDU Capacity Created</th>
<th>(F) ENR EDU Loading Rate (lbs/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Area</td>
<td>23.2</td>
<td>0.8</td>
<td>18.56</td>
<td>9.28</td>
<td>3.8</td>
<td>2.44</td>
</tr>
<tr>
<td>1,000 Ft of Stream</td>
<td>23.2</td>
<td>0.5</td>
<td>11.6</td>
<td>5.80</td>
<td>2.4</td>
<td>2.44</td>
</tr>
<tr>
<td>All Other</td>
<td>23.2</td>
<td>0.3</td>
<td>6.96</td>
<td>3.48</td>
<td>1.4</td>
<td>2.44</td>
</tr>
</tbody>
</table>

* The other 50% is directed to Bay reduction progress for the Chesapeake Bay subject to a deliver factor of about 0.94 for the E. Shore
Basic Concepts: Addressing Phosphorus when transferring Nitrogen Credit Transfer to ENR Plant from one Septic Connection

• If available, the State would use the surplus TP WLA coming from the minor plant upgrade to provide adjusted phosphorus WLA for OSDS connection to a minor ENR facility.
• TP credit of 0.23 lbs/year per EDU is the basis of the plant load allocation for OSDS connections to an upgraded facility.
• Allow minor facilities to connect OSDSs without the need to achieve lower than 0.3 mg/l TP.
• All is subject to ensuring protection of local water quality in light of increased surface water loads from WWTP.
Thank you

Contact:

Jim.George@Maryland.gov

(410) 537-3579