Small Community Nutrient Permitting

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Mike Tate, PE - EPA
Agenda

- Background/Issues
- Possible Resolution Options
- Discussion
Background/Issues

- Discussion raised in Boise last December
  - Increasing pressure to adopt Numeric Nutrient Criteria (NNC)
    - This may disproportionately affect POTWs, particularly small POTWs
  - The majority of POTWs serve a population (e.g. <3000) where construction and O&M of nutrient reduction technologies may be unaffordable
    - Large number of dischargers, small fraction of the permitted discharge flow
  - Nutrient reduction strategies remain a high priority for ACWA, states, EPA, environmental NGOs, and municipalities
  - Are variances for perhaps half or more of POTWs a reasonable solution?
    - How can the NPDES program best accommodate nutrient reduction?
- The small group that brought up issue in Boise has met informally
  - Debated the issue a little more/kicked around some ideas
Large and Small Communities

Percentage of US Cities by Population

- Pop >3000: 32%
- Pop <=3000: 68%

Percentage of US Population by City Size

- Pop >3000: 93%
- Pop <=3000: 7%

Based on 2010 Census Data

7% of US Population Lives in 2/3 of our Communities
Large and Small POTWs

Based on ICIS Data
Large and Small Communities

2010 Census Results - United States and Puerto Rico
Population Density by County or County Equivalent

People per Square Mile
- 2,000.0 to 69,468.4
- 500.0 to 1,999.9
- 88.4 to 499.9
- 20.0 to 88.3
- 1.0 to 19.9
- 0.0 to 0.9

Overall density 88.4

Source: U.S. Census Bureau

United States Census Bureau
Large and Small POTWs

Percentage of POTWs by Region with Flows Above and Below 0.3 MGD

Based on ICIS Data
Large and Small POTWs

Based on ICIS Data

1.2% of Flow from <0.3 MGD
Income and Small Communities

Percentage of Cities in MHI Ranges Above and Below 3000 Population Cities

2% MHI = $67-$75/mo

Based on 2010 Census Data
Costs and Small Communities

**Cost for Mechanical Treatment to Reduce NH\textsubscript{3}/NO\textsubscript{3}**

TN only. TP cost from UT Study:

<table>
<thead>
<tr>
<th>TP (mg/L)</th>
<th>Low</th>
<th>High</th>
<th>Avg</th>
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<tbody>
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<td>1.0</td>
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<td>4.45</td>
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<td>0</td>
<td>47.66</td>
<td>14.27</td>
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TetraTech/KDHE
Costs and Small Communities

Cost Per Household For Biological Nutrient Removal ($/month)

Assumes:
100 gal/person/day
2.5 persons/household
TN - 6 mg/L
TP - 2 mg/L

FWPCA (inflation adjusted)
Rural/Metro Demographics

Non-Metro Population Change 2010 - 2016

2/3 experiencing population loss

Source: USDA, Economic Research Service using data from the U.S. Census Bureau.
Are Small Systems an Issue?

- Is there enough of a potential issue here to pursue further?
  - If not - we are done. Next speaker!
  - If so, what do we need to look at?
- Group came up with five general options for further consideration…
Option 1

- States continue to develop nutrient translators as appropriate
  - Permitting authority develops permit with technology and/or water quality based limits
    - Limits may be extremely difficult, if not impossible, to meet
    - Expensive for the permittee to comply

- Worst Case Outcome:
  - Translators likely challenged by permittee
  - Permittee violates permits, compliance order/enforcement
  - Return to compliance may not be possible
  - Permittees may never achieve necessary reductions to comply
Option 2

- State develops variances for small POTWs
  - Administratively expensive and time consuming
  - Process needs to be periodically repeated
  - Permitting authority develop permits with limits that may initially be easier to achieve but could get significantly more stringent over time

- Worst Case Outcome:
  - State variance process time consuming and likely challenged
  - State permits likely challenged by NGOs
  - Uncertain future for the permittee
Option 3

- Encourage states to consider tiered thresholds in their small POTW permits associated with treatment technology or affordability
  - Use TMDL or other mechanism to establish water quality or technology based limits as appropriate
  - Encourage=require optimization and long term nutrient reduction plans (LNRPs).
- Worst Case Outcome:
  - Inconsistent implementation nationally
  - Two similarly situated facilities in neighboring states treated differently
  - NGO litigation still viewed as a possibility
  - Uncertain future for permittee
Option 4

- Develop **national technology** based approach (ELG) only for **major** POTWs with appropriate thresholds considering affordability and cost of technology
  - Addresses the large gap in major POTWs that do not remove nutrients vs. those that do
  - Allow LNRPs
  - Supplements current state efforts (permitting, NNC, trading, variances, etc.)
  - Unaffordability documented for small facilities as a part of rule making. State discretion in how to address these facilities (e.g., a national optimization program informed by POTW survey)
  - Manageable administratively speaking due to smaller universe of facilities

- **Worst Case Outcome:**
  - National rule will take a long time and will likely get challenged
    - Minor permittees are voluntary
  - ELG costs for major POTWs may still be viewed as too high
  - Inconsistent implementation nationally for small communities
Option 5

- Develop national technology based approach (ELG) for small POTWs (size to be determined) with tiered thresholds looking at affordability and cost of technology similar to Option 3
  - Could piggyback off of EPA’s national 2ndary treatment study
  - Incorporate limits and LNRPs into the permits
  - Supplement current state efforts (permitting, trading, variances, etc.)
  - Larger facilities could still have a WQBEL/TBL they would need to meet

- Worst Case Outcome:
  - National rule will take a long time and will likely get challenged
  - Costs for facilities may still be viewed as too high
  - Less nutrient reduction might occur
Coffee Talk with Martha

I’m getting a little *verklempt*!
Don’t worry. It’ll pass....
I’ll give you a topic....

**Nutrient permitting options at small POTWs**

Discuss amongst yourselves!

Linda Richman
Let's Think Critically About Small Communities

**Critical – [krit-i-kuh l]**

Adjective

1. inclined to find fault or to judge with severity, often too readily.

2. involving skillful judgment as to truth, merit, etc.; judicial: *a critical analysis.*
Each Table Should

- Discuss whether there is a potential problem/challenge to be addressed
- Evaluate the 5 options presented
- Develop any other options
- Discuss whether ACWA/EPA should continue to pursue any of the options or other ways to address the problem/challenge
## Options Review

<table>
<thead>
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<th>Feature</th>
<th>Options</th>
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<td>Voluntary – All</td>
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<tr>
<td>Voluntary - Minor</td>
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<td>Narrative Translator Limits</td>
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<td>TMDL-Driven Goals</td>
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<td>Variance</td>
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<td>ELG - Major</td>
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<td>ELG - Small</td>
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<td>WQBEL/TBL - Large</td>
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<td>WQBEL/TBL - All</td>
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Feel Free to Mix and Match Parts