Pollutant Based Utility Charge System

Presented at Wisconsin Wastewater Operator’s Association

Green Bay, Wisconsin
October 2014

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608-354-0037
Types of Sewer Utility Charge Systems

A. 100% Fixed or Flat Rate

B. 100% Variable or Flow Based

C. Combination of Fixed and Variable

D. Combination of Fixed and Variable with Pollutant Charges
Example

- Community of 500 People
- No Public Water System
- 200 Connections
- Utility Costs - $100,000/year
- Utility Bills Monthly
- All Residential Users

Sewer Utility Rate:
$100,000 = $41.67/Month/Connection
200 (12)
Example

- Community of 500 People
- Public Water System
- 200 Connections
- Each Connection has a Water Meter
- Utility Costs - $100,000/Year
- Utility Bills Monthly
- All Residential Users
- Water Usage 5,000 Gallons/Month/Connection

Average Sewer Utility Rate:
$100,000 \times $1,000 - $8.33/1,000 Gallons
5,000 (12) 200

Average Sewer Utility Rate: $41.65/Month/Connection
Combination of Fixed and Variable

Example

- Community of 5,000 People
- Public Water System
- 2,500 Connections
- Each Connection has a Water Meter
- Utility Costs - $1,100,000/Year
- Utility Bills Monthly
- Residential Users and Commercial/Industrial Users
- Set Fixed Rate at $10/Month/Connection (25% Budget)
- Variable Rate - $4.41/1,000 Gallon
- Residential Water Usage – 5,000 Gallon/Month/Connection
- Total Daily Sewer Flow – 500,000 GPD
- No Pollutants Higher than Residential
  - \( \text{BOD}_5 \) – 250 MG/L
  - TSS – 250 MG/L
  - TKN – 25 MG/L
  - P – 4 MG/L

Average Sewer Utility Rate = $32.05/Month/Connection
Combination of Fixed and Variable With Pollutant Charges

**Example**

- Community of 5,000 People
- Public Water System
- 2,500 Connections
- Each Connection has a Water Meter
- Utility Costs - $1,130,000/Year
- Utility Bills Monthly
- Residential Users and Commercial/Industrial Users
- Set Fixed Rate at $10/Month/Connection (25% Budget)
- Variable Rate - $4.41/1,000 Gallon
- Residential Water Usage – 5,000 Gallon/Month/Connection
- Total Daily Sewer Flow – 500,000 GPD
- Industrial P ~ 50% of Total P at WWTF

Average Sewer Utility Rate = $32.05/Month/Connection
Industrial Pays Additional $30,000/Year ($5.63/lb. P)
Capital Cost Rate with Pollutant Charge System

Example

- Community of 5,000 People
- Industrial P ~ 50% of Total Phosphorus
- Upgrade Cost - $2 Million
- Borrowing at 3%, 20 years, Annual Cost is $147,840
- Assign Costs to Flow and Phosphorus Only

Rate Increase:

- Residential - $.60/1,000 Gallon
- Phosphorus - $8.32/lb. Phosphorus
- Industrial – Pays 33% or More of Upgrade Cost
- Average Residential Increase - $3/Month/Connection
### Sanitary Sewer Utility

**WWOA**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Installed Cost ($)</th>
<th>% Local Cost</th>
<th>Local Portion Capital O &amp; M</th>
<th>Annual Expense ($/YR)</th>
<th>Flow %</th>
<th>Annual Flow Cost</th>
<th>BOD %</th>
<th>Annual BOD Cost</th>
<th>TSS %</th>
<th>Annual TSS Cost</th>
<th>TKN %</th>
<th>TKN Cost</th>
<th>Phosphorus %</th>
<th>Annual Phosphorus Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 WWTF Upgrades</td>
<td>$2,000,000</td>
<td>100%</td>
<td>$2,000,000</td>
<td>$147,840</td>
<td>40%</td>
<td>59,136</td>
<td>0%</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td>60%</td>
<td>$88,704</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>$88,704</td>
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</tbody>
</table>

**Schedule 5**

**WWOA**

Capital Cost/WWTP Interest: 3.00%

Phosphorus Upgrades Years: 20

Date: October, 2014
# WWOA
## Sanitary Sewer Utility

<table>
<thead>
<tr>
<th>Schedule 6</th>
<th>Date: October, 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>WWOA</td>
<td></td>
</tr>
<tr>
<td>Unit Treatment Costs</td>
<td></td>
</tr>
<tr>
<td>Phosphorus Upgrades</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost per Unit</th>
<th>Cost per 1000 gal domestic WW:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow: $0.32 per 1000 gal based on annual flow</td>
<td>Flow: $0.32</td>
</tr>
<tr>
<td>BOD: $0.000 per lb BOD based on annual BOD loading</td>
<td>BOD: 0.000</td>
</tr>
<tr>
<td>TSS: $0.000 per lb TSS based on annual TSS loading</td>
<td>TSS: 0.000</td>
</tr>
<tr>
<td>TKN: $0.000 per lb TKN based on annual TKN loading</td>
<td>TKN: 0.000</td>
</tr>
<tr>
<td>Phosphorus: $8.323 per lb Phos based on annual P loading</td>
<td>Phosphorus: 0.277</td>
</tr>
</tbody>
</table>

Total Cost: $0.601 per 1000 gal
<table>
<thead>
<tr>
<th>No.</th>
<th>User</th>
<th>Avg Flow GAL/yr</th>
<th>P LB/yr</th>
<th>Flow ($)</th>
<th>P ($)</th>
<th>Total ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Residential</td>
<td>164,250,000</td>
<td>5,475</td>
<td>98,720</td>
<td>0</td>
<td>98,720</td>
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<tr>
<td>2</td>
<td>Industrial</td>
<td>18,250,000</td>
<td>5,183</td>
<td>10,969</td>
<td>38,004</td>
<td>48,973</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>182,500,000</strong></td>
<td><strong>10,658</strong></td>
<td><strong>109,689</strong></td>
<td><strong>38,004</strong></td>
<td><strong>$147,693</strong></td>
</tr>
</tbody>
</table>
Requirements for Pollutant Based Charge System

Industry

- Flow Metering
- Pollutant Testing
- Submit Data to Municipality

Municipality

- Political Will to Charge Industry/Commercial
- Create Charge System per Pollutant
- Modify User Charge System Ordinance
- Create Spread Sheets for Fee Calculations
- Monitor Pollutant Concentrations
- Adjust Rates as Needed
Pollutant Based Utility Rates (PBUR)

Summary

- PBUR System not Needed if You Have All Residential Users

- PBUR System is Recommended When You Have Contributors With Higher Pollutant Concentrations (Phosphorus, etc.)

- Revenue Increases can be Calculated to See if PBUR is Worth Doing

- For a Capital Improvement for Phosphorus Treatment, PBUR is a Very Good Option

- PBUR System will Require Data Collection and Analysis
SECURITY PROBLEM
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QUESTIONS?