GreenStep Cities Workshop: Benchmarking Wastewater Treatment Plants

December 6, 2017

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B3 History:

- 2001 State legislation passed
- 2004 MN Benchmarking.com established for public buildings

Today:

- B3 Benchmarking has more than 527 million square feet contained in over 12,000 buildings
- Benchmark 50+ building types containing 60+ space types

Design of New Buildings and Renovations

Use B3 Guidelines on new buildings or renovations to meet sustainability goals for site, water, energy, indoor environment, materials and waste.

Use the SD 2030 Energy Standard to meet energy use goals only. If the B3 Guidelines are used, the SD 2030 Energy Standard is automatically included in the process.

Operation of Existing Buildings

Use B3 Benchmarking to track and compare energy use on existing buildings. The B3 Guidelines and SD 2030 Energy Standard direct the user to the B3 Benchmarking tool.

Use B3 Energy Efficient Operations to minimize energy use during building operations. This program can be applied to any existing building.

Use B3 Post Occupancy Evaluation (POE) to determine occupants’ perceptions of the buildings’ indoor environmental quality. The POE survey is required for B3 buildings.
MN.B3Benchmarking.com

1. Public Sections
   • Home
   • About
     • Webinars
     • Support Videos
   • News
   • Reports
     • Public summary of data

2. Secure Section
   • Launch
     • Once signed in, button to launch application
Request Access

Please fill out the form below to request a user account to the B3 Benchmarking system. If you are not a member of the organization you are requesting access to or are requesting edit privileges, written permission from the organization’s data owner will be required prior to access being granted. Required fields are indicated in red.

First Name: 
Last Name: 
Company: 
Title: 
Address: 
City: State: Zip: 
Office Phone: 
Mobile: 
E-mail: 

Please provide a valid email address. A welcome email will be sent to this address as well as it being the account username.

ACCESS REQUESTED

Sector: [Select] 
Organization: [Select] 

If you don’t see your organization listed, please call us at 952-939-1878.

Data Privileges: [Select] 

If access is needed to additional organizations, please provide sector, organization and data privileges in the comments field below.

Comments: 

I would like to receive quarterly newsletter emails highlighting new features and functions of the B3 Benchmarking system.

Submit
Day’s Topics

1. Data Entry
   - DMR
     - Plant Attributes
     - Flow data
   - Energy

2. WWTP Metrics
   - ENERGY STAR
   - Peer Rating
   - Baseline

3. Reports
   - Plant Flow Rate Normalize
   - BOD Removed Normalize

https://mn.b3benchmarking.com/WastewaterTreatmentPlants
Data Entry – DMR Import of Attributes and Flow Data

DMR data imported in B3 quarterly
- Plant Attributes
- Flow Data

- Review data and check for errors
- Corrections submitted via DMR updates
Data Entry – Energy Data

• Respective energy data needs to be entered
• All WWTP sites have default electric meter
  • Contact us if your plant does not utilize any energy sources
• Add A Meter for additional energy sources plant uses
  • E.g. natural gas, PV, wind
  • Currently no biofuel meter
• Must have at least 12 months of complete data to calculate metrics
Data Entry – Energy Data

- Manually enter data via Meter Editor
  - Utilize *Add a New Reading* to add subsequent rows
  - Save & Close when complete
Data Entry – Energy Data

• Utilize Import Wizard to generate spreadsheet template via Excel
  • A worksheet tab will be created for each meter
Data Entry – Energy Data

- Utilize Import Wizard to generate spreadsheet template via Excel
  - A worksheet tab will be created for each meter

- Enter or copy/paste readings in appropriate meter tab and save workbook
Data Entry – Energy Data

• Utilize Import Wizard to generate spreadsheet template via Excel
  • A worksheet tab will be created for each meter

• Enter or copy/paste readings in appropriate meter tab and save workbook

• Reinitialize Import Wizard to import the completed spreadsheet

• Step through wizard to complete import process
B3 Benchmarking WWTP Metrics

Eligible plants receive 1-100 scores directly from ESPM

ESPM Criteria:
- Plants operating above 0.6 MGD
- Average influent BOD levels > 30 and < 1,000
- Average effluent BOD levels > 0
## B3 Benchmarking WWTP Metrics

<table>
<thead>
<tr>
<th>B3 Peer Rating</th>
<th>Percentile Score</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td>72</td>
<td>-19.47%</td>
</tr>
</tbody>
</table>

This site is ranked in the 95th percentile amongst 22 similar sites. This site has received a score of 72. This site is operating below the baseline period.

Smaller plants receive calculated 1-100 scores

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**NOTE:** This score has been manually calculated using ENERGY STAR's formula outside of their recommended filters. For plants operating outside these criteria the score remains a useful gauge of energy intensity, but shouldn't be viewed as a precise percentile ranking of energy performance. ENERGY STAR's score for wastewater treatment plants are limited to:

- Plants operating above 0.6 MGD
- Average influent BOD levels > 30 and < 1,000
- Average effluent BOD levels > 0
B3 Benchmarking WWTP Metrics

Three plant types are not eligible for either score:
- Aerated Ponds
- Non-aerated Ponds
- Other Treatment – Low Energy

Plants of type 'Aerated Pond' are not eligible to receive an ENERGY STAR score.
B3 Benchmarking WWTP Metrics

B3 Peer Rating: ranking of site as compared to other sites in B3 of same space usage

For WWTPs, peer rating utilizes ENERGY STAR (or calculated) score to rank site
B3 Benchmarking WWTP Metrics

Baseline: score or no score, can compare site to itself using a defined 12 month baseline period

Normalization Options:

• Weather
  – Actual or Baseline

• Flow Rate
  – kBtu/MGal

• BOD Removed
  – kBtu/kg BOD Removed
B3 Benchmarking WWTP Reports

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Monthly Continuous

Plant Flow Rate Normalize
Baseline Weather Normalize

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Consumption Summary By Year

<table>
<thead>
<tr>
<th>Period</th>
<th>Days</th>
<th>Complete</th>
<th>SF</th>
<th>Actual kWh/m^3gal</th>
<th>Baseline kWh/m^3gal</th>
<th>Change from Baseline kWh/m^3gal</th>
<th>% Change</th>
<th>Total Cost</th>
<th>Cost Rate $/kWh/m^3gal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 2015-Dec 2015</td>
<td>365</td>
<td>100%</td>
<td>0</td>
<td>5,502.75</td>
<td>6,317.06</td>
<td>-814.31</td>
<td>-12.89%</td>
<td>$747,195.44</td>
<td>$68,001</td>
</tr>
<tr>
<td>Jan 2016-Dec 2016</td>
<td>366</td>
<td>99%</td>
<td>0</td>
<td>4,924.04</td>
<td>2,254.35</td>
<td>-1,320.31</td>
<td>-21.11%</td>
<td>$265,646.26</td>
<td>$74,310</td>
</tr>
</tbody>
</table>
B3 Benchmarking WWTP Reports
Thank You

Cheri Schneider

https://mn.b3benchmarking.com
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952.939.1878