



## Today's Speakers

- **David Hair**  
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TBELs for POTWs-2

## Technology- and Water Quality-based Effluent Limitations

<b>CWA Section 101(a) Goal or Policy:</b>	<ul style="list-style-type: none"> <li>Zero Discharge of Pollutants</li> </ul>	<ul style="list-style-type: none"> <li>Fishable and Swimmable Waters</li> <li>No Toxics in Toxic Amounts</li> </ul>
<b>Standards:</b>	<ul style="list-style-type: none"> <li>Technology</li> </ul>	<ul style="list-style-type: none"> <li>Water Quality</li> </ul>
<b>NPDES Regulations:</b>	<ul style="list-style-type: none"> <li>40 CFR 122.44(a), (e)</li> <li>40 CFR 125.3</li> </ul>	<ul style="list-style-type: none"> <li>40 CFR 122.44(d)</li> </ul>

Develop **TBELs** (derived from technology standards) for all applicable pollutants of concern. Develop **WQBELs** where TBELs are not adequate to meet water quality standards in the receiving water.



TBELs for POTWs-3

## Technology-Based Requirements

- Technology-based requirements:**
  - establish performance-based level of pollutant controls
    - conventional pollutants
    - nonconventional pollutants
    - toxic (priority) pollutants
  - provide equity among dischargers within categories



TBELs for POTWs-4

## Technology-based Effluent Limitations

- **National technology-based standards**
  - *secondary treatment standards for POTWs*
  - effluent guidelines for certain categories of non-POTWs (industrial discharges)
- **In the absence of national standards**
  - technology-based requirements developed on a case-by-case basis
- **Technology-based requirements implemented in NPDES permits through technology-based effluent limitations (TBELs)**



TBELs for POTWs-6

## POTW and Non-POTW

- **POTWs** are treatment works *owned by a state or municipality*
  - include devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature
  - Definition at 40 CFR 403.3(q)
- **Non-POTWs** include all other facilities and are often called “non-municipals” or “industrials”



TBELs for POTWs-6

## Technology-based Requirements in NPDES Permits for POTWs

- Secondary treatment standards are found in **40 CFR 133**
- **40 CFR 122.44(a) and 125.3** require NPDES permits for **POTWs** to include technology-based effluent limitations based on secondary treatment standards



TBELs for POTWs-7

## Applying Technology-based Standards for POTWs in NPDES Permits

Step 1: Determine Which Standards Apply



Step 2: Calculate Effluent Limitations Using  
Applicable Standards



Step 3: Apply Special Considerations for  
Further Adjustments



Step 4: Document Decisions



TBELs for POTWs-8

## Standards That Could Apply to a POTW

- **Secondary treatment standards**
- **Equivalent to secondary standards**
  - State-adjusted standards



TBELs for POTWs-9

## Secondary Treatment Standards (40 CFR 133.102)

Parameter	30-Day Average	7-Day Average
➔ 5-day BOD	30 mg/L (25 mg/L 5-day CBOD)	45 mg/l (40 mg/L 5-day CBOD)
➔ TSS	30 mg/l	45 mg/l
➔ Removal	85% BOD <sub>5</sub> (or CBOD <sub>5</sub> ) and TSS	—
➔ pH	Maintained within the limits of 6.0 – 9.0 (standard units)	

**Note: Compliance Deadline was 7/1/88**



TBELs for POTWs-10

## Standards That Could Apply to a POTW

- Secondary treatment standards
- **Equivalent to secondary standards**
  - State-adjusted standards



TBELs for POTWs-11

## Equivalent to Secondary Treatment Standards 40 CFR 133.105

- Federal regulations allow adjustments to the secondary treatment requirements for BOD<sub>5</sub> and TSS for **equivalent to secondary** facilities
- Facilities with certain types of treatment processes might qualify
  - Trickling filters
  - Waste stabilization ponds
- Facilities must meet the eligibility criteria in 40 CFR 133.10(g)



TBELs for POTWs-12

## Equivalent to Secondary Treatment Standards (40 CFR 133.105)

Parameter	30-Day Average	7-Day Average
5-day BOD	not to exceed 45 mg/L (not to exceed 40 mg/L 5-day CBOD)	not to exceed 65 mg/l (not to exceed 60 mg/L 5-day CBOD)
TSS	not to exceed 45 mg/l	not to exceed 65 mg/l
Removal	Not less than 65% BOD <sub>5</sub> (or CBOD <sub>5</sub> ) and TSS	—
pH	Maintained within the limits of 6.0 – 9.0 (standard units)	



TBELs for POTWs-13

## Standards That Could Apply to a POTW

- Secondary treatment standards
- Equivalent to secondary standards
  - State-adjusted standards



TBELs for POTWs-14

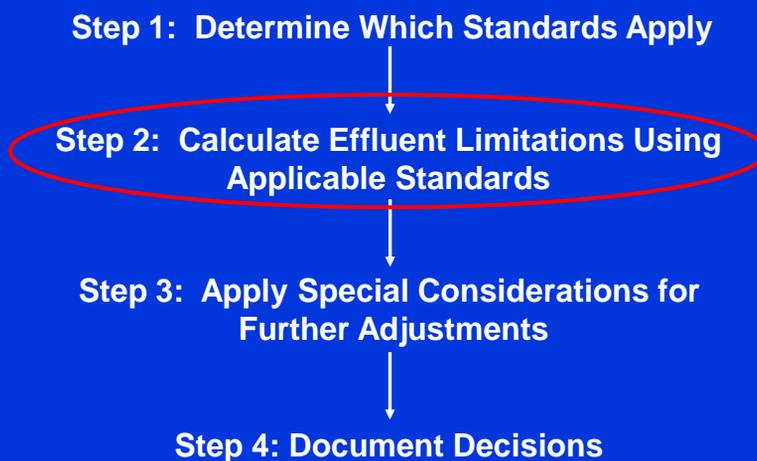
## State Adjustments to BOD<sub>5</sub> and TSS Requirements

- States, territories, and tribes may **further adjust** the maximum concentration standards for equivalent to secondary facilities:
  - special adjustment for waste stabilization pond equivalent to secondary requirements for TSS [§133.103(c)]
    - Example: several states have a maximum concentration standard of 100 mg/L TSS as a 30-day average for waste stabilization ponds (rather than 45 mg/L)
  - Alternative State Requirements (ASRs) [§133.105(d)]
    - trickling filters – BOD<sub>5</sub> and TSS
    - waste stabilization ponds – BOD<sub>5</sub>



TBELs for POTWs-15

## Applying Technology-based Standards for POTWs in NPDES Permits



TBELs for POTWs-16

## Step 2: Calculate Effluent Limitations Using Applicable Standards

- Effluent limits generally expressed as **average monthly and average weekly limits** for POTWs [§122.45(d)(2)]
- pH limits are in **standard units** and BOD<sub>5</sub> and TSS limits must be **concentration-based** (at a minimum) because secondary treatment standards are expressed in concentration units [§122.45(f)(1)]



TBELs for POTWs-17

## Step 2: Calculate Effluent Limitations (continued)

- Percent removal permit requirement for BOD<sub>5</sub> and TSS must be included (with some exceptions for dilute influent)
- Compliance determined based on monthly average removal efficiency calculated using influent and effluent concentrations [§133.101]

$$\text{Percent Removal} = \frac{\text{Monthly average influent conc.} - \text{Monthly average effluent conc.}}{\text{Monthly average influent conc.}} \times 100$$



TBELs for POTWs-18

## Effluent Limitations Calculated from Secondary Treatment Standards

Parameter	Average Monthly Limitation	Average Weekly Limitation
BOD <sub>5</sub>	30 mg/L (25 mg/L for CBOD <sub>5</sub> )	45 mg/L (40 mg/L for CBOD <sub>5</sub> )
TSS	30 mg/L	45 mg/L
BOD <sub>5</sub> and TSS removal (concentration)	≥ 85%	NA
pH	Must be maintained within the range of 6.0—9.0 standard units at all times	



TBELs for POTWs-19

## Applying Equivalent to Secondary and State-Adjusted Standards

- Actual limitations should be based on **performance capability** (at least two years of data) [40 CFR 133.101(f)]
- Equivalent to secondary and state-adjusted standards for BOD<sub>5</sub> and TSS are **maximum** (“up to”) values
  - **Examples:** If performance data show that an “equivalent to secondary” facility can meet an average monthly BOD<sub>5</sub> limitation of:
    - 40 mg/L
      - set average monthly limit at 40 mg/L
    - 50 mg/L
      - set average monthly limit at 45 mg/L



TBELs for POTWs-20

## Mass Loading Limitations

Mass loading limitations for BOD<sub>5</sub> and TSS may be used to supplement concentration limitations

- use design flow of the POTW to calculate mass loading limitations [**§122.45(b)(1)**]



TBELs for POTWs-21

## Applying Technology-based Standards for POTWs in NPDES Permits

Step 1: Determine Which Standards Apply



Step 2: Calculate Effluent Limitations Using Applicable Standards



Step 3: Apply Special Considerations for Further Adjustments



Step 4: Document Decisions



TBELs for POTWs-22

## Step 3: Apply Special Considerations for Further Adjustments

### Other adjustments based on:

- **pollutant parameter substitution**
  - substitution of CBOD<sub>5</sub> for BOD<sub>5</sub> [**§133.102(a)(4)**]
  - substitution of COD or TOC for BOD<sub>5</sub> [**§133.104(b)**]
- **special considerations for certain influent or collection system characteristics**
  - modification of BOD<sub>5</sub> and TSS requirements for POTWs with large industrial contributions [**§133.103(b)**]
  - adjustment or deletion of percent removal requirements for POTWs with less concentrated influent [**§133.103(a),(d),(e)**]



TBELs for POTWs-23

## Applying Technology-based Standards for POTWs in NPDES Permits

Step 1: Determine Which Standards Apply



Step 2: Calculate Effluent Limitations Using Applicable Standards



Step 3: Apply Special Considerations for Further Adjustments



Step 4: Document Decisions



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## Step 4: Document Decisions

- **Document in the fact sheet or statement of basis:**
  - Statutory and regulatory citations
  - How you determined which standards apply
  - How you characterized the POTW's past performance (if equivalent to secondary or adjusted standards apply)
  - How you calculated effluent limitations (concentration and, if applicable, mass)



TBELs for POTWs-25



## Feedback and Other Presentations

Questions or comments?

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