Technology-based Effluent Limitations for Non-POTWs

NPDES Permit Writers' Course
Online Training Curriculum

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2

Technology- and Water Quality-based Effluent Limitations

	Technology-based Effluent Limitations (TBELs)	Water Quality-based Effluent Limitations (WQBELs)
Goal or Policy:	▪ Zero Discharge of Pollutants	▪ Fishable and Swimmable Waters ▪ No Toxics in Toxic Amounts
Standards:	▪ Technology	▪ Water Quality
NPDES Regulations:	▪ 40 CFR 122.44(a), (e) ▪ 40 CFR 125.3	▪ 40 CFR 122.44(d)

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.

3

Technology-Based Requirements

- Technology-based requirements:
  - establish performance-based level of pollutant controls
  - provide equity among dischargers within categories
- Technology-based treatment requirements under CWA Section 301(b) represent the minimum level of control that must be imposed in a permit [§ 125.3(a)]

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 (non-POTWs)
  - technology-based requirements developed on a case-by-case basis

5

Effluent Limitations Guidelines and Standards (Effluent Guidelines)

- Definition
  - national standards developed by EPA
  - prescribe allowable discharges of pollutants from industrial point source categories corresponding to various levels of treatment or control
- Scope
  - established for most primary and some secondary industries
- Regulations
  - 40 CFR Parts 405-471

6

EPA's Development of Effluent Guidelines

- Developed for a specific industrial category (and possibly subcategories) after an in-depth assessment of available:
  - pollution control technologies
  - pollution prevention practices
- For each technology, EPA considers
  - pollutant loadings and removals
  - industry-wide compliance costs
  - non-water quality effects
- EPA selects a model technology as the basis for each required level of control

7

CWA Performance Standards

- Direct Dischargers
  - Existing Source Standards [CWA sections 301 and 304]
    - Best Practicable Control Technology Currently Available (BPT)
    - Best Conventional Pollutant Control Technology (BCT)
    - Best Available Pollutant Control Technology Economically Achievable (BAT)
  - New Source Performance Standards (NSPS) [CWA section 306]
- Indirect Dischargers [CWA section 307]
  - Pretreatment Standards for New Sources
  - Pretreatment Standards for Existing Sources

8

Compliance Deadlines—Direct Discharges

- Existing Source Standards
  - BPT: Compliance deadline: July 1, 1977
  - BCT: Compliance deadline: March 31, 1989
  - BAT: Compliance deadline: March 31, 1989
- New Source Standards
  - NSPS: commencement of discharge

9

Key Definitions—New Source [§ 122.2]

- Any building, structure, facility, or installation from which there is or may be a discharge of pollutants, the construction of which commenced:
  - after promulgation of applicable New Source Performance Standards in the effluent guidelines, or
  - after proposal of applicable New Source Performance Standards in effluent guidelines, but only if the standards are promulgated within 120 days of proposal

10

Determining New Source Dates

- Effluent guideline publication dates in Federal Register (as listed in the Code of Federal Regulations)
- EPA Memo "New Source Dates for Direct and Indirect Dischargers"
  http://www.epa.gov/npdes/pubs/memo_complianceschedules_may07.pdf

11

Additional New Source Information

- Additional New Source Determination Criteria [§ 122.29(b)]
  - constructed at a site at which no other source is located;
    or
  - totally replaces the process causing the discharge from an existing source;
    or
  - processes are substantially independent of an existing source at the same site;
    and
  - a New Source Performance Standard is independently applicable to the discharge.

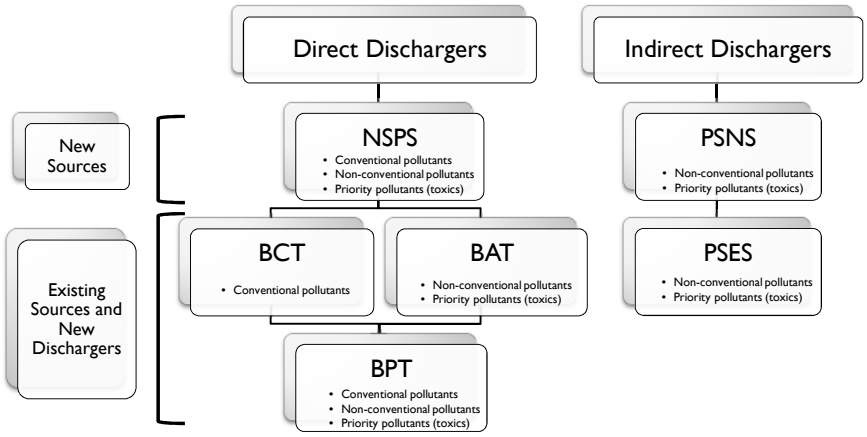
12

Key Definitions—New Discharger and Existing Source

- New Discharger [§ 122.2]
  - Any building, structure, facility, or installation from which there is or may be a discharge of pollutants that did not commence the discharge of pollutants at a particular site prior to August 13, 1979, which is not a new source, and which never received a finally effective NPDES permit
- Existing Source [§ 122.29(a)(3)]
  - Any building, structure, facility, or installation from which there is or may be a discharge of pollutants which is not a new source or a new discharger

13

Determining Required Performance Standards



Compliance Deadlines:: BPT—7/1/1977; BCT—3/31/1989; BAT—3/31/1989; NSPS—discharge commencement

14

Implementing Effluent Guidelines

- Effluent guidelines:
  - are implemented and enforced through NPDES permits
  - serve as the basis for technology-based effluent limitations

15

Steps to Implementing Effluent Guidelines

Step 1: Determine Proper Category and Subcategory

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Step 2: Calculate Numeric Limitations

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Step 3: Incorporate Narrative Requirements

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Step 4: Account for Multiple Sets of Requirements

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Step 5: Apply Additional Regulatory Considerations

↓

Step 6: Document Decisions

16

Step 1: Determine Category and Subcategory

- Application and supplemental information
- Existing permit
- Applicability section in regulation
- Preamble to regulation
- SIC Code(s)
  (e.g., Copper Forming = SIC Code 3351)
- Development documents
- Effluent guidelines program contacts:
  http://water.epa.gov/scitech/wastetech/guide/contact.cfm#elg-list

17

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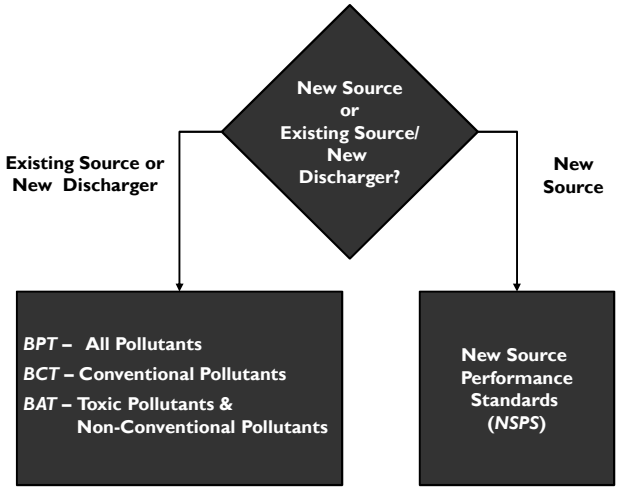
18

Step 2: Calculate Numeric Limitations

- Determine applicable level(s) of control
- Determine appropriate measures of production and flow (if necessary)
- Calculate numeric limitations for all regulated processes and pollutants

19

Step 2: Calculate Numeric Limitations



20

Considerations for Limit Calculation

- When calculating numeric limitations from effluent guidelines:
  - include all regulated pollutants
  - do not include parameters considered by but not regulated by the effluent guideline
  - include both maximum daily and average monthly effluent limitations
  - express as mass limitations unless the guideline allows or requires concentration limitations

21

Effluent Limitation Calculation Example: Limits Based on Production

- Canned and Preserved Fruits and Vegetables Processing: 40 CFR Part 407
  - Subpart A: Apple Juice Subcategory
- Given:
  - existing source
- Example Problem:
  - Calculate BPT Average Monthly Limitations for BOD_5, TSS, and pH

22

§ 407.12 **Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.**

Except as provided in §§125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Effluent characteristic	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed—
	Metric units (kilograms per 1,000 kg of raw material)	
BOD5	0.60	0.30
TSS	0.80	.40
pH	(1)	(1)
	English units (pounds per 1,000 lb of raw material)	
BOD5	0.60	0.30
TSS	0.80	.40
pH	(1)	(1)

[1] Within the range 6.0 to 9.0.

Example:

Calculate BPT AMLs

BPT average monthly standards

Standards are in lbs per 1,000 lbs of raw material; therefore…

we need to know the *amount of raw material used* in order to calculate effluent limits

(except for the pH limits).

23

Production or Flow Measure

- Determining appropriate measures of production and flow
- § 122.45(b)(2)
  - use reasonable measure of actual production (or other measure of operation—e.g., flow)
  - account for planned changes

24

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[1] Within the range 6.0 to 9.0.

Example:

Verify production units

200,000 pounds of raw material per day

Multiply (200,000 / 1,000) × each value from the table

25

Effluent Limitation Calculation Example: Mass-based, Production-normalized AMLs

- BOD_5 $\frac{\text{200,000 lbs raw material}}{\text{day}} \times \frac{\text{0.30 lbs}}{\text{1,000 lbs raw material}} = \text{60 lbs/day}$
- TSS $\frac{\text{200,000 lbs raw material}}{\text{day}} \times \frac{\text{0.40 lbs}}{\text{1,000 lbs raw material}} = \text{80 lbs/day}$
- pH Within the range of 6.0 to 9.0 standard units

26

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27

Step 3: Incorporate Narrative Requirements

- Incorporate all narrative requirements from the effluent guidelines such as:
  - best management practices
  - treatment practices
  - monitoring, reporting, and compliance requirements
- **Example:** § 451.11 establishes BPT requirements for Concentrated Aquatic Animal Production Facilities as management practices for
  - solids control
  - materials storage
  - structural maintenance
  - record keeping
  - training

28

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29

Step 4: Account for Multiple Sets of Requirements

A single facility could include:

- multiple processes within the same category or subcategory
- production or services in more than one category or subcategory
- both new and existing sources
- wastewater streams not containing the regulated pollutant
- unregulated wastewater streams

30

Step 4: Account for Multiple Sets of Requirements (continued)

- For a facility with multiple sets of requirements:
  - address all applicable effluent guidelines
  - recognize that some guidelines supersede others
  - account for common treatment systems
    - building block approach for mass limits
    - flow-weighting for concentration limits
    - BPJ for non-regulated pollutants and waste streams
  - use internal outfalls where appropriate
  - be aware of inconsistent expressions of limits (units)

31

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32

Step 5: Apply Additional Regulatory Considerations

Tiered (or alternative) limitations

- account for anticipated variability of production/flow (e.g., seasonal)
- significant variation is > 20%
- requires careful examination of production/flow data
- requires special reporting requirements
  - notification of changed production/flow
  - reporting of production/flow data

33

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34

Step 6: Document Decisions

- Document in the fact sheet or statement of basis:
  - statutory and regulatory citations
  - how you determined which effluent guidelines apply
  - how you determined the facility's production, flow, or other measures used to apply the effluent guidelines
  - how you calculated effluent limitations (mass or concentration or both)

35

Requirements for Technology-based Effluent Limitations

- Technology-based treatment requirements under CWA Section 301(b) represent the minimum level of control that must be imposed in a permit [§ 125.3(a)]
- For dischargers other than POTWs technology-based limitations are based on BPT, BCT, and BAT [§ 125.3(a)(2)] (NSPS for new sources addressed in § 122.29)

36

Case-by-Case Technology-based Effluent Limitations – § 125.3(c)(2)

§ 125.3(c) states that technology-based treatment requirements may be imposed through one of the following three methods:

1. Application of EPA-promulgated effluent limitations developed under section 304 of the Act to dischargers by category or subcategory.
2. On a *case-by-case* basis under section 402(a)(1)(B) of the Act, *to the extent that EPA-promulgated effluent limitations are inapplicable.*
3. Through a combination of the methods in 1 and 2.

37

Authority for Case-by-Case Limitations

- "…promulgated effluent limitations are inapplicable…" when
  - EPA has *not developed effluent guidelines* that apply to the discharge (i.e., to the industry or to the type of facility) we are permitting
  - there is an applicable effluent guideline, but *pollutants or processes are present that were not considered* when the effluent guideline was developed

38

How are Case-by-Case Limits Developed?

- Case-by-case technology-based limits are developed using ***Best Professional Judgment (BPJ)***

39

Using BPJ to Develop Case-by-Case Limits

The permit writer applies the criteria used to develop technology-based standards as required in § 125.3(d)

- similar to the EPA's analysis for developing national effluent guidelines but
- performed by the permit writer for a single facility to establish BPT, BCT, and BAT

40

BPJ Considerations – § 125.3(d)

Establish appropriate level of performance on a case-by-case basis considering:

- *the appropriate technology* for the class or category of point sources
- *any unique factors* related to the facility

41

Selecting an Appropriate Technology

- Technical Criteria (BPT, BCT, BAT)
  - age of equipment and facilities involved
  - process(es) employed
  - engineering aspects of the application of various types of control techniques
  - process changes
  - non-water quality environmental impact including energy requirements
- Economic Criteria
  - candidate technologies evaluated based on economic criteria
  - criteria vary by standard (e.g., cost/benefit, economic achievability)

42

BPJ Tools and Resources

- Permits and fact sheets with BPJ rationale for similar facilities
- Effluent Limitations Guidelines Webpage: http://water.epa.gov/scitech/wastetech/guide/index.cfm
- Effluent guideline data/information
  - development documents
  - proposed regulations
  - industry studies
  - industry teams/national experts
- Economic guidance (BCT two-part cost test and BAT economic achievability guidance)

43

BPJ Tools and Resources (continued)

- Other sources of information
  - Discharge Monitoring Reports
  - *Technical Support Document for Water Quality-Based Toxics Control*
    - provides statistical approach for setting MDL and AML at an appropriate performance level based on expected long-term average performance

44

BPJ Defensibility and Documentation

- Defensibility depends on reasonableness
- Reasonableness is demonstrated by documentation:
  - include statutory and regulatory citations
  - establish that case-by-case limits are appropriate—why effluent guidelines don't apply
  - identify pollutant(s) for BPJ analysis and the performance level required by the CWA (i.e., BPT and BAT or BCT)
  - list each of the applicable criteria from § 125.3(d) and provide an explanation of how each was considered in the BPJ analysis

45

Feedback and Other Presentations

Questions or comments?

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49