



# **Combined Wastestream Formula Worksheet:**

**2021 National  
Pretreatment Coregulator  
Meeting: ACWA-EPA**

May 20, 2021  
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Office of Water

# 40 CFR 403.6(e)

## **Combined wastestream formula.**

Where process effluent is mixed prior to treatment with wastewaters other than those generated by the regulated process, fixed alternative discharge limits may be derived by the Control Authority or by the Industrial User with the written concurrence of the Control Authority. These alternative limits shall be applied to the mixed effluent. When deriving alternative categorical limits, the Control Authority or Industrial User shall calculate both an alternative daily maximum value using the daily maximum value(s) specified in the appropriate categorical Pretreatment Standard(s) and an alternative consecutive sampling day average value using the monthly average value(s) specified in the appropriate categorical Pretreatment Standard(s). The Industrial User shall comply with the alternative daily maximum and monthly average limits fixed by the Control Authority until the Control Authority modifies the limits or approves an Industrial User modification request. Modification is authorized whenever there is a material or significant change in the values used in the calculation to fix alternative limits for the regulated pollutant. An Industrial User must immediately report any such material or significant change to the Control Authority. Where appropriate new alternative categorical limits shall be calculated within 30 days.

- ◆ (1) *Alternative limit calculation.* For purposes of these formulas, the “average daily flow” means a reasonable measure of the average daily flow for a 30-day period. For new sources, flows shall be estimated using projected values. The alternative limit for a specified pollutant will be derived by the use of either of the following formulas:

■ ■ ■

(2) *Alternate limits below detection limit.* An alternative pretreatment limit may not be used if the alternative limit is below the analytical detection limit for any of the regulated pollutants.

(3) *Self-monitoring.* Self-monitoring required to insure compliance with the alternative categorical limit shall be conducted in accordance with the requirements of §403.12(g).

(4) *Choice of monitoring location.* Where a treated regulated process wastestream is combined prior to treatment with wastewaters other than those generated by the regulated process, the Industrial User may monitor either the segregated process wastestream or the combined wastestream for the purpose of determining compliance with applicable Pretreatment Standards. If the Industrial User chooses to monitor the segregated process wastestream, it shall apply the applicable categorical Pretreatment Standard. If the User chooses to monitor the combined wastestream, it shall apply an alternative discharge limit calculated using the combined wastestream formula as provided in this section. The Industrial User may change monitoring points only after receiving approval from the Control Authority. The Control Authority shall ensure that any change in an Industrial User's monitoring point(s) will not allow the User to substitute dilution for adequate treatment to achieve compliance with applicable Standards.



# Alternative concentration limit.

$$C_T = \left( \frac{\sum_{i=1}^N C_i F_i}{\sum_{i=1}^N F_i} \right) \left( \frac{F_T - F_D}{F_T} \right)$$

Where

$C_T$  = the alternative concentration limit for the combined wastestream.

$C_i$  = the categorical Pretreatment Standard concentration limit for a pollutant in the regulated stream i.

$F_i$  = the average daily flow (at least a 30-day average) of stream i to the extent that it is regulated for such pollutant.

$F_D$  = the average daily flow (at least a 30-day average) from:

- (a) Boiler blowdown streams, non-contact cooling streams, stormwater streams, and demineralizer backwash streams; provided, however, that where such streams contain a significant amount of a pollutant, and the combination of such streams, prior to treatment, with an Industrial User's regulated process wastestream(s) will result in a substantial reduction of that pollutant, the Control Authority, upon application of the Industrial User, may exercise its discretion to determine whether such stream(s) should be classified as diluted or unregulated. In its application to the Control Authority, the Industrial User must provide engineering, production, sampling and analysis and such other information so that the Control Authority can make its determination; or
- (b) sanitary wastestreams where such streams are not regulated by a Categorical Pretreatment Standard; or
- (c) from any process wastestreams which were or could have been entirely exempted from categorical Pretreatment Standards pursuant to paragraph 8 of the *NRDC v. Costle* Consent Decree (12 ERC 1833) for one or more of the following reasons (see appendix D of this part):

- (1) The pollutants of concern are not detectable in the effluent from the Industrial User (paragraph (8)(a)(iii));
- (2) The pollutants of concern are present only in trace amounts and are neither causing nor likely to cause toxic effects (paragraph (8)(a)(iii));
- (3) The pollutants of concern are present in amounts too small to be effectively reduced by technologies known to the Administrator (paragraph (8)(a)(iii)); or
- (4) The wastestream contains only pollutants which are compatible with the POTW (paragraph (8)(b)(i)).

$F_T$  = The average daily flow (at least a 30-day average) through the combined treatment facility (includes  $F_i$ ,  $F_D$  and unregulated streams).

$N$  = The total number of regulated streams.

# Alternative mass limit

$$M_T = \left( \sum_{i=1}^N M_i \right) \left( \frac{F_T - F_D}{\sum_{i=1}^N F_i} \right)$$

Where

$M_T$  = the alternative mass limit for a pollutant in the combined wastestream.

$M_i$  = the categorical Pretreatment Standard mass limit for a pollutant in the regulated stream  $i$  (the categorical pretreatment mass limit multiplied by the appropriate measure of production).

$F_i$  = the average flow (at least a 30-day average) of stream  $i$  to the extent that it is regulated for such pollutant.

$F_D$  = the average daily flow (at least a 30-day average) from:

(a) Boiler blowdown streams, non-contact cooling streams, stormwater streams, and demineralizer backwash streams; provided, however, that where such streams contain a significant amount of a pollutant, and the combination of such streams, prior to treatment, with an Industrial User's regulated process wastestream(s) will result in a substantial reduction of that pollutant, the Control Authority, upon application of the Industrial User, may exercise its discretion to determine whether such stream(s) should be classified as diluted or unregulated. In its application to the Control Authority, the Industrial User must provide engineering, production, sampling and analysis and such other information so that the Control Authority can make its determination; or

(b) sanitary wastestreams where such streams are not regulated by a categorical Pretreatment Standard; or

(c) from any process wastestreams which were or could have been entirely exempted from categorical Pretreatment Standards pursuant to paragraph 8 of the *NRDC v. Costle* Consent Decree (12 ERC 1833) for one or more of the following reasons (see appendix D of this part):

- (1) The pollutants of concern are not detectable in the effluent from the Industrial User (paragraph (8)(a)(iii));
- (2) The pollutants of concern are present only in trace amounts and are neither causing nor likely to cause toxic effects (paragraph (8)(a)(iii));
- (3) The pollutants of concern are present in amounts too small to be effectively reduced by technologies known to the Administrator (paragraph (8)(a)(iii)); or
- (4) The wastestream contains only pollutants which are compatible with the POTW (paragraph (8)(b)(i)).

$F_T$  = The average flow (at least a 30-day average) through the combined treatment facility (includes  $F_i$ ,  $F_D$  and unregulated streams).

$N$  = The total number of regulated streams.



# Why & When to use the Combined Wastestream Formula

- ◆ Where regulated process effluent is mixed with other wastewaters prior to treatment
- ◆ Already constructed treatment plant where separate treatment units in facility could be costly, wasteful (of energy and space), inefficient, counterproductive
  - ◆ Example: metals treatment needed for wastestreams regulated under 2 different ELGs
- ◆ Primary importance in large, diversified IUs with multiple processes
- ◆ Cannot use if calculation results in limits below detection level

Formula appears in 1981

- 403.6(e)(1)-(3)

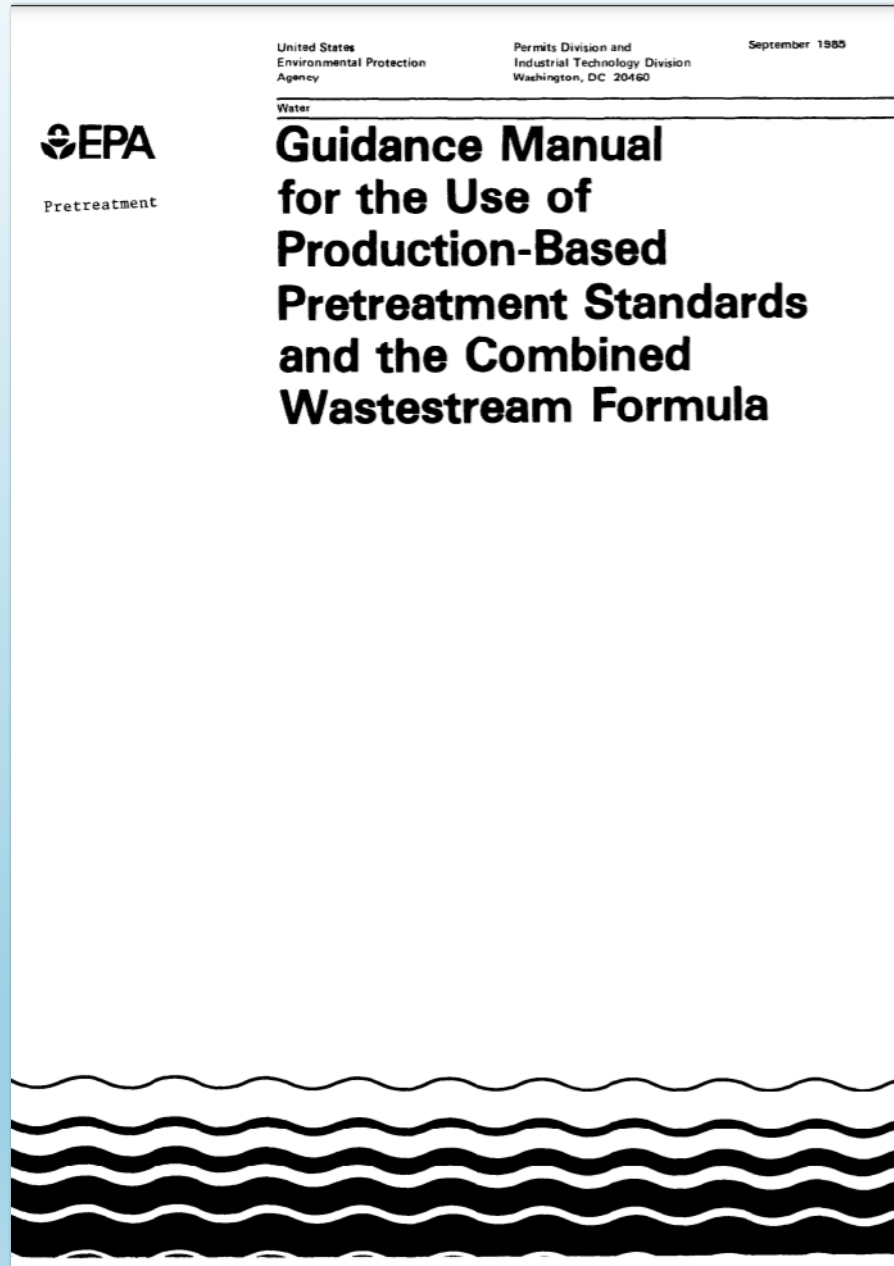
PIRT requests guidance

Issued 1985: 91 pages

PIRT Regulation: 1988

- modifies statements under the formula;
- modifies (e)(3) *monitoring in accordance with 403.12)(g), Part 136*;
- add (e)(4) *monitoring location*

<https://www3.epa.gov/npdes/pubs/owm0260.pdf>





# Example Calculations in 1985 Manual

**Example 3.4.4.1** - Simple Example of Combined Wastestream Formula Calculations with Concentration Limits

**Example 3.4.4.2** - *More Complex (?)* Combined Wastestream Formula Example Calculations with Concentration Limits

**Example 3.4.4.3** - Above Combined Wastestream Formula Calculations with Concentration Limits for Cyanide

**Example 3.4.4.4** - Combined Wastestream Formula Example Calculations Using Concentration and Mass Limits

**Example 3.4.4.5** - Combined Wastestream Formula Example Calculations for an Integrated Facility

*Another Guidance issued the same month!*

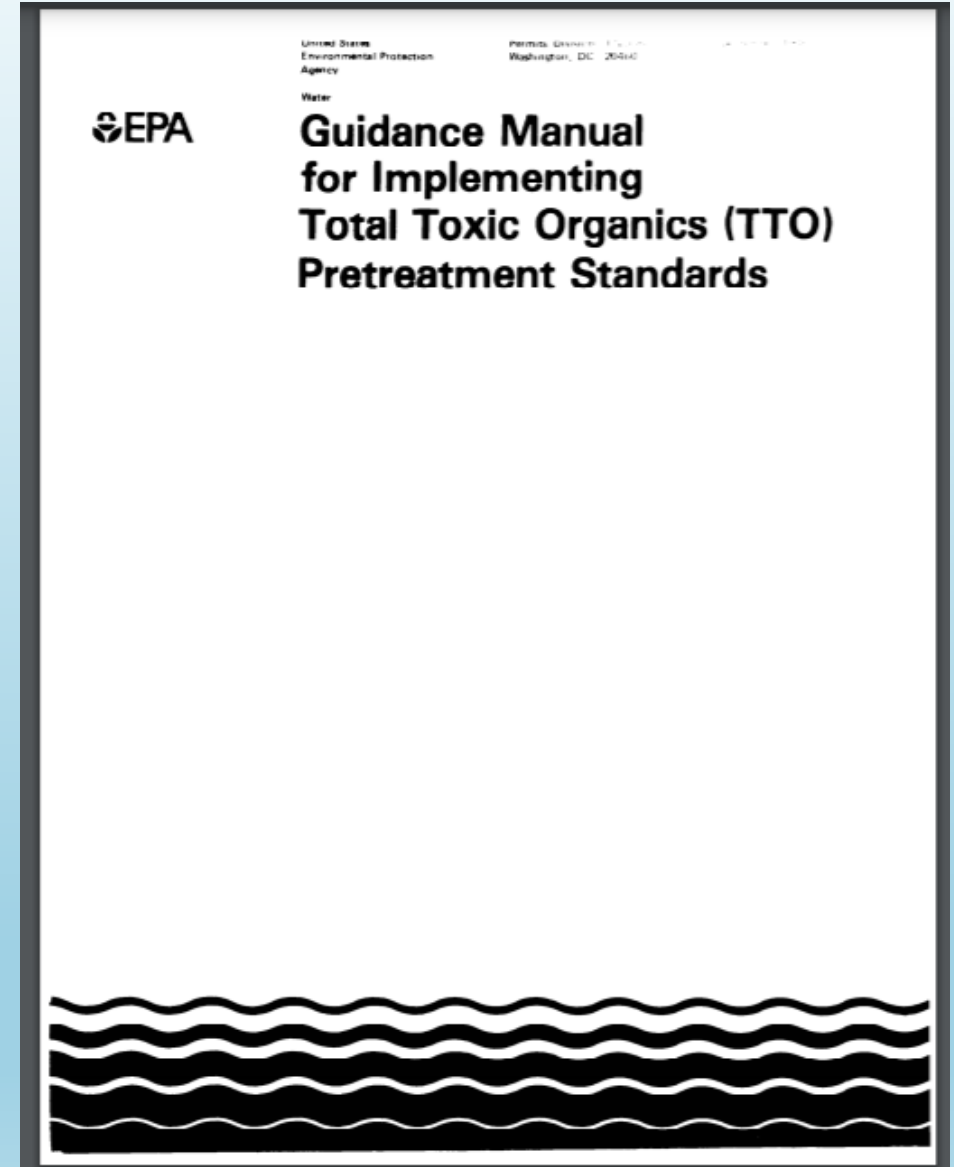
## Chapter 5.3.1: Examples of Calculating Alternative TTO Limit using CWF

Examples 1 & 2: TTO regulated flow + unregulated flow + dilution flow.

Example 3: Production-based TTO + Concentration TTO + dilution flow

Example 4: wastestream with TOMP + production-based oil & grease alternative + dilution flow

[https://www.epa.gov/sites/production/files/2015-10/documents/tto-pretreatment-standards-guidance\\_1985.pdf](https://www.epa.gov/sites/production/files/2015-10/documents/tto-pretreatment-standards-guidance_1985.pdf)





# Worksheets:

## 1. Combined Wastestream Formula

## 2. Production-Based Standards

## 3. Quality Data Selection

- ◆ Can be used as calculation documentation for Control mechanism fact sheet
- ◆ Identify the values and basis of values selected and used in the calculation:
  - ◆ the production and flow rates upon which the limit is based, and
  - ◆ the resulting equivalent limit.
- ◆ Reminder that changes in flow and/or production rates affect the Equivalent Limits
- ◆ Equivalent limits are enforceable as local limits, but they do not take the place of the categorical standard.



Time to share screen with the actual worksheet:

1: large screen overview – 1 or 2 pages at a time, to show format/structure:

- Definitions
- Equation box
- Footnotes with more ‘conditions’
- STEPS
- Diagrams
- Helpful Hints Boxes

2. Close ups to show actual text



# Next Steps

## States

Review –

- Missing items?
- confusing items?
- format skips?
- extra hints needed?

## EPA

Edits;

Management Briefing

Launch (issue) with  
webinar

Transfer into online/self-  
guided training

## Further Steps

- Production-based standards worksheet
- Quality Data Selection worksheet

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