

Local Limits Development National Pretreatment Program

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National Pretreatment Program

Pollution Control Strategy

Prohibited Discharge Standards

Broad level of control applying to all IUs discharging to any POTW



National Categorical Standards

Uniform industry-specific effluent limits



Local Limits

Site-specific requirements developed and enforced by individual POTWs

General Methodology

Five-Step Approach

- **Step 1:** Determine POCs
- **Step 2:** Collect and Analyze Data
- **Step 3:** Calculate AHLs for each POC
- **Step 4:** Determine MAHL & MAIL, calculate LLs
- **Step 5:** Allocation of local limits

General Methodology

Step 1: Determine POCs

- National POCs:

Arsenic

Copper

Mercury

Selenium

Ammonia

Cadmium

Cyanide

Molybdenum

Silver

BOD₅

Chromium

Lead

Nickel

Zinc

TSS

- Detected in sludge, influent, effluent scans?
- Existing NPDES permits?
- Existing industrial discharge permits?
- Existing local limits?
- Regulatory criteria?
- Treatment inhibition problems?

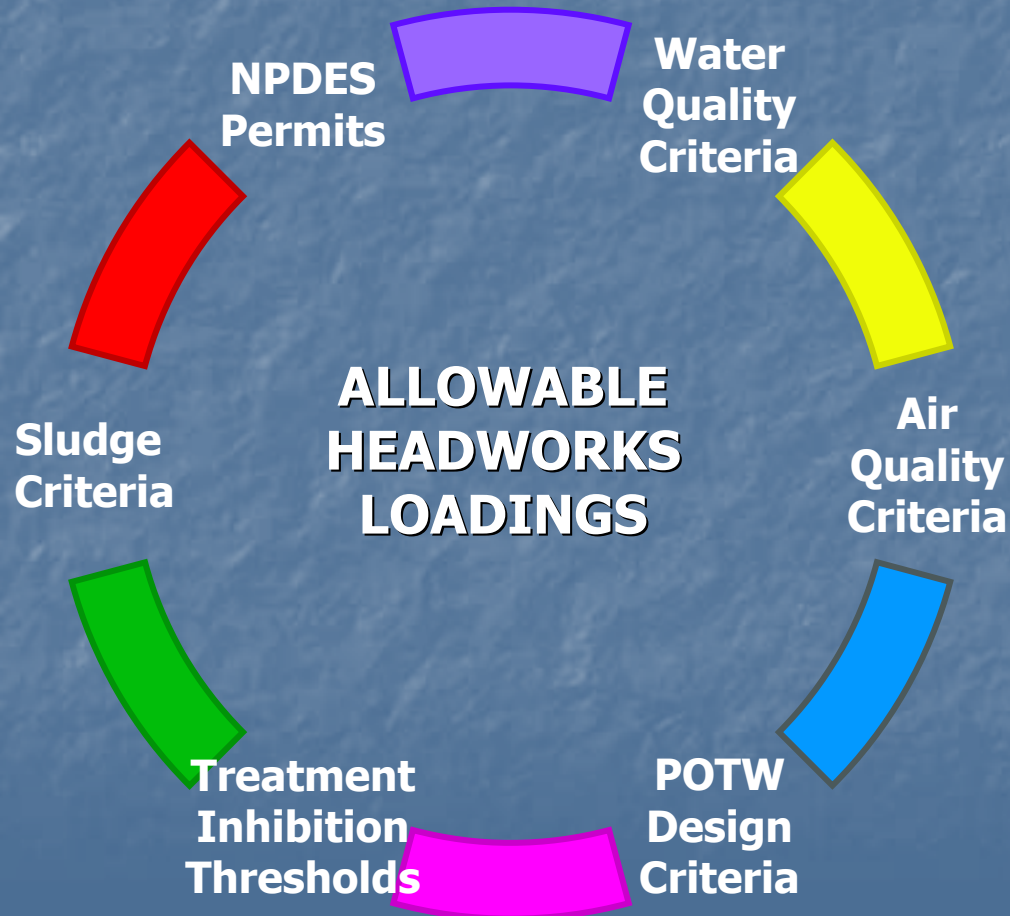
General Methodology

Step 2: Collect and Analyze Data

- NPDES Permit Limits
- POTW Influent
 - Domestic and commercial
 - Industrial
- POTW Effluent
 - Primary, secondary and final concentrations
 - Flow rates
- Sludge
 - Sludge flow to digester
 - Sludge flow to disposal
 - Percent solids
 - Specific gravity or density
 - Sludge concentrations
- Receiving Stream
 - Acute (1Q10) and chronic (7Q10) flow rates
 - Background concentrations
 - Stream hardness
- Treatment Inhibition Levels
 - Activated sludge
 - Nitrification
 - Sludge digestion
 - Other treatments
- POTW Design Criteria
- Regulatory Criteria
 - Water
 - Air
 - Sludge

General Methodology

Step 3: Calculate AHLs



General Methodology

Step 3: Calculate AHLs

- AHL based on Water Quality Criteria

$$\text{AHL}_{\text{WQC}} \text{ (lbs/day)} = \frac{(8.34) [\text{WQC}_{\text{TOTAL}} (Q_{\text{STR}} + Q_{\text{POTW}}) - (C_{\text{STR}} * Q_{\text{STR}})]}{(1 - R_{\text{POTW}})}$$

For metals: $\text{WQC}_{\text{TOTAL}} \text{ (mg/L)} = \text{WQC}_{\text{DISSOLVED}} / \text{CF}$

$$\text{WQC}_{\text{DISSOLVED}} \text{ (mg/L)} = [e^{M(\ln(\text{hardness}))} + B] \times \text{CF}/1000$$

- AHL based on NPDES Permit Limit

$$\text{AHL}_{\text{NPDES}} \text{ (lbs/day)} = \frac{(8.34) (C_{\text{NPDES}})(Q_{\text{POTW}})}{(1 - R_{\text{POTW}})}$$

General Methodology

Step 3: Calculate AHLs

- AHL based on Sludge Disposal Criteria

$$\text{AHL}_{\text{SLDG}} \text{ (lbs/day)} = \frac{(8.34) (C_{\text{SLDG}})(\text{PS}/100)(Q_{\text{SLDG}})(G_{\text{SLDG}})}{R_{\text{POTW}}}$$

- AHL based on Secondary Treatment Inhibition

$$\text{AHL}_{\text{SEC}} \text{ (lbs/day)} = \frac{(8.34) (C_{\text{INHIB2}})(Q_{\text{POTW}})}{(1 - R_{\text{PRIM}})}$$

- AHL based on Tertiary Treatment Inhibition

$$\text{AHL}_{\text{TER}} \text{ (lbs/day)} = \frac{(8.34) (C_{\text{INHIB3}})(Q_{\text{POTW}})}{(1 - R_{\text{SEC}})}$$

General Methodology

Step 3: Calculate AHLs

- AHL based on Sludge Digestion Inhibition

$$\text{AHL}_{\text{DGSTR}} (\text{lbs/day}) = \frac{(8.34) (C_{\text{DGSTINHIB}})(Q_{\text{DGSTR}})}{R_{\text{POTW}}}$$

- AHL based on POTW Design Criteria

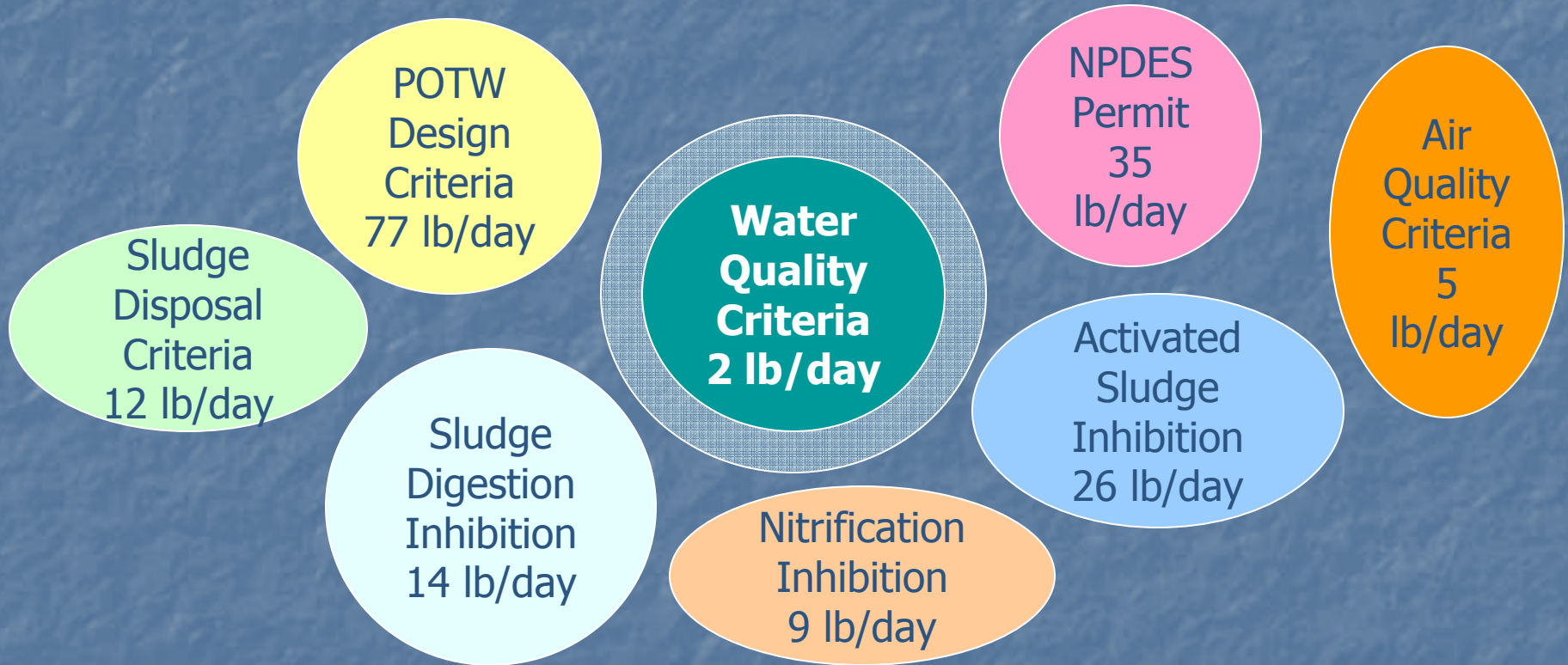
$$\text{AHL}_{\text{DESIGN}} (\text{lbs/day}) = (8.34) (C_{\text{DESIGN}})(Q_{\text{NPDES}})$$

- Other AHLs that can be calculated:

- AHLs based on land application of sludge
- AHLs based on air criteria and volatilization rates
- AHLs based on worker health and safety (fumes, toxicity, explosive and flammable substances)

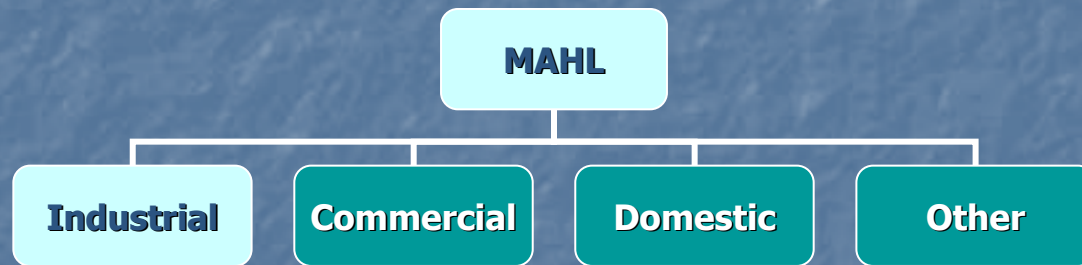
General Methodology

Step 4: Determine MAHL, MAIL & LL



General Methodology

Step 4: Determine MAHL, MAIL & LL



- MAIL is the portion of the MAHL that can be allocated to industrial users
- Incorporates safety factor and growth allowance

$$\text{MAIL (lbs/day)} = \text{MAHL} (1 - \text{SF}) - (L_{\text{UNC}} + \text{GA})$$

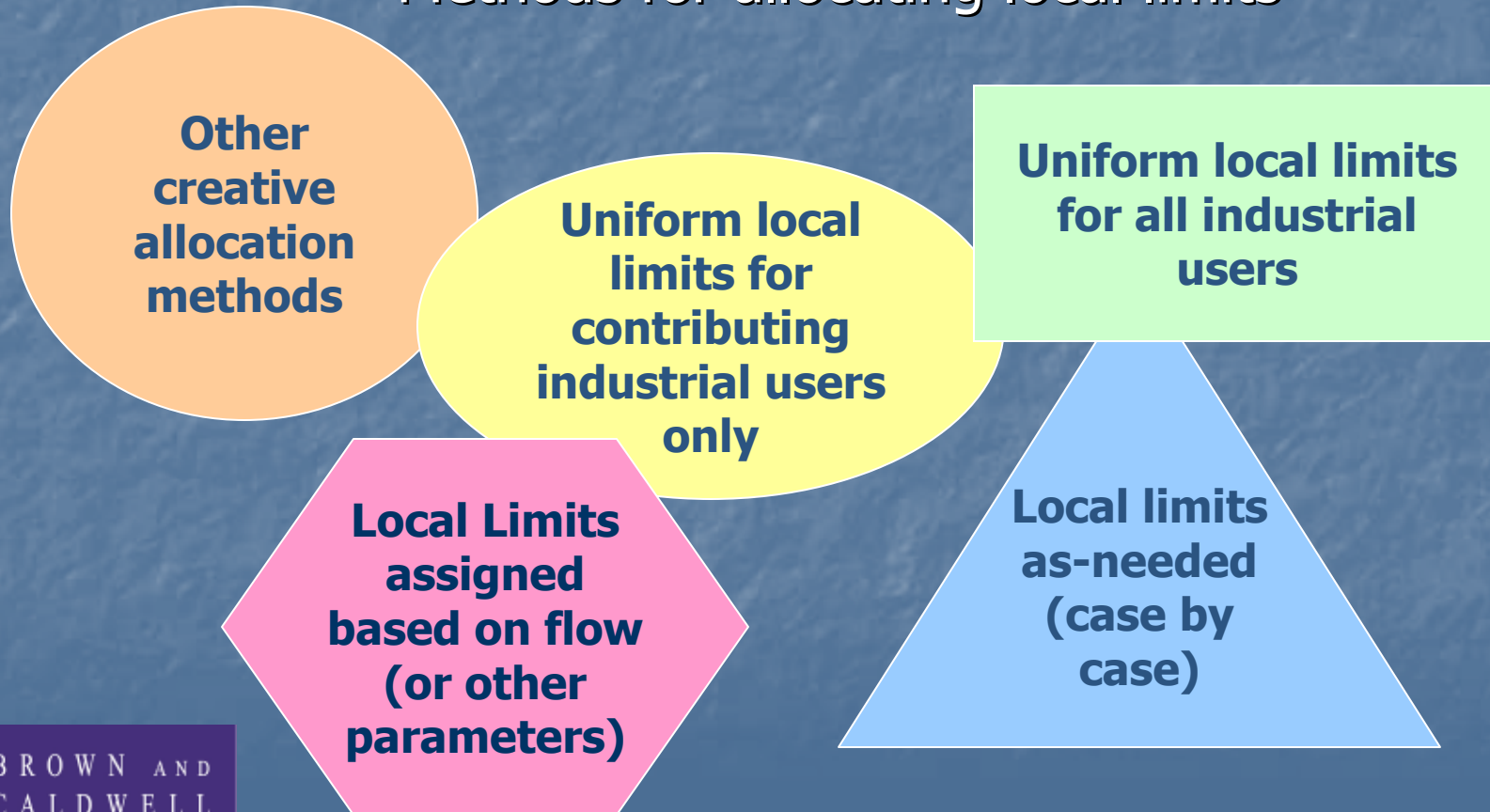
- Convert MAIL to LL

$$\text{LL (mg/L)} = \text{MAIL} / (Q_{\text{POTW}})(8.34)$$

General Methodology

Step 5: Allocation of Local Limits

Methods for allocating local limits



Local Limits Evaluation Calculation Spreadsheets

- Calculation spreadsheets available at EPA's website:
[www.epa.gov/region8/water/pretreatment/Pret_download/R8%20Spreadsheet%205-9-05%20\(ver%201\).xls](http://www.epa.gov/region8/water/pretreatment/Pret_download/R8%20Spreadsheet%205-9-05%20(ver%201).xls)

Pollutant	IU Flow (MGD)	POTW Flow (MGD)	Domestic & Commercial Flow (MGD)	Pollutant Loading* (mg/L)	Domestic & Commercial Bkgd Conc. (mg/L)	Removal Efficiency* (%)	NPDES Limit
	(Q _{IU})	(Q _{POTW})	(Q _{DC})	(PL)	(C _{DC})	(P _{POTW})	(C _{NPDES})
Arsenic	0.79	3.18	2.39	0.0025	0.0025	45	
Cadmium	0.79	3.18	2.39	0.00035	0.00035	67	
Chromium, Total	0.79	3.18	2.39	0.002	0.002	82	
Chromium (VI)	0.79	3.18	2.39	0.0025		82	
Copper	0.79	3.18	2.39	0.035	0.03216	86	
Cyanide	0.79	3.18	2.39	0.025	0.01	69	
Lead	0.79	3.18	2.39	0.0005	0.0005	61	
Mercury	0.79	3.18	2.39	0.00025	0.00025	60	
Molybdenum	0.79	3.18	2.39			29	
Nickel	0.79	3.18	2.39	0.003			
Selenium	0.79	3.18	2.39	0.0025			
Silver	0.79	3.18	2.39	0.003			
Zinc	0.79	3.18	2.39	0.091			
Ammonia	0.79	3.18	2.39	22.8			
BOD/CBOD	0.79	3.18	2.39	228			
COD	0.79	3.18	2.39				

Pollutant	Maximum Allowable Headworks Loadings				Maximum Allowable Industrial Loadings (lbs/day)
	Most Stringent Criterion	MAHL (lbs/day)	Current Influent Loading* (lbs/day)	Percent of MAHL Currently in Use* (%)	
Arsenic	Activated Sludge Inhibition	2.65	0.066	2.50	2.39
Cadmium	Chronic WQS	0.01	0.009	115.50	0.01
Chromium, Total	Chronic WQS	1.68	0.053	3.158	1.68
Chromium (VI)	Chronic WQS	1.68	0.066	3.947	1.68
Copper	Chronic WQS	0.55	0.928	168.97	-0.01
Cyanide	Chronic WQS	0.44	0.332	74.52	0.44
Lead	Chronic WQS	0.03	0.013	39.00	0.03
Mercury	Chronic WQS	0.001	0.007	714.29	-0.01
Molybdenum					
Nickel	Chronic WQS	0.74	0.080	10.81	0.74
Selenium	Chronic WQS	0.27	0.066	25.00	0.27
Silver	Acute WQS	0.03	0.080	250.00	0.03

* The spreadsheet shown here was modified from the EPA spreadsheet by Brown and Caldwell.

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Local Limits Evaluation Documentation

- Components of LLE Documentation for Submission to Approval Authority (EPD)
 - All data used for determining POCs and performing calculations
 - Rationale for choosing POCs
 - Record of calculations (formulas used) and related assumptions
 - Printouts of any spreadsheets or computer programs used
 - Rationale for choosing local limits
 - Rationale for not setting limits for particular pollutants or deleting any existing limits

Local Limits Evaluation

How Often?

- Local limits should be reevaluated when:
 - Changes associated with industrial users
 - Significant domestic/commercial growth
 - Additions/improvements to treatment processes
 - Addition of new stream monitoring stations
 - Changes in any applicable criteria (water, air, sludge)
 - Changes in sludge disposal methods
 - Regulatory changes affecting your Pretreatment Program
 - When your local limits just get too old!

Local Limits Evaluation

Guidance Documents

USEPA, 2004. Local Limits Development Guidance. EPA 833-R-04-002A.

USEPA, 1987. Guidance Manual on the Development and Implementation of Local Discharge Limitations Under the Pretreatment Program. EPA 833-B-87-202.

USEPA, 2006. National Recommended Water Quality Criteria.

USEPA Region 8, 2003. Technically-based local limits development strategy.

USEPA, 1996. The metals translator: Guidance for calculating a total recoverable permit limit from a dissolved criterion. EPA 823-B-96-007.

USEPA, 1975. Treatability of oil and grease discharged to publicly owned treatment works. EPA 440-I-75-066.