PRETREATMENT PROGRAM
LOCAL LIMITS

Pacific Northwest Pretreatment Conference
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Types of SIU Permit Limits
What Does EPA Say About Local Limits?
MAHL to MAIL
MAIL Allocation Considerations
MAIL Allocation Methods
Types of SIU Permit Limits

- **EPA General Prohibitions** [40 CFR Part 403.5(a)(1)]
  - Pass-Through and Inhibition

- **EPA Specific Prohibitions** [40 CFR Part 403.5(b)(1-8)]
  - fire/explosion, pH, obstruction, slug loading, heat, petroleum oil, toxic vapors/gases, hauled waste

- **Federal Categorical Pretreatment Standards**
  - Technology Based

- **Local Limits**
  - Technically Based
Why Are Local Limits Needed?

- Federal Categorical Standards May Not Adequately Protect POTW
  - Receiving water quality
  - Biological processes
  - Sludge quality
  - Collection system

- Federal Categorical Standards Do Not Address All Contributed Pollutants

- Federal Categorical Standards Do Not Regulate Significant Industrial Users due to flow
FEDERAL CATEGORICAL PRETREATMENT STANDARDS

- Based on Treatment Technology **Not** POTW Protection …
  - Metal Finishing Cyanide Limit (40 CFR Part 433)
    - Daily Maximum = 1.2 mg/l
  - Pharmaceutical Cyanide Limit (40 CFR Part 439)
    - Daily Maximum = 33.5 mg/l

- EPA studies determined limits that could be met consistently by well operated and maintained PT system
What Does EPA Say About Local Limits?

From 40 CFR Part 403.8(f)(4): “The POTW shall develop local limits as required in 403.5(c)(1) or demonstrate they are not necessary.”

From 40 CFR Part 122.44(j)(2)(ii): POTWs must provide a written technical evaluation of the need to revise local limits...following [NPDES] permit issuance or reissuance...”

- Local Limits Development Guidance EPA 833-R-022A July 2004
- Local Limits Development Guidance Appendices EPA 833-R-022B July 2004
Maximum Allowable Headworks Loading (MAHL)

**MAHL Calculations**

- **NPDES Permit Limits**
  - CBOD [4 mg/l], Cadmium [2 ppb], Cyanide [5 ppb]
- **State Water Quality Standards**
  - Some more stringent than drinking water standards
- **Sludge Criteria [40 CFR Part 503]**
  - Land Application/Incineration
- **Biological Process Inhibition Criteria**
  - Protect those bugs!

*Choose the most stringent as MAHL in lbs/day*
MAHL to MAIL

- Calculated in Pounds for all Pollutants
  - Determine “Domestic or Uncontrollable” Loading and Subtract from MAHL
  - Determine “Future Growth” Loading and Subtract from MAHL
  - Determine Septage/Hauled Waste Loading and Subtract from MAHL (if applicable)
  - Determine “Safety Factor” and Subtract from MAHL

- What’s Left = Maximum Allowable Industrial Loading [MAIL]
MAIL Allocation Considerations

- MAIL Allocation Method is **very** important decision made by Pretreatment Coordinator
  - Significant economic impacts on regulated community
  - Effect on economic development of municipality
- Method chosen should be best fit for POTW-specific or pollutant specific situation
MAIL Allocation Considerations: Choosing An Allocation Method

- EPA does NOT dictate the allocation method
- Any allocation method can be selected as long as it is:
  - Protective
  - Enforceable
- More than one allocation method can be used
  - Can use different allocation methods for each pollutant
MAIL Allocation Considerations:

- How large is the MAHL and the MAIL?
- How many SIUs discharge the pollutant above domestic concentrations?
  - How much flow is associated with the SIUs?
- How many SIU permits does the POTW issue?
  - How many Categorical SIUs?
- How stringent are the POTW’s NPDES permit limits for that pollutant?
MAIL Allocation Considerations: *Concentration Based Local Limits*

- Local Limits can be concentration or mass based
- Appears Fair on a Concentration Basis
  - Look at the pounds, though!
- No incentive to conserve water
- Be Careful...
  - “I’d like a million gallons at that concentration, please...”
  - If SIU develops ambitious water conservation program, they may conserve themselves into noncompliance
Common Sense Assessment

- Are the limits technologically achievable?
- Can compliance with the limits be determined by the POTW and the SIU?
  - Look at detection limit/PQL
- Do the limits make sense based on actual POTW conditions and compliance history?
- Did you use site-specific data to determine MAHL/MAIL or did you use literature values to determine MAHL/MAIL?
- Suggestion: Review actual POTW influent loading vs. sum of SIU allocations
MAIL ALLOCATION METHODS

Uniform Concentration: 1 POTW
Uniform Concentration: >1 POTW
Industrial User Contributory Flow
Selected Industrial Reductions
Creative Allocation Methods
What You Need Is What You Get (WYNIWYG)
MAIL ALLOCATION METHODS:
Uniform Concentration 1 POTW

- Same pollutant concentration limit applies to every controlled (permitted) discharger
  - Even those that do not discharge the pollutant
- Method prevalent throughout most of the country
- Calculation uses the pounds formula
  - Total flow of permitted dischargers in MGD
  - MAIL in pounds
  - Solve for mg/l
Uniform Concentration Allocation

MAIL = 11.01 pounds NICKEL

ALLOCATE ONE LIMIT BASED ON FLOW FROM ALL SIUs

= 11.01 pounds / (2.65 * 8.34) = 0.5 mg/l

TOTAL FLOW = 2.65 MGD

0.265 MGD

0.529 MGD

0.265 MGD

0.265 MGD

0.794 MGD

0.529 MGD
Uniform Concentration Method: [\(>1\) POTW]

- MAHL and MAIL calculated for each POTW
- Option 1
  - Same (most stringent) Uniform Concentration limit applied to all POTWs
- Option 2
  - Different Uniform Concentrations are applied to each POTW
Uniform Concentration Option 1

ONE (MOST STRINGENT) LIMIT

POTW 2
1.43 mg/l
1.17 mg/l

POTW 3
2.14 mg/l

POTW 1
1.17 mg/l

POTW 4
1.34 mg/l

NICKEL LIMIT
Uniform Concentration Option 1

ONE (MOST STRINGENT) LIMIT
Possible Industrial Expansion

POTW 2
1.43 mg/l
2 New Large Ni Industries

POTW 1
1.17 mg/l
No New Ni Industry

POTW 3
2.14 mg/l
5 New Large Ni Industries

POTW 4
1.34 mg/l
1 New Large Ni Industry
Uniform Concentration Option 1

**PROS**
- No economic advantages to any industry
- Easy to calculate & apply
- Allows for industrial growth in certain areas of the municipality
- Wastewater can be switched from one POTW to another
- Sewer Use Ordinance contains limits that apply to ALL users

**CONS**
- Limits may be overly stringent for some industries
- Inflexible, no consideration given for actual POC discharges
- Overprotection of the POTW
- Can create unnecessary noncompliance
Uniform Concentration Option 2

FOUR DIFFERENT LIMITS

POTW 2
1.43 mg/l

POTW 3
2.14 mg/l

POTW 1
1.17 mg/l

POTW 4
1.34 mg/l
Uniform Concentration Option 2

**PROS**
- Better allocation of the different MAILs
- POTWs not overprotected
- Limits are fair to all SIUs
- Easy to calculate and apply

**CONS**
- Appears to grant economic advantages to SIUs in certain areas and penalize those in others
- Problems arise if WW can be switched from one POTW to another
- More complex to administer with different limits for each pollutant
- Minimal Industrial Growth Allowed
- SUO complex or No Limits in SUO at all
MAIL ALLOCATION METHODS:
Industrial User Contributory Flow

- Similar to Uniform Concentration except.....
- SIUs that discharge at or below the background level are given a background allocation
  - i.e. Counted as domestic/uncontrollable
- Non-contributing SIUs must be held to background concentration or over-allocation may result
  - Be careful about putting background concentration in SIU permit as a limit, though
Industrial User Contributory Flow

(1) Calculate “background” pounds for non-contributing SIUs and subtract from MAIL
(2) Calculate “contributory flow” from SIUs that have a pollutant in their discharges at greater than background levels
(3) Divide MAIL by this contributory flow
(4) New concentration based limit applies ONLY to selected SIUs
(5) Others held to background concentration
Industrial User Contributory Flow

MAIL = 11.01 POUNDS NICKEL

ALLOCATE ONE LIMIT BASED ON FLOW FROM INDUSTRIES THAT DISCHARGE POLLUTANT ABOVE BACKGROUND LEVELS

= (11.01 – 0.44) / (8.34 * 1.588) = 0.80 mg/l

0.05 * 8.34 * 1.059 MGD = 0.44 LBS

CONTRIBUTORY FLOW = 1.588 MGD

0.05 * 8.34 * 1.059 MGD = 0.44 LBS

0.265 MGD

0.529 MGD

0.265 MGD

0.265 MGD

0.529 MGD

0.794 MGD
Industrial User Contributory Flow

**PROS**
- Common discharge limit established for all contributory users
- Limits higher than uniform concentration method
- MAIL apportioned more efficiently only to SIUs discharging the pollutant above background levels
- Unnecessary noncompliance reduced

**CONS**
- Need accurate effluent flow and pollutant data for each SIU
- SUO cannot contain limits
- Permits for contributing facilities contain limits
- Permits for non-contributing facilities should contain reference to back-ground levels
MAIL ALLOCATION METHODS: 
Selected Industrial Reduction

- Used if current headworks loading exceeds the MAIL for a particular pollutant
  - “Over-Allocation” situation

- POTW requires selected SIU(s) to reduce discharge of pollutant on case-by-case basis
  - Typically SIU that has pretreatment and significant loading is the one targeted
  - Proceed with caution when determining new limit
Selected Industrial Reduction

MAIL = 20.0 POUNDS NICKEL/DAY

PRETREATMENT PROGRAM SELECTS CERTAIN INDUSTRIAL USERS TO REDUCE POLLUTANT LOADINGS

ACTUAL IU LOADING = 22.25 POUNDS NICKEL/DAY

0.794 MGD @ 1.66 mg/l (WAS 1.94 mg/l)

0.265 MGD @ 0.05 mg/l

0.529 MGD @ 0.03 mg/l

0.265 MGD @ 0.80 mg/l

0.265 MGD @ 0.10 mg/l

0.265 MGD @ 0.03 mg/l (WAS 1.64 mg/l)

0.529 MGD @ 1.50 mg/l
Selected Industrial Reduction

**PROS**
- Method cost effectively reduces pollutant loadings
- Reductions based on wastewater treatability information
- Technology based limitations may be developed
- Greatest pollution abatement for the least amount of money

**CONS**
- POTW’s method for selecting industries for pollutant reduction will be subject to close examination and involvement by users
- Political pressures
- Requires detailed understanding of each user’s processes and effluent production
## Monthly Average Discharge Limitations in mg/l

<table>
<thead>
<tr>
<th>SIU Range</th>
<th>0 to 10,000 gpd</th>
<th>10,000-20,000 gpd</th>
<th>20,000-30,000 gpd</th>
<th>30,000-40,000 gpd</th>
<th>40,000-200,000 gpd</th>
<th>200,000-400,000 gpd</th>
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</thead>
<tbody>
<tr>
<td>Cadmium</td>
<td>0.5</td>
<td>0.4</td>
<td>0.3</td>
<td>0.2</td>
<td>0.1</td>
<td>0.05</td>
</tr>
<tr>
<td>Chromium</td>
<td>10.0</td>
<td>8.0</td>
<td>6.0</td>
<td>4.0</td>
<td>2.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Copper</td>
<td>10.0</td>
<td>8.0</td>
<td>6.0</td>
<td>4.0</td>
<td>2.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Lead</td>
<td>5.0</td>
<td>4.0</td>
<td>3.0</td>
<td>2.0</td>
<td>1.0</td>
<td>0.5</td>
</tr>
<tr>
<td>Nickel</td>
<td>5.0</td>
<td>4.0</td>
<td>3.0</td>
<td>2.0</td>
<td>1.0</td>
<td>0.5</td>
</tr>
<tr>
<td>Zinc</td>
<td>10.0</td>
<td>8.0</td>
<td>6.0</td>
<td>4.0</td>
<td>2.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Limits for SIUs >400,000 gpd are established on a case-by-case basis.
MAIL ALLOCATION METHODS: “W.Y.N.I.W.Y.G.”

- “What You Need Is What You Get” *(within reason!)*
- Essentially a pollutant trading system with the POTW in complete control of the trades
- Permit Limit Determination
  - Review historical data
  - Determine limit/value that can be met *on a consistent basis*
  - Add a safety factor
“What You Need Is What You Get”

WYNIWYG

- SIU Permit Limits Set on Case-by-Case Basis
- Limits Can Be Based On:
  - SIU Current loading
  - SIU Ability to Pretreat Pollutant
  - Any other technically based factor POTW determines
- Limits Can Be Concentration or Mass-Based
Uniform Concentration vs. WYNIWYG

ALLOCATE ONE CONCENTRATION LIMIT BASED ON FLOW FROM ALL SIUs

= 2.5 pounds Nickel / (0.3 MGD * 8.34) = 1.0 mg/l

TOTAL FLOW = 300,000 gpd
# UNIFORM CONCENTRATION

vs.

<table>
<thead>
<tr>
<th>MAIL = 2.5 lbs Nickel</th>
<th>Industry</th>
<th>Food Processing</th>
<th>Metal Finishing</th>
<th>Textile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge</td>
<td>0.05 mg/l</td>
<td>1.5 mg/l</td>
<td>0.11 mg/l</td>
<td></td>
</tr>
<tr>
<td>Uniform Limit</td>
<td>1.0 mg/l</td>
<td>1.0 mg/l</td>
<td>1.0 mg/l</td>
<td></td>
</tr>
<tr>
<td>2.5 Pounds Ni Permitted</td>
<td>0.834 lbs</td>
<td>0.834 lbs</td>
<td>0.834 lbs</td>
<td></td>
</tr>
</tbody>
</table>
“What You Need Is What You Get”

Determine Site-Specific Nickel Limits Based on Historical Data [plus a safety factor]

<table>
<thead>
<tr>
<th>Limit</th>
<th>Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 mg/l limit</td>
<td>0.05 mg/l</td>
</tr>
<tr>
<td>2.38 mg/l limit</td>
<td>1.5 mg/l</td>
</tr>
<tr>
<td>0.2 mg/l limit</td>
<td>0.11 mg/l</td>
</tr>
</tbody>
</table>

TOTAL FLOW = 300,000 gpd
“What You Need Is What You Get”

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<td>1.5 mg/l</td>
<td>0.11 mg/l</td>
<td></td>
</tr>
<tr>
<td><strong>WYNIWYG Limit</strong></td>
<td>0.1 mg/l</td>
<td>2.38 mg/l (Categorical Std)</td>
<td>0.2 mg/l</td>
<td></td>
</tr>
<tr>
<td>2.23 Pounds Ni Permitted</td>
<td>0.08 lbs</td>
<td>1.98 lbs</td>
<td>0.17 lbs</td>
<td></td>
</tr>
</tbody>
</table>
WYNIWYG Cautions:

- POTW needs to assure that sum of allocated loadings is not > MAIL
  - Must have mechanism to track loading allocated to each IU
  - Compare to MAIL
  - Review actual influent loading at least annually

- POTW should provide for at least background allocation for each pollutant for each IU
**PROS**
- MAIL apportioned more efficiently & representative of actual POTW capacities
- Limits higher than uniform concentration method
- Reduces cost of compliance for most SIUs
- Properly administered, it is technically defensible
- Unnecessary noncompliance reduced

**CONS**
- Complicated and labor intensive method
- Requires detailed tracking system
- Requires detailed support documentation for allocations, esp. new SIU
- Perception of inequitable allocation
- SUO cannot contain limits
WYNIWYG ALLOCATION TABLES

- WYNIWYG “Allocation Table”
  - Includes All Limited Parameters
  - Tracks POTW Loadings
    - SIU Permitted Loadings
    - Uncontrollable [Domestic/Commercial]
    - Available MAHL/MAIL

- Allocation Table submitted with every Pretreatment Annual Report

- Update/Submittal Required with Every Permit Issuance/Modification
WYNIWYG

- Greensboro NC using WYNIWYG for >25 years
- Some permit limits in concentration and some limits in pounds
- Developed after Konica situation and desire to give full Categorical Standards to CIUs
  - Categorical given except for Cd and CN
  - No need to compare LL to Categorical Standards if local limits are applied End of Process
GREENSBORO MAIL ALLOCATION

- Review applicable Categorical Standards
  - Can these limits be applied?
  - Are more stringent limits needed? Cd, CN

- If Categorical Standards Do Not Apply
  - What are the current IU discharge levels?
  - What are the current POTW loadings for that pollutant?
    - <50% MAHL-You get a “Local Pollutant Allocation”
    - >50% MAHL and IU >5%MAHL= PERMIT LIMIT

- Unique to Greensboro
No uniform concentration limits
“Allocations”, not limits for <5% MAHL
Allocations are all mass-based
Allocations based on WYNIWYG
Separate “Local Pollutant Allocation Document” Issued to SIU/IU
Notice of Exceedance, not NOV
Allocation for each pollutant at each SIU/IU, even if at “domestic” values
Sewer Use Ordinance Language

- “POTW Protection Criteria” (not Local Limits)
  - Concentrations listed are slightly >domestic levels
  - Statement that local limits are permit-specific and that MAHL will not be exceeded

- IU wanting to discharge >POTW Protection Criteria concentrations must...
  - Complete Permit application or IWS
  - Obtain written permission from POTW
    - Letter of Acceptance
    - Special Discharge Permit
EXAMPLE

- 40 CFR Part 413 Electroplater <10,000 gpd
  - Zinc plater that does not use cyanide
  - Family owned
  - EPA Categorical Standards have limits for only Cadmium, Lead and Cyanide

- WYNIWYG Local limit for Chromium, Copper, Nickel, Silver and Zinc
  - Receiving POTW has >60% of MAHL left so zinc limit can be very generous
QUESTIONS?

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