

Where Do Pretreatment Permit Limits Come From?

NC-PC Industry Day
November 5, 2025

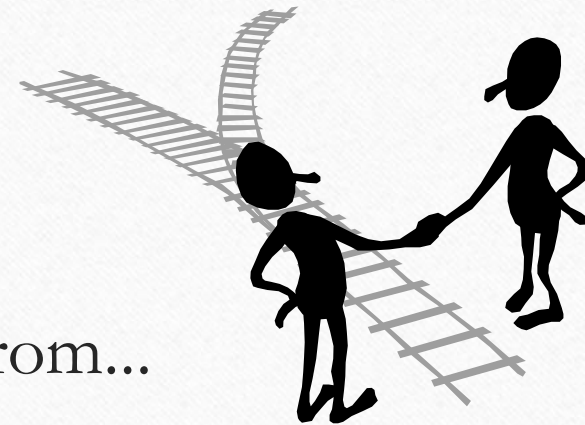


And Most Importantly...

- Are You Meeting Your Current Pretreatment Permit Limits?
- If Not, Can Your Company Participate In Establishing New Pretreatment Permit Limits?

MAYBE.

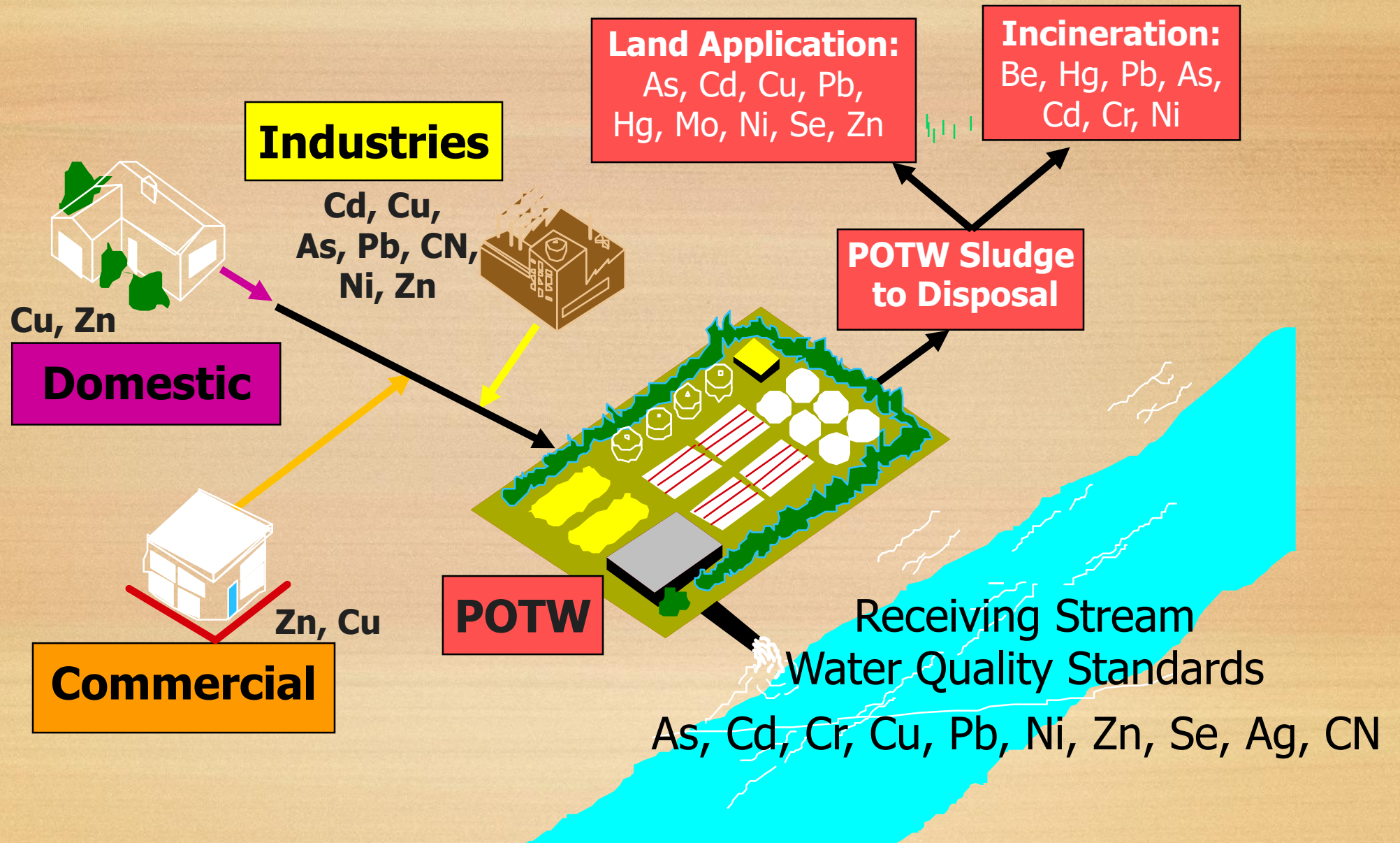
Depending on Where The Limits Came From...



Acronyms/Definitions

- **SIU** - Significant Industrial User [means EPA says “U gotta have a permit”]
- **SNC** - Significant Non-Compliance [means you’re in big trouble and everybody’s gonna know about it]
- **POTW** – Publicly Owned Treatment Works [a.k.a. Wastewater Treatment Plant WWTP]

POTWs and the Environment



Significant Industrial User Definition [SIU]

[40 CFR 403.3]

- *Subject to Federal Categorical Pretreatment Standards; OR*
- *Discharges >25,000 gpd of Process Wastewater; OR*
- *Discharges >5% of POTW permitted flow or organic maximum allowable headworks loading; OR*
- *Designated as such by POTW based on reasonable potential to adversely impact the POTW*

SIU Definition [40 CFR 403.3]

- *Subject to Federal Categorical Pretreatment Standards;*
 - Established by U.S. Environmental Protection Agency for Specific Types of Industries with toxic pollutants
 - National Standards no matter where the SIU is located
 - Removes economic benefit of “city shopping” by new industry

SIU Definition [40 CFR 403.3]

- *Discharges >25,000 gpd of Process Wastewater;*
- Process wastewater does NOT include:
 - Domestic Waste [bathrooms, kitchen, etc.]
 - Non-contact cooling water
 - Boiler blowdown

SIU Definition [40 CFR 403.3]

- *Discharges >5% of POTW permitted flow or organic maximum allowable headworks loading [MAHL];*
- MAHL is maximum POTW influent pollutant loading that can be allowed without causing:
 - NPDES permit violations
 - POTW treatment process upset and/or interference
 - Sludge Criteria Violation or Sludge Contamination

SIU Definition [40 CFR 403.3]

- *Designated as such by POTW based on reasonable potential to adversely impact the POTW*
- Examples:
 - Hospitals
 - Small food processing operation [$<25,000$ gpd] but with high BOD concentrations
 - Facility with history of spills to sewer
 - Industries whose discharge may impact the collection system
 - Landfills

Significant Non-Compliance (SNC)

[40 CFR Part 403.8 (f)(2)(vii)]



- Chronic Violations: $\geq 66\%$ of all values in 6 month period *exceed* permit limit by any magnitude
- Technical Review Criteria [TRC] Violations: $\geq 33\%$ of all values in 6 month period *equal or exceed* permit limit times the TRC value [TRC for Conventional Pollutants =1.4, TRC for toxics =1.2]
- Public Notice in Newspaper Required by EPA

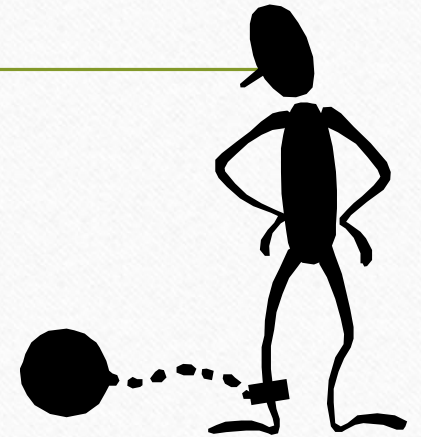
So You're An SIU...

- Now, Where Do Your Significant Industrial User Permit Limits Come From?



Types of Pretreatment Permit Limits

- Prohibited Discharge Standards [40 CFR 403.5]
 - General Prohibitions
 - Specific Prohibitions
- Federal Categorical Pretreatment Standards [40 CFR Parts 405-471]
- Local Limits [Required by 40 CFR 403.8 (f)(4)]



EPA General Prohibitions for All Users

Pass Through

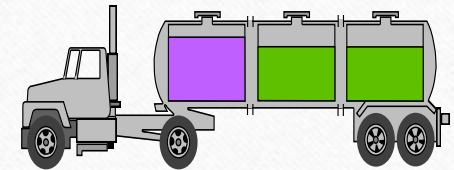
- Discharge which exits the POTW into waters of the United States in quantities or concentrations which...is a cause of a violation of any requirement of the POTW's NPDES permit...

Interference

- Discharge which: inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and therefore is a cause of a violation...of the POTW's NPDES permit or prevention of sludge use or disposal...

EPA Specific Prohibitions

- Fire or Explosion Hazards
- Corrosive Waters [pH < 5.0 units]
- Obstruction of Flow
- Excessive Heat
- Non-biodegradable oils
- Pollutants resulting in toxic gases, vapors or fumes
- Trucked/hailed wastes except at POTW designated sites



Federal Categorical Pretreatment Standards

- Published in Federal Register in 40 CFR Parts 405 - 471
- Local POTW Can Be More Stringent, but CANNOT make Federal Categorical Standards More Lenient
- Limits Based on Treatment Technology [Not POTW Protection]

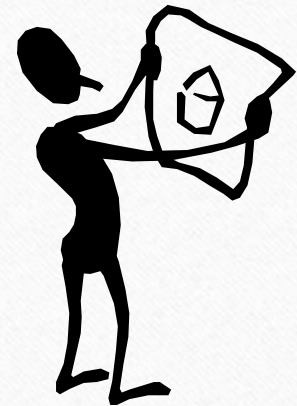
Federal Categorical Pretreatment Standards

- Based on Treatment Technology NOT POTW Protection or “Equal Treatment”
 - Cyanide Limit for Metal Finishing [40 CFR Part 433]
 - Daily Maximum = 1.2 mg/L
 - Cyanide Limit for Pharmaceutical Mfg [40 CFR Part 439]
 - Daily Maximum = 33.5 mg/L



Federal Categorical Pretreatment Standards

- Numerical Limits: Daily Maximum and Monthly Average
 - Concentration Based [mg/L or ppm]
 - Mass-Based [pounds]
 - Production Based [pounds of pollutant per pounds of products]
- Management Plans/Certifications
 - Toxic Organic Management Plan [TOMP]
 - Pollutant Management Plan [PMP]
 - Pollutant Certifications
- Zero Discharge



Industries Subject to Federal Categorical Pretreatment Standards

- 40 CFR Part 413 – Electroplating
- 40 CFR Part 414 - Organic Chemicals, Plastics & Synthetic Fibers
- 40 CFR Part 415 - Inorganic Chemicals
- 40 CFR Part 417 - Soaps and Detergents
- 40 CFR Part 418 - Fertilizer Manufacturing
- 40 CFR Part 419 - Petroleum Refining
- 40 CFR Part 420 - Iron and Steel Manufacturing
- 40 CFR Part 421 - Nonferrous Metals

Industries Subject to Federal Categorical Pretreatment Standards

- 40 CFR Part 423 - Steam Electric Power Generating
- 40 CFR Part 425 - Leather Tanning
- 40 CFR Part 430 - Pulp, Paper & Paperboard
- 40 CFR Part 432 - Meat Products
- 40 CFR Part 433 - Metal Finishing
- 40 CFR Part 437 - Centralized Waste Treatment
- 40 CFR Part 439 - Pharmaceutical Manufacturing

Industries Subject to Federal Categorical Pretreatment Standards

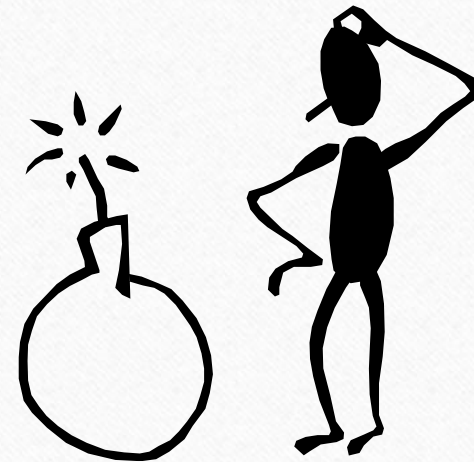
- 40 CFR Part 442 - Transportation Equipment Cleaning
- 40 CFR Part 443 - Paving and Roofing Materials
- 40 CFR Part 446 - Paint Formulating
- 40 CFR Part 447 - Ink Formulating
- 40 CFR Part 455 - Pesticide Chemicals
- 40 CFR Part 458 - Carbon Black Manufacturing
- 40 CFR Part 461 - Battery Manufacturing

Industries Subject to Federal Categorical Pretreatment Standards

- 40 CFR Part 464 - Metal Molding and Casting
- 40 CFR Part 465 - Coil Coating
- 40 CFR Part 466 - Steel Basis Material
- 40 CFR Part 467 - Aluminum Forming
- 40 CFR Part 468 - Copper Forming
- 40 CFR Part 469 - Electrical and Electronic Components
- 40 CFR Part 471 - Nonferrous Metals Forming & Metal Powders

Local Limits

- Established by POTW to Prevent:
 - Pass Through and Interference
 - Sludge Contamination
 - Worker Health Hazards
 - NPDES Permit Violations
- Address POTW-Specific Concerns
- Development Unrelated to Categorical Pretreatment Standards



Why Are Local Limits Needed?

- Federal Categorical Standards May Not Adequately Protect POTW
 - collection system
 - sludge quality
 - personnel
- Federal Categorical Standards Do Not Address All Contributed Pollutants
- Federal Categorical Standards Do Not Regulate All Significant Industrial Users

How Are Local Limits Determined?

■ Collect Data from:

— POTW

- Influent and Effluent
- Treatment Unit Processes
- Activated Sludge [Microorganisms]
- Sludge to Disposal

— Industrial Users

— Domestic/Commercial Sources



How Are Local Limits Determined?

EPA 15 Required “Pollutants of Concern” (POCs)

Arsenic	Lead	Silver
Cadmium	Mercury	Zinc
Chromium	Molybdenum	BOD ₅
Copper	Nickel	TSS
Cyanide	Selenium	Ammonia

Other “Local” Pollutants of Concern

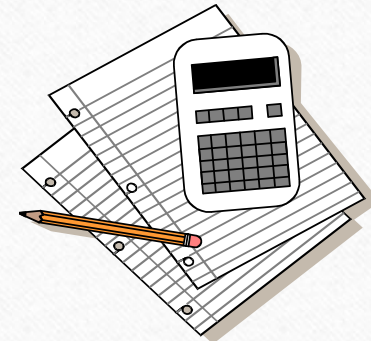
Identify All Limiting Criteria



- NPDES Permit Limits - Some depend on size of POTW receiving stream
- Water Quality Standards - Some more stringent than drinking water limits
- Sludge Criteria - Land Application/Incineration/Surface Disposal
- Activated Sludge Inhibition Criteria (Protect those bugs!)
- Collection System Problems (Sanitary Sewer Overflows, Corrosion, Hazardous Gases)

Calculate/Determine: For Each Pollutant of Concern

- POTW Removal Rates
- Accumulation Rate in Sludge
- Activated Sludge Inhibition Concentration
- Maximum Allowable Headworks Loading for:
 - NDPES Permit Compliance
 - Sludge Compliance
 - Biological Process Inhibition
- *Must Choose Most Stringent of the 3 Loading Values*



Maximum Allowable Headworks Loading (MAHL)

- Calculated in Pounds for all Pollutants of Concern
- Determine “Domestic or Uncontrollable” Loading and Subtract from MAHL
- Determine “Future Growth” Loading and Subtract from MAHL
- Determine “Safety Factor” and Subtract from MAHL
- What’s Left = **Maximum Allowable Industrial Loading [MAIL]**

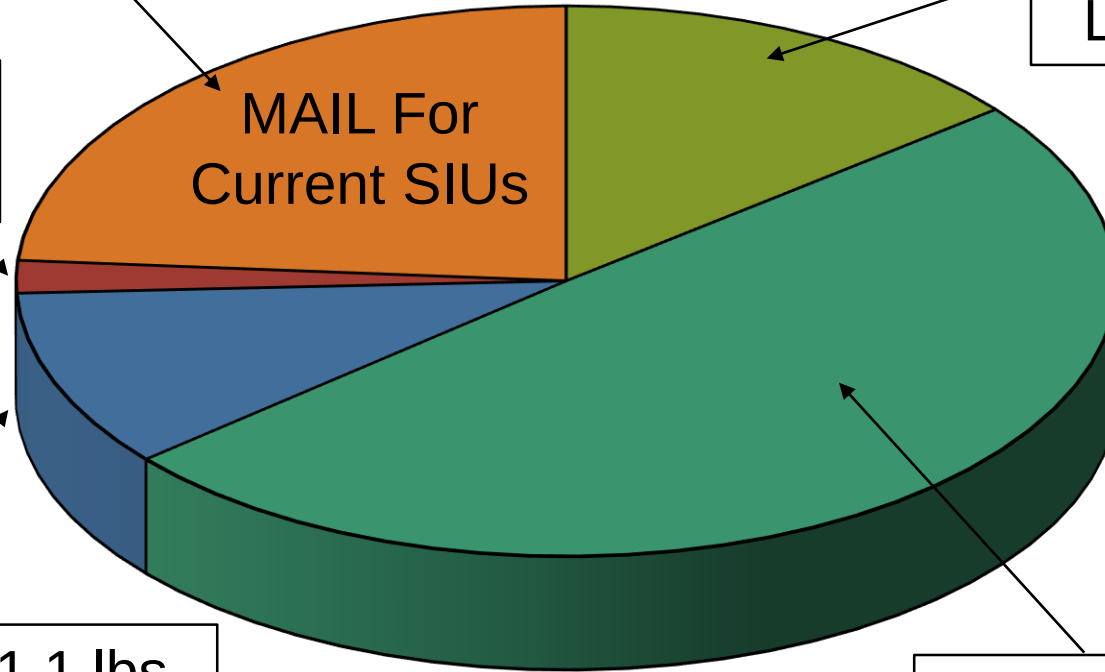
Example: MAHL Loading Distribution

NICKEL MAHL = 10.5 pounds

Allowable Industrial
Loading = 2.5 lbs

- Hauled Waste
Loading = 0.2 lbs

- Safety Factor = 1.1 lbs
(EPA recommends 10%)



- Current Uncontrollable
Loading = 1.5 lbs

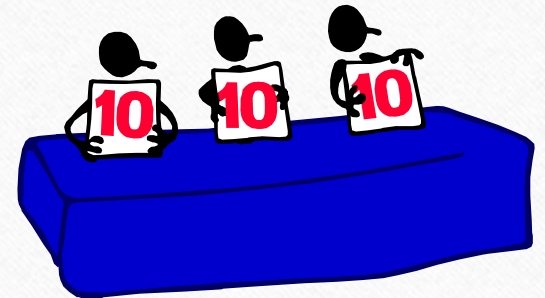
- Future Growth = 5.2 lbs

“MAIL” Allocation Methods

- **Uniform Concentration Limit for All Industrial Users**
- Uniform Concentration Limit for Only Contributing Industrial Users
- **“WYNIWYG” - What You Need Is What You Get**
- Selected Industrial Reductions Based on Treatability

Local Limits: Uniform Concentration Method by POTW

- Permit Issuance a Breeze – Just Xerox ‘em!
- Appears Fair on a Concentration Basis [Look at the pounds, though!]
- Be Careful...
 - If SIU develops an ambitious water conservation program, they may “conserve” themselves right into noncompliance
 - “I’d like a million gallons at that concentration, please.”

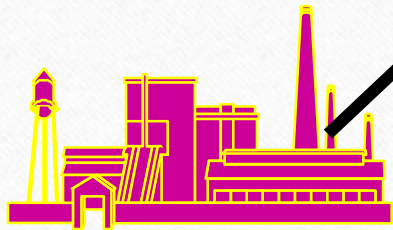


Uniform Concentration Calculation

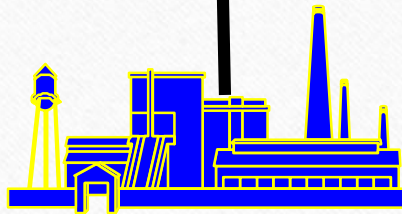
Allocate Same Concentration Limit
Based on Flow From All SIUs

$$= 2.5 \text{ pounds Nickel} / (0.3 \text{ MGD} * 8.34) = 1.0 \text{ mg/l}$$

TOTAL FLOW = 300,000 gpd



0.10 MGD

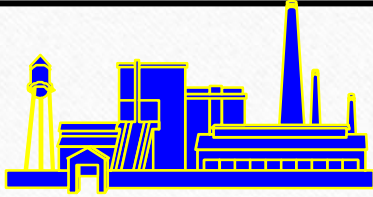
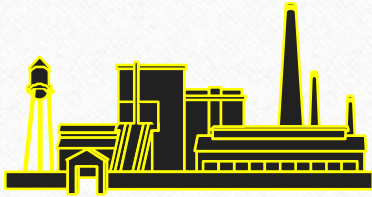


0.10 MGD



0.10 MGD

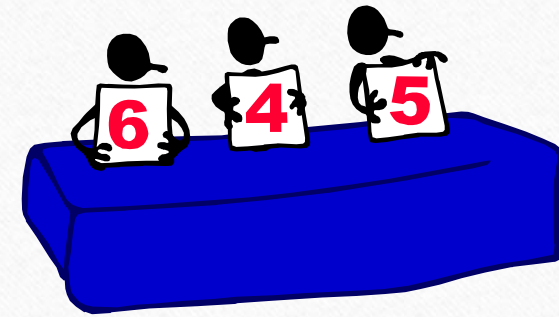
Uniform Concentration Method

MAIL = 2.5 lbs Nickel			
Industry	Food Processing	Metal Finishing	Textile
Discharge	0.05 mg/l	1.5 mg/l	0.11 mg/l
Uniform Limit	1.0 mg/l	1.0 mg/l (\$\$\$\$\$)	1.0 mg/l
2.5 Pounds Ni Permitted	0.834 lbs	0.834 lbs	0.834 lbs

Local Limits:

“W.Y.N.I.W.Y.G.” Method by POTW

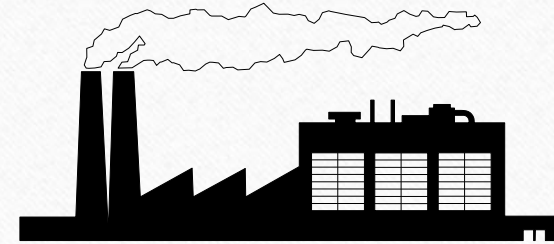
- Much more labor intensive at permit issuance and permit renewal time
 - Every permit is unique
 - Must understand process discharge
- May appear “unfair” on the surface
- No “false capacity” tied up at POTW
- WYNIWYG limits can be mass-based or concentration-based
- Most NC Cities use WYNIWYG



WYNIWYG Allocation Method by POTW

■ *New SIU*

- Is process Categorical?
 - If yes, determine required pollutants for limits
 - All parameters in regulation must have a limit
- Review SIU Effluent Data from Application
 - Is the data estimated or from a “sister” facility in another town?
 - Determine pollutant concentrations *that can be met on a consistent basis*
 - Issue specific permit limits [with a safety factor] for all pollutants of concern



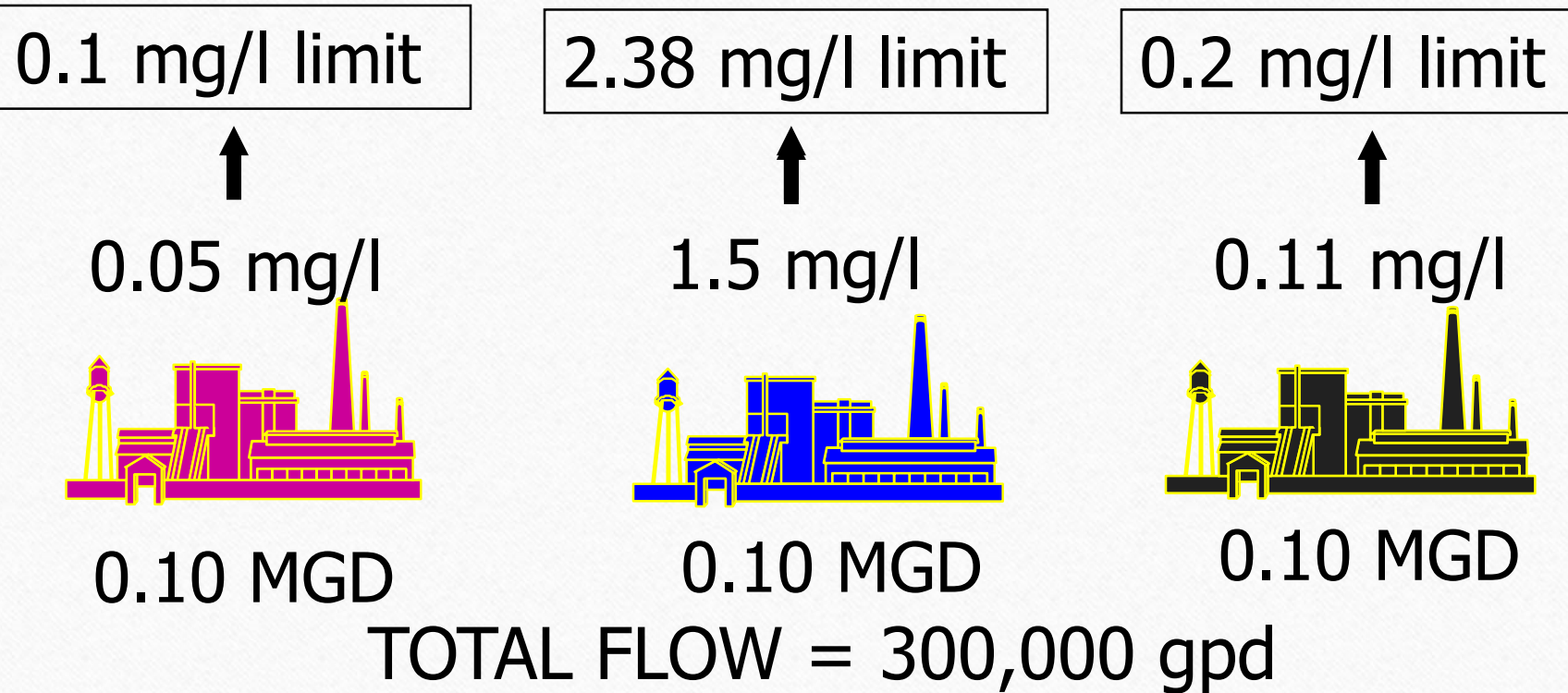
WYNIWYG Allocation Method by POTW

■ *Existing SIU*

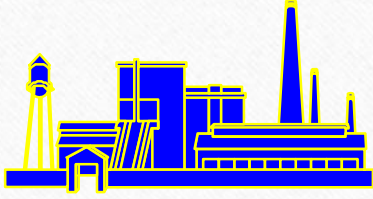
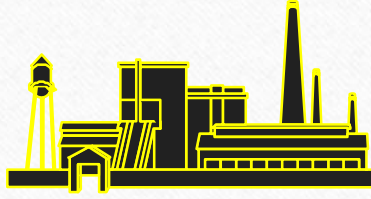
- Review Historical SIU Effluent Data [POTW data and self-monitoring data]
- Review compliance history and Determine cause of any non-compliance [e.g. spill, etc.]
- Determine pollutant concentrations *that can be met on a consistent basis*
- Issue specific permit limits [with a safety factor] for all pollutants of concern

“WYNIWYG” Determination

Determine Site-Specific Limits Based on
Historical Data (plus a safety factor)



“What You Need Is What You Get”

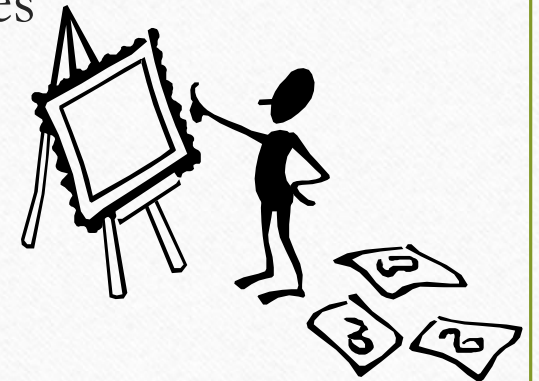
MAIL = 2.5 lbs Nickel			
Industry	Food Processing	Metal Finishing	Textile
Discharge	0.05 mg/l	1.5 mg/l	0.11 mg/l
WYNIWYG Limit	0.1 mg/l	2.38 mg/l (Categorical Std)	0.2 mg/l
2.23 Pounds Ni Permitted	0.08 lbs	1.98 lbs	0.17 lbs

Allocation Table Tool

- NCDEQ Developed a Required Allocation Table for Use by POTWs
 - Data Input: SIU Permit Limits, SIU Flows, POTW Pollutant MAHLs
 - Calculates SIU Permitted Loading (in pounds)
 - Calculates Uncontrollable Loading [Domestic/Commercial]
 - Tracks POTW Pollutant Loadings - Available MAHL/Available MAIL
- In NC, Update/Submittal of AT is Required with Every Permit Issuance or Permit Modification and Pretreatment Annual Report
 - NCDEQ can object to an SIU Permit if there is no available pollutant loading

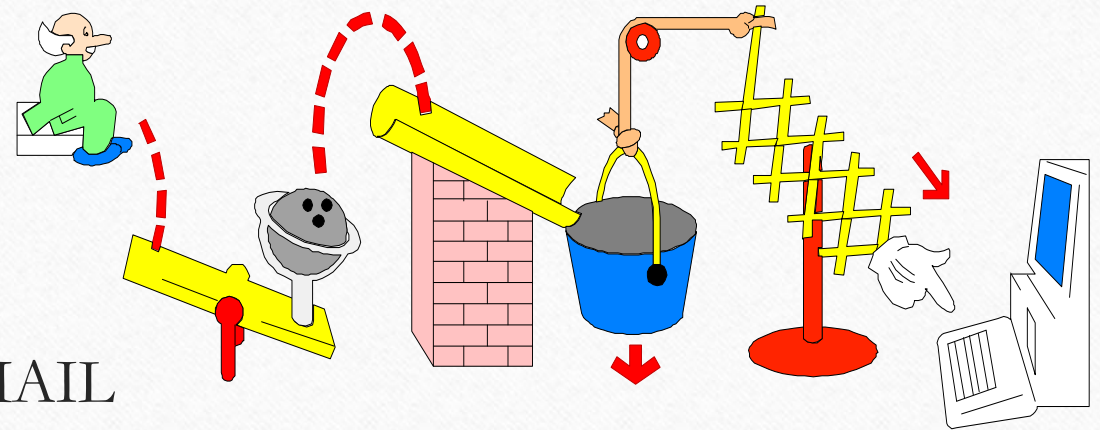
Why Are Local Limits Revisited/Revised?

- Changes in POTW NPDES Permit Limits
- Changes in Sludge Disposal Methods
- Contributing Industries Exceed Maximum Allowable Industrial Load
- POTW Loading Changes Result in Lower Removal Efficiencies
- Additional New Industrial Loading
- Chronic POTW NPDES Permit Violations



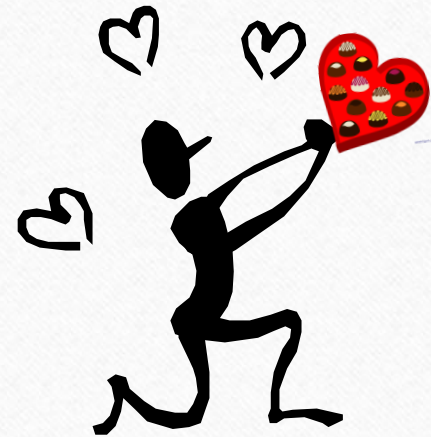
How Can an Industry Get Involved?

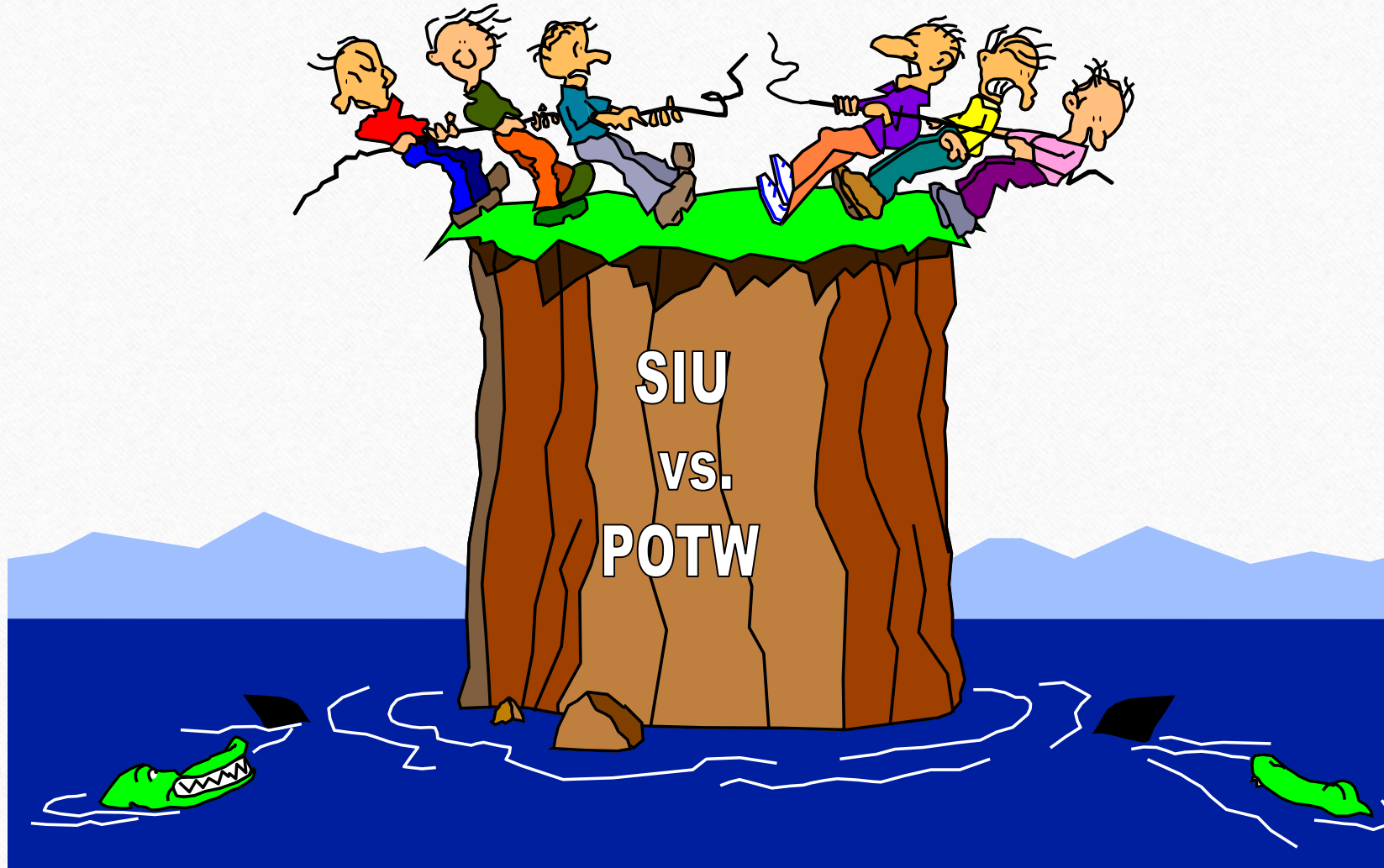
- Know your process and your pollutant loadings
- Know your POTW
 - Compliant?
 - Noncompliant? Which pollutants?
 - Do YOU discharge those pollutants?
- Know how your POTW Allocates MAIL
 - Uniform Concentration for IUs?
 - WYNIWYG?



Ask POTW Where Your Limits Came From (Nicely)

- Source of Each Permit Limit is in “Permit Fact Sheet” Sent to State
 - EPA General/Specific Prohibitions?
 - Smile, Say Thank You and Leave
 - Categorical Standards?
 - Smile, Say Thank You and Leave
 - Local Limits?
 - Smile, offer chocolate and stay for a chat...





Where are we going...and why are we in this handbasket?