PRETREATMENT 101 - TYPICALVILLE

An Introduction to Pretreatment

September 2023

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Department of Environmental Quality

Today's Presentation

- Goals of Pretreatment
- History of Pretreatment Program
- Pretreatment in North Carolina
- The Program
  - Major program elements
  - Files
  - Inspections / Guidance / Training
  - Summary and Contacts

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Acronyms

- AT- Allocation Table
- BOD- Biological Oxygen Demand
- CIU- Categorical Industrial User
- COD – Chemical Oxygen Demand
- DENR/NCDEQ- Department of Environmental Quality
- DMR- Discharge Monitoring Report
- DWR- Division of Water Resources
- EPA-Environmental Protection Agency
- ERP- Enforcement Response Plan
- HWA- Headworks Analysis
- IU- Industrial User
- IUP- Industrial User Permit
- IWS- Industrial Waste Survey
- LL- Local Limit
- LTMP- Long term monitoring plan
- MAHL- Maximum Allowable Headworks Loading
- MAIL- Maximum Allowable Industrial Loading
- MGD- Million gallons per day
- NCAC- North Carolina Administrative Code
- NCGS- North Carolina General Statute
- NPDES- National Pollutant Discharge Elimination System
- NSCIU – Non-Significant Categorical Industrial User
- OCPSF- Organic chemicals, plastics and synthetic fibers
- PAR-Pretreatment Annual Report
- POC- Pollutant of Concern
- POTW- Publicly Owned Treatment Works
- QNCR- Quarterly noncompliance report
- RPA- Reasonable potential analysis
- SIU- Significant Industrial User
- SNC- Significant noncompliance
- STMP- Short term monitoring plan
- SUO- Sewer Use Ordinance
- TMDL- Total Maximum Daily Load
- TOC – Total Organic Carbon
- WQS- Water Quality Standard
- WWTP- Wastewater Treatment Plant

What's the Purpose of the Pretreatment Program?

- Prevent **Pass Through**
  - clean rivers, groundwater, and land
  - compliance with NPDES+sludge limits
- Prevent **Interference**
  - properly functioning + compliant wastewater treatment plants (WWTPs) and sewer collection systems
- Promote the beneficial use of biosolids
  - good sludge for land application or composting
- Protect Worker Health and Safety

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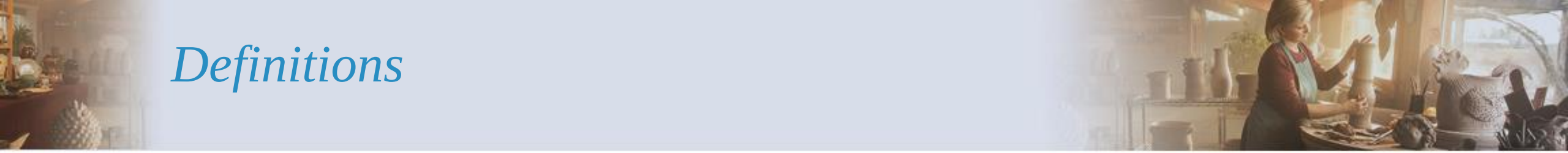

Definitions

- **Pass through** (40 CFR Part 403.3(p)) (PDF)(4 pp, 192 K) – "A discharge that exits the POTW into waters of the United States in quantities or concentrations that, alone or in conjunction with a discharge or discharges from other sources, is a *cause of a violation of any requirement of the POTW's NPDES [National Pollutant Discharge Elimination System] permit* (including an increase in the magnitude or duration of a violation)."
- **Interference** (40 CFR Part 403.3(k)) (PDF)(4 pp, 192 K) – "A discharge that, alone or in conjunction with a discharge or discharges from other sources, both *(1) inhibits or disrupts the POTW*, its treatment processes or operations, or its sludge processes, use, or disposal; and *(2) therefore is a cause of a violation* of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any state sludge management plan prepared pursuant to subtitle D of the SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act."

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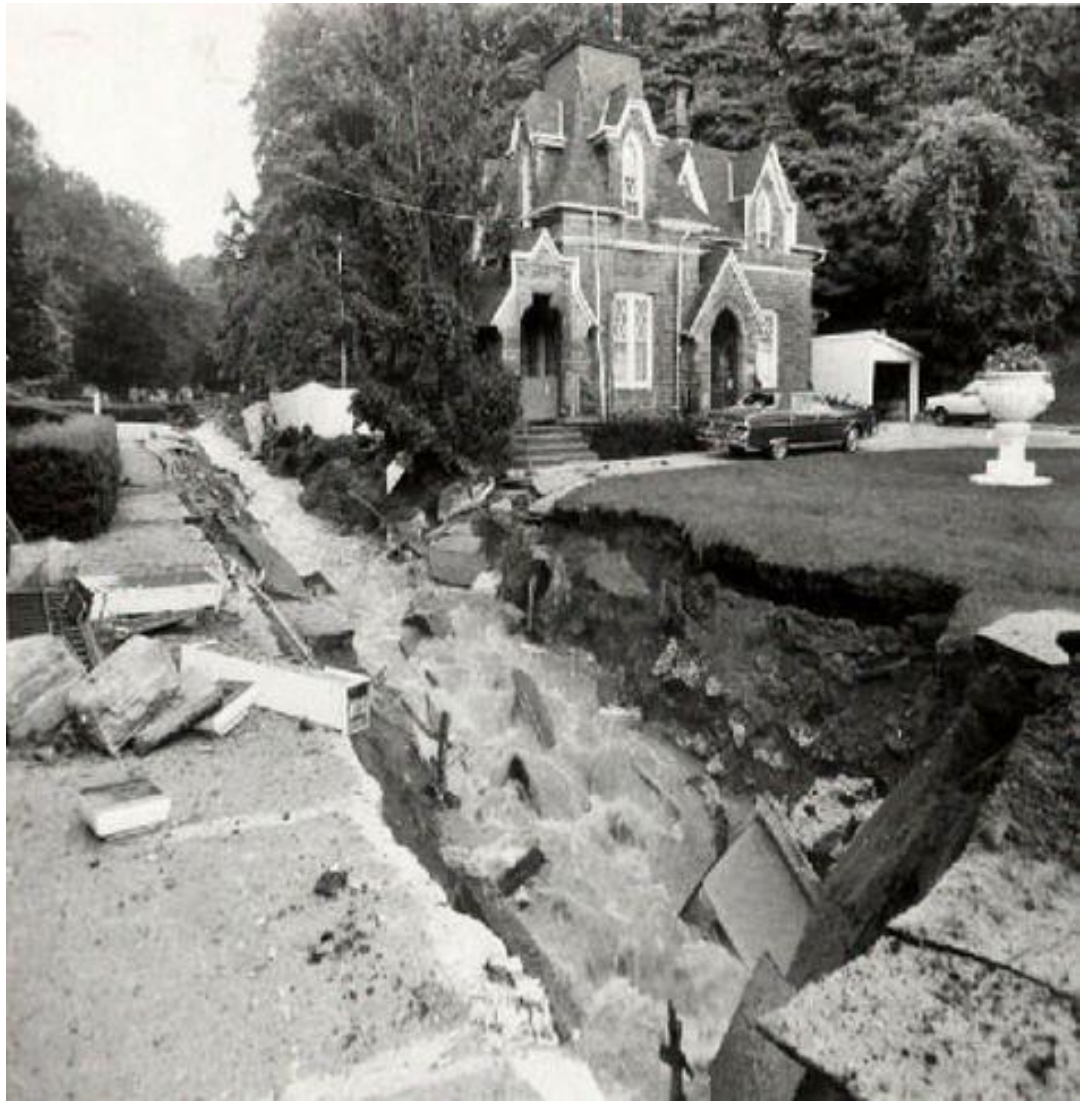
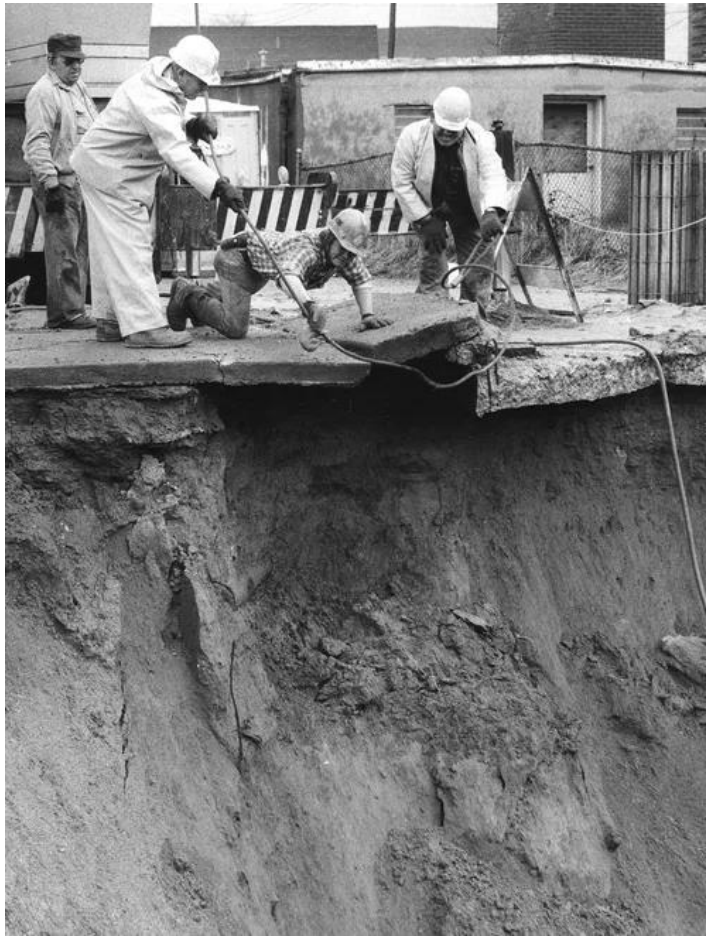
Louisville Kentucky : Sewer explosions



February 13th, 1981

Ignition of hexane in the sewer line
~10,00 liters of hexane was illegally discharged by a soybean processing plant
13 miles of sewer line destroyed
Explosions from 5am-4pm, 20 blocks evacuated
4 people injured
23,000 people suffered from water and sewage service disruption
$18 million paid to Louisville Metropolitan Sewer District ($60 million in 2023), even more to various lawsuits, the city, and the public
Repairs took over 2 years

Louisville Kentucky



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Louisville Kentucky

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Louisville Kentucky Sewer Explosion

This disaster occurred over 2 years after 40 CFR 403 General Pretreatment Regulations for Existing and New Sources of Pollution was implemented.

Pretreatment Program History

- 1972 - Clean Water Act
- 1978 - Federal Pretreatment regulations established (40 CFR Part 403)
- 1982 - EPA approval of the NC PT Program
- 1983/84 - Majority of NC POTW Pretreatment Programs approved
- 1987-90 - Major revision to NC and Federal pretreatment regulations
- 2005 - EPA Streamlining of the Pretreatment Program
- 2011 - Revision to NC pretreatment regulations and model SUO
- 2019 - Additional revisions to the NC Pretreatment Rules

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Develop and Implement the "Right" Pretreatment Program

Creating a Pretreatment Program that:

- Protects the POTW
- Is Environmentally sound
- Is Technically feasible
- Is Judicially defensible
- Is Financially sound

There is a delicate balance between these goals and protecting the POTW!

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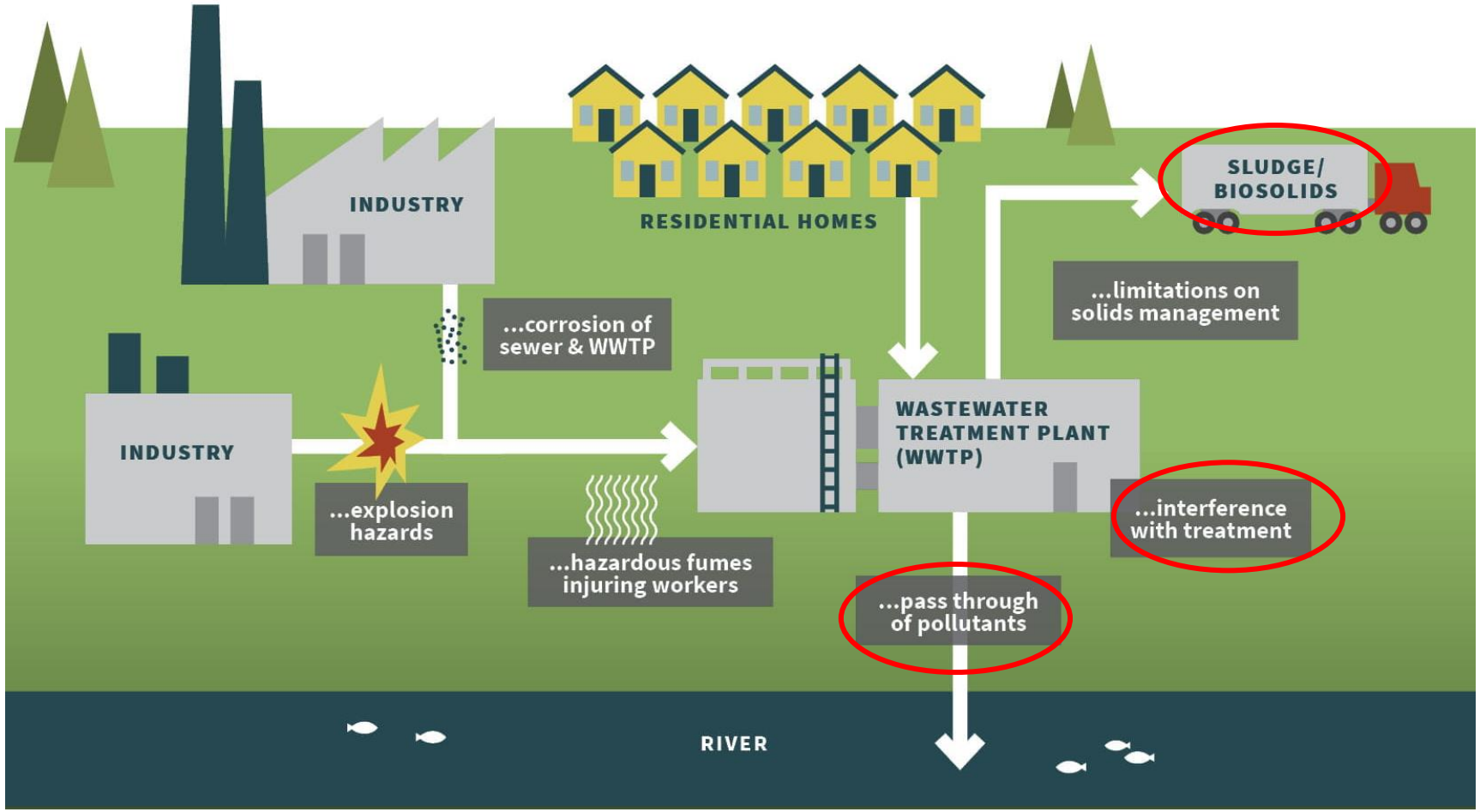
TYPICALVILLE



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Pretreatment Laws and Regulations

- Federal Clean Water Act
- Federal General Pretreatment Regulations
  - CFR = Code of Federal Regulations
  - 40 CFR 403

The EPA Pretreatment Program has regular trainings, publications, etc. (click here to sign up for the mailing list)

- North Carolina Administrative Code (NCAC)
  - 15A NCAC 02H .0900 – Local Pretreatment Programs

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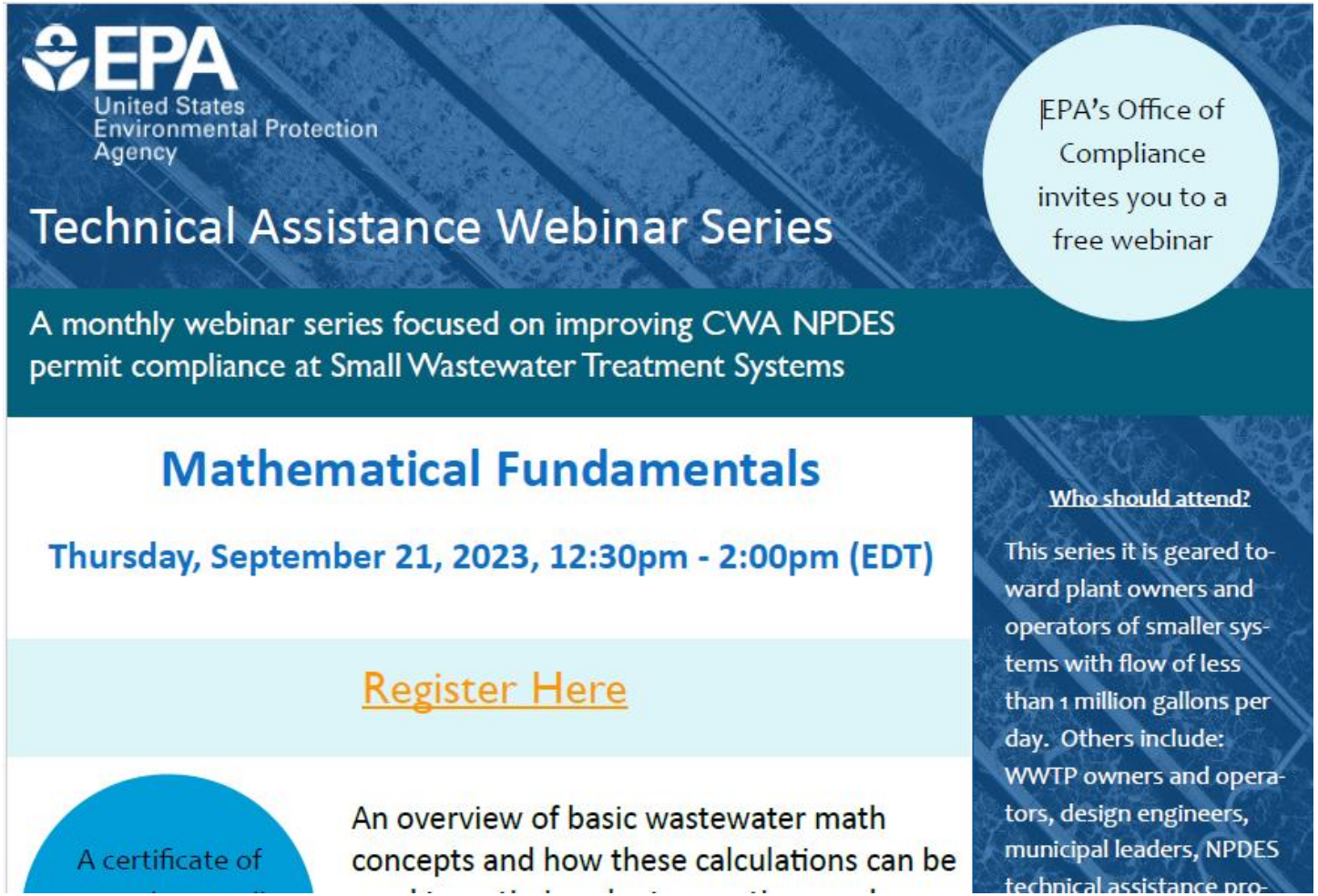
Pretreatment Laws and Regulations



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Pretreatment Laws and Regulations

- North Carolina Administrative Code (NCAC)
  - 15A NCAC 02H .0900 – Local Pretreatment Programs

SECTION .0900 - LOCAL PRETREATMENT PROGRAMS

15A NCAC 02H .0901 PURPOSE

(a) The rules in this Section are designed to implement North Carolina General Statutes 143-215.3(a)(14) and 143-215.1 and provisions of the Federal Water Pollution Control Act (also known as the "Clean Water Act" or "CWA") regarding the discharge of non-domestic wastewater into publicly owned treatment works (POTWs). They establish responsibilities of state and local government, industry, and the public to implement pretreatment standards to control pollutants that pass through or interfere with treatment processes in POTWs, may contaminate sewage sludge, or otherwise have an adverse impact on the POTW, its workers, or the environment.

(b) Copies of rules and regulations referenced in this Section may be obtained from the Division of Water Resources, Water Quality Permitting Section, free of charge, at the following locations:

(1) http://deq.nc.gov/about/divisions/water-resources/water-resources-permits/percs/pretreatment-permits; and

(2) the North Carolina Department of Environmental Quality, Division of Water Resources Offices of the Pretreatment, Emergency Response, and Collection Systems (PERCS) Unit
Physical Address: Archdale Building, 512 N. Salisbury St.
Raleigh, N.C. 27604
Mailing Address: 1617 Mail Service Center
Raleigh, N.C. 27699-1617.

Got Pretreatment?

- Publicly Owned Treatment Works (POTWs) required to have a Pretreatment Program if process wastewater from Significant Industrial User (SIU) is accepted
  - POTW = city, town, county, Sanitary District, Sewer Authority
  - federally owned are exempt

Reference: NPDES Permit, PART IV SPECIAL CONDITIONS FOR MUNICIPAL FACILITIES

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Got Pretreatment?

- What is a SIU?

- To understand this, first learn -
  - What is an IU?
  - What is a Pretreatment Program supposed to do?
- User
  - "Person" that uses the sewer collection system, as in discharges into it
- Industrial User (IU).
  - broadly intended to cover any User of the collection system (and WWTP) that is not a house
    - maybe even some houses, too, for example someone doing large amounts of commercial cooking in their home

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What is a Significant Industrial User (SIU)?

- An IU with the potential to cause
  - **Pass Through** (NPDES problems)
  - **Interference** (collection system problems and inhibition)
  - Bad biosolids
  - Poor Worker Health and Safety
- i.e., goals of Pretreatment Program

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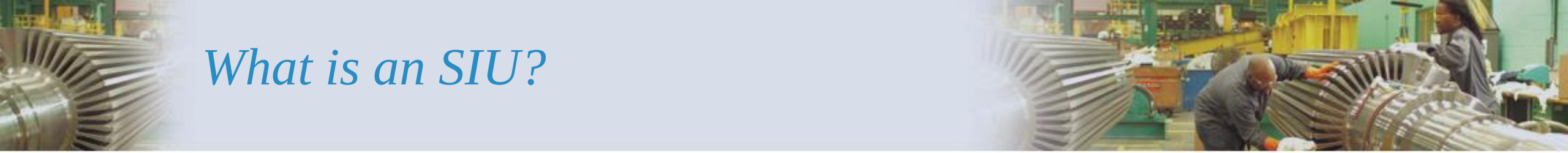


What is an SIU?

Significant Industrial User –
15A NCAC 2H .0903(b)(33)

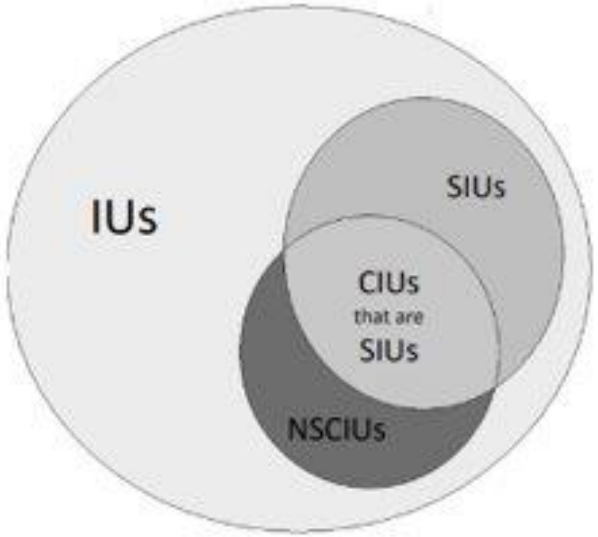
- **>25,000 gal/day of process wastewater**
- **>5% Maximum Allowable Headworks Loading (MAHL)** i.e., WWTP treatment capacity for BOD, TSS, NH3
- covered under Federal Categorical Pretreatment Regulations as a CIU
- any facility which the Control Authority or DWR believes has the potential to adversely impact the POTW

Typically:

- large manufacturing facilities

What's a CIU?

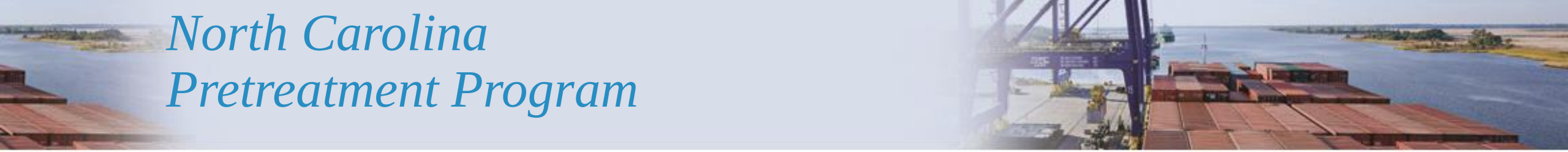
- CIU = Categorical Industrial User
  - Self-Implemented
- A subset of SIUs (all CIUs are SIUs)
- a SIU that is covered by a specific Federal Categorical Regulation, for example:
  - metal finisher (40 CFR 433)
  - Pharmaceutical (40 CFR 439)



What's a non-SIU?

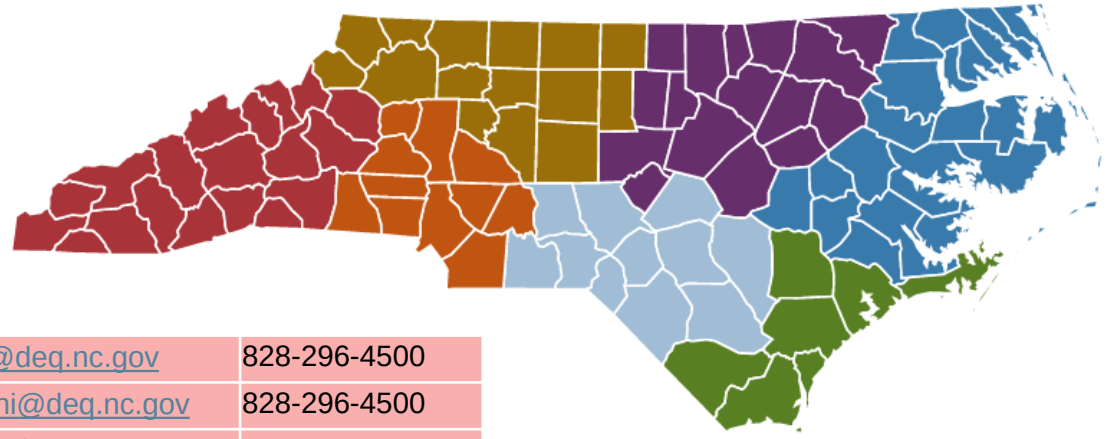
- IU that is not a SIU
- may or may not be issued a local IUP or other individual control mechanism
- Industrial, Commercial, or Institutional (ICI) entity
  - Examples:
    - Dental office
    - Car wash
    - Paint line without metal finishing

North Carolina Pretreatment Program



- 113 Active Pretreatment Programs
- Over 200 local POTW Pretreatment Coordinators and consultants
- DWR/NC DEQ
  - Pretreatment Staff in NPDES Municipal Permitting Unit
  - 7 Regional Offices' DWR Staff
  - Other Division of Water Resources (DWR) and Dept of Environmental Quality (DEQ) staff interaction

Pretreatment Regional Staff



Red: Asheville Regional Office

Orange: Mooresville Regional Office

Brown: Winston-Salem Regional Office

Purple: Raleigh Regional Office

Light Blue: Fayetteville Regional Office

Green: Wilmington Regional Office

Blue: Washington Regional Office

ARO	Daniel Boss	daniel.boss@deq.nc.gov	828-296-4500
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NC - Full Program versus Modified Program

- Modified Program - 32 Programs
  - POTW combined permitted flow of 2 MGD or less AND have 3 or less SIUs
  - DWR determines who qualifies
  - Short Term Monitoring Plan (STMP)
    (quarterly for 1 year every 5 years)
  - submit slightly smaller Pretreatment Annual Report (PAR)
- Full Program - 79 Programs
  - Long Term Monitoring Plan (LTMP) (on-going)
  - Full Pretreatment Annual Report (PAR) Required

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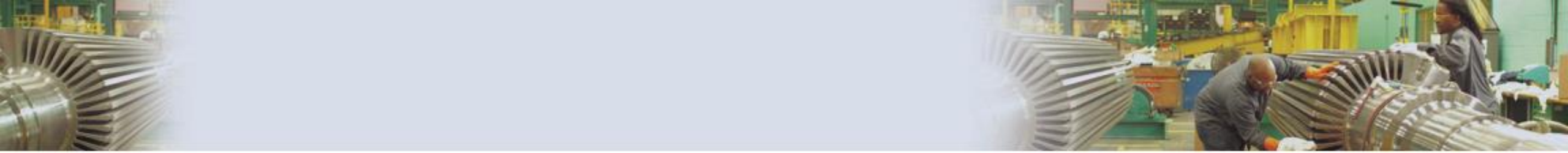
NC Pretreatment Program 2023

In 1995, NC had 1220 SIUs which was 10% of all US SIUs. 600 were Textiles

SIU COUNT	603
Total Program Count	113
Full Programs	79
Modified Programs	32
Inactive Programs	1
Dev. Programs	3



NC DEQ Website

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Divisions ▾ Permits & Rules ▾ Outreach & Education ▾

About > Divisions > Water Resources > Permitting > Municipal: NPDES, Pretreatment and Collection System > **Pretreatment**

Pretreatment

The Federal and State Pretreatment Program gives regulatory authority for EPA, states, and municipal governments to control the discharge of industrial wastewater into municipal Wastewater Treatment Plants (WWTPs) or Publicly Owned Treatment Works (POTWs). The objectives of the Pretreatment Program are to prevent pass-through, interference, or other adverse impacts to the POTW, its workers or the environment; to promote the beneficial reuse of biosolids, and to assure that all categorical pretreatment standards are met. There are over 600 Significant Industrial Users (SIUs) who discharge industrial wastewater to more than 100 POTWs throughout the State of North Carolina.

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Division of Water Resources (DWR) Responsibility

- DWR is Approval Authority
  - Delegate DWR's responsibilities for Industrial Users under General Statutes to POTW.
  - Approve POTW's Pretreatment Program, including review of each element and Industrial User Pretreatment Permit (IUP).
  - Compliance judgment and enforcement for failure to implement Pretreatment Program
  - Training and Support

POTW Responsibility

- POTW is Control Authority
  - POTW is permittee of Approval Authority (DWR)
  - Develop and Implement DWR approved Pretreatment Program
  - Control Industrial Users through Industrial User Pretreatment Permits (IUP) and Sewer Use Ordinance (SUO)
  - Perform compliance judgment and take enforcement against IUs for failure to comply with IUP and SUO

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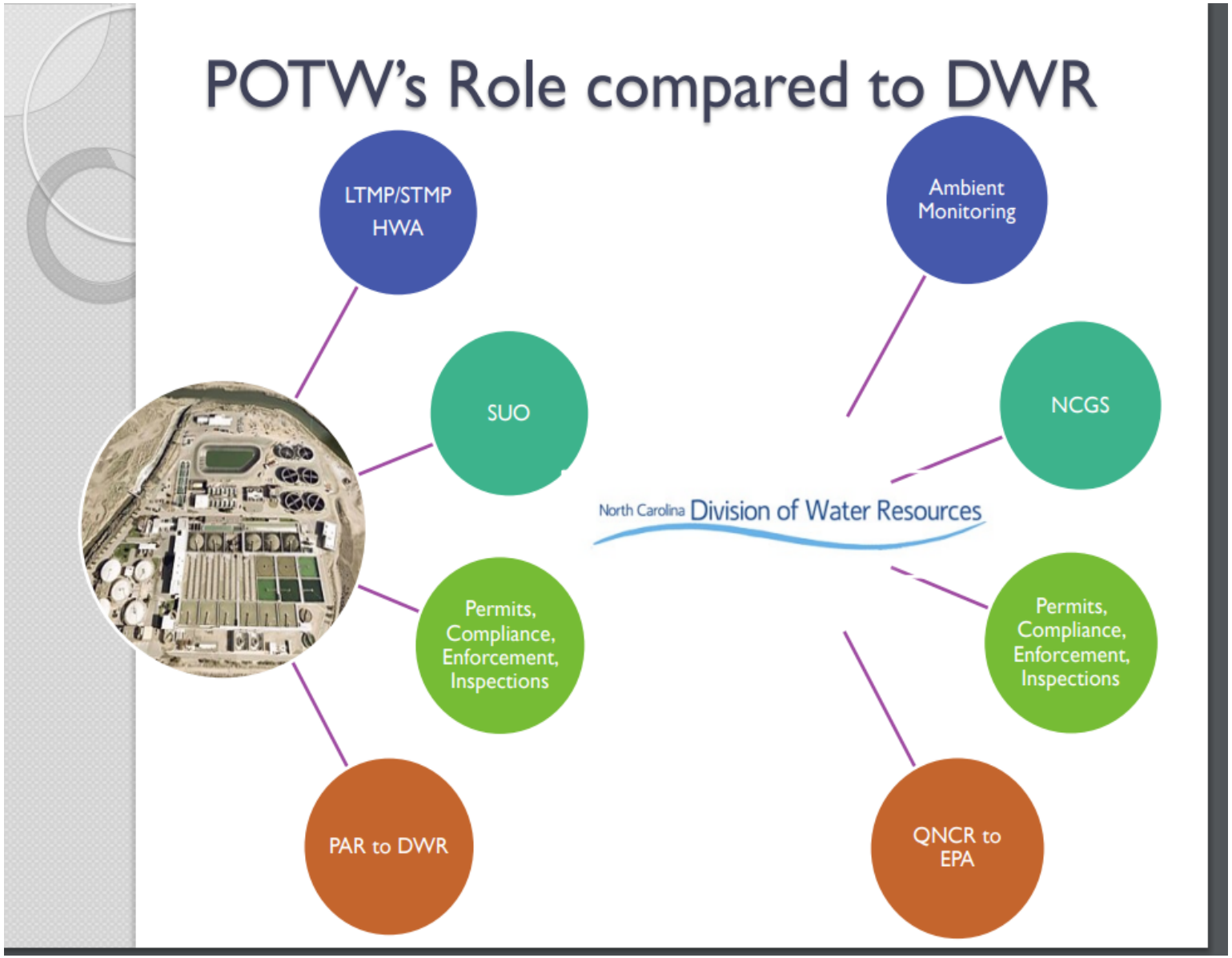
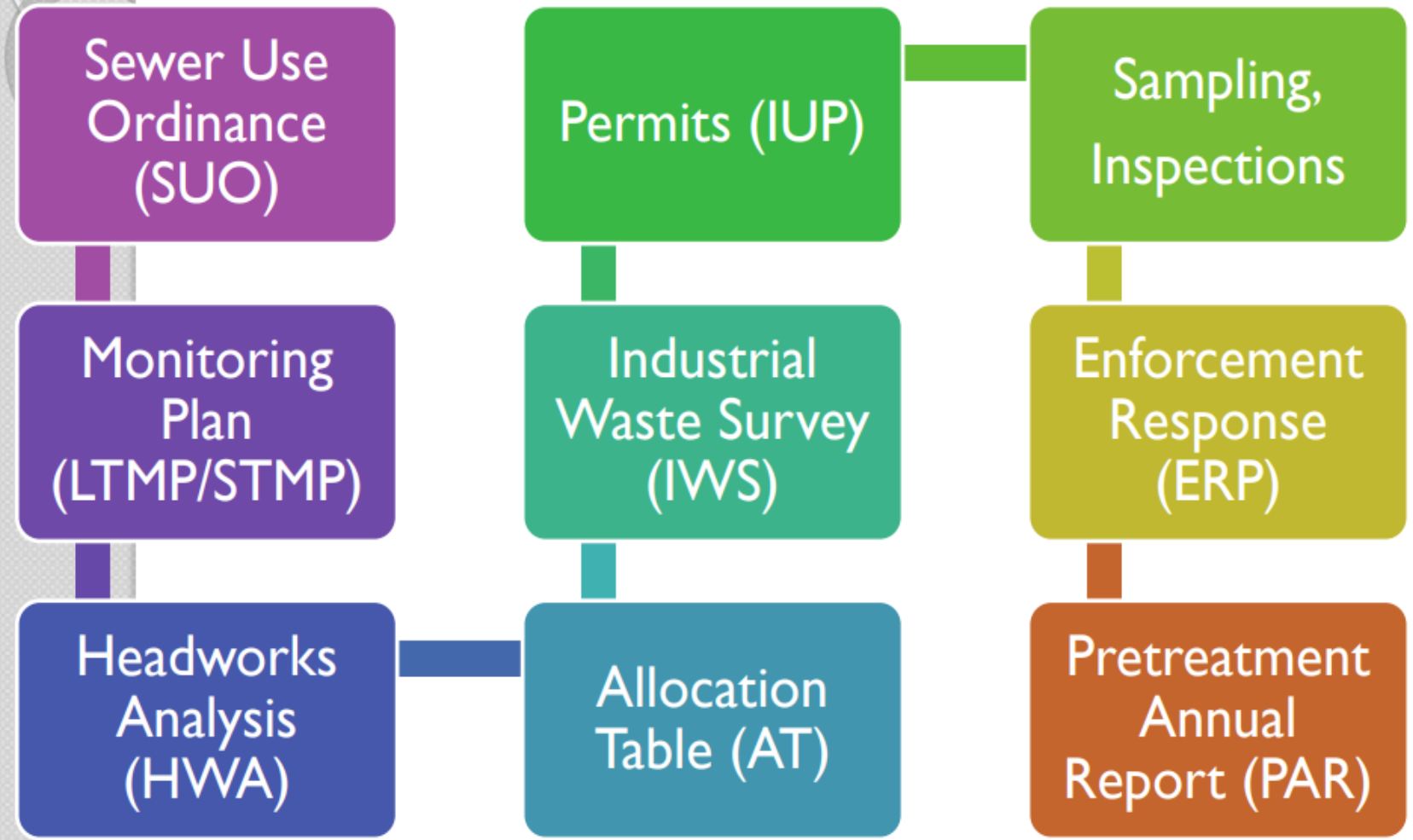
SIU Responsibility

- SIU is Permittee of POTW
  - "Controlled" by POTW
  - Comply with SUO and IUP
  - Keep POTW informed of SIU operations, including notification of changes before they make the change.

POTW's Role compared to NC DWR



Major Program Elements



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Pretreatment Permits versus Pretreatment Equipment

- SIU definition not tied to whether Industrial User (IU) has treatment units
  - Not all SIUs have pretreatment *equipment*, but all SIUs have pretreatment *permits* (IUPs)
  - Not all IUs (Industrial Users) are SIUs
  - Not all IUs with pretreatment *equipment* are SIUs
  - non-SIUs can be issued non-SIU (or local) IUPs

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Sewer Use Ordinance (SUO)

- Adopted by the POTW's governing board
- Prohibited discharges
- Gives the POTW the authority to Control Users:
  - Deny or Halt discharge
  - Establish Local Limits
  - Issue permits
  - Enforce permits
  - Issue penalties

What is a SIU Permit (IUP)?

IUP= Industrial User Pretreatment Permit

- SIU= Significant Industrial User

- Like DWR permits, IUPs are issued under NC General Statute (NCGS) 143-215.1

  - Purpose is to protect POTW and the environment.
  - Same format as NPDES permits: Include limits, monitoring, reporting, general and specific conditions.

SUO and IUP

- POTW is Control Authority
  - POTW controls what IU discharges and under what conditions
- SUO and IUP are Control Mechanisms
  - SUO is general control of all IUs
  - IUP is individual control mechanism for one specific SIU or non-SIU
- If SUO and IUP don't do what you need them to do, change them!
  - Too harsh, too weak, can cause extra work

Wording can affect permit enforceability:

DO use specific language, writing clearly and simply

DO develop concise and complete conditions and requirements

DO follow most recent standards

DO regulate ALL discharge points

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Permit Writing Guidance

Details about the next Pretreatment Permit Writing Workshop are on the Training page.

Basic IUP Guidance, Including What to Submit (August 2005)

IUP Training Materials

- IUP Writing Steps: Workshop Outline
- Industrial User Wastewater Survey and Discharge Permit Application: Slugem Hosiery
- Guidance Document for Completing the Industrial User Wastewater Survey and Discharge Permit Application
- Slugem Hosiery SIU Inspection Form
- Slugem Hosiery Data Summary Spreadsheet
- Categorical Industry Overview Presentation
- Blank Industrial User Wastewater Survey and Discharge Permit Application (April 2012)

Permit Writing Files

- Generic Industrial User Permit (includes Permit Synopsis) - update changes in red. (July 27, 2018)
- Example IUP & Synopsis: Will Plateit (40 CFR 433) (March 2009)
- Combined Wastestream Formula: Example IUP & Synopsis: Will Plateit (40 CFR 433).
- Example IUP modification: Will Plateit (40 CFR 433)
- Ammonia and Total Nitrogen IUP Limit Guidance (July 2005)
- SIU Inspection Form

Pretreatment Guide

- Mercury Guidance
- Annual Report Guidance
- **Permit Writing Guidance**
- Other Industrial Information

https://www.deq.nc.gov/about/divisions/water-resources/water-resources-permit-guidance/pretreatment-guide/permit-writing-guidance

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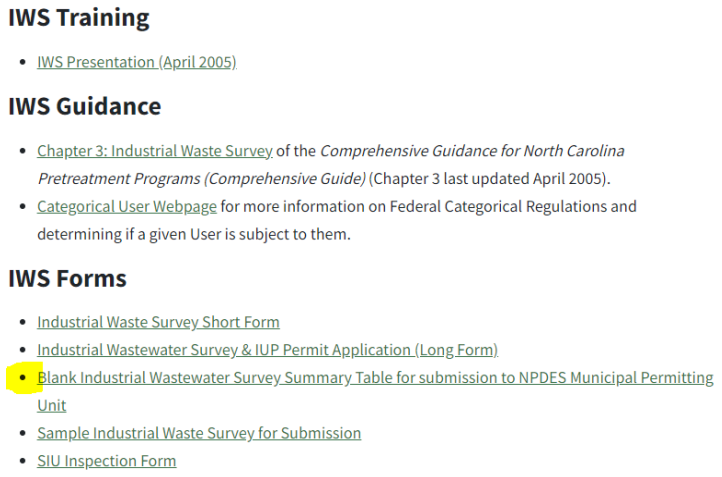
IUPs

- IUP Basic Guidance
  - Include all specific requirements
  - Include standard conditions
  - Specify signatory requirements
  - Consider and account for predictable variations

- DWR Pretreatment Permitting Website

Industrial Waste Survey (IWS)

- Should be **continuously maintained** by POTW- this will benefit you and us! Should always remain updated and available for reference
- Survey all ICIs connected to POTW
- Determine who is a SIU
- IWS summary table template (has multiple tabs with important resources and references)



IWS Training

- IWS Presentation (April 2005)

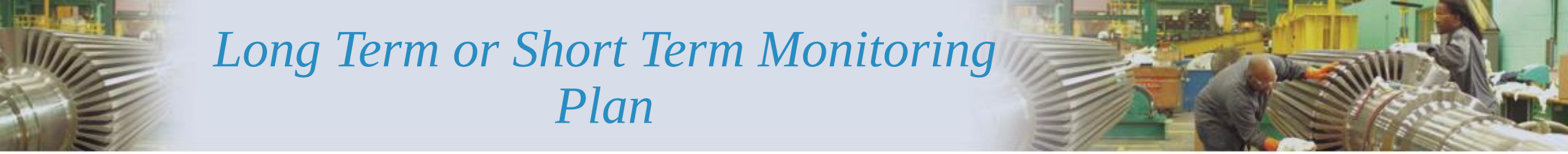
IWS Guidance

- Chapter 3: Industrial Waste Survey of the *Comprehensive Guidance for North Carolina Pretreatment Programs (Comprehensive Guide)* (Chapter 3 last updated April 2005).
- Categorical User Webpage for more information on Federal Categorical Regulations and determining if a given User is subject to them.

IWS Forms

- Industrial Waste Survey Short Form
- Industrial Wastewater Survey & IUP Permit Application (Long Form)
- Blank Industrial Wastewater Survey Summary Table for submission to NPDES Municipal Permitting Unit
- Sample Industrial Waste Survey for Submission
- SIU Inspection Form

Long Term or Short Term Monitoring Plan



- POTW Site-Specific Sampling Plan
- Collects data for use in
  - Headworks Analysis (HWA)
    - WWTP removal rates
    - WWTP inhibition criteria
    - WWTP influent + uncontrolled load
  - Local Limits
  - NPDES/Non-discharge permit
  - Other applications

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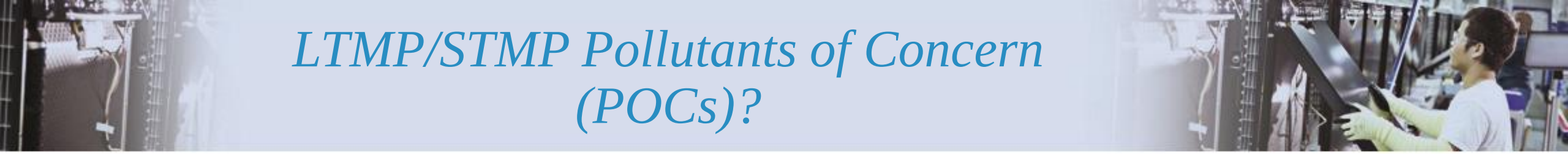
LTMP/STMP Pollutants of Concern (POCs)?



- NPDES Permit Limited Pollutants of Concern
- Sludge Regs (40 CFR 503)- As, Cd, Cu, Pb, Hg, Mo, Ni, Se, and Zn
- EPA Required- Cd, Cr, Cu, Pb, Ni, Zn
- SIU/CIU IUP Limits- Ag, CN, Chlorides, Fluoride, organics, etc.

- Not all POTWs have the same POCs
- A POTW's POCs can change over time

Typical LTMP Monitoring Frequencies

- Full Programs have a LTMP–
  Long Term Monitoring Plan
  - Influent and Effluent - Quarterly
  - Aeration Basin - Semi-annually
  - Sludge to Disposal - per sludge/land app/compost permit

- Some POTWs may be required to do more
- Some POTWs allowed to do less in DWR approved LTMP

- CONTINUOUS because of constant change

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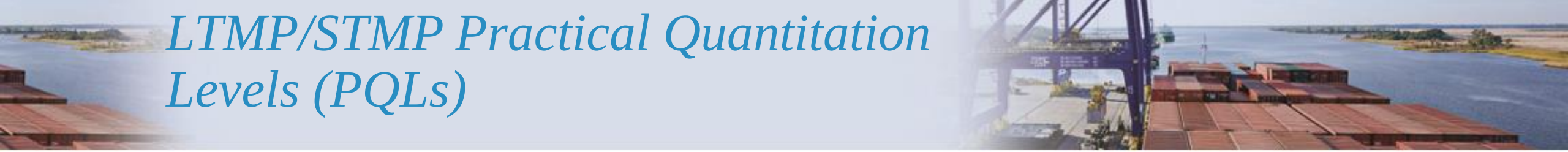
Typical STMP Monitoring Frequencies

- Modified Programs have a STMP- Short Term Monitoring Plan
  - Influent and Effluent- One year of quarterly sampling once every 5 years
  - Aeration Basin- once every 5 years
  - Sludge to Disposal- per sludge/land app/compost permit

- Some POTWs may be required to do more
- Some POTWs allowed to do less in DWR approved STMP

- Done in the year leading up to HWA

LTMP/STMP Practical Quantitation Levels (PQLs)



- PQLs must be approved by DWR in LTMP/STMP
- PQLs = "the lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions."
- *Front page of NC DEQ Pretreatment website*
  - Some POTWs use lower
  - Some POTWs allowed to use higher in DWR approved LTMP/STMP
- Each time you receive a lab report, make sure PQLs are met!
  - If not met, ask lab to reanalyze

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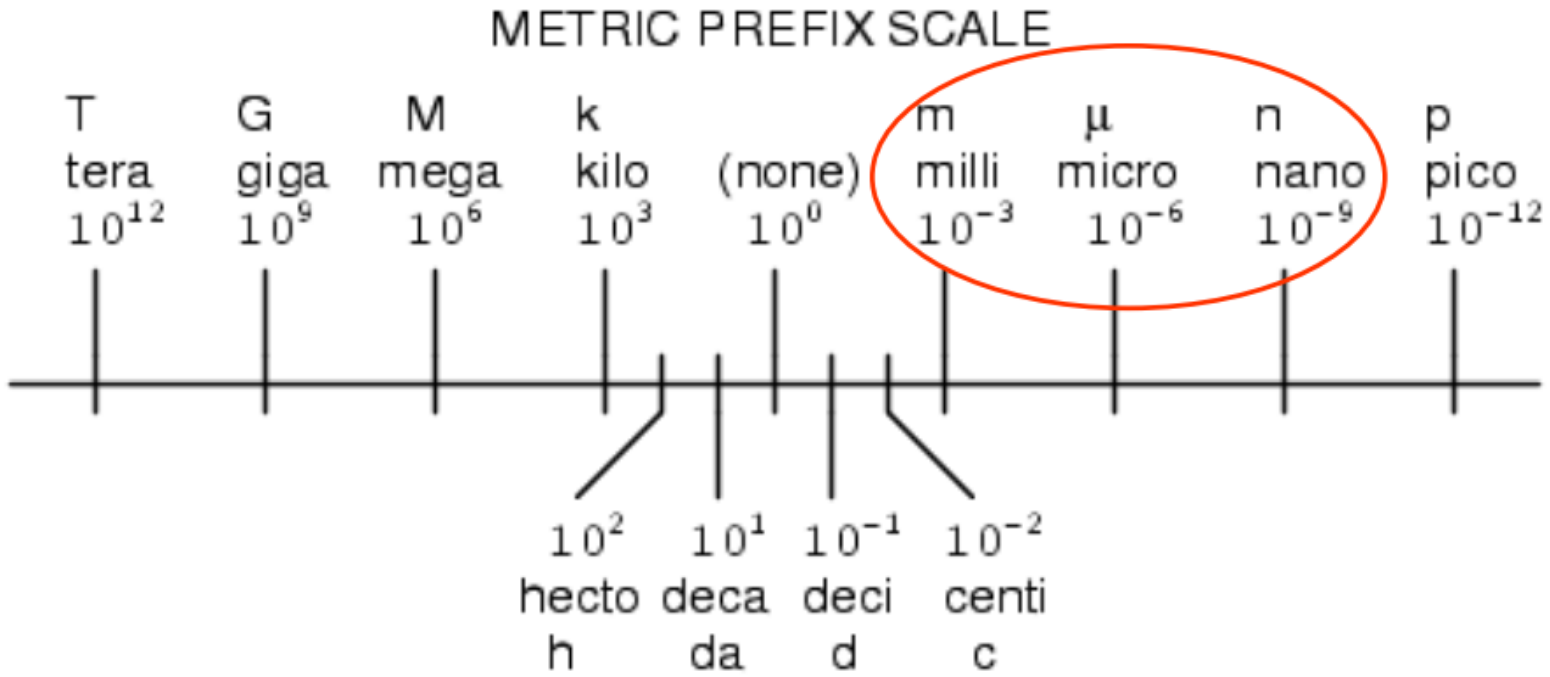
LTMP/STMP Guidance

- Find yours
- Understand and follow it
- *Comprehensive Guide, Chapter 4*
- Data Summaries - forms on website
  - separate column for “less than” sign
  - average, max, and min
- If LTMP/STMP doesn’t do what you need it to do, update it
- Includes Effluent LTMP/STMP data
  - All pollutants of concern

Unit Conversions



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Unit Conversion

Prefix	Symbol	Multiplier	
exa	E	10^{18}	1,000,000,000,000,000,000
peta	P	10^{15}	1,000,000,000,000,000
tera	T	10^{12}	1,000,000,000,000
giga	G	10^{9}	1,000,000,000
mega	M	10^{6}	1,000,000
kilo	k	10^{3}	1,000
hecto	h	10^{2}	100
deka	da	10^{1}	10
deci	d	10^{-1}	0.1
centi	c	10^{-2}	0.01
milli	m	10^{-3}	0.001
micro	μ	10^{-6}	0.000,001
nano	n	10^{-9}	0.000,000,001
pico micro micro	p μμ	10^{-12}	0.000,000,000,001
femto	f	10^{-15}	0.000,000,000,000,001
atto	a	10^{-18}	0.000,000,000,000,000,001

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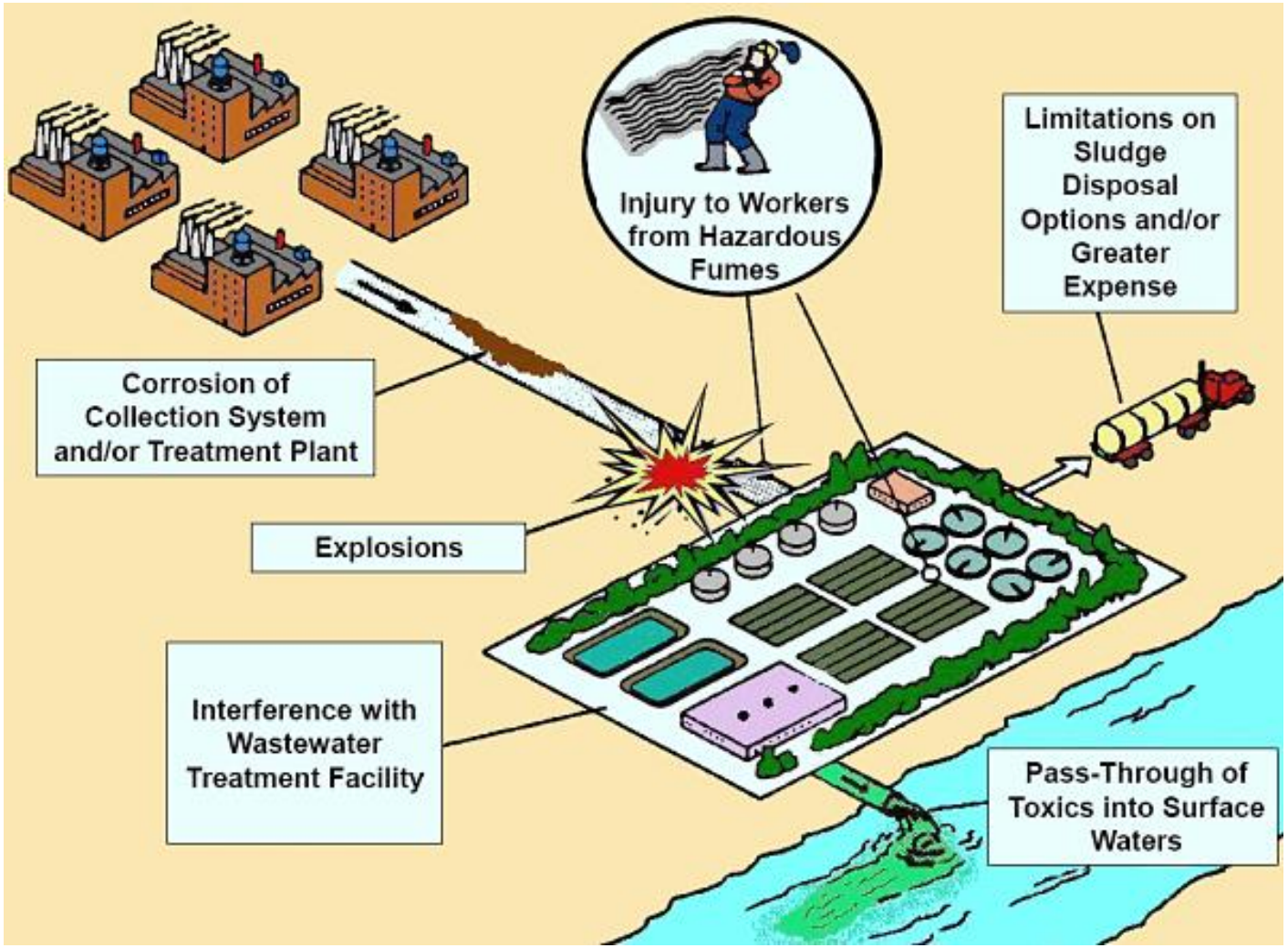
Local Limits



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Local Limits

REGULATORY CITATIONS

- **40 CFR 403.2:** Objectives of the General Pretreatment Regulations are to prevent pass- through, interference, and improve opportunities to recycle and reclaim sludges;
- **40 CFR 403.5(c):** Each POTW shall develop and continue to develop and enforce local limits;
- **40 CFR 403.5(d):** Local limits shall be the pretreatment standards for purposes of CWA.
- **40 CFR 122.44(j):** NPDES permits must require a written technical evaluation of the need to revise local limits following permit issuance or issuance.

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Local Limits

WHY AREN'T FEDERAL LIMITS ENOUGH?

- Federal Categorical Standards do not address all contributed pollutants, and are not applied to non-categorical industrial users;
- Categorical standards may not adequately protect the POTW, its collection system, biosolids, workers, or receiving water.

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Local Limits

"TECHNICALLY BASED LOCAL LIMITS"

- **Eleventh Commandment: "Thou Shalt Neither Covet Nor Steal Thy Neighbor's Local Limits"**
- **Keep in mind the definition of "local" [i.e. site specific…YOUR site]**
- **Local limits should support and accommodate the strengths and weaknesses of each POTW**

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Local Limits

PUTTING THE LOCAL INTO LOCAL LIMITS

- Limits are developed for the plant design, flow, and treatment structures.
- Biosolids disposal practices
- NPDES Permit Limits
- State and Federal Water Quality Standards
- Air Quality Standards
- Water Reuse potential

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Local Limits

National Pollutant Discharge Elimination System (NPDES) CONTACT US

- NPDES Home
- About NPDES
- All NPDES Program Areas
- Animal Feeding Operations
- Aquaculture
- Forest Roads
- Industrial Wastewater
- Municipal Wastewater
- National Pretreatment Program
- Pesticide Permitting
- Stormwater

Pretreatment Standards and Requirements-Local Limits

Pretreatment standards are pollutant discharge limits which apply to industrial users (IUs). Pretreatment requirements are substantive or procedural requirements applied to IUs.

Local limits address the specific needs and concerns of a publicly owned treatment works (POTW), its sludge, and its receiving waters. Most of the general prohibited discharge standards specified at 40 CFR Part 403.5 (PDF) (2 pp, 204 K) are not specific pollutant limitations. As a result, a POTW must evaluate its facility's capabilities and establish local limits to protect it from receiving wastes that pass through or interfere with operations (including sludge management).

These local limits are intended to protect:

Pretreatment Standards and Requirements Topics

- Applicability
- General and Specific Prohibitions
- Categorical

https://www.epa.gov/npdes/pretreatment-standards-and-requirements-local-limits

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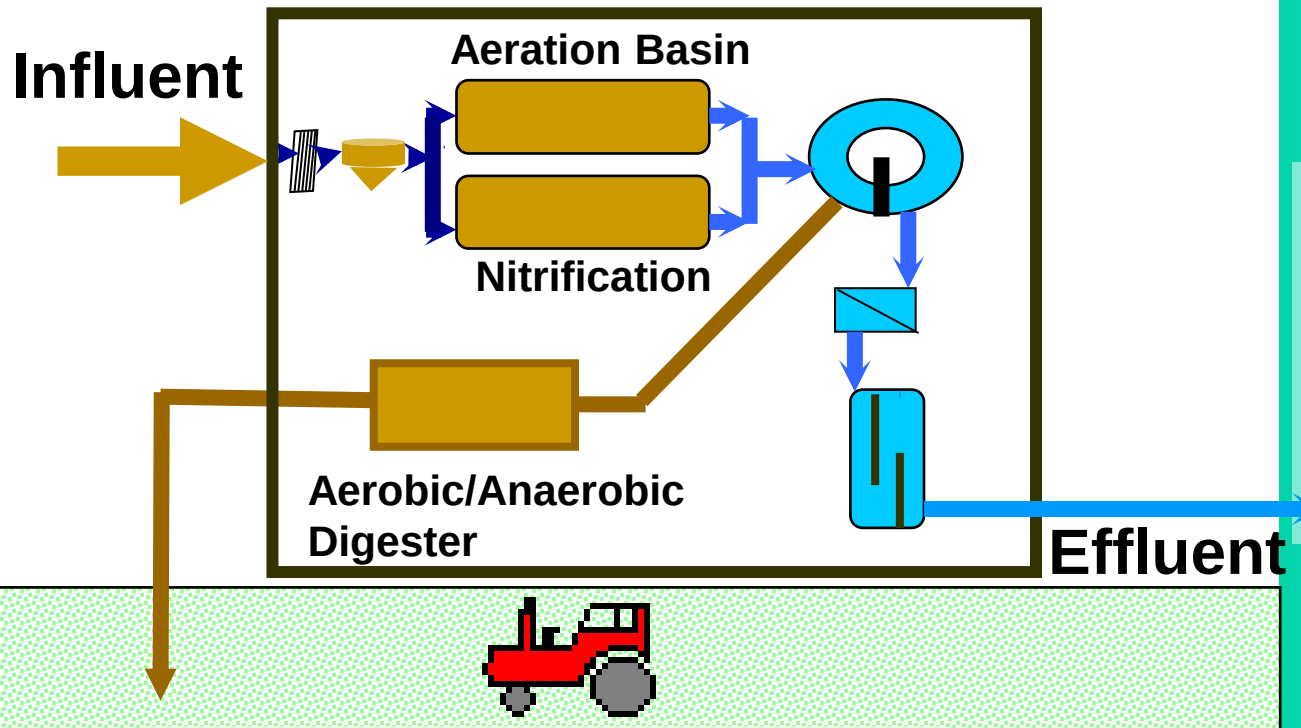
Headworks Analysis (HWA)

- Technical Analysis of a WWTP
    - Passthrough, inhibition, sludge
- Maximum Allowable Headworks Loading (MAHL)
- Maximum Allowable Industrial Loading (MAIL)

Three Limiting Criteria

Biological Inhibition

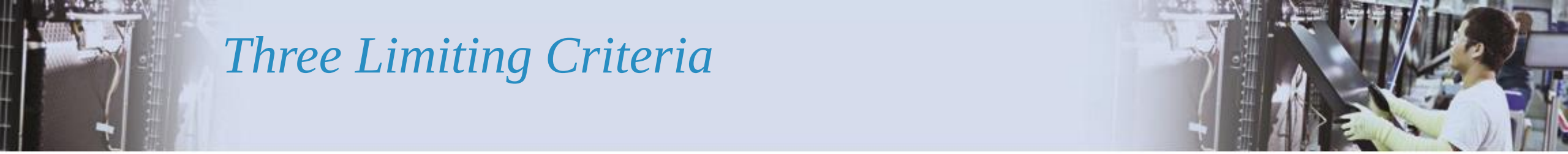


Pass Through NPDES and WQS

Sludge Standards

Ceiling and Cumulative

Three Limiting Criteria



pass through

A discharge that exits the POTW into waters of the United States in quantities or concentrations that, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation). [40 CFR 403.3(p)]

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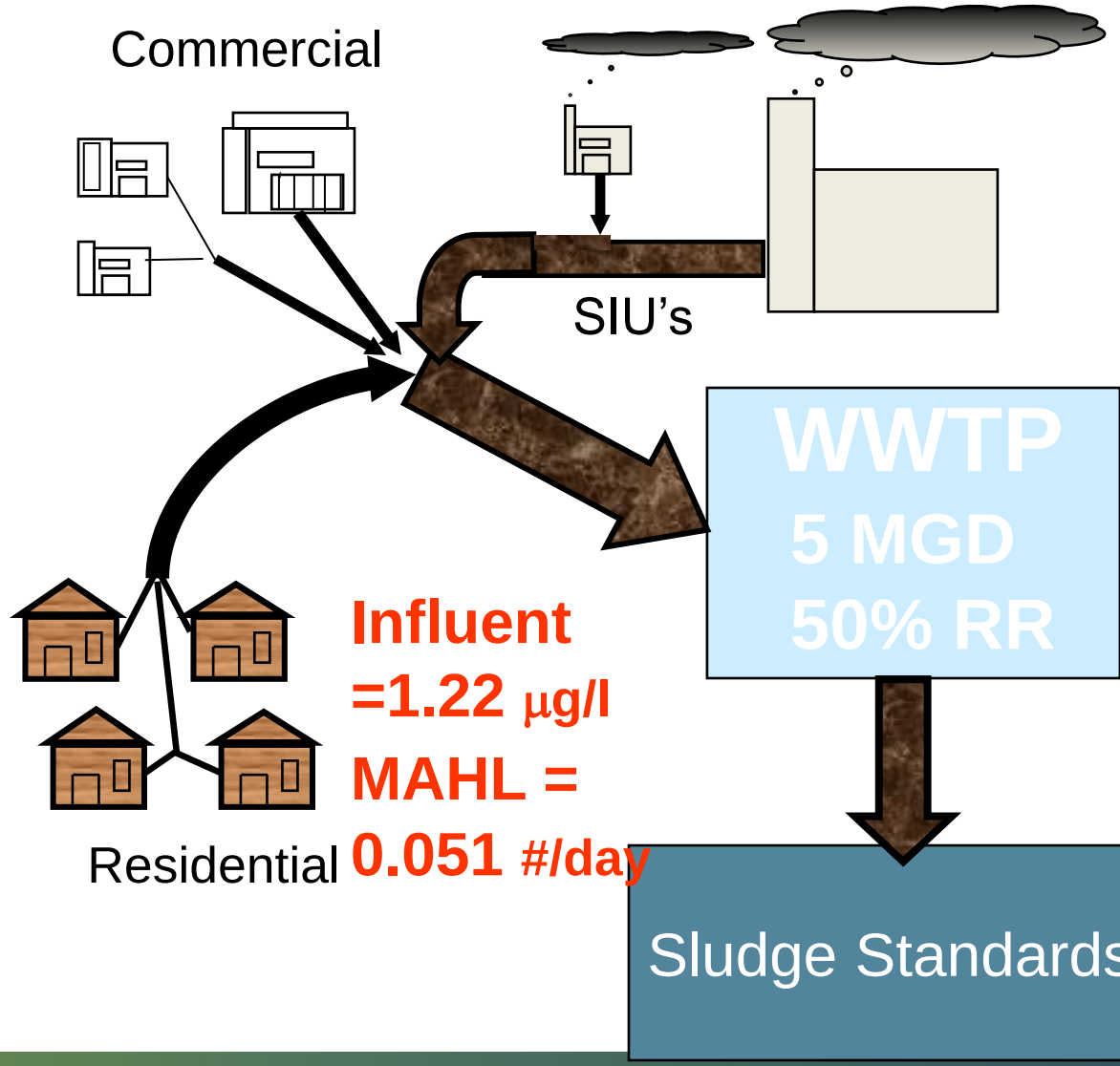
Pass Through cadmium - load- based on NPDES



NPDES Permit Limit=
0.61 µg/l
equal to NC Water Quality Std. bec stream flow zero at 10 year drought (7Q10)

Headworks Analysis (HWA)

2.1.1 Chronic Inhibition

Chronic inhibition refers to a more or less consistent pattern of impairment of the functioning of the biomass in a biological treatment process caused by influent pollutant concentrations that are above tolerable levels. Inhibition is usually defined by a decrease in oxygen uptake rate or a decrease in COD/BOD removal. If the inhibition leads to a permit violation, it then is classified as interference. This type of interference results from either a continuous or semi-continuous discharge of an industrial pollutant to the POTW. Chronic inhibition may also result from the total effect of several industries discharging a variety of inhibitory pollutants. Industrial sources of chronic problems tend to be by-products of production activities such as chemical derivatives, rinse waters and contact cooling water.

Guidance Manual for Preventing Interference at POTWs

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Headworks Analysis (HWA)

Industrial users discharges can cause the first type of interference, involving a permit violation, by several means. These include, but are not limited to:

- physically disrupting the flow of wastewater through the POTW's system
- chemically, physically, or thermally inhibiting the treatment processes
- hydraulically overloading the plant so that proper settlement does not occur or wastes are retained for too short a time to receive adequate treatment before discharge.

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Headworks Analysis (HWA)

As mentioned in Chapter 1, any type of interference is a violation of the general prohibition (40 CFR Part 403.5(a)). Some interferences are also violations of the specific prohibitions (40 CFR Part 403.5(b)). The specific prohibitions bar discharges which:

1. create a fire or explosion hazard;
2. are corrosive to POTW structures;
3. obstruct wastewater flow resulting in interference;
4. release pollutants (including BOD) at rates or concentrations which will cause interference; or
5. increase the influent wastewater temperature above 40°C, or inhibit biological activity due to heat, resulting in interference.

Headworks Analysis (HWA)

interfere

A discharge that, alone or in conjunction with a discharge or discharges from other sources, both (1) inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use, or disposal; and (2) therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with ... [applicable] statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations). [paraphrased from 40 CFR 403.3(k)]

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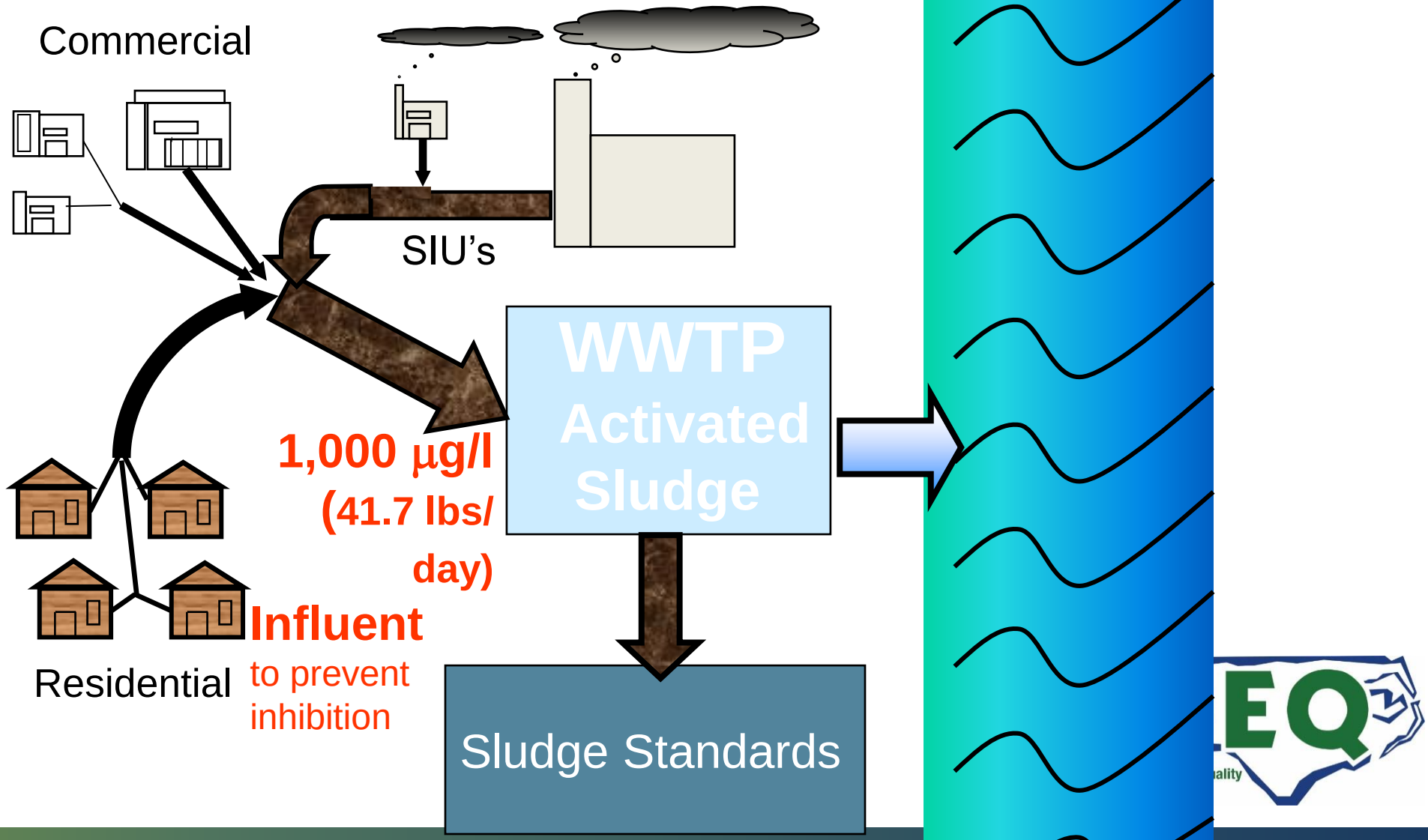
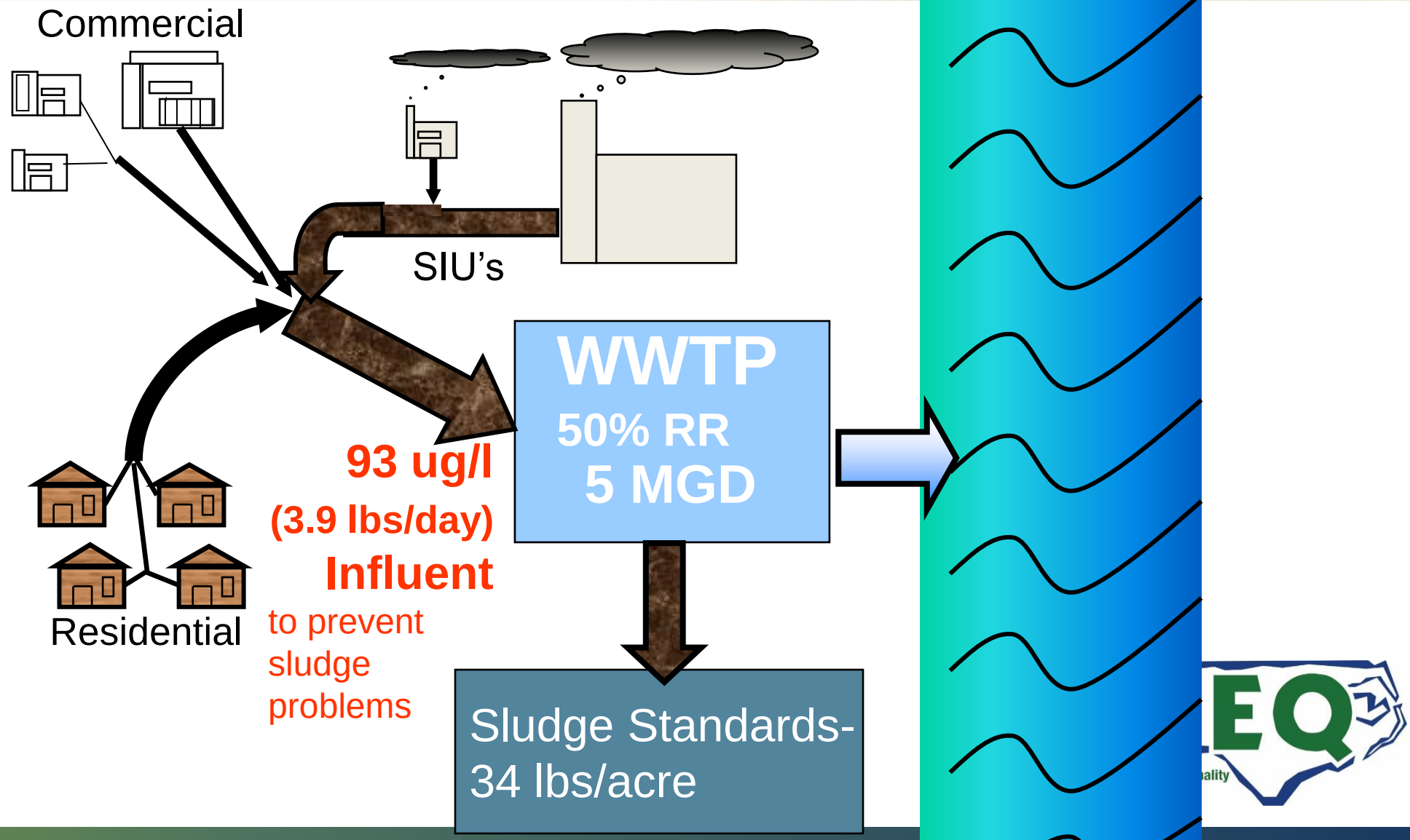
Inhibition cadmium load



Sludge cadmium load-
based on 40 CFR 503



Evaluation of the most limiting criteria at the POTW

1) Pass Through Criteria – 1.22 ug/l

2) Biological Inhibition Criteria - 1,000 ug/l

3) Sludge Criteria - 93 ug/l

Use the most limiting factor as the Maximum Allowable Headworks Load (MAHL)

MAHL = 1.22 ug/l or 0.051 lbs/day

based on pass through

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Headworks Analysis (HWA)

We have just performed an HWA, the technical basis of the Pretreatment Program!

Headworks Analysis

The Headworks Analysis (HWA) calculates the flow and pollutant treatment capacity of a wastewater treatment plant (WWTP). It incorporate the WWTP design criteria as well as environmental criteria to protect the receiving stream (NC Water Quality Standards or NPDES limits), the WWTP biomass (inhibition criteria), and the sludge disposal site (40 CFR 503 land application or incineration standards).

The Allocation Table compares the flow and pollutant loads permitted to the WWTP's significant industrial users (SIUs) to the allowable WWTP influent loads from the HWA to ensure the WWTP will not be overloaded.

HWA Training Materials

- HWA Workshop Slides. These slides (Tab 2 of the workshop materials) include detailed discussions on calculations, definitions, references, decision making and explanations.
    - Individual Workshop Materials: Tabs 1, 3A, 3B, 3C, 3D, Calculator

Spreadsheets for the HWA

- Headworks Analysis Spreadsheet with linked Allocation Table and Headworks Addendum for Sludge Loading (HASL) Worksheet (February 2008)
- Calculator (April 2017)
- Separate Allocation Table (not linked to the HWA Spreadsheet)
- Generic Data Summary Spreadsheet
- Removal Rate Spreadsheet
- Uncontrollable Mass Balance Spreadsheet

Guidance Documents for HWA

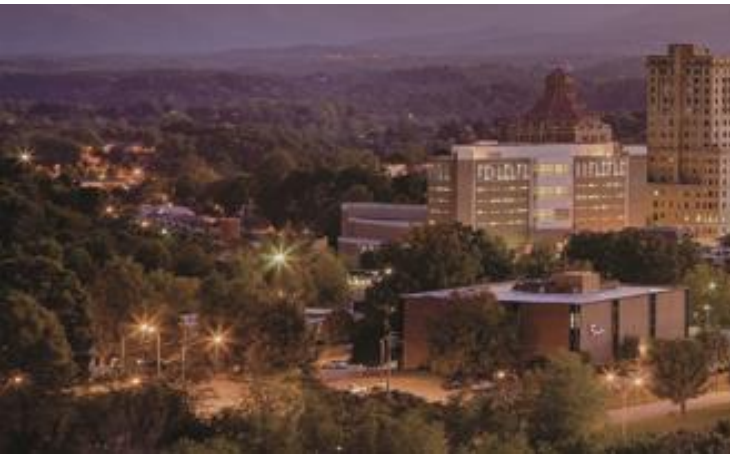
- HWA Design Memos (February 2007, December 2007 and December 2008)
- What items to submit with your POTW's HWA (February 2009)
- February 2009 HWA Numbers
- Removal Rate Determination Guidance (2004)
- Headworks Addendum for Sludge Loading (HASL) (2004 modifications)
- Sludge conversion formulas
- Typical Problems with HWA

Organics HWA and Related Guidance Documents

- Organics Headworks Analysis Spreadsheet
- Organics Headworks Analysis Guidance

Pharmaceutical HWA and Related Guidance Documents

- Pharmaceutical Organics Headworks Analysis Spreadsheet
- Pharmaceutical OHWA Guidance



HWA and MAHL

- How can I get a larger MAHL?
  - bigger river
  - better removal rate
  - site-specific inhibition criteria
  - more land for sludge disposal

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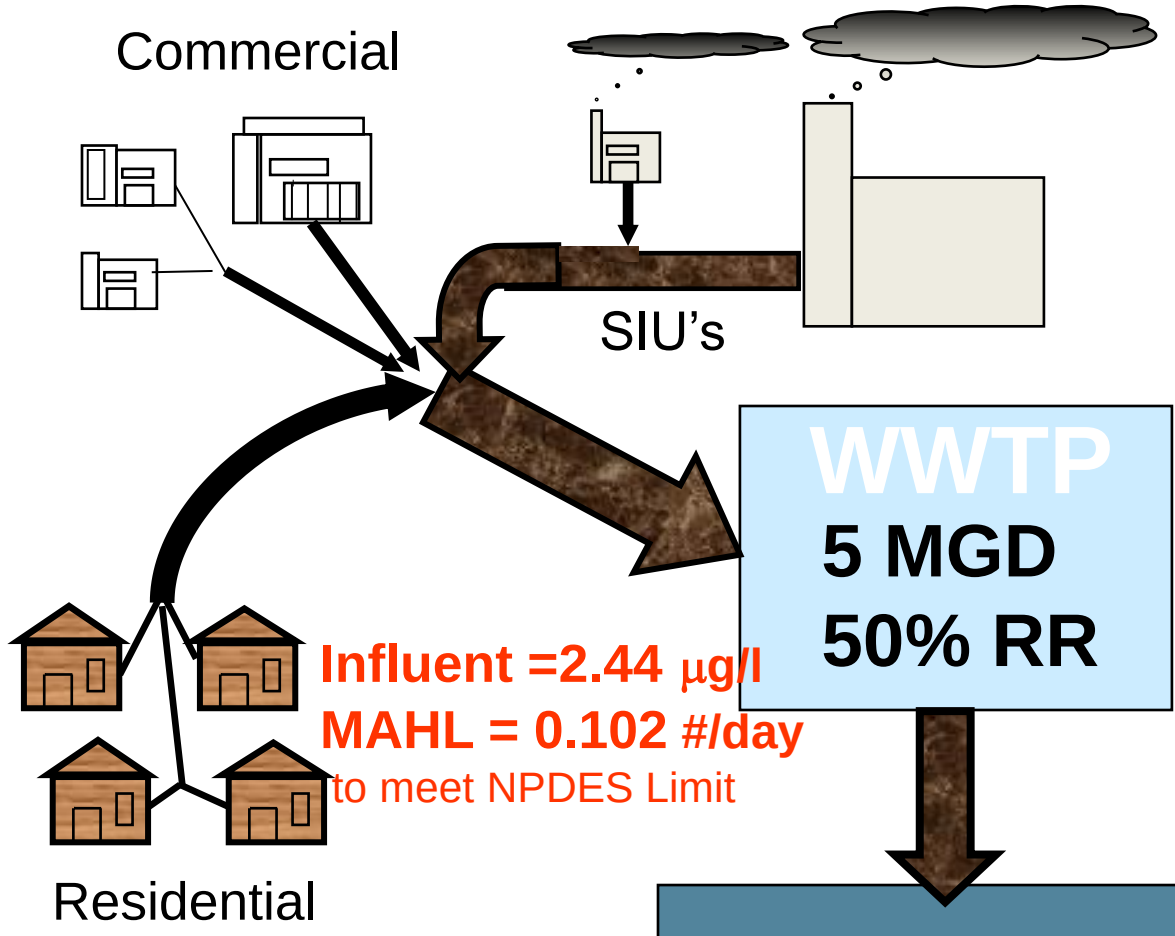
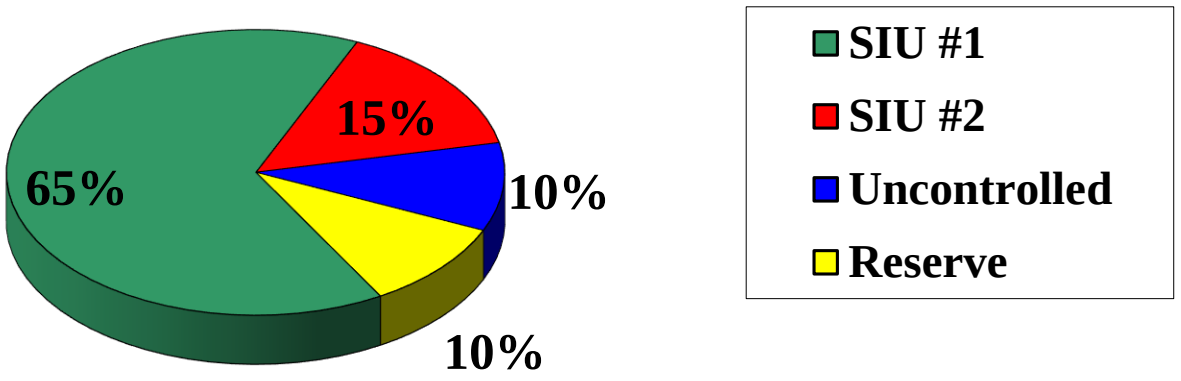
Pass Through cadmium load- based on NPDES



NC WQS= 0.61 µg/l; 7Q10= 5 MGD (IWC= 50%); NPDES Permit Limit= 1.22 µg/l

Cadmium Allocation



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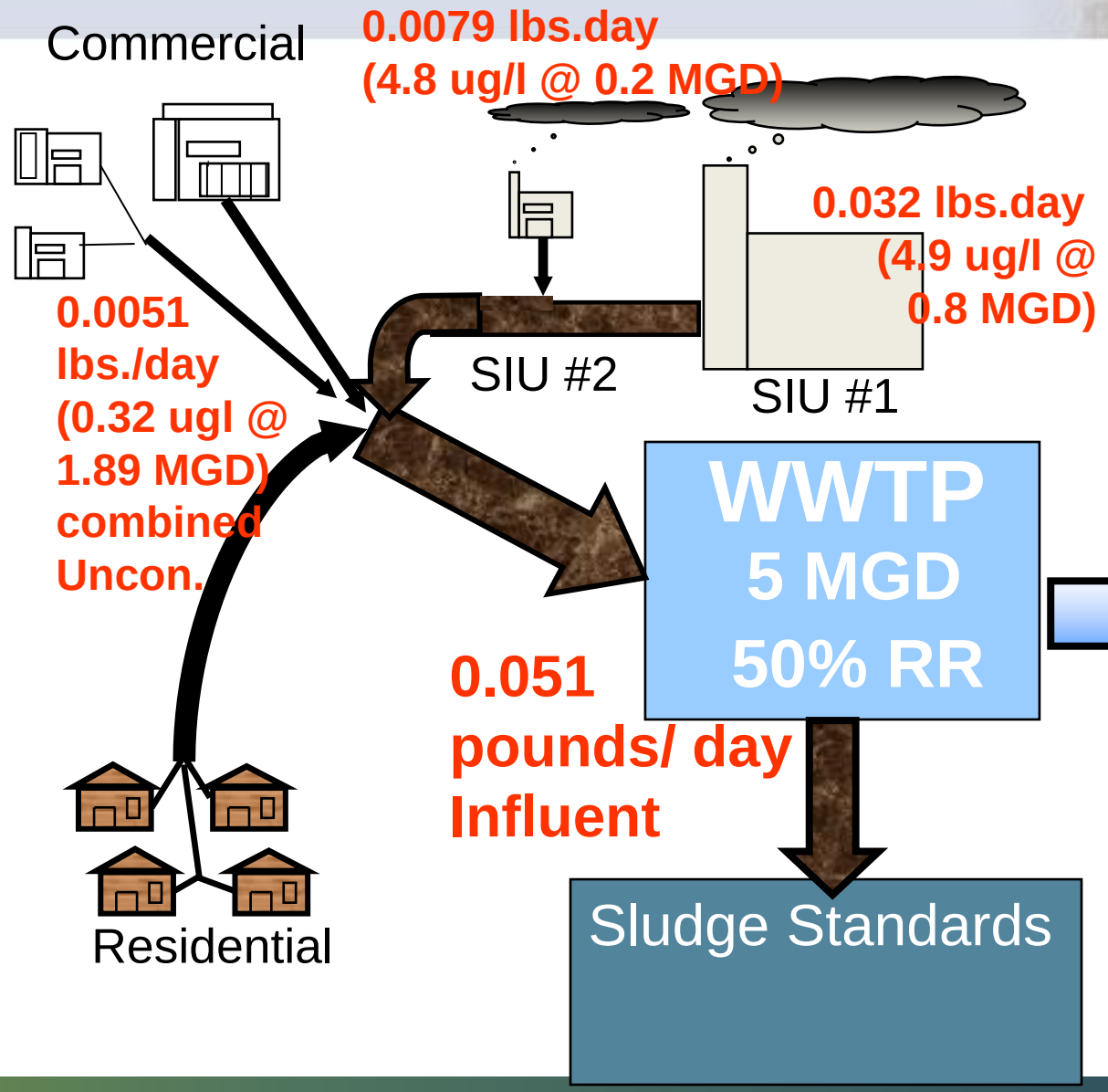
Allocating Cadmium



0.0253 pounds/ day
to meet NPDES Limit

Allocation Table (AT)

			FLOW		Cadmium	
	INDUSTRY	Industry	Permit Limits		Permit Limits	
IUP Count	NAMES	Permit/Pipe number	MGD	gal/day	Conc. mg/l	Load lbs/day
1	Gold Brick Metal Finishing	001 / 1	0.01	10,000	0.07	0.00584
2	Flying Monkey's Food Creations	002 / 1	0.2	200,000		
3						
	Column Totals =>		0.21	210,000		0.00584
	Basis for MAHL =>		NPDES			Pass Thru
	MAHL from HWA (lbs/day) =>		5.0000			**0.0510**
	Uncontrollable Loading from HWA (lbs/day) =>		1.8690			0.0297
	Maximum Allowable Industrial Loading (lbs/day) =>		3.1310			0.0213
	Total Permitted to Industry (lbs/day) =>		0.2100			0.00584
	Total MAIL still available (lbs/day) =>		2.9210			0.0155
	Total MAIL still available (%) =>		93.29 %			72.58 %
	Total MAHL still available (%) =>		58.42 %			30.31 %
	5 % MAHL (lbs/day) =>		0.2500			0.0026

AT is SITE SPECIFIC for WWTP

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Allocation Table

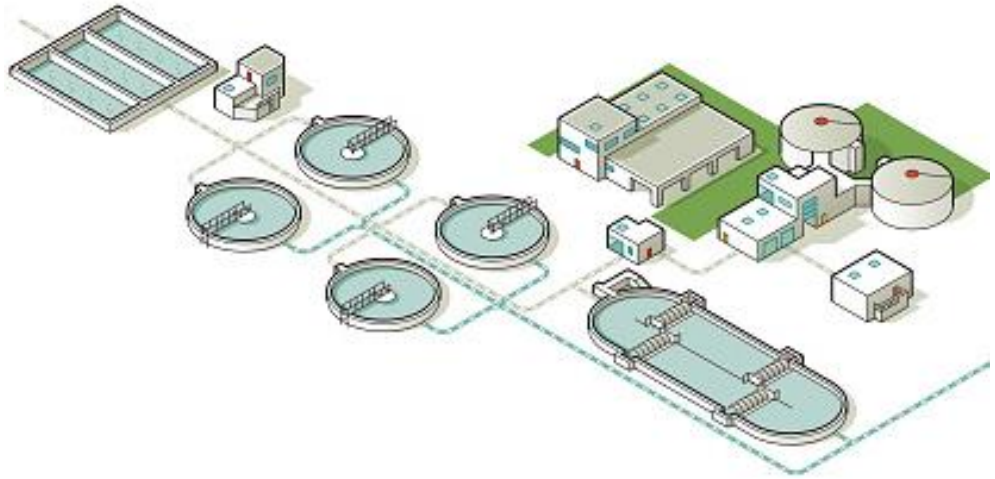
- SIU IUP limits
- Compute pounds/day
- Sum of SIU permitted load
- Compare against the MAHL and MAIL

No over allocation is the goal!

- Find yours.
- Understand it.
- *Comprehensive Guide, Chapter 6*

Compliance Judgment

- Is the SIU in compliance with the IUP or not?
- Compliance judgment responsibilities and required time frames are in the Enforcement Response Plan (ERP).



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Limits Compliance Judgment

- IUP Limits – yes or no
- Technical Review Criteria (TRC)
- Significant NonCompliance (SNC)

Sampling of SIUs

- Must be performed per IUP
  - 15A NCAC 15H .0908(e) and 40 CFR 403.8(f)(2)(v)
  - 40 CFR 136
- DWR Chain of Custody forms found in *Comprehensive Guide, Appendix 7-A and B*
- Data Summaries
  - good detection levels
  - separate column for “less than” sign
  - average, max, min, and lbs/day

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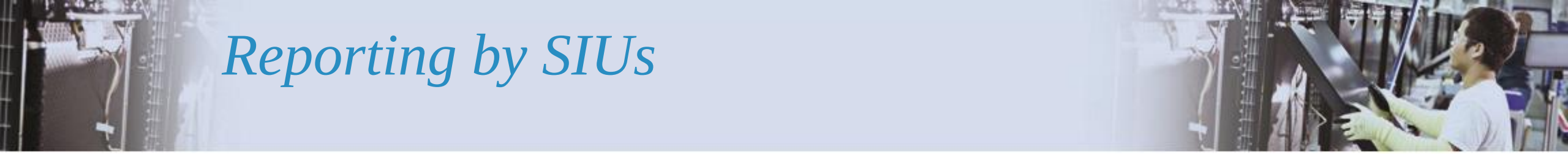
Reporting by SIUs



- Must be performed per IUP
- Must submit reports on time
- IUP Part II, 2-sampling reports and 24 hour notification of violations
- Most other IUP conditions, including
  - Part II, 4 - additional monitoring
  - Part II, 7 - pretreatment unit operations
  - Part II, 23 - re-application
  - Part II, 25 - changes in operation
  - Part II, 30 - potential problems
- SIU communicate early and often

Inspections

- REQUIRED ANNUALLY AT ALL SIUs
- POTW staff goes on-site to SIU to confirm the SIU is in compliance:
  - Production changes
  - Pretreatment Unit operation
  - sampling and data summary sheets
    - Are they the same as what SIU sent you? Especially important if SIU not required to submit lab sheets and chain of custody
  - Slug/Spill Control Plan needed, followed
  - Housekeeping
  - Schematic/Diagram in application/permit adequate

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Enforcement Response Plan (ERP)

- Enforcement that is timely, effective, fair, and equitable
  - Response time for POTW's issuance of Notices of Violation, etc.
  - Required fines/penalties
  - Required follow-up actions
  - Enforcement actions must escalate

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Sampling, Inspection, and Enforcement

- Find your IUPs and ERP.

- Understand and follow them.
  - *Comprehensive Guide*, *Chapter 6* - IUP
  - *Comprehensive Guide*, *Chapter 7* - Compliance Judgment, Sampling, and Inspection
  - *Comprehensive Guide*, *Chapter 8* – Enforcement

- If IUPs and ERP don't do what you need them to do, change them!
  - Too harsh, too weak, can cause extra work

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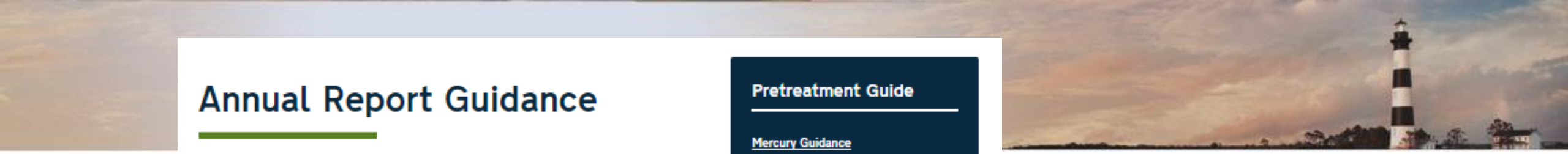
Pretreatment Annual Report (PAR)

- Annual Progress Report
- DWR review of these documents:
  - Pretreatment “vital signs”
  - accuracy
  - compliance judgment
- Complete PAR required for Full Programs
  - Modified Programs must submit SIU in SNC info, Pretreatment Performance Summary (PPS) form
- Due March 1st. - 2 copies to DWR Unit
- Classes in Jan/Feb of each year



Annual Report Guidance

Pretreatment Annual Report (PAR) Training Materials

- PAR Workshop Guidance Manual (January 2018)
- PAR Workshop Compliance Judgment Examples (January 2013)

PAR Guidance

- PAR Workshop Questions, Discussion and Addendum (January 2012)
- Town of Typicalville Example 2013 PAR
- Compliance Judgment Scenario: Split Samples
- Example of Consent Order and Compliance Schedule
- Enforcement-So your SIU has a Limit Violation- What do you do?
- Enforcement- So your SIU has a Reporting violation-What do you do?
- PAR Requirements Memo, including what is required for Modified Pretreatment Programs (February 10, 2012)
- Pretreatment Delegation Guidance

PAR Forms

- Compliance Judgment Spreadsheet Form (February 2009)
- Compliance Judgment Worksheet for SNC With Limits Form (March 2013)
- Industrial Data Summary Form (IDSF) - SIUs with daily limits only
- IDSF for SIUs with both daily and monthly avg. limits (December 2012)
- Pretreatment Performance Summary Form (PPS) (January 2018)
- PPS Form Explanations (January 2018)
- Significant Non-Compliance Report (SNCR) Form (2001)

Pretreatment Guide

- Mercury Guidance
- Annual Report Guidance
- Permit Writing Guidance
- Other Industrial Information

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Files - Organized

Files - Organized

- Can you easily find everything?
  - Chronological order
  - For each major program element (HWA, LTMP, IWS, etc.), have file with:
  - The element itself
    - Your submittal letter to DWR
    - Approval letter back from DWR
  - for SIU related info – by SIU
  - Need SIGNED paper copies. For SUO and maybe ERP, need documentation of adoption.
- Mark “received” date on <u>everything</u>!

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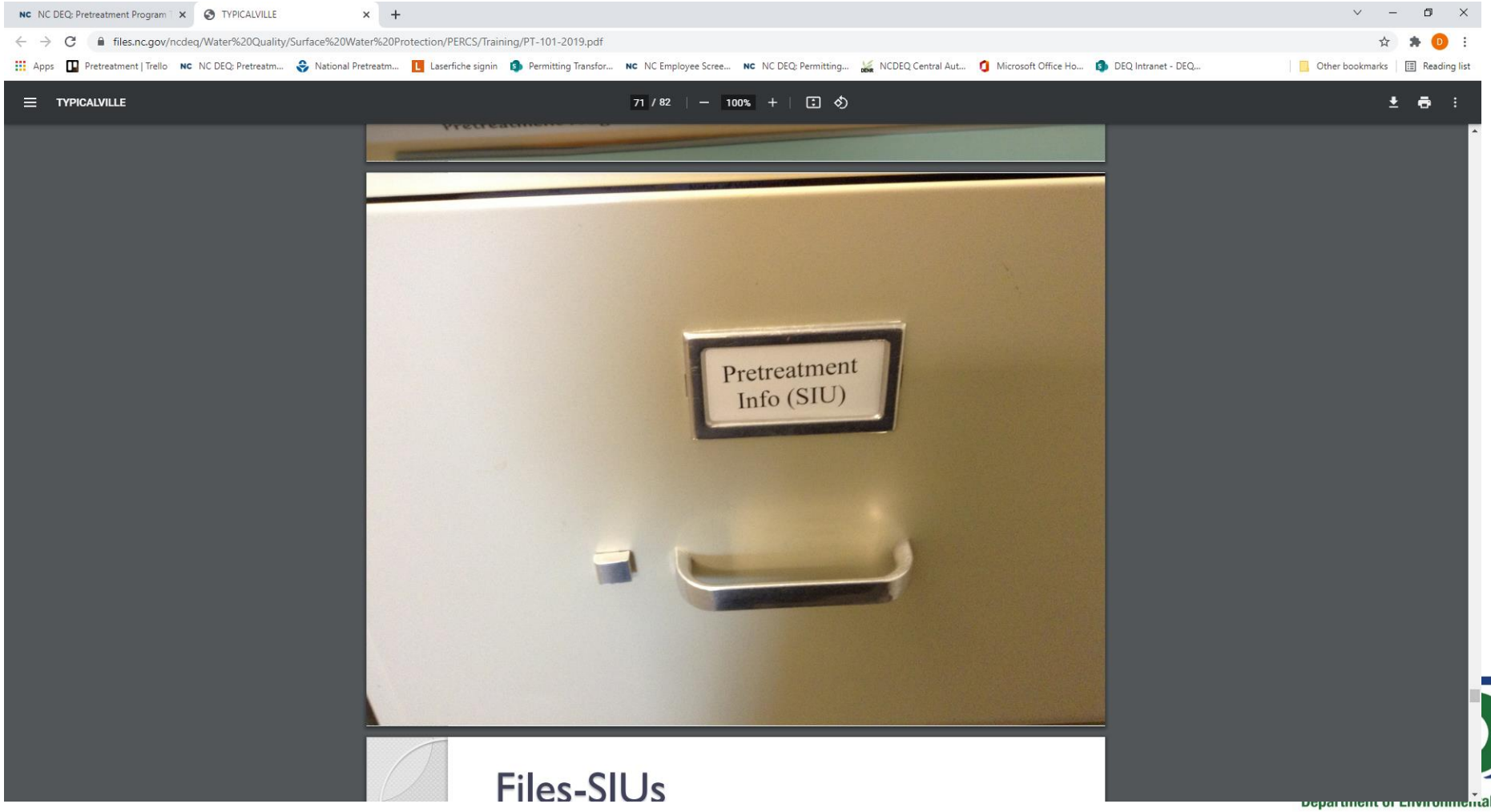
Files - Complete

- keep at least 3 years (recommend 5)

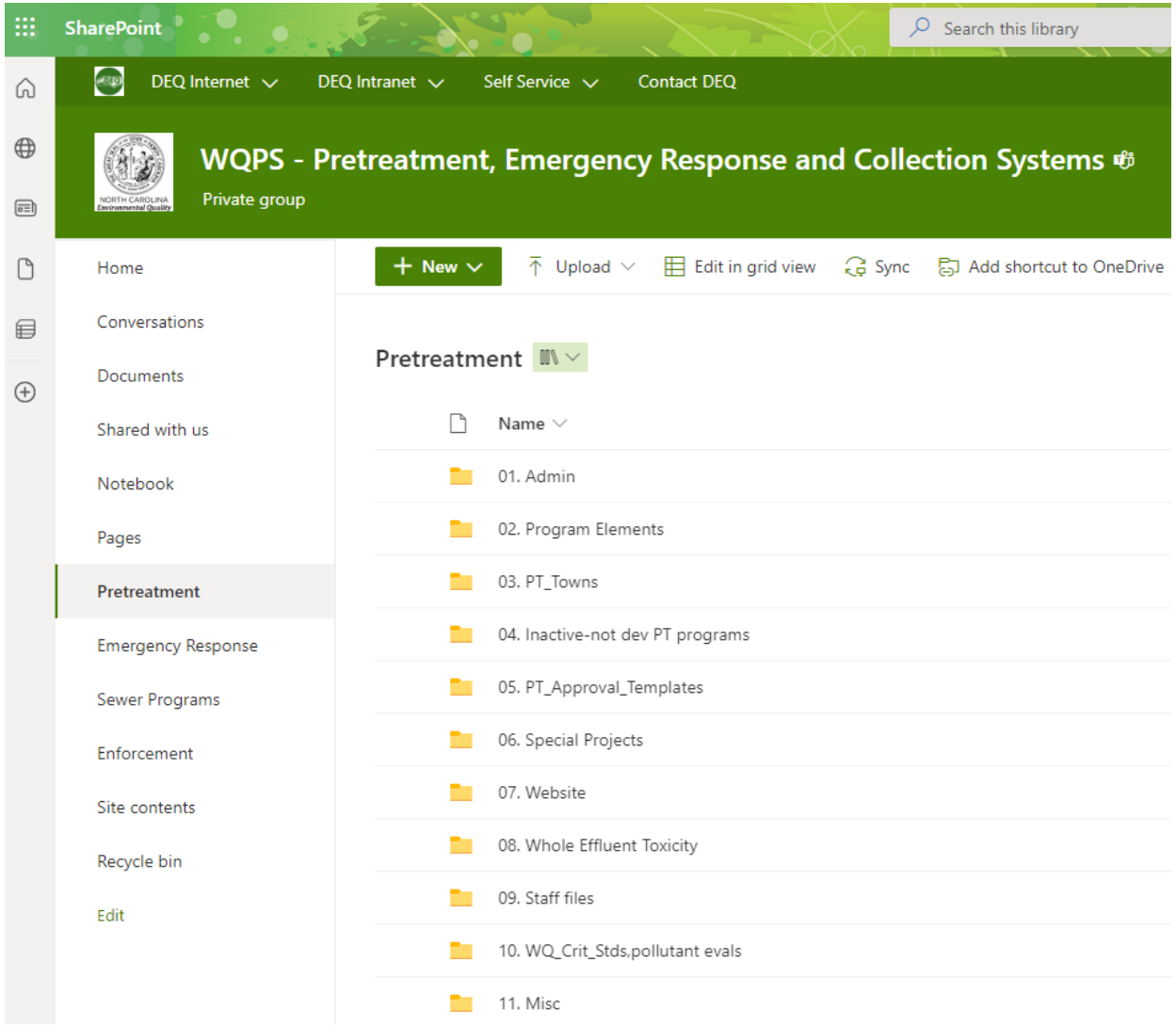
- for major elements that are in effect for long periods, such as HWAs, IUPs, SUO, keep latest version and one before that (~6-10 years)
  - eliminate / clarify redundant copies
    - keep previous versions separate or marked “void”
    - toss draft versions or keep separate marked “draft”
- Categorical determination–forever?

Old School – PT Files




PAR
2009
PAR 2013
PAR
Sewer
ERP
ERP
2006
LTMP Test Results
2008 LTMP Test Results
Results
CORRESPONDENDCE
Admin 15 NCAC 2H.0900 Code for
Pretreatment Programs

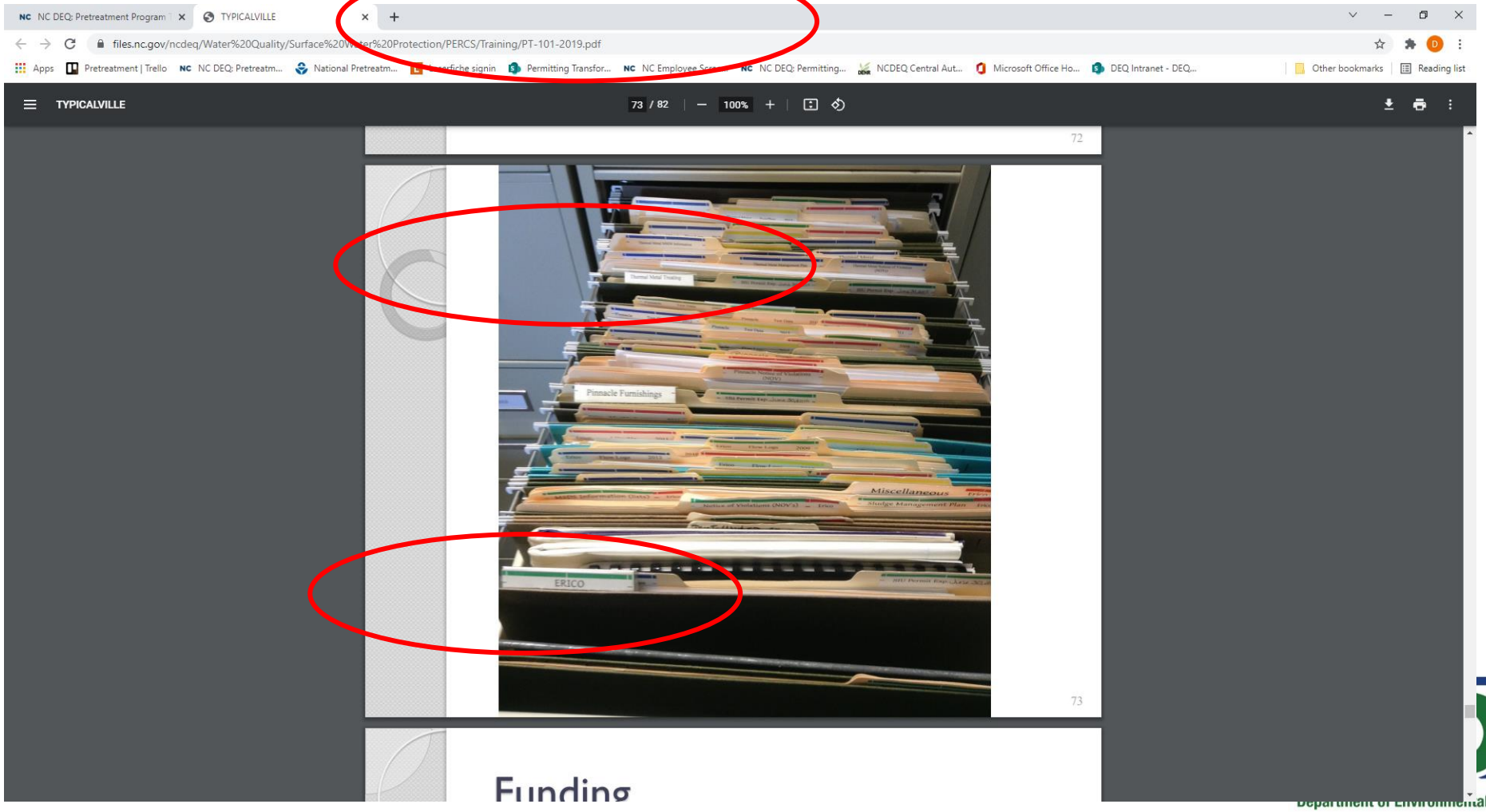
New School – PT SharePoint Files



SIU Files

- file for each SIU, folders inside for different items for that SIU
  - IUP, with transmittal letter, synopsis, application, and DWR approval letter
  - inspections
  - NOVs and SIU responses
  - Correspondence, possibly separated by POTW and SIU
  - Data, possibly separated by POTW collected and SIU collected

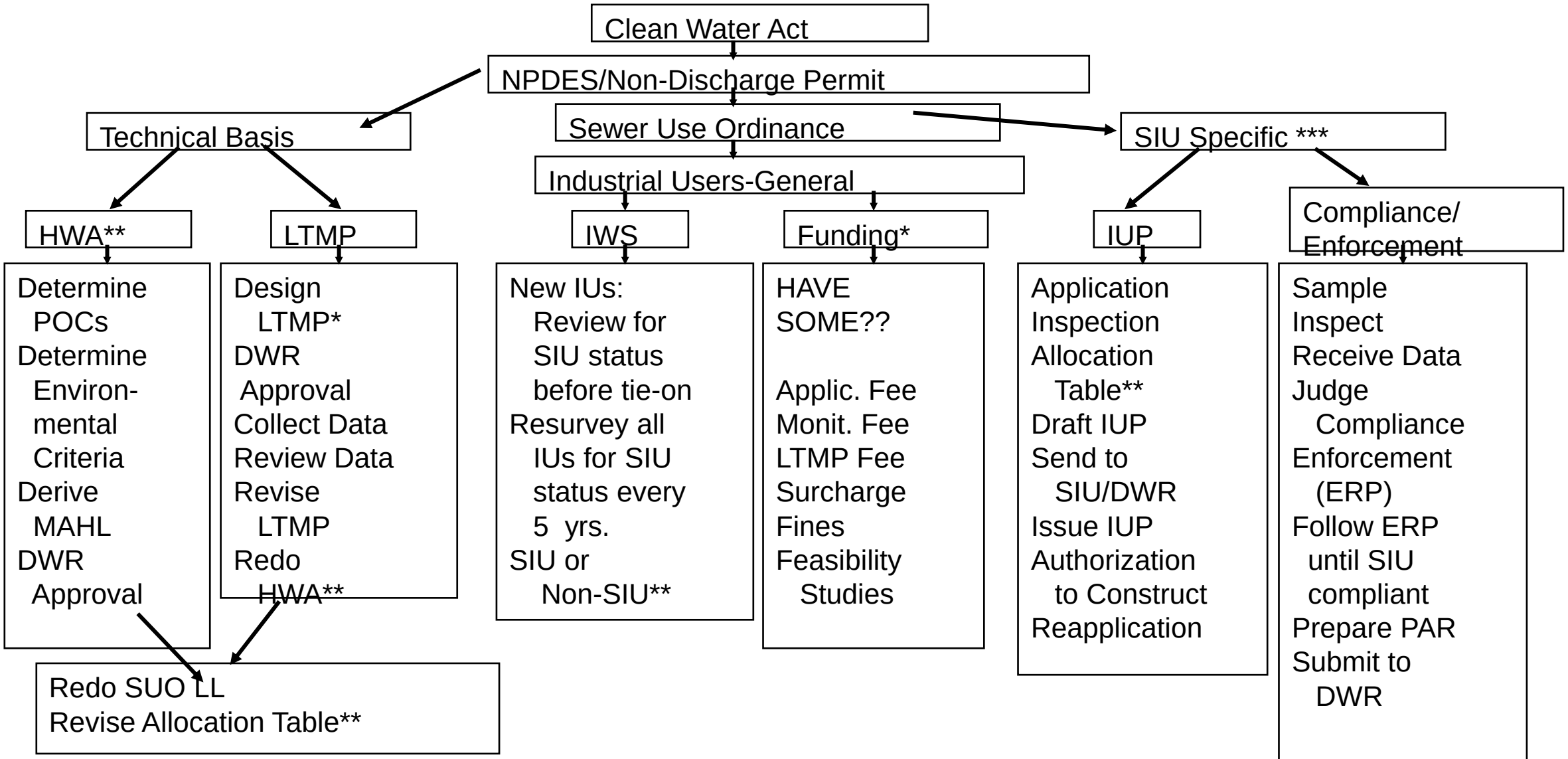
Electronic Files Should Have Same Folders



Funding

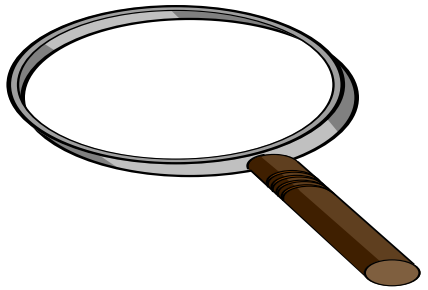
- Fair and Equitable
- Defendable
- Based on actual costs
- Examples:
  - Permit Charge
  - Sampling Cost Recovery Charges
  - Administration Charge
  - LTMP Charge
- Do you have enough money to operate the POTW's PT Program?

Pretreatment Implementation Flow Chart



DWR Inspections and Audits

- DWR staff goes on-site a minimum of 3 times in 5 years to POTW to perform detailed review of POTW's Pretreatment Program:
  - program elements
  - files
  - sampling and data summary sheets
  - compliance judgment/enforcement
  - SIU correspondence
  - inspections of SIUs
  - Forms are on "Other Downloads" web-page



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DWR Guidance and Training

- DWR Guidance - *Comprehensive Guidance for North Carolina Pretreatment Programs or "Comp Guide"*
- Training
  - One-day workshops on PAR, HWA and IUPs
  - Phone calls, emails, meetings, letters
- Pretreatment Program Training Web site –

https://deq.nc.gov/about/divisions/water-resources/water-resources-public-information/training/pretreatment-program-training

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Pretreatment Program Training

Training

Pretreatment Program Training

Surface Water Identification Training and Certification (SWITC) Course

2020 worskhops have been scheduled - locations and dates below. Please click here to register. IUP Workshops will be scheduled based on demand.

EPA Pretreatment Training

Please visit EPA's Pretreatment Training page to review upcoming events and available training. Check EPA's website regularly for announcements of future topics.

Pretreatment 101 for Pretreatment Beginners

As presented at the 2019 NC-PC Annual Conference.

- Pretreatment 101 Presentation (October 2019)
- Units Conversion Guidance (2012)
- Basic IUP Guidance and Compliance Judgment (2012)

Pretreatment Annual Report (PAR) Workshops

Dates	PAR Workshop Locations
January 24, 2020	Neuse River Resource Recovery Facility (Admin Bldg.) Address: 8500 Battle Bridge Road, Raleigh, NC 27610
January 29, 2020	Salisbury-Rowan Utilities Administration Bldg. Address: 1 Water Street, Salisbury, NC 28144

Showing 1 to 2 of 2 entries

- 2020 PAR Invitation
- PAR Workshop Presentation, Compliance Judgment Examples

Headworks Analysis (HWA) Workshops

Dates	HWA Workshop Locations
January 30, 2020	Salisbury-Rowan Utilities Administration Bldg. Address: 1 Water Street, Salisbury, NC 28144
April 30, 2020 (Cancelled)	Neuse River Resource Recovery Facility (Admin Bldg.) Address: 8500 Battle Bridge Road, Raleigh, NC 27610

NORTH CAROLINA Environmental Quality

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NC DEQ » About » Divisions » Water Resources » Water Resources Permit Guidance » Pretreatment Guide » Permit Writing Guidance

Permit Writing Guidance

Details about the next Pretreatment Permit Writing Workshop are on the Training page.

Basic IUP Guidance, Including What to Submit (August 2005)

IUP Training Materials

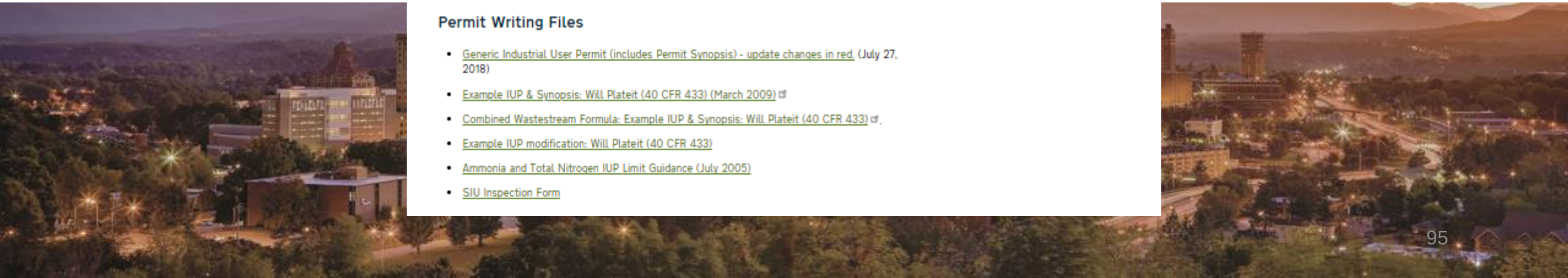
- IUP Writing Steps: Workshop Outline
- Industrial User Wastewater Survey and Discharge Permit Application: Slugem Hosiery
- Guidance Document for Completing the Industrial User Wastewater Survey and Discharge Permit Application
- Slugem Hosiery SIU Inspection Form
- Slugem Hosiery Data Summary Spreadsheet
- Categorical Industry Overview Presentation
- Blank Industrial User Wastewater Survey and Discharge Permit Application (April 2012)

Permit Writing Files

- Generic Industrial User Permit (includes Permit Synopsis) - update changes in red (July 27, 2018)
- Example IUP & Synopsis: Will Plateit (40 CFR 433) (March 2009)
- Combined Wastestream Formula: Example IUP & Synopsis: Will Plateit (40 CFR 433).
- Example IUP modification: Will Plateit (40 CFR 433)
- Ammonia and Total Nitrogen IUP Limit Guidance (July 2005)
- SIU Inspection Form

Pretreatment Guide

- Mercury Guidance
- Annual Report Guidance
- Permit Writing Guidance
- Other Industrial Information



POTW Support and Training

- POTWs -
  - Annual Pretreatment Workshop - presented by Pretreatment Workshop Planning Committee
  - Pretreatment Consortium - www.ncpretreatment.org
  - Voluntary Certification Program
  - One on one support

Summary

- You are now ready (hopefully)!
- Find and read your Pretreatment Program Elements in your files
  - element itself
  - submittal letter to DWR
  - approval letter from DWR
  - especially IUPs, AT, LTMP/STMP, ERP
- Read *Comprehensive Guide*
  - especially Chapters 7 and 8
- Call us with any questions

Develop and Implement the "Right" Pretreatment Program

Creating a Pretreatment Program which

- Protects the POTW staff and facilities
- Is Environmentally sound
- Is Technically feasible
- Is Judicially defensible

There is a delicate balance between these goals and protecting the POTW!

- If Program doesn't do what you need it to do, work to fix it!
  - Too harsh or too weak, can cause aggravating circumstances.

NORTH CAROLINA
Department of Environmental Quality

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NORTH CAROLINA *Environmental Quality*

DEQ NORTH CAROLINA Department of Environmental Quality

Acronyms

- AT- Allocation Table
- BOD- Biological Oxygen Demand
- CIU- Categorical Industrial User
- COD – Chemical Oxygen Demand
- DENR/NCDEQ- Department of Environmental Quality
- DMR- Discharge Monitoring Report
- DWR- Division of Water Resources
- EPA-Environmental Protection Agency
- ERP- Enforcement Response Plan
- HWA- Headworks Analysis
- IU- Industrial User
- IUP- Industrial User Permit
- IWS- Industrial Waste Survey
- LL- Local Limit
- LTMP- Long term monitoring plan
- MAHL- Maximum Allowable Headworks Loading
- MAIL- Maximum Allowable Industrial Loading
- MGD- Million gallons per day
- NCAC- North Carolina Administrative Code
- NCGS- North Carolina General Statute
- NPDES- National Pollutant Discharge Elimination System
- NSCIU – Non-Significant Categorical Industrial User
- OCPSF- Organic chemicals, plastics and synthetic fibers
- PAR-Pretreatment Annual Report
- PERCS- Pretreatment, Emergency Response and Collection Systems
- POC- Pollutant of Concern
- POTW- Publicly Owned Treatment Works
- QNCR- Quarterly noncompliance report
- RPA- Reasonable potential analysis
- SIU- Significant Industrial User
- SNC- Significant noncompliance
- STMP- Short term monitoring plan
- SUO- Sewer Use Ordinance
- TMDL- Total Maximum Daily Load
- TOC – Total Organic Carbon
- WQS- Water Quality Standard
- WWTP- Wastewater Treatment Plant

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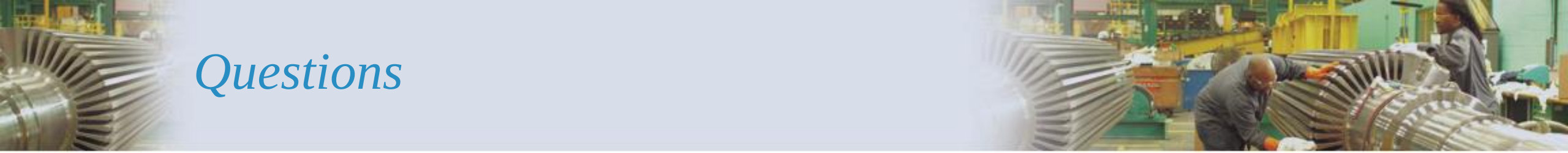

Questions

- Question Time
  - Please feel free to ask questions about today's presentation
  - Please maintain questions at a 101 level, opportunities to ask higher level questions will be available throughout the conference time.
  - Current Pretreatment items will be covered in Michael Montebello's presentation