Industrial Wastewater Pretreatment

An Introduction

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Pretreatment Overview

- Origin / history of the National Pretreatment Program.
- Definitions / intent of the National Pretreatment Program.
- Who must develop a local pretreatment program.

Pretreatment Overview

- Components of a technically and legally defensible pretreatment program.
- What industries must be regulated by a POTW.
- Pretreatment program requirements for POTWs.

Pretreatment Overview

- Local Limits
- POTW & IU reporting requirements under the National Pretreatment Program.
- Updating Your Industrial Pretreatment Program and Associated Components.
- Categorical Industries and Determinations

Allows for exotic travel opportunities

Origin / History of the National Pretreatment Program

Clean Water Act

- First enacted in 1972 - as the Federal Water Pollution Control Act (FWPCA).
- Directed EPA to develop and implement regulations for limiting pollutants discharged to surface waters.
- FWPCA amended several times since 1972 – now known as the *Clean Water Act.*

Key Elements of the Clean Water Act

Provides EPA with the legal authority to:

- Establish the National Pollutant Discharge Elimination System (NPDES) program – regulating direct discharges to surface waters of the United States (POTWs and industrial dischargers).
- Establish the National Industrial Pretreatment Program – regulating industrial discharges to POTWs (indirect discharges).

History of Pretreatment Regulations

1972: FWPCA Amendments create NPDES Program. Establishes Effluent Guidelines (technology-based effluent limits).

1972: EPA established general prohibitions against Pass Through and Interference (40 CFR Part 128).

1978: EPA was sued and lost, leading to the promulgation of Part 403, General Pretreatment Regulations (replaced Part 128).

1990: EPA promulgates changes from DSS and PIRT: addressed RCRA discharges to POTWs (Domestic Sewage Exclusion) and other significant changes.

2005: Streamlining Pretreatment Regulations: October 14, 2005 - Published in the Federal Register: [(Volume 70, Number 198). Pages 60133-60198]

General Pretreatment Regulations 40 CFR Part 403 January, 1981

Pretreatment Program Legal Framework

This is the only environmental program where EPA has authorized local governments (POTWs) directly to implement and enforce Federal Regulations.

EPA Definitions

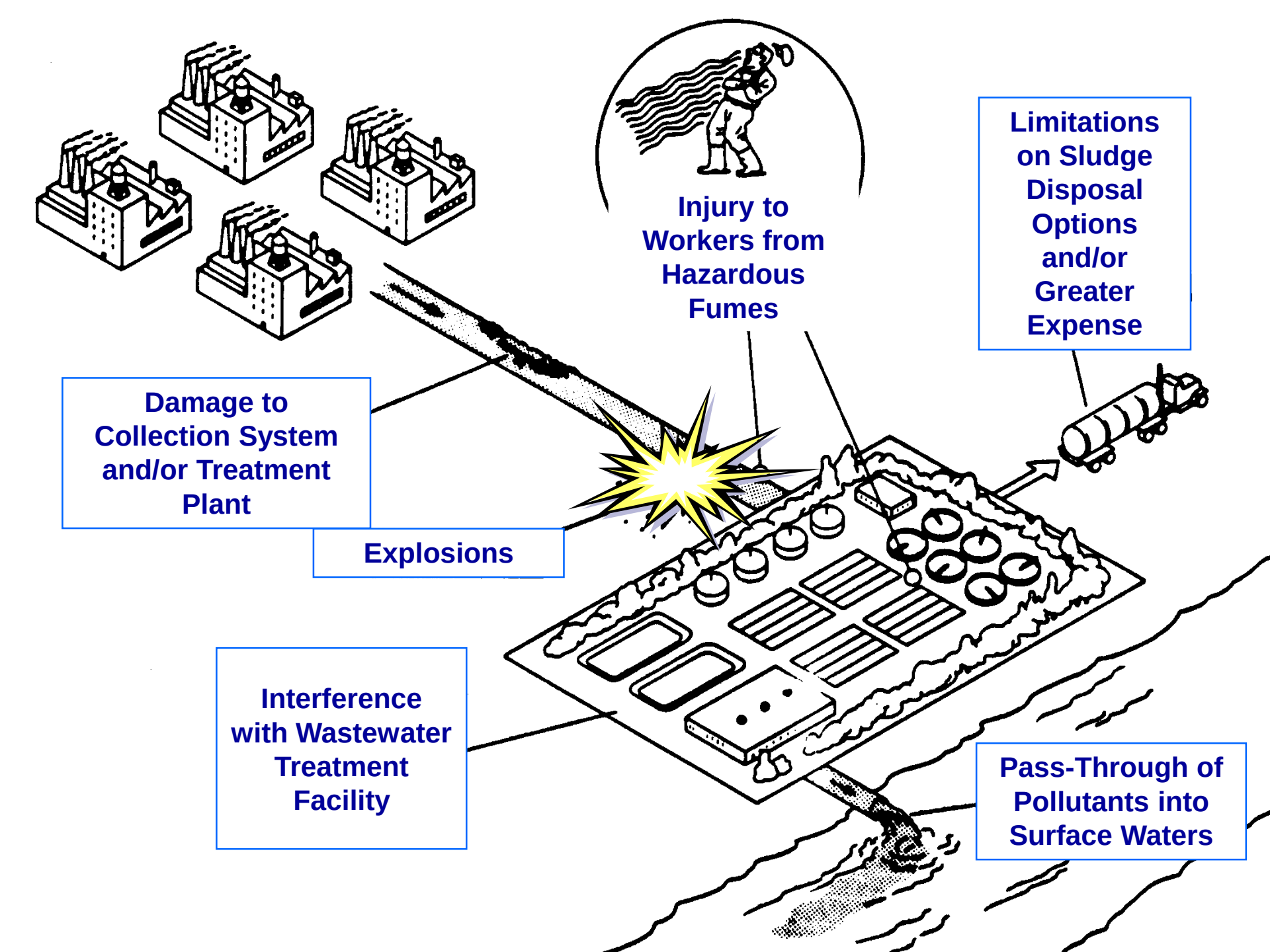
Pass Through: A discharge which exits the POTW into Waters of the U.S. which alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's permit.

Interference: A discharge which alone or in conjunction with a discharge or discharges from other sources, inhibits or disrupts the POTW, it's treatment processes or operations, or its sludge processes, use or disposal; AND, therefore is a cause of a violation of any requirement of the POTW's NPDES permit.

Intent of the Pretreatment Program

The objectives of the Pretreatment Program are to prevent the introduction of pollutants to a POTW (sewerage system and treatment works) that may cause Pass Through or Interference or otherwise interfere or be incompatible with the POTW, or hinder the disposal of biosolids. *40 CFR 403.2*

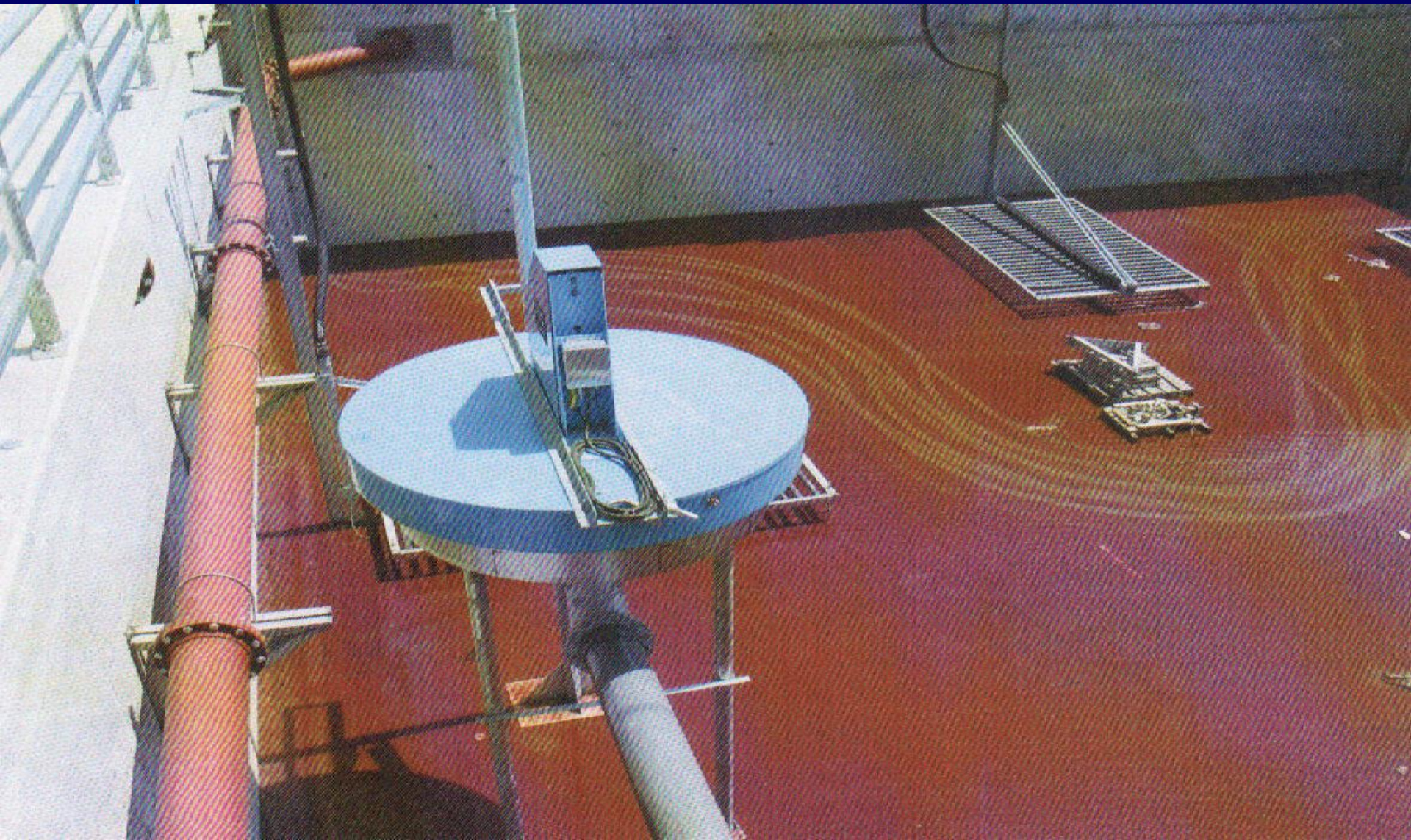
To protect POTW and sewer systems' workers as well as general public.

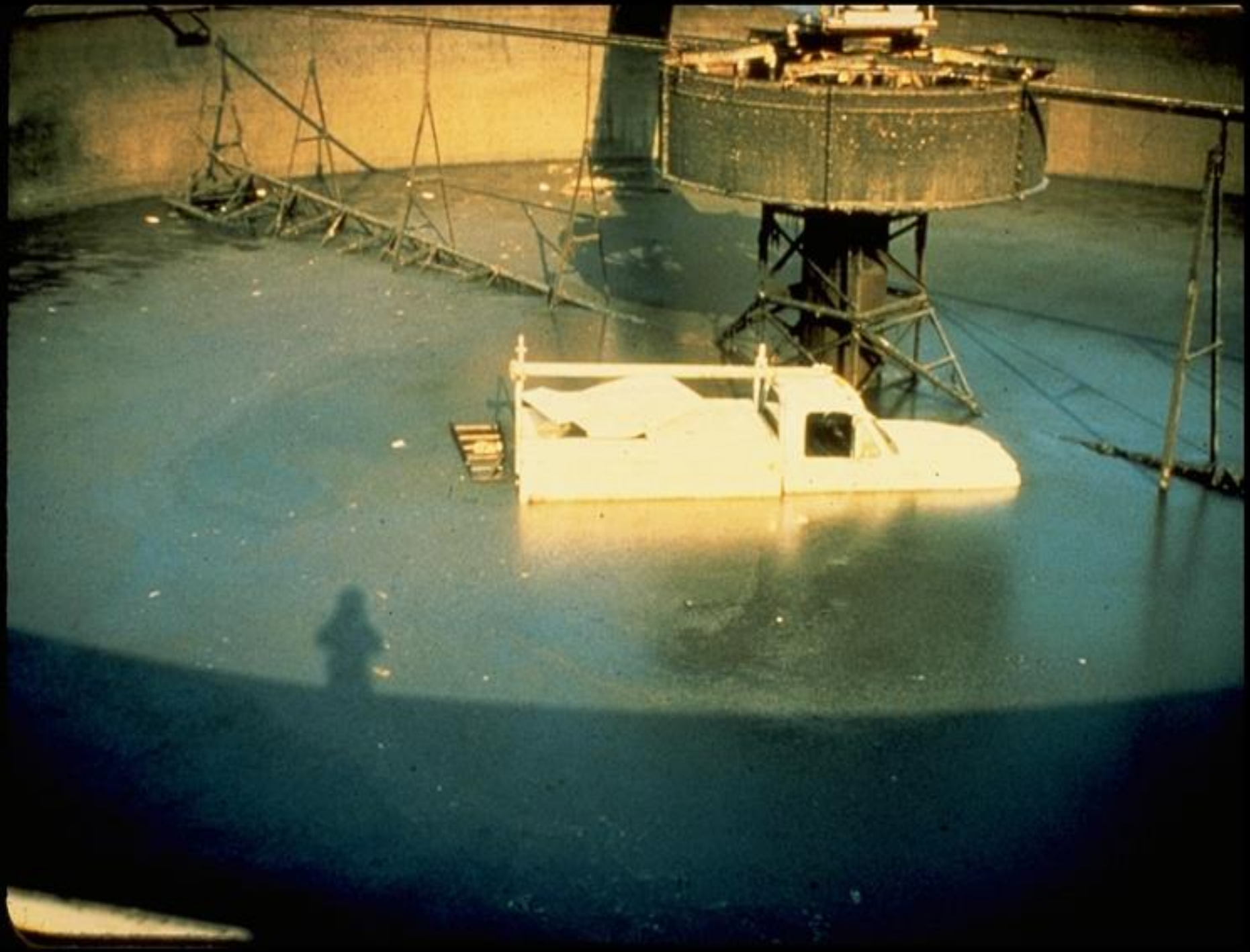

Injury to Workers from Hazardous Fumes
Limitations on Sludge Disposal Options and/or Greater Expense
Damage to Collection System and/or Treatment Plant
Explosions
Interference with Wastewater Treatment Facility
Pass-Through of Pollutants into Surface Waters

Pass Through

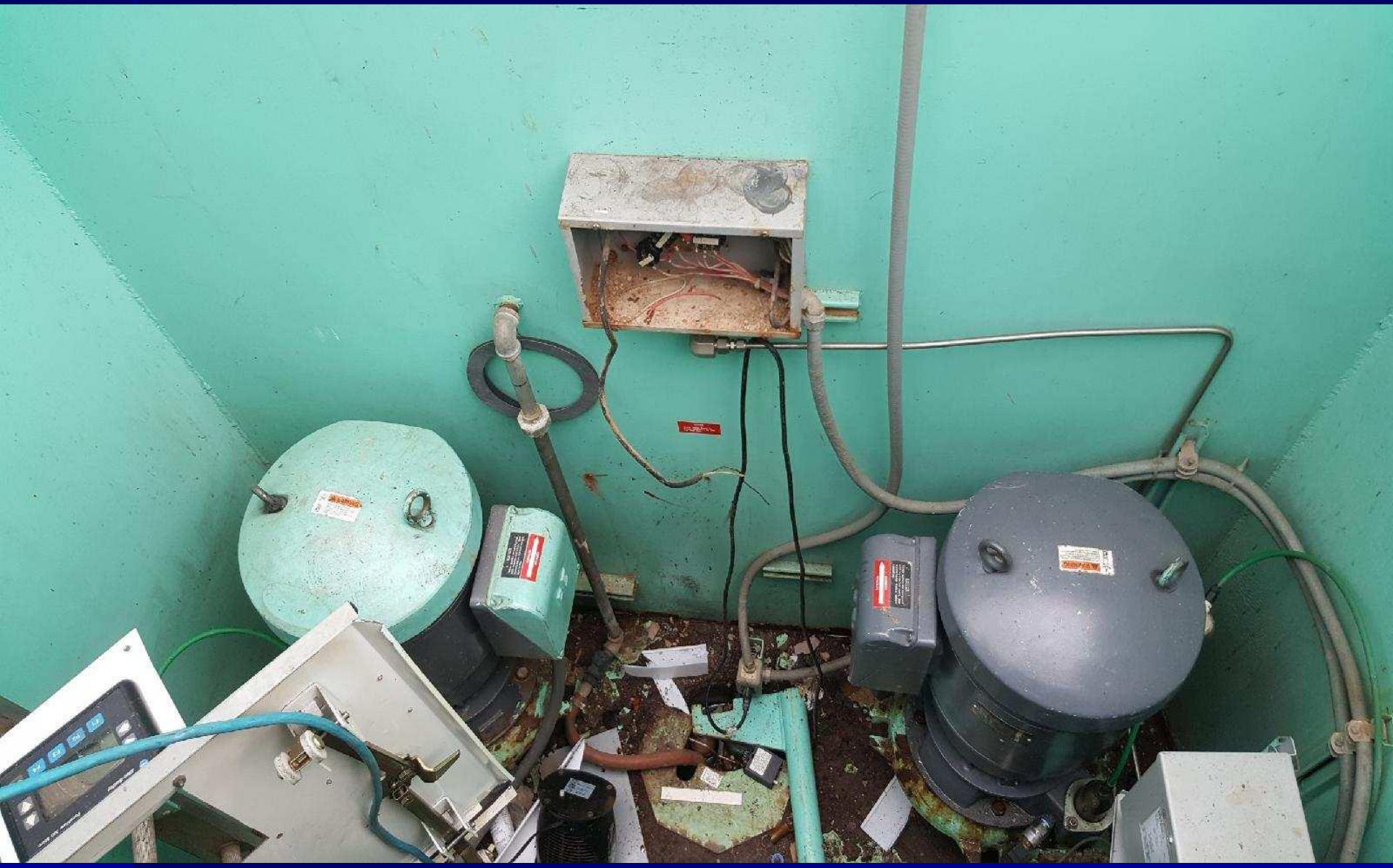
Cause Interference

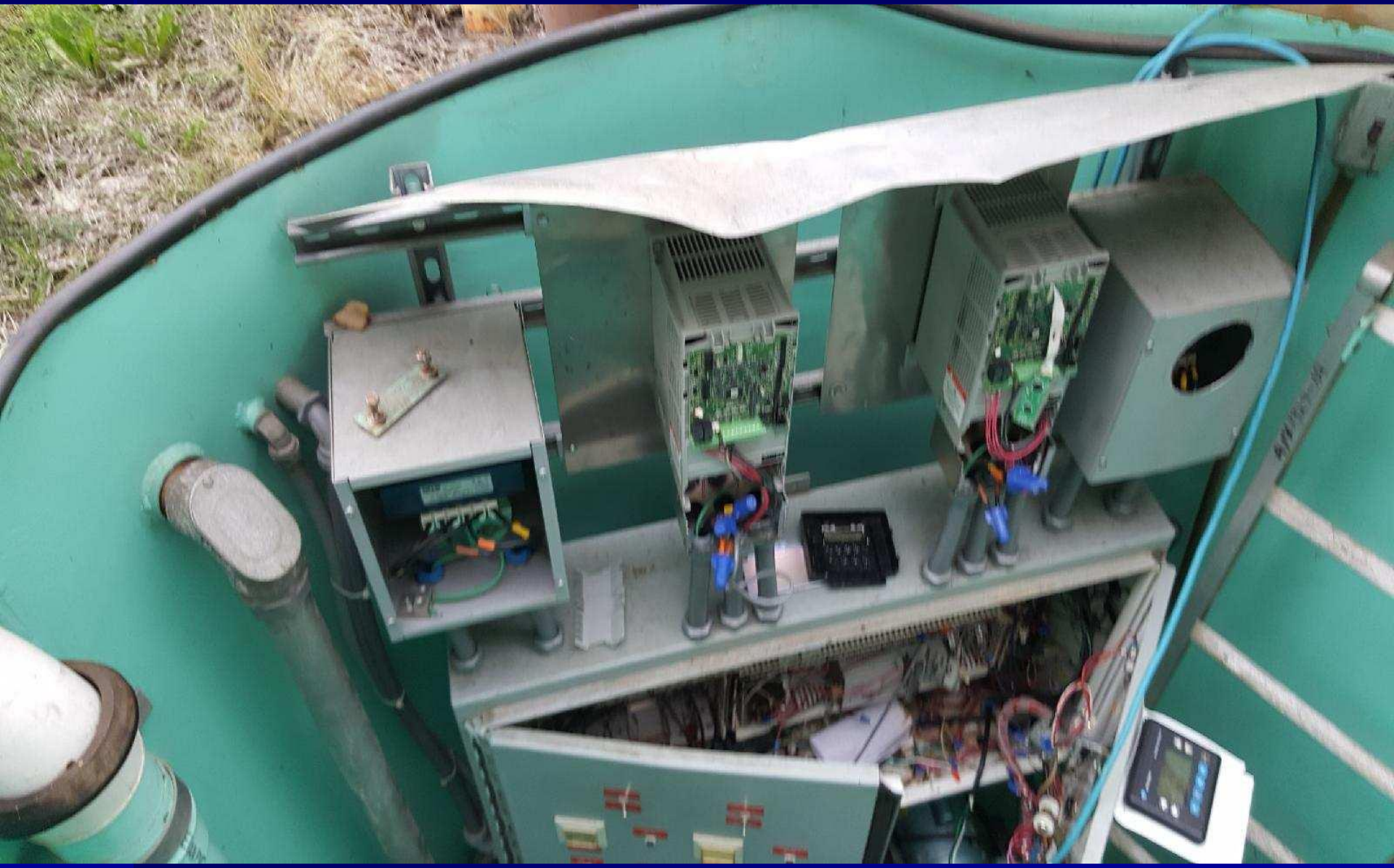
Be incompatible to treatment





GLENDALE
CEMETERY





Pretreatment Standards

- General Prohibitions
- Specific Prohibitions
- Categorical Standards
- Local Limits

General Prohibitions [40 CFR § 403.5(a)(1)]

- No non-domestic user shall introduce into a POTW any pollutants which cause Interference or Pass Through.

Specific Prohibitions [40 CFR § 403.5(b)]

(1) Pollutants which create a fire or explosion hazard;

(2) Pollutants which will cause corrosive structural damage to the POTW; but in no case Discharges with pH less than 5.0 S.U.

(3) Solid or viscous pollutants causing obstruction and resulting in interference;

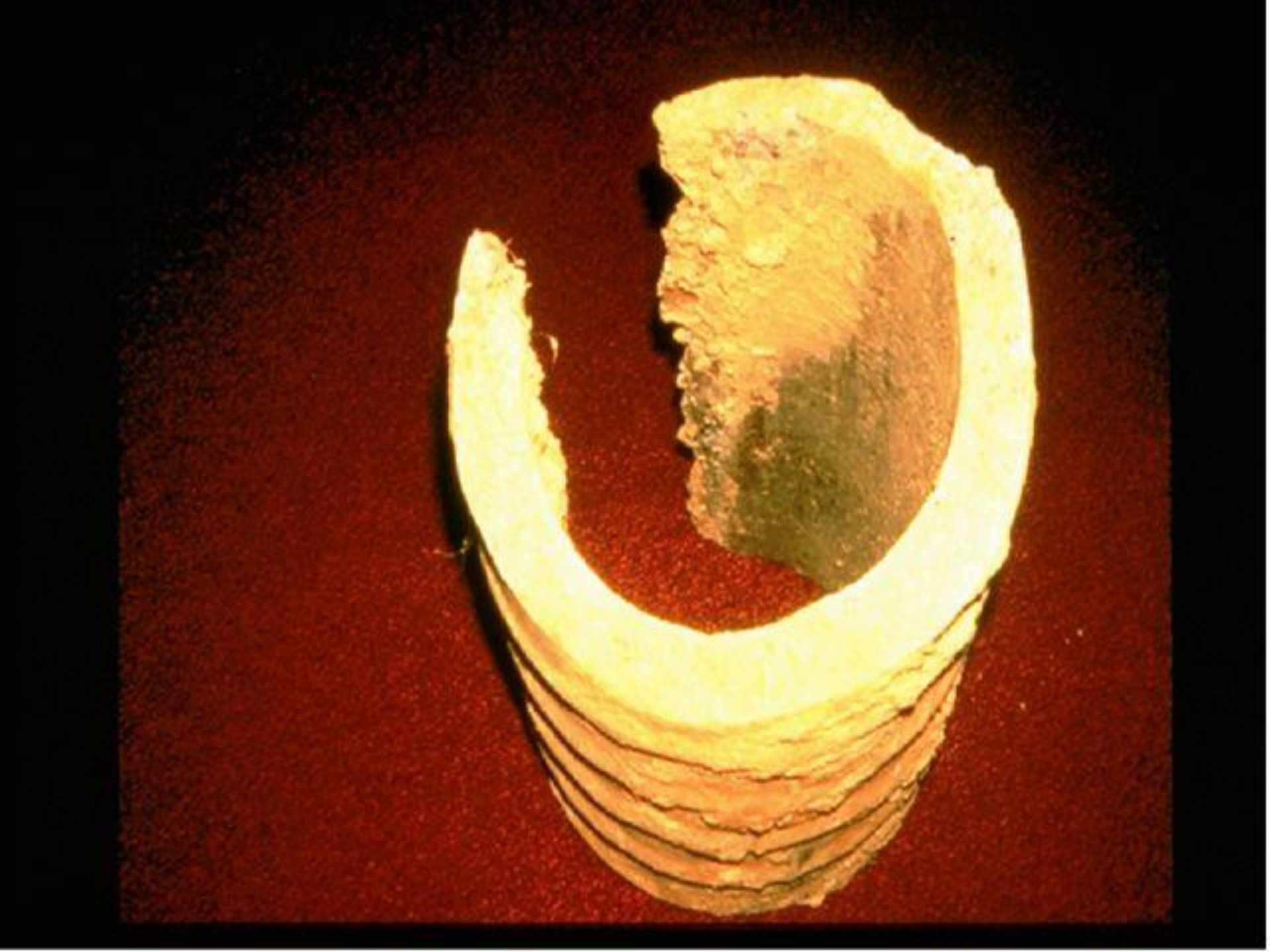
(4) Pollutants released at a flow rate and/or concentration causing interference

(5) Heat in amounts which will inhibit biological activity in the POTW resulting in interference;

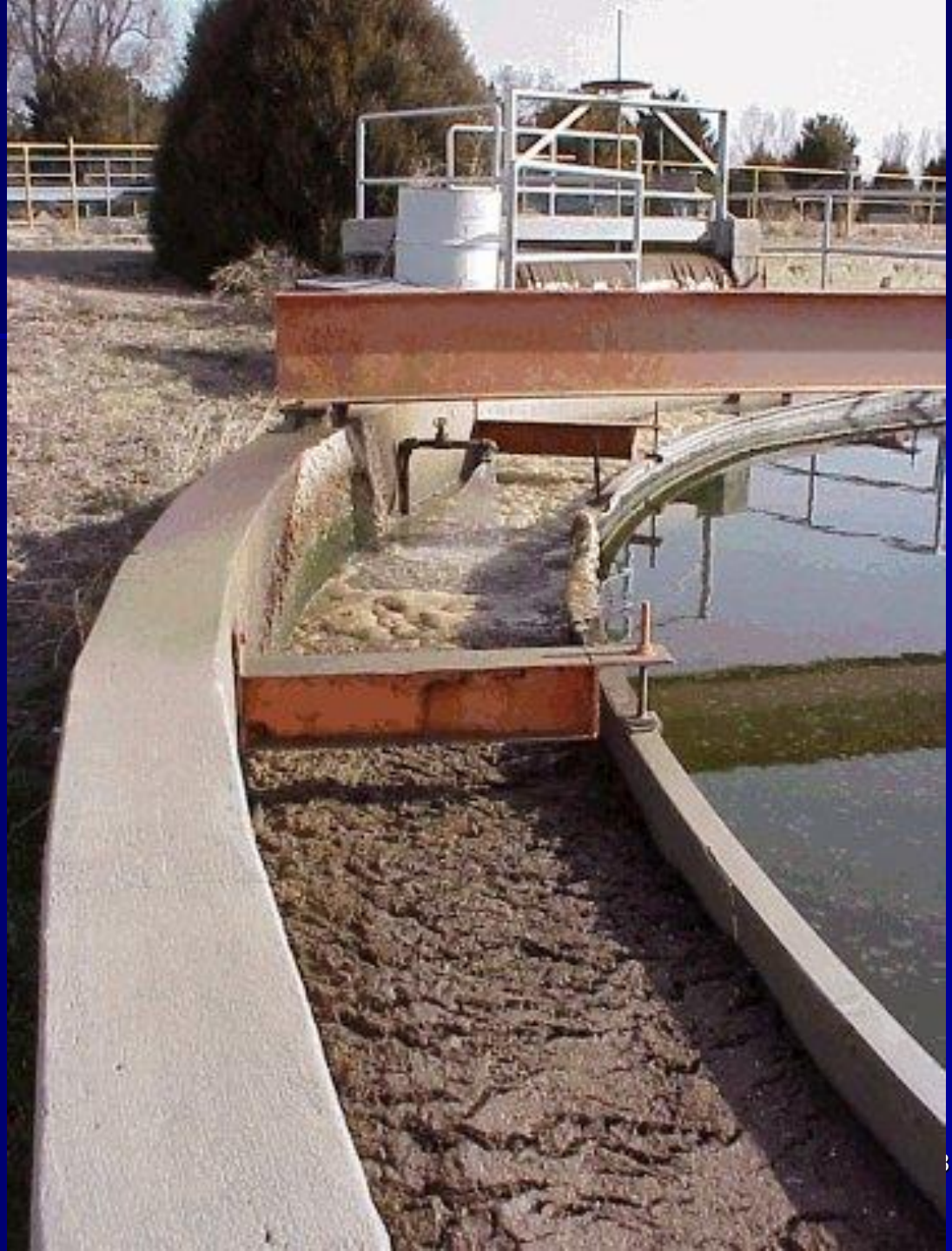
(6) Oils in amounts that will cause interference or pass through;

(7) Pollutants which result in the presence of toxic gases, vapors, or fumes; and

(8) Trucked or hauled pollutants, except at discharge points designated by the POTW.



We don't have a grease problem!



Definitions

Approval Authority: EPA or an authorized state.

Control Authority: EPA or state in a non-approved program. The POTW in an approved program.

Indirect Discharge: The introduction of pollutants into a POTW from any non-domestic source regulated under section 307(b), (c) or (d) of the Act.

Industrial User: A source of Indirect Discharge.

Categorical Industrial User (CIU): Covered by specific Federal effluent guidelines. There are now 3 "types" of CIUs per Streamlining Regulations (regular, mid-tier, non-significant).

Significant Industrial User (SIU): CIUs plus all other IUs that meet the definition at 40 CFR 403.3(v).

Definitions

POTW: means a treatment works which is owned by a state or municipality. Includes any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature. It includes sewers, pipes, and other conveyances if they convey wastewater to the treatment plant.

Definitions

Pretreatment Standards: This term includes categorical standards, local limits, general and specific prohibitions, and Best Management Practices (BMPs). Once these are legally adopt by the POTW, these Pretreatment Standards become Federally enforceable.

Definitions

Local Limits: Technically developed pollutant limits adopted by the POTW. The limits are the concentrations or loadings of pollutants that a POTW can accept, based on MAIHL calculations, and prevent Pass Through, Interference or a violation of General or Specific Prohibitions.

Local Limits include the final approved limit, the MAHL, MAIHL, other loadings and the pretreatment program package submitted by the POTW.

Question and Answer Period

Who Must Develop a Local Pretreatment Program?

- POTWs with total design flow > 5 MGD, and
  - Receives pollutants from industrial users that pass through or interfere or
  - Receives discharges from categorical industrial users (discussed later in the presentation).

Learn more in: 40 CFR 403.8(a)

Who Must Develop a Local Pretreatment Program?

- POTWs less than 5 MGD if the Approval Authority (state or EPA) determines that a program is required to prevent pass-through and interference – or has significant industrial contribution or chronic NPDES violations due to non-domestic discharges.

- NPDES states may assume responsibility

Learn more in: 40 CFR 403.10(e)

Components of a Technically and Legally Defensible Pretreatment Program

- Legal Authority to implement and enforce the program's requirements (as derived from State law that confers federal legal authority on Control Authority)
- Technically-based Local Limits
- Adequate funding and staffing for continued program implementation/execution

Learn more in: 40 CFR 403(f)

Legal Authority

Must Enable the POTW to:

- Require IU compliance with applicable standards
- Deny IU contribution of pollutants that do not meet applicable requirements
- Issue industrial user permits (aka control mechanism)
- Perform surveillance monitoring activities
- Obtain remedies for non-compliance (orders/fines/criminal)
- Comply with confidentiality requirements

Learn more in: 40 CFR 403.8(f)(1) & Model Pretreatment Ordinance (EPA 833-B-06-002).

Are yours up to date?

Which Industries Must POTWs Regulate?

1. All Categorical Industrial Users (CIUs) regardless of flow.
2. Significant Industrial Users ("SIUs"), which are industrial users that:
   - Discharge an average of 25,000 gpd or more of ***process*** wastewater
   - Contribute 5% or more of a POTW's average dry weather hydraulic or organic (e.g. BOD/TSS) capacity
   - Are determined to have "reasonable potential" to adversely affect POTW's operation, or violate pretreatment standards or requirements.
3. Any other non-domestic user that discharges pollutants of concern.

Categorical Industrial Users

- Defined types of industries subject to National Categorical Pretreatment Standards
- Examples:
  - Electroplating (40 CFR 413)
  - Metal Finishing (40 CFR 433)
  - Plastics Molding and Forming (40 CFR 463)
  - Metals Molding and Casting (40 CFR 464)
  - Electrical and Electronic Components (40 CFR 469)
  - Pharmaceuticals (40 CFR 439)
  - Dentists* (40 CFR 441)

Program Requirements for POTWs

- Maintain compliance monitoring database
- Issue Notices of Violation
- Apply enforcement actions consistent with the Program's Enforcement Response Plan, including assessing monetary penalties and civil/criminal prosecution.
- Develop, enforce, and update Local Limits as required (changes in regulations, treatment plant compliance status and/or capacity).

Learn more in: 40 CFR 408(f)

Monitoring Requirements for POTWs

POTWs must:

- Inspect each CIU / SIU at least once per year
- Independently sample each CIU/ SIU at least once per year for ALL REGULATED POLLUTANTS (including local limits).
- Require a minimum of 2 semi-annual self-monitoring reports from each CIU/SIU for ALL REGULATED POLLUTANTS (including local limits)

Learn more in: 40 CFR 403.8(f)(2)(v)

What Is a Regulated Pollutant?

A pollutant that:

- Is listed in a categorical effluent guideline (for CIUs)
- Is a local limit AND contained in an Industrial User permit (for CIUs and non-categorical SIUs)

Note: POTWs may need to sample for more local limits to evaluate loading for the annual report where the pollutant in the POTW headworks is elevated.

Surprise!

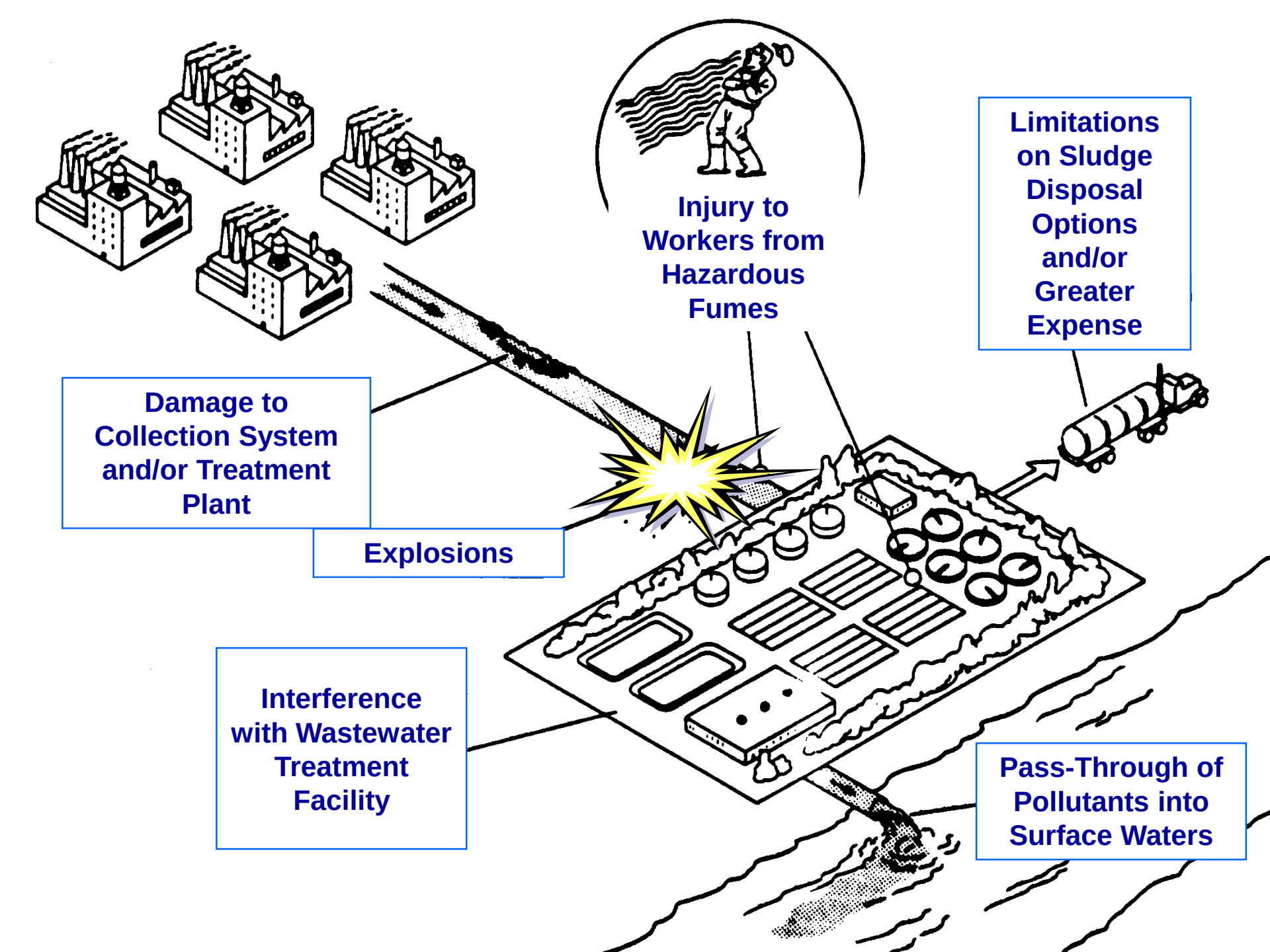
Inspections

- Unannounced vs. Announced
- Signing facility entry waivers
- Delays
- Safety issues

Monday, at 10:00am.

Local Limits

- Protect the POTW
- Protect POTW personnel
- Maintain sludge disposal options
- Protect Water Quality
- Comply with NPDES Permit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Local Limits

- Local limits are designed to keep the POTW in compliance with its NPDES permit and prevent problems from occurring in the collection system
- Violations should be considered serious
- State and EPA are not the only audience for analysis
- Local limits should be believable, real and technically based

When to Update?

- NPDES Permit change/requirement
- Increase/Decrease in SIUs
- Upgrade of POTW
- Increase/Decrease in POTW Removal Efficiency
- Increase/Decrease in Flow

Local Pollutants of Concern

- Facility-specific POC: phosphorous, ammonia, copper, etc. (limited by NPDES permit)
- Collection system issues: Oil and Grease

Local Limits Nomenclature

- Maximum Allowable Headworks Loading (MAHL)- This is the amount of any single pollutant that can come from all sources and not cause pass-through or interference.
- Maximum Allowable Industrial Headworks Loading (MAIHL)- This is the amount that would be regulated through your industrial sources. THIS IS THE BASIS FOR THE LOCAL LIMIT

Influences on Local Limits

- Greatly affected by changes in state water quality standards through NPDES permit limits
- Generally not comparable between POTWs
- Allocations first to uncontrollable sources (domestic and infiltration/inflow) and then controllable sources (industrial and commercial)
- Greatly affected by allocation method (uniform, BMPs, contributory)

Local Limit Approval Process

- Develop technically based local limits.
- Publish proposed limits and give the public/regulated community a chance to comment.
- Adopt local limits into Sewer Use Ordinance.

POTW IPP Reporting Requirements

Approved Programs - Annual Report to EPA/State (403.12(i))

- Updated list of IUs/SIUs/CIUs
- Summary of IU compliance status
- Summary of POTW's IU enforcement and inspections

IU Reporting – Non-Approved Pretreatment Programs

CIUs/SIUs must:

- Submit a minimum of 2 semi-annual self-monitoring reports to EPA or State for ALL REGULATED POLLUTANTS

When to Update Your Program

- When there is “significant change in the operation of a POTW Pretreatment Program that differs from the information in the POTW's submission” that could result in increased pollutant loadings to the POTW or less stringent requirement on IU, such as relaxing Local Limits – headworks loading analysis.

Why is Existing/New Source Determination So Important?

- New source standards generally are more stringent
- New sources are required to be in compliance upon commencement of discharge
- New source requirements are triggered by some facility modifications

Categorical Standards

- Applicable to specific industry categories
- Technology-based limitations
- Clean Water Act section 307 and 1976 EPA/NRDC consent decree.
- Currently at 59 categories.
- Found in 40 CFR Parts 405-471.
- Applicable to direct & indirect dischargers.

Categorical Standards

- National standards
  - technology available
  - economic impacts
  - processes performed
- Apply to regulated process flow only
- Concentration or mass based limits
- Daily maximum and long term averages
- Developed for new and existing sources

Part 405 - Dairy Products Processing

Part 406 - Grain Mills

Part 407 - Canned and Preserved Fruits and Vegetables Processing

Part 408 - Canned and Preserved Seafood Processing

Part 409 - Sugar Processing

Part 410 - Textile Mills

Part 411 - Cement Manufacturing

Part 412 - Feedlots

Part 413 - Electroplating

Part 414 - Organic Chemicals, Plastics and Synthetic Fibers

Part 415 - Inorganic Chemical Manufacturing

Part 417 - Soap and Detergent Manufacturing

Part 418 - Fertilizer Manufacturing

- Part 419 - Petroleum Refining
- Part 420 - Iron and Steel Manufacturing
- Part 421 - Nonferrous Metals Manufacturing
- Part 422 - Phosphate Manufacturing
- Part 423 - Steam Electric Power Generating
- Part 424 - Ferroalloy Manufacturing
- Part 425 - Leather Tanning and Finishing
- Part 426 - Glass Manufacturing
- Part 427 - Asbestos Manufacturing
- Part 428 - Rubber Manufacturing
- Part 429 - Timber Products Processing
- Part 430 - Pulp, Paper and Paperboard
- Part 431 - The Builders' Paper and Boardmills
- Part 432 - Meat Products

- Part 433 - Metal Finishing
- Part 434 - Coal Mining
- Part 435 - Oil and Gas Extraction
- Part 436 - Mineral and Mining Processing
- Part 437 – Centralized Waste Treatment
- Part 438 – Metal Products and MAchinery
- Part 439 - Pharmaceutical Manufacturing
- Part 440 - Ore Mining and Dressing
- Part 441 – Dental Office Point Source Category
- Part 442 – Transportation Equipment Cleaning
- Part 443 - Paving and Roofing Materials(Tars and Asphalt)
- Part 444 – Waste Combustors
- Part 445 - Landfills
- Part 446 - Paint Formulating
- Part 447 - Ink Formulating
- Part 451 – Concentrated Animal Production
- Part 454 - Gum and Wood Chemicals Manufacturing
- Part 455 - Pesticide Chemicals
- Part 457 - Explosives Manufacturing
- Part 458 - Carbon Black Manufacturing

Part 459 - Photographic Processing
Part 460 - Hospital
Part 461 - Battery Manufacturing
Part 463 - Plastics Molding and Forming
Part 464 - Metal Molding and Casting
Part 465 - Coil Coating
Part 466 - Porcelain Enameling
Part 467 - Aluminum Forming
Part 468 - Copper Forming
Part 469 - Electrical and Electronic Components
Part 471 - Nonferrous Metals Forming and Metal Powder

- The CWA(304(m)) requires that every two years EPA develop and publish plans for effluent guidelines, review, revision, development, and adoption.

Categorical Determinations

- Production processes/products
- Raw Materials
- Production volume
- Determine applicable category
- Determine applicable subcategory
- Contact Approval Authority for assistance

Streamlining Rule 2005

- All approved programs must have updated their:
  - Ordinance
  - Rules and Regulations
  - By-Laws

Conclusion / Questions?