

Environmental Engineering Design

CE 356

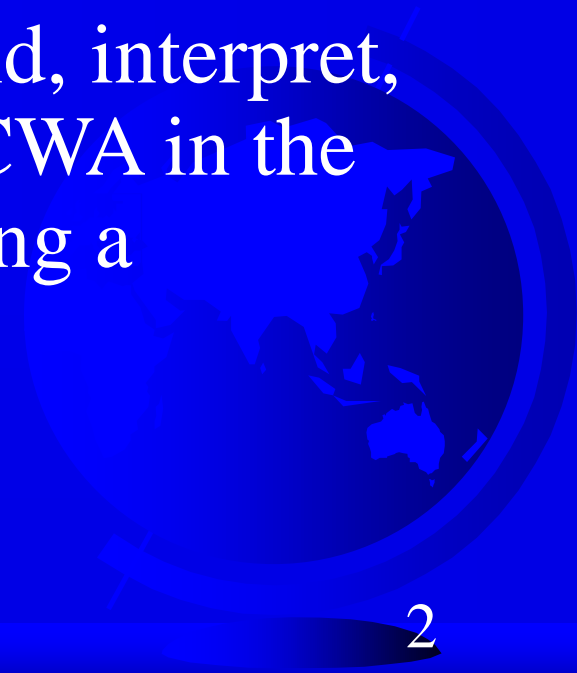
The Clean Water Act



Adopted from Dr.
Fernando Cadena
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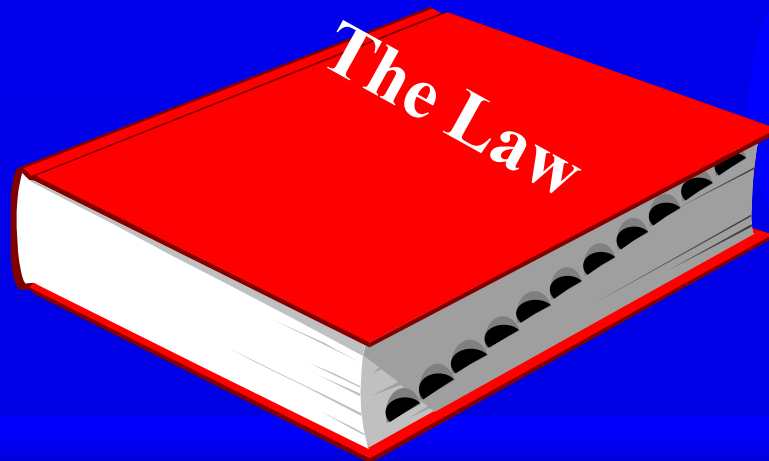
Learning Objectives

- 1 Comprehend the four key parts of the CWA: technology-based standards, permits, industrial pre-treatment, and construction funding.
- 2 As a civil engineer: comprehend, interpret, and apply requirements of the CWA in the context of designing or upgrading a municipal wastewater system.



History of Federal Law

- Various laws dating back to 1886
- Water Quality Act of 1965
- Clean Water Act of 1972
- Amendments to CWA in 1977 and 1981



Key Parts of the CWA

1. EPA sets standards for discharge of waste-waters
2. National Pollutant Discharge Elimination System (NPDES)
 - Wastewater
 - Storm water
 - CAFOs
3. Industrial Pre-treatment program
4. Funding for construction of municipal treatment plants

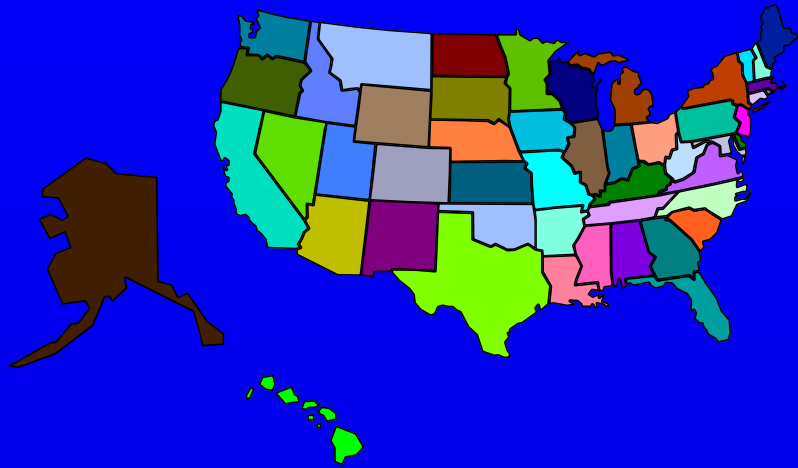


Kinds of Standards

- ☞ Technology based
 - Set by EPA
- ☞ Water quality based
 - Set by the states



Technology Standards



☞ Limits set on amount or concentration discharged

☞ Advantages

- Easy to enforce
- Nationwide uniformity

Technology-Based Standards

☞ Municipal Treatment Plants

- BOD 30 mg/L
- Suspended Solids 30 mg/L

☞ Electroplaters

- pH 6 to 9
- Cyanide 1.48 mg/L
- Chromium 0.62 mg/L



Water Quality Standards

☞ Based on use of water body

- Drinking water
- Recreational

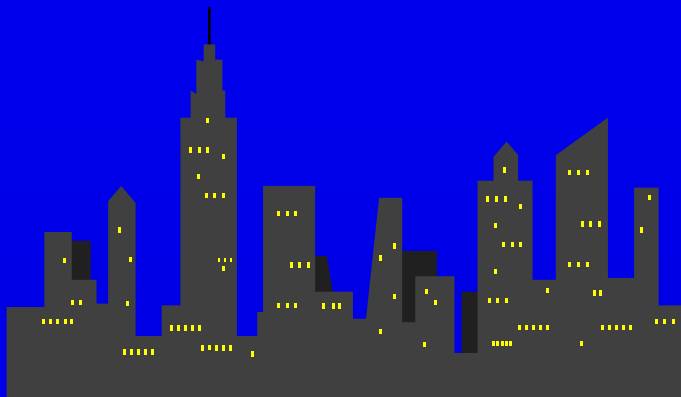
☞ Advantages

- More cost-effective
- Standards are tailored to each situation



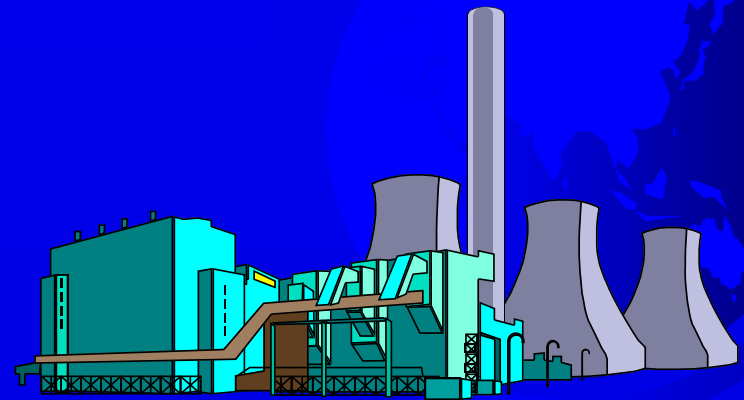
Standards Apply to ...

☞ Cities



☞ Existing Industries

☞ New Industries



Types of Regulated Industries

- ☞ Oil refining
- ☞ Electroplating
- ☞ Food processing plants
- ☞ Pharmaceuticals
- ☞ Many others ...



CWA Permit Programs

- ☞ Discharge to a Surface Water Body –
Requires an NPDES Permit
 - Direct
 - Indirect
- ☞ Discharge to a Publicly Owned
Wastewater Treatment Works –
Requires a Pretreatment Permit

NPDES Program

- ☞ Must get a discharge permit from EPA or state
- ☞ Applies to city or industry which discharges to a water body
 - Wastewater
 - Storm water
 - Ocean Discharges
 - CAFOs



Permit Requirements

- ☞ Must meet standards
 - Compliance is shown by taking and analyzing samples
- ☞ Reporting and record keeping
- ☞ EPA and/or the state have authority to inspect at any time

Pre-Treatment Program

- ☞ Applies to industries that discharge to city sewer systems
- ☞ Required by EPA, enforced by city government
- ☞ Standards may be different than NPDES standards



Reasons for Pre-Treatment

- 1 Prevent dangerous conditions
 - Explosions
 - Poisonous atmosphere to public
- 2 Prevent interference with city system
 - Toxic chemicals can kill bacteria in city treatment plant (i.e. pesticides)

Reasons for Pre-Treatment

3 Prevent pass-through

- Some wastes are not bio-degradable
- City plant can't handle very high strength waste

4 Prevent sludge contamination

- Limits on the metals concentration of sludges

Construction Grants

- Grants given to cities to upgrade treatment plants
- \$590 Billion spent from 1972 to 1990
- Grants have been replaced by revolving loans
 - Cities and states can borrow \$ from EPA for sewer & treatment plant construction

