

# National Pollutant Discharge Elimination System



Protecting the Environment  
and Public Health

- Regulates discharges of pollutants to water of the United States



- The Environmental Protection Agency (EPA) sets effluent standards.

# PRINCIPLES OF THE "LAW"

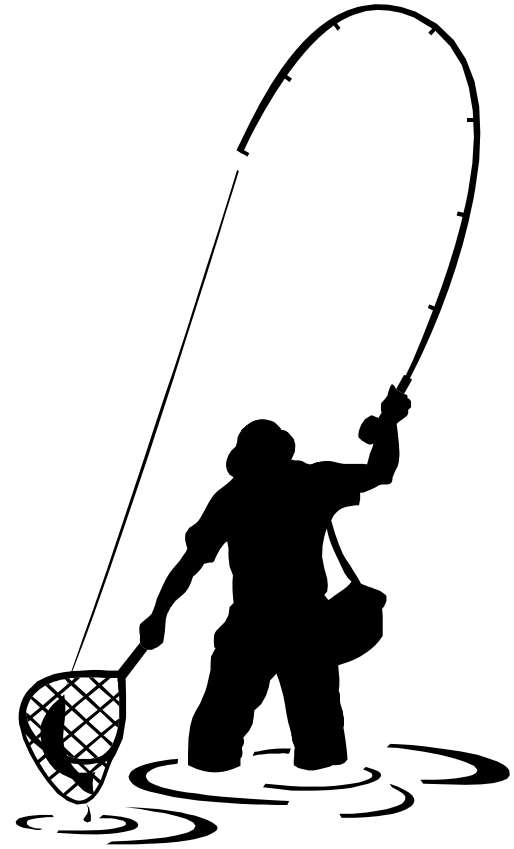
- DISCHARGING POLLUTANTS IS NOT **A RIGHT**
- A DISCHARGE PERMIT IS REQUIRED
- WASTEWATER **MUST BE TREATED** REGARDLESS OF THE RECEIVING WATER
- LIMITS BASED ON **TECHNOLOGY** AND SCIENCE

- Discharge of any pollutant into navigable waters without a NPDES permit is unlawful
  - Point source pollution



## ■ Importance

- Drinking  
water  
supplies
- Recreation
- Fish and  
Wildlife



# MUNICIPALITIES MUST MEET NPDES LIMITS ON THE FOLLOWING:

- BIOCHEMICAL OXYGEN DEMAND (BOD)
- TOTAL SUSPENDED SOLIDS (TSS)
- pH
- FECAL COLIFORM
- CHLORINE RESIDUAL



- Effluent Limits
  - Municipal Wastewater Treatment Facilities

- Biochemical Oxygen Demand (BOD)

- 30 day avg. - 30 mg/L
- 7 day max. avg. - 45 mg/L
- Minimum 85% removal

- Effluent Limits (cont.)

- Total Suspended Solids

- 30 day average - 30 mg/L
- 7 day max. average - 45 mg/L
- Minimum 85% removal

- Effluent Limits (cont.)

- pH
  - 6-9 S. U.
  - Report maximum and minimum pH values for month

- Effluent  
Limit (cont.)

- Fecal coliforms
  - 30 day average - 200 cfu/100ml
  - 7 day max. average - 500 cfu/100 ml

- Effluent  
Limit (cont.)

- Chlorine

- No  
measurable  
amount

- 0.01 mg/L

# Other Requirements

- Flow
  - Report only
- Biomonitoring
- Stream standards may result in more stringent effluent limits

# Sampling Frequency

- Depends on size of facility



# Reporting

- Discharge Monitoring Report – DMR
  - Frequency depends on size of facility

# Non-Compliance

- Fine
- Imprisonment

# New Mexico Certification Regulations



# Levels of Certification

- Collections
  - 1 and 2
- Distribution
  - Small, 1, 2, and 3
- Wastewater
  - Small, Small Advanced, 1, 2, 3, and 4
- Water
  - Small, Small Advanced, 1, 2, 3, and 4

# Level of Certification Required for Municipality

- Depends on
  - Population served
  - Level of process complexity



# EXAMPLES

- RAW WASTEWATER LAGOONS

Classification \_\_\_\_\_ Population served

Small

up to 500

1

>500

- PRIMARY TREATMENT & AERATED LAGOONS

Small

up to 500

2

>500

# EXAMPLES (con't)

- SECONDARY TREATMENT (trickling filter)

Small

2

3

4

up to 500

up to 5,000

up to 20,000

>20,000

# EXAMPLES (con't)

## ■ SECONDARY TREATMENT (AERATION)

Small	Advanced	up to 500
<u>3</u>		up to 10,000
4		>10,000

## ■ ADVANCED TREATMENT

Small	Advanced	up to 500
<u>3</u>		up to 5,000
4		>5,000

# Requirements for Certification

- Small, Small Advanced and Level 1
  - High school graduation or GED
  - One year of experience
  - Ten training credits
- Level 2
  - High school graduation or GED
  - Two years of experience
  - Thirty training credits

# Requirements for Certification (cont.)

## ■ Level 3

- High school graduation or GED
- Four years of experience
- Fifty training credits

## ■ Level 4

- High school graduation or GED
- One year of experience as Level 3
- Eighty training credits

# Requirements for Certification (cont.)

- Actual experience never less than one year except:
  - Water Technology Program Graduates (Associates Degree)
    - One year of experience - eligible for Level 3

# Substitutions

- No more than one year (30 semester hours) of college education in non-related field = 6 months of experience
- One year of approved vocational school in water and/or wastewater = One year of experience

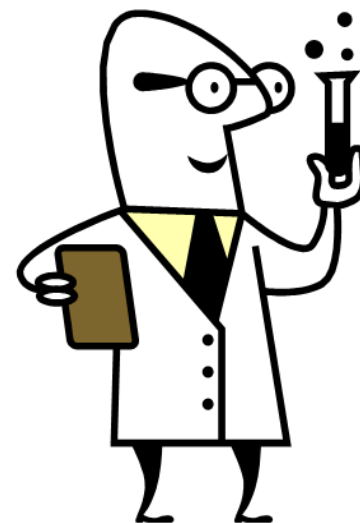
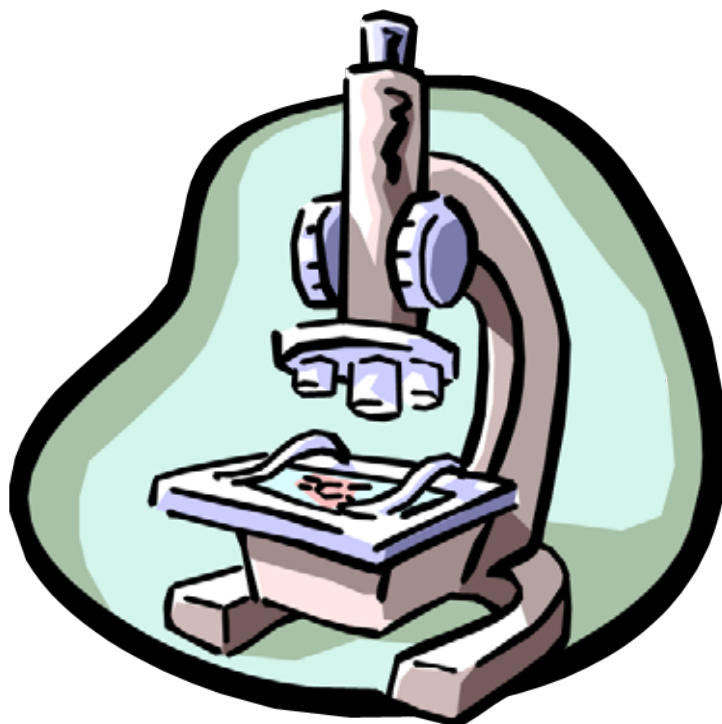
# Renewal

- Every three years
  - 30 Training credits
    - At least 10 credits in area of certification

# Reciprocity

- To New Mexico from other states
- From New Mexico to other states

# ANALYTICAL OVERVIEW



# Total Solids

- Approximately 0.1% of wastewater
- Includes dissolved and suspended solids
- Analysis
  - Sample volume in evaporating dish
  - Dried at 103 C-105 C in drying oven

# Total Suspended Solids

- 150-400 mg/L concentration in raw influent
- Non-soluble or particulate
- Non-filterable solids
- Analysis
  - Solids capture on glass fiber filter
  - Dried at 103 C-105 C in drying oven

# Settleable Solids

- Comprise 40%-60% of total suspended solids
- 90%-99% removed in primary clarifier
- Analysis
  - Imhoff cone
  - 1 hour (45 minutes, gently agitate along wall of cone, 15 additional minutes)
  - mL / L

# Total Dissolved Solids

- Filterable solids
- Analysis
  - Sample volume of filtrate in an evaporating dish
  - Evaporated to dryness in drying oven or on steam bath
  - Dried at 180 C  $\pm$  2 C in drying oven

# pH

- Measure of how acidic or basic a material or solution is
- Analysis
  - Litmus paper
  - Color strips
  - Electrode
  - Reported in standard units (S.U.)

# Biochemical Oxygen Demand

- Indicator of organics present and resulting oxygen depletion
  - Due to microbial aerobic respiration
- Analysis
  - 5 day
  - 20 C  $\pm$  1 C
  - Incubated in the dark

# Chlorine

- Analysis
  - Amperometric
  - Colorimetric (color comparison)
    - DPD
    - Most common form of measurement

# Fecal Coliforms

- Sub-group of total coliforms
- Found in the intestines of warm-blooded animals
- Analysis
  - cfu (colony forming unit)
  - MPN - multiple tube fermentation
  - MF - membrane filtration
    - 44.5 C  $\pm$  0.2 C for 24 hours  $\pm$  2 hours