

MONTANA WATER CENTER OPERATOR BASICS TRAINING SERIES 2005 OUTLINE FOR WASTEWATER LAGOONS COURSE

1 - The Basics

- 1.1 - Importance of Wastewater Treatment
- 1.2 - Origins of Wastewater Lagoon Treatment
- 1.3 - Nature of Wastewater
 - 1.3.1 - Wastewater Contributors
 - 1.3.2 - Wastewater Constituents
 - 1.3.3 - Solids
 - 1.3.4 - Biochemical Oxygen Demand
 - 1.3.5 - pH
 - 1.3.6 - Nutrients
- 1.4 - Rules Governing Wastewater Discharge
 - 1.4.1 - Clean Water Act
- 1.5 - Responsible Parties and Management
 - 1.5.1 - Owner
 - 1.5.2 - Operator(s)
 - 1.5.3 - Regulatory Agencies
 - 1.5.4 - Records
 - 1.5.5 - Planning for the Future
 - 1.5.6 - Effective Communication
 - 1.5.7 - Relief Operator
 - 1.5.8 - Important Contacts

2 - Collection Systems and Lagoon Structure

- 2.1 - Collection Systems
 - 2.1.1 - Lift Station Operation and Maintenance
- 2.2 - Lagoon Types
- 2.3 - Design Standards
- 2.4 - Design Components
- 2.5 - Flow and Load
 - 2.5.1 - Flow Measurement
 - 2.5.2 - Load Variations
- 2.6 - Cross-Connections
 - 2.6.1 - Public Health Significance of Cross-Connections
 - 2.6.2 - Types of Cross-Connection Control Protection
- 2.7 - Backflow Preventers
 - 2.7.1 - Air Gap
 - 2.7.2 - Atmospheric/Hose Bibb Vacuum Breakers
 - 2.7.3 - Pressure Vacuum Breaker Assembly
 - 2.7.4 - Double Check Valve Assembly
 - 2.7.5 - Reduced Pressure Principle Assembly
 - 2.7.6 - Specialty Valves
 - 2.7.7 - Installation and Servicing of Backflow Preventers
- 2.8 - Cross-Connection Control Plans

**MONTANA WATER CENTER OPERATOR BASICS TRAINING SERIES 2005
OUTLINE FOR WASTEWATER LAGOONS COURSE**

3 - Wastewater Treatment

3.1 - Microorganisms

3.1.1 - Bacteria

3.1.2 - Algae

3.1.3 - Animals Found in Lagoons

3.1.4 - Higher Plants

3.2 - Biological and Chemical Treatment

3.3 - Natural Physical Treatment

4 - Operation and Maintenance

4.1 - Multi-Cell Lagoon Operations

4.1.1 - Facultative Lagoon Systems

4.1.2 - Aerated Lagoon Systems

4.2 - Direct Discharge Operations

4.2.1 - Indirect Discharge Operations

4.3 - Disinfection for Direct Discharge Operations

4.3.1 - Chlorination

4.3.2 - Gas Chlorination

4.3.3 - Hypochlorination

4.3.4 - Dechlorination

4.3.5 - Ultraviolet Light (UV)

4.3.6 - Ozone

4.4 - Sludge Removal

4.5 - Maintenance

4.6 - Safety

4.6.1 - Disease

4.6.2 - Confined Spaces

4.6.3 - Traffic Control

4.6.4 - Shoring and Trenching

4.6.5 - Personal Hygiene and Protective Clothing

4.6.6 - Electrical Safety

4.6.7 - Chemical Safety

4.6.8 - Chemical Storage Issues

4.6.9 - Chlorine Safety

4.6.10 - Fire Safety

4.6.11 - First Aid

4.7 - Security

**MONTANA WATER CENTER OPERATOR BASICS TRAINING SERIES 2005
OUTLINE FOR WASTEWATER LAGOONS COURSE**

5 - Monitoring and Reporting

5.1 - Sampling

5.1.1 - Types of Samples

5.1.2 - Sample Site Location

5.1.3 - Sampling Devices and Sample Containers

5.1.4 - Preservation, Shipping and Holding Time

5.2 - Monitoring: Flows and Sludge Accumulation

5.3 - Reporting

5.3.1 - National Pollutant Discharge Elimination System (NPDES)

5.3.2 - General Pretreatment Regulations

5.3.3 - Standards for the Use or Disposal of Sewage Sludge

6 - Troubleshooting Lagoons

6.1 - Troubleshooting

6.2 - Short-Circuiting

6.3 - Overloading/Low Dissolved Oxygen

6.4 - Algae

6.4.1 - Temperature and Algae

6.4.2 - pH and Algae

6.4.3 - BOD, TSS and Algae

6.4.4 - Color and Algae

6.4.5 - Odors and Algae

6.5 - Effluent High in Suspended Solids

6.6 - Effluent High in BOD - Nitrogenous/Carbonaceous

6.7 - Decrease in pH

6.8 - Dike Vegetation

6.9 - Water Weeds

6.10 - Odors

6.11 - Scum

6.12 - Insects

6.13 - Burrowing Animals

6.14 - Waterfowl