

Biological/Natural Systems Operator Need-To-Know Criteria (Subject Areas)

The following list of categories suggests topics of information which are important to know in order to be a successful and proficient Biological/Natural Systems Operator. The list may not be all inclusive, and knowledge of additional topics may be of benefit to the operator.

Category of Information: Processes

Collection Systems

- Types
- Inflow, Infiltration, Exfiltration
- Sources of wastewater
- Pre-treatment
- Pump stations

Flow

- Measurement
- Flow equalization

Screening

- Bar screens (hand-cleaned)
- Bar screens (mechanically cleaned)

Grinding

- Grinders
- Comminutors

Clarification

- Septic tanks

Solids handling

- Land application

Disinfection/Use of Chlorine

- Chlorination
- Dechlorination
- UV
- Other methods

Lagoons

- Aerobic
- Facultative
- Anaerobic
- Aerated
- Discharging
- Total Containment
- Other BNS

Effluent Disposal

- Discharge
- Direct Use
- Irrigation
- Underground Disposal
- NPDES Permit

Cross- Connection

- Prevention
- Types of devices

Category of Information: Support Systems

Motors

- Single Phase
- Variable Speed

Drives

- Coupled
- Direct (Shaft; Gear)
- Speed Reducer (Fixed; Variable)
- Right Angle

Pumps

- Air Lift
- Centrifugal
- Positive Displacement
 - Piston Plunger
 - Progressive Cavity
 - Diaphragm
- Metering
- Ejector

Blowers and Compressors

- Centrifugal
- Positive Displacement (Rotary)

Generators

- AC
- DC

Engines

- Gasoline

Joints

- Flanged
- Compression
- Dresser
- Victualic
- Fused
- Threaded

Category of Information: Support Systems (continued)

Valves

- Ball
- Check
- Globe
- Gate
- Plug
- Petcock
- Pressure Control
- Vacuum Relief
- Mud
- Butterfly
- Multiport
- Telescoping
- Sluice Gate
- Air Release
- Foot

Fittings

- Coupling
- Union
- Plug/Caps
- Corporation (Ferrell; Cock)
- Curb Stop

Chemical Feeders

- Solids
- Liquids
- Evaporators
- Gas
- Slurry

Measuring/ Control

- Signal Generators
 - Parshall Flume
 - Proportional Weir
 - Rectangular Weir
 - Ultrasonic
- Signal Receivers
 - Totalizers
 - Recorders
- Alarms
- Controls
 - Float
 - Hydraulic
 - Electrical
 - Timers

Rolling Stock

- Service Vehicles
- Trucks
- Lawn Mowers
- Portable Pumps
- Generators

Safety Equipment

- Personal Protection Gear
- Traffic Control (Warning Devices; Barricades)
- Hazard Detectors
- First Aid/Hygiene

Category of Information: Lab Tests

Routine Tests

- B.O.D.
- Ammonia
- Chlorine Residual
- Coliform (Fecal)
- Dissolved oxygen
- E. coli
- pH

- Phosphorus
- Solids
 - Settleable
 - Suspended
 - Total dissolved
 - Total
 - Volatile

Control Tests:

- Temperature

Special Tests:

- Biomonitoring

Category of Information: General Information

Units expressions

- Define units
- Convert units

Sources and Characteristics

- Characterize
- Quality/quantity
- Physical/chemical/biological
- Effects
- Grease control

Hydraulics (Basic)

Maps/plans - Interpretation and use

WWT Processes

- Sketch sequence
- Describe processes
- Explain why treated
- Goals of WWT (protect public; protect environment)