



Wastewater Treatment Plant Operations and Maintenance Manual Checklist for New Plants or Upgrades

Directions for the Preparation of Treatment Plant O&M Manuals

Any upgrades or new facility construction require that an Operation and Maintenance Manual be provided as part of the project and approved by the New Hampshire Department of Environmental Services according to the following rules. This checklist is specific to wastewater treatment facilities only. There is a separate checklist for pump station work.

The New Hampshire Code of Administrative rules, Chapter Env-Wq 700 Standards of Design and Construction for Sewerage and Wastewater Treatment Facilities, Part Env-Wq 708.08(a), requires that *“Operation and Maintenance Manuals providing information and guidance for day- to-day operation of the WWTP shall be submitted within 60 days following substantial completion of the construction of the WWTP”*. Part Env-Wq 708.08(b) lists, at a minimum, what should be included in an O&M manual. These rules apply to all projects, regardless of funding source.

The standard **Engineering Construction Phase Contract** for Professional Services for Treatment Works, Part I.A.2.c, requires the *“Preparation of an Operation and Maintenance Manual for approval by the DIVISION. After DIVISION approval, the ENGINEER agrees to supply four (4) sets of the completed manual to the OWNER, and an electronic version of the document for the DIVISION.”*

Manual Format

The attached Treatment Plant checklist provides a preferred format in terms of chapter arrangement and structure. Consultants are encouraged to follow this format as much as possible and are directed to contact DES to suggest an alternative format, if needed, to accommodate unique treatment plant requirements. Consultants should provide draft copies to the owner as well as DES for review.

The following items address the preferred format for both draft manuals and final copies:

- The manual should be assembled using a three ring binder for ease of updating.
- Chapters should be separated with numbered tabs for ease of identification.
- Double sided pages where feasible.
- Drafts for review and approval may be submitted in paper or electronically.
- A copy of the final approved manual shall be submitted electronically. The following conditions can be used to determine how extensive the manual must be:
 - For new treatment plants, the manual must address all pertinent items in the checklist.
 - For a significant upgrade involving an increase in capacity or multiple new major pieces of equipment, a complete new manual may be required. Contact DES Wastewater Operations for help in determining the extent of the manual.
 - For minor upgrades consisting of a limited amount of equipment, such as a new sludge dewatering system, new disinfection, new screening, etc. that have a minimal effect on the overall plant, the manual may be developed as a stand-alone manual or may be incorporated as an addendum into the existing O&M manual. At a minimum, the manual or addendum must include the project description, design criteria of the upgraded equipment,



system operation and control as it relates to the upgraded equipment, drawings or schematics, alarm and notification system, SCADA controls, safety as it relates to the upgraded equipment, references to manufacturers O&M manuals supplied as part of the project, and references to the existing O&M manual where appropriate.

- For any upgrades to a treatment plant that does not already have an approved O&M manual on file, regardless of the significance of the upgrades, a new O&M manual will need to be developed incorporating all of the pertinent elements listed in this checklist.
- In all cases, an up-to-date Emergency Response Plan, as outlined in Chapter 12 of the checklist, must be included in its entirety. If a site specific plan is not available, the generic DES Emergency Response Planning Guide shall be included.

Useful Links

- [NPDES State Water Discharge Permit Reporting of Non-Compliance / Spill Procedure](#)
- [Standard Engineering Construction Phase Contract](#)
- [Pump Station O&M Manual Review Checklist](#)
- [Env-Wq 700 Standards of Design for Construction of WWTFs](#)
- [DES Emergency Response Planning Guide for Wastewater Treatment Facility O&M Manuals](#)
- [NPDES Permit Part II Standard Conditions, April 2018](#)

Yes	No	n/a	Item
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Table of Contents
			Chapter 1 Introduction
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Purpose of Manual
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Stand-alone manual or supplement / inclusion to an existing manual
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Project description
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	New plant or upgraded components (list individual components if upgrade)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Plant type
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Simplified schematic drawing showing plant layout
			Chapter 2 Permits and Standards
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Discharge permit requirements
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NPDES permit (effluent limitations table only)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	State groundwater discharge permit if applicable
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NPDES / State Water Discharge Permit Reporting of Non-Compliance / Spill Procedure
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Monitoring and Record Keeping
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	For NPDES permits copy and insert pages 6 thru 9 of NPDES Part II Standard Conditions (April 2018 or most recent version) of NPDES permit to highlight Part II.C Monitoring Requirements and Part II. D. Reporting Requirements
			Chapter 3 Detailed Design Criteria
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. General description of influent wastewater
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Service area

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Yes	No	n/a	Item
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Average daily design flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Maximum daily flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Peak hour flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Peak instantaneous flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Domestic flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Industrial flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Commercial flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Infiltration / inflow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Design BOD and TSS concentrations and loadings
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Septage volumes and loads
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Wastewater characterization (for nutrient removal systems)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Number and location of pumping stations
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Individual unit process design criteria and physical data. Each unit process shall include the following:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unit process title
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Equipment manufacturer(s)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Number and type of units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Design criteria
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Appropriate unit specific information as outlined below
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Influent / intermediate / effluent pumping
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Wet well dimensions and volumes
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Level control system
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type of pump, manufacturer & number of units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pump capacity GPM at TDH
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Range of GPM flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	HP
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Influent and effluent flow measurement
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type and manufacturer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Size
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Flow range
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Headworks screening / comminution
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type, manufacturer and number of units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Screen size
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Capacity
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Grit removal
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type, manufacturer & number of units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tank dimensions & volumes
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type of pump, manufacturer and number of units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pump capacity GPM at TDH, range of flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. Septage handling
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type, manufacturer and number of units

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Yes	No	n/a	Item
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tank dimensions & volumes in gallons
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pump capacity GPM at TDH, range of flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Mixing devices
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Aeration system
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Primary clarification
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type, manufacturer & number of units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tank dimensions and volume in gallons
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Weir length, each
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Surface area, each
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Detention times @ design ADF
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Surface overflow rate @ design ADF & peak hour flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sludge pump capacity GPM at TDH, range of flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Scum pump capacity GPM at TDH, range of flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sludge/scum flow measurement
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Secondary or Advanced Treatment (activated sludge, IFAS, fixed film, RBC, lagoon, other)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type of process & number of units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tank dimensions and volume in gallons
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Detention time @ design ADF
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BOD loading
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Design MLSS & MLVSS concentration
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Design F/M ratio
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Design SRT
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Individual anaerobic / anoxic / aerobic compartment specifications
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Aeration requirements (SCFM or Pounds of Oxygen)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Blowers - HP and capacity in SCFM
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Mechanical aerators - HP, oxygen transfer rate
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Mechanical mixers - HP
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Recycle pumping - type, capacity GPM at TDH, range of flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. Secondary clarification
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type, manufacturer & number of units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tank dimensions and volume in gallons
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Surface area, each
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Detention time @ design ADF
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Design solids loading @ ADF & peak hour flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Design surface overflow rate @ ADF & peak hour flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Weir length, each
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Design weir overflow rate @ ADF & peak hour flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	RAS withdrawal mechanism
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	RAS pump capacity GPM at TDH, range of flow and flow measurement
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	WAS / scum pump capacity GPM at TDH, range of flow and flow measurement
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Effluent filtration or other tertiary treatment

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Yes	No	n/a	Item
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type, manufacturer & number of units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Design flow capacity, MGD
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Design solids loading per unit
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Design hydraulic loading per unit
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Media surface area per unit
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tank dimensions and volumes in gallons
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Backwash requirements
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Disinfection - Chlorination / Dechlorination
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Number of tanks
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tank dimensions and volumes in gallons
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Detention time @ peak hour flow
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Point of application chemical mixing type
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chemical dose & pacing
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chemical storage tank dimensions, volumes and containment
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chemical metering pumps (Manufacturer and capacities (GPM or GPH))
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chlorine residual monitoring
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Disinfection - Ultra-Violet Light
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type, manufacturer & number of units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Number of bulbs / banks
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Number of channels
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dose requirements (Example: mJ/cm ²)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dose pacing
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cleaning system
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Transmittance / intensity monitoring
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Back-up disinfection alternative if UV system fails (also discuss in Chapter 4)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Uninterruptable power supply
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13. Post aeration system
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type & number of units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Final effluent D.O. limits
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tank dimensions and volume in gallons
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Air requirements
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Number of diffusers
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Blowers - HP and capacity in SCFM
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	D.O. monitoring and pacing
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14. Effluent disposal
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Surface water / groundwater
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Outfall location / GPS coordinates
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dilution factor / receiving stream water quality classification
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7Q10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Diffuser system
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Gravity / Pumping

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Yes	No	n/a	Item
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Drip dispersal
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Spray irrigation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Rapid infiltration basins
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15. Plant Water System
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type, manufacturer & number of units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	GPM Capacity
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. Chemical feed systems for nutrient removal, solids handling, odor control, alkalinity, other
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chemical name and purpose
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Storage volumes and containment
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Metering pumps (GPM or GPH)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Number of units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dose pacing
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17. Odor control
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type, manufacturer & number of units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Location of each unit
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18. Solids handling (storage, thickening, dewatering, stabilization)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Anticipated sludge quantities
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hydraulic capacity per unit
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Solids loading per unit
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Performance criteria per unit
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sludge storage volumes
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sludge conveyance mechanisms
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sludge grinding mechanisms
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sludge stabilization criteria
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	19. Generator / alternate power source
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type & manufacturer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fuel source and containment structure
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fuel storage volume (Gallons)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fuel usage per hour (Gallons per Hour)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Run time on a full tank (Hours)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fuel storage tank location(s)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	List of equipment on standby power
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20. HVAC (Heating system, air handling or conditioning units, supply/exhaust fans, unit heaters, etc.)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fuel
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Capacities of each unit
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Air flow / exchanges per area
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	21. Fire protection and detection
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Monitoring, alarms and suppression system
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	22. Other

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Yes	No	n/a	Item
			Chapter 4 Detailed Unit Process Operations and Control
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Plant layout schematic
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Detailed process flow diagram
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Hydraulic profile
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. For each unit process identified in Chapter 3, provide the following:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Description and function of unit and relationship to adjacent or related units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Location of unit(s)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Determination of how many units to run
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Normal startup and shut down procedures
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Normal operating conditions and control settings
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Normally open/normally closed valves and gates
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unit by-pass procedure
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tank draining procedure
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> • Anti-flotation protection for empty tanks
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> • Winterization and cold weather operation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unit controls
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> • H/O/A functions and switch locations
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> • SCADA controls
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> • Operator adjustable / non-adjustable set points
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> • Power supply
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Alternate or emergency operation for equipment malfunction, process upset and loss of power
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Laboratory monitoring and sampling requirements and locations
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Process control strategy
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Expected unit performance
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Operational problems and troubleshooting guides
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	High flow procedures
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Operable / non-operable on generator power
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Alarm conditions
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unit specific safety concerns and procedures (confined space?)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unit diagrams
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unit process related formulas and example calculations
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Recommended spare parts
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	On-line monitoring systems
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Summary troubleshooting guidance for each unit operation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Digital pictures of equipment and controls where appropriate

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Yes	No	n/a	Item
			Chapter 5 Maintenance
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. List of all manufacturer's O&M manuals supplied as part of this project
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Provide summaries of routine preventative maintenance activities based upon manufacturer's recommendations for each specific major piece of equipment (simply referring to the manufacturer's O&M manual will not suffice)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lubrication schedule and type of lubricant
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Special tools
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Valve and equipment exercising
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Summary troubleshooting guidance (for each piece of equipment)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Generator
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Exercise under load & provide an exercise schedule
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Check transfer switch
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Oil and coolant specifications
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Generator log with O&M records
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Spare parts list (simply referring to the manufacturer's O&M manual will not suffice)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Preventative maintenance program
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Existing system
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Recommended system
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Equipment numbering system
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Maintenance record system
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Computerized maintenance management
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Planning and scheduling
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. General maintenance practices and procedures
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Mechanical maintenance
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Electrical maintenance
			Chapter 6 Safety
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Health hazards
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Recommended immunizations
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Sewer gas dangers & confined space entry procedure
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. General mechanical safety
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. General electrical safety
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. Fire extinguishers / usage, locations and maintenance
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Emergency shower/eyewash stations
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Recommended safety equipment
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. MSDS sheets for bulk chemicals used in plant
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Chemical safety
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Lockout / tag out procedures
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Hot Work permit program
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13. Electrical arc-flash program
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14. AED supplied equipment / location if any

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Yes	No	n/a	Item
			Chapter 7 Alarm & Notification System
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. General description
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Complete list of alarm conditions
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Transmission system
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. After hours alarm notification and response
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Routine testing of alarm systems
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. Loss of notification system
			Chapter 8 Electrical Systems
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. General description
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Power distribution
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Electrical system maintenance
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Backup power system
			Chapter 9 SCADA Systems
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. General SCADA system overview
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Computer hardware
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Type
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Number of computers and locations
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dedicated for SCADA or multipurpose
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Laptops
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Remote capabilities
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Maintenance and troubleshooting
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Support
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. SCADA software
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Using the system
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Components being monitored inclusive of pump stations
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Telemetry devices
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	System capabilities
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	General operating directions
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Entering set points
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Alarms and alarm acknowledgement
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Data archiving
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Trending, graphing and report generation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PLCs, remote terminal, local control panels, etc.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Troubleshooting guide
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Glossary
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Example graphics screens
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	System expandability
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Startup procedures
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Back-up power supply
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Loss of phone line / transmission line - discuss back-up capabilities

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Yes	No	n/a	Item
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Data backup capabilities
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Authorization required to make changes
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. SCADA system security and vulnerability
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Password protection
			Chapter 10 Staffing
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Engineer's recommended staffing plan with supporting documentation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Grade of plant as determined by consultants NHDES .
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Required Certification Level for Chief Operator and Backup Operator
			Chapter 11 Utilities
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Contact information for all utility suppliers
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Location of emergency shutoff valves for natural gas, propane and water supplies
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Location of main disconnect for electrical feed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Location and size of propane tanks
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Location and size of fuel oil storage tanks
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. Communications systems (telephone, cable, radio, etc.)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Location of potable water backflow devices
			Chapter 12 Emergency Response
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Site specific emergency response plan, OR
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. DES Emergency Response Planning Guide
			Appendix
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Major equipment suppliers and contact information
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Valve and gate schedule
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Sample forms
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Laboratory
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Daily rounds
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Process control
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Solids handling
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Maintenance
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	State Monthly Operations Report (MOR)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other forms as required

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