

GUIDESHEET VI

OPERATION AND MAINTENANCE MANUAL

LEGAL REQUIREMENTS

Facilities authorized to discharge under R 323.2218 are required to develop an Operation and Maintenance (O&M) manual. R 323.2218(4) b states,

- “A discharger shall have an operation and maintenance manual for the wastewater treatment facility. The manual shall be used by the certified operator of the facility as a guide for facility operation and maintenance. The operation and maintenance manual shall include all of the following information:
- (i) The function, start-up, shut down, and periodic maintenance procedures for each unit process and item of mechanical equipment.
 - (ii) A description of the appropriate response or facility adjustment to minimize the impact of emergency situations with the potential to affect the discharge or compliance with the permit so as to facilitate rapid implementation of a correct response during an emergency.
 - (iii) A monitoring program to monitor the process efficiency.
 - (iv) The details of how inspections will be conducted and a schedule for the inspection of collections system and pump stations, where applicable.
 - (v) The periodic maintenance procedures for the collection system and pump stations, where applicable.
 - (vi) Procedures for routine maintenance and inspection of lagoons and equipment used for irrigation, where applicable, and the documentation of maintenance and inspection.
 - (vii) A listing of environmental regulations, other than this part, that apply to operation of the wastewater treatment facility.”

Facilities authorized to discharge under R 323.2216(3) are also required to develop an O&M manual. The requirements for this O & M manual are listed in R 323.2230(e) and are the same as those of R 323.2218(4) b (i) – (vi) listed above.

Part 4, Operation and Maintenance of Sewerage Systems, of Part 41, Sewerage Systems, of Act 451 lists O & M requirements for public sewerage systems and treatment facilities. R299.2957(1) requires the owner of a public treatment facility to prepare an O & M manual and submit a draft of such for approval 60 days before the date of operation of the facility. If Michigan Department of Environmental Quality (MDEQ) staff find the manual to be inadequate, the owner is required to make appropriate modifications.

For federally funded projects, the O&M should be developed utilizing the EPA publication Considerations For the Preparation of Operation and Maintenance Manuals (EPA – 430/9-74-001) and include a review of the approved manual one year after initiation of plant operation. Subsequent to the review, the manual shall be revised as necessary to reflect actual treatment plant experience per 40 CFR 35.2218(b)(1) for Construction Grant Projects.

SAMPLE OUTLINE

This sample outline is intended as a guide to be used when developing an O & M manual. Use of this sample outline will facilitate the development, review, and approval of the O & M manual. All aspects of the sample outline may not be relevant for all facilities. However, the manual must meet regulatory requirements in the outline above.

I. Background Information

- A. Legal Description of Discharge Area, Mailing Address of Permittee, Site Location Map
 - 1. Area served, pertinent Part 41 collection sewer permit(s) – blueprints
 - 2. Most recent User Survey
 - 3. Add-on, provisions to notify the Department of additional hook-ups
 - 4. Ordinance preventing industrial hook-ups (if applicable)
- B. Plant Classification
 - 1. Physical Treatment Process
 - 2. Chemical Treatment Process
 - 3. Biological Treatment Process
- C. Certified Operator Information
 - 1. Operator responsibilities defined
 - a) Subordinate Employees
 - b) Training Schedule
- D. Basis of Design Information
 - 1. Inclusion or referenced location of basis of design document
 - a) R 323.2230 and R 323.2231 criteria
 - b) R 323.2218 criteria

II The function, start-up, shutdown, and periodic maintenance procedures for each unit process and item of mechanical and electrical equipment

- A. Operational requirements (e.g. R 323.2231, R 323.2232-36)
 - 1. Plant site map, Flow pattern diagram
 - a) Pump stations, equalization tank, bar screen, sequencing batch reactors, activated sludge return and wasting, treatment lagoons (primary, secondary)/equalization lagoons, seepage or infiltration lagoons, spray irrigation, septic tanks, drainfields
 - b) Methods of wastewater flow control, mechanical equipment - valves, floats, pumps
 - c) Electrical equipment, control panels
 - i) Function and start-up/shutdown for mechanical and electrical equipment
 - ii) List of equipment manuals and recommended publications
 - iii) Spare parts inventory
 - iv) List of warranty equipment – warranty provision
 - d) Solid waste disposal requirements
 - i) Screened solids to type II landfill
 - ii) Settled solids – type II landfill (if de-watered) or land application (residuals management authorization from the Water Bureau - Biosolids Unit, Field Operations Division – municipal sludge, Water Bureau – Industrial Pretreatment Unit, Field Operations Division - industrial sludge, or EPA approved land application site)

- III. A description of the appropriate response or facility adjustment to minimize the impact of emergency situations with the potential to affect the discharge or compliance with the permit so as to facilitate rapid implementation of a correct response during an emergency
 - A. Measures to minimize upsets of the treatment system – discussion of common operating problems and corrective measures
 - 1. Containment provisions to prevent the accidental losses of polluting materials
 - 2. Inclement weather
 - a) Site access
 - b) Eliminating (e.g. insulate water lines) or minimizing effects of let-run conditions
 - B. Corrective Action and Reporting for Public Systems
 - 1. Facility breakdown or emergency resulting in discharge of excessive pollutants
 - a) Notification to Water Bureau (WB) District office
 - b) Written report to WB District office within 72 hours outlining the cause and corrective actions
- IV. A monitoring program to monitor process efficiency
 - A. Sample equipment used to perform test, sample location, specific treatment process step applicable to sample collection, and sample handling
 - 1. Volume monitoring locations and methods
 - 2. Wastewater quality bench testing, dissolved oxygen monitoring, microscopic bacterial examination
 - 3. Effluent sampling – lab protocol for in-house testing or reference to off-site laboratory's Sampling and Analysis Manual
 - 4. Groundwater sampling – parameters and frequency or reference to permittee's Sampling and Analysis Plan
- V. The details of how inspections will be conducted and a schedule for the inspection of collections system and pump stations, where applicable
 - A. Observations of mechanical and electrical parts
 - B. Gas accumulations and oxygen deficiency monitoring or observations
- VI. The periodic maintenance procedures for the collection system and pump stations, where applicable
 - A. Routine cleaning of collection sewer
 - B. Periodic exercising of mechanical parts
 - C. Replacement of mechanical and electrical parts
- VII. Procedures for routine maintenance and inspection of lagoons and equipment used for irrigation, where applicable, and the documentation of maintenance and inspection
 - A. Inspection checklist
 - 1. Observations on corrosion and chemical/biological buildup on valves or pipes
 - 2. Liner integrity, freeboard, grooming of berm vegetation, algal blooms, sludge buildup, sheens
 - 3. Run-on diversion structures, erosion control
 - 4. Odor monitoring

B. Recordkeeping

1. Observation log

- a) Date of entry, inspection observations, maintenance performed
- b) Process efficiency monitoring results
- c) Operating cost records and recommendations

VIII. A listing of environmental regulations, other than this part, that apply to operation of the wastewater treatment facility

A. Vegetation control – pesticide/herbicide regulations