GUIDELINES FOR PREPARATION OF

OPERATION AND MAINTENANCE PERFORMANCE REPORTS

Florida Department of Environmental Regulation

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PURPOSE AND APPLICABILITY

Purpose

The purpose of this document is to provide guidelines for the preparation of Operation and Maintenance Performance Reports. The following aspects of operation and maintenance performance report preparation are included:

1. Field evaluation of the wastewater facilities,
2. Evaluation of the physical condition,
3. Evaluation of treatment efficiencies,
4. Identification of performance trends,
5. Evaluation of the operation and maintenance program,
6. Evaluation of the collection system, and
7. Identification of problems, deficiencies, and corrective actions.

Applicability

These guidelines are to be used in the preparation of operation and maintenance performance reports by permittees of domestic wastewater treatment facilities and by professional engineers and operators assisting in report preparation.

BACKGROUND

Since Congress passed the Clean Water Act in 1972, more than $73 billion have been invested in the nation's wastewater infrastructure. In an effort to prevent these facilities from deteriorating, the Environmental Protection Agency (EPA) asked states to develop and promote state-based municipal water pollution prevention (MWPP) programs. These programs would be aimed at preventing pollution rather than taking corrective action after pollution has occurred.

The EPA guidance on MWPP programs identified two concepts which, if incorporated into the Department's domestic wastewater facilities rules, would help improve compliance and facilitate program management:

1. Establishment of a mechanism for assessing the operations and physical capabilities of treatment facilities on a regular basis, and
2. Implementation of necessary preventative measures, including the planning, design, and construction of new or expanded facilities.

In 1990, when Chapter 17-600, Florida Administrative Code (F.A.C.), was being modified, these two key pollution prevention concepts were incorporated in the rule.

Rule Requirements

Rule 17-600.735, F.A.C., Operation and Maintenance Performance Report, was added to establish a mechanism for assessing the operations and physical capabilities of treatment, reuse, and disposal facilities on a regular basis. The report will be used, in part, to establish reasonable assurances that the facilities will meet permit limitations during the period for which the operation permit is requested.

The rule requires that an Operation and Maintenance Performance Report be submitted with all applications to renew operation permits for treatment, reuse, or disposal facilities. The report shall evaluate the capability of the facilities to function as intended during the period for which the operation permit is requested. More specifically, the report shall:

1. Evaluate the physical condition of each treatment unit, the treatment efficiencies of each treatment process, the overall treatment efficiency of the treatment plant, performance trends, and the operation and maintenance program,

2. Identify physical, capacity, performance, and operation and maintenance problems and deficiencies which need immediate attention and areas which are potential problems,

3. Identify the consequences if these problems and deficiencies are not corrected in a timely fashion, and Provide recommendations and schedules for corrective actions.

Collection/transmission systems must be evaluated if treatment plant problems result from the operation of collection/transmission facilities (such as excessive infiltration/inflow, septic wastewater, introduction of toxic substances, or lack of controls on industrial wastewater discharges to the collection/transmission system).

The report must be jointly prepared by staff responsible for operation of the facilities, by the permittee or the permittee's delegated representative, and by a professional engineer registered in Florida. The owner and the facility's lead operator shall sign the report. The professional engineer shall sign and seal the report.

Definitions

"Collection/transmission Systems," "Domestic Wastewater," "Infiltration," "Inflow," "Lead or Chief Operator," "Modification," "Monthly Average Daily Flow," "Peak Hourly Flow," "Permitted Capacity," "Pretreatment," "Three-month Average Daily Flow," and "Wastewater Facilities" are defined as follows:

Collection/transmission Systems - means sewers, pipelines, conduits, pumping stations, force mains, and all other facilities used for collection and transmission of wastewater from individual service connection laterals to facilities intended for the purpose of providing treatment prior to release to the environment.

Domestic Wastewater - means wastewater derived principally from dwellings, business buildings, institutions, and the like; sanitary wastewater; and sewage. Where wastewater from sources other than typical domestic sources (e.g., industrial sources) is combined and treated with wastes from domestic sources, the determination of whether or not the wastewater treatment plant is designated as "domestic" shall be made by the Department considering any or all of the following: wastewater residuals classification; whether wastewaters have been pretreated or contain constituents within 50-150 percent, by concentration, of typical domestic wastewater; and whether the permittee, when not required to provide more stringent or otherwise specific levels of treatment, can provide assurance of facility compliance with domestic wastewater treatment standards contained in Chapter 17-600, F.A.C.

Infiltration - means water, other than wastewater, that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes.

Inflow - means water, other than wastewater, that enters a sewer system (including sewer service connections) from sources such as, but not limited to, roof leaders, cellar drains, yard drains, area drains, drains from springs and swampy areas, manhole covers, cross-connections between storm sewers and sanitary sewers, catch basins, cooling towers, storm waters, surface run-off, street wash waters, or drainage.

Lead or Chief Operator - means the certified operator whose responsibilities include the supervision of all other persons who are employed at a plant, performance of on-site treatment plant operation and whose responsibility it is for the effectiveness and efficiency of the overall treatment plant operation.

Modification - means any alteration, expansion, upgrade, extension, addition, or replacement of an existing wastewater facility for which a construction permit is required from the Department after January 1, 1982.

Monthly Average Daily Flow - means the total volume of wastewater flowing into a wastewater facility during a calendar month, divided by the number of days in that month and expressed in units of mgd.

Peak Hourly Flow - means the average flow rate during the one-hour period of the day when wastewater flows are at a maximum, expressed in units of mgd.

Permitted Capacity - means the treatment capacity for which a plant is approved by Department permit expressed in units of mgd. The permit shall specify the time frame associated with the permitted capacity (e.g., annual average daily flow, maximum monthly average daily flow, three-month average daily flow).

Pretreatment - means the conditioning of wastes by the originator of the wastewater which is not exclusively of domestic origin, prior to introduction into the

collection system, to levels which the permittee has agreed in writing, so as not to interfere with compliance of the treatment facility with the requirements of Chapter 17-600, F.A.C., or hinder the disposal or use of wastewater residuals.

Three-month Average Daily Flow - means the total volume of wastewater flowing into a wastewater facility during a period of three consecutive months, divided by the number of days in this three-month period and expressed in units of mgd. The three-month average daily flow also can be calculated by adding the three monthly average daily flows observed during this three-month period and dividing by three. The three-month average daily flow is a rolling average that is to be assessed for each month of the year.

Wastewater Facilities - means any or all of the following: the collection/transmission system, the treatment plant, and the reuse or disposal system.

DATE FOR SUBMITTAL

Operation and Maintenance Performance Reports must be submitted with all applications to renew operation permits for treatment, reuse, or disposal facilities.

If a separate reuse or disposal system permit is issued for a wastewater treatment plant, a single operation and maintenance performance report should be submitted for the entire wastewater facilities. The initial report should be submitted when the first application to renew an operation permit for either facility is submitted to the Department. Subsequent reports are due each time the permit for the facility that triggered the initial report is renewed.

FIELD EVALUATION

A field inspection of the wastewater facilities needs to be conducted by the professional engineer and the operator. Although not mandatory, the permittee may wish to accompany the engineer and operator on the field inspection to become familiar with the wastewater facilities. Information necessary to evaluate the physical condition of each treatment unit, the treatment efficiencies of each treatment process, the overall treatment efficiency of the treatment plant, performance trends, and the operation and maintenance program should be gathered during the field evaluation. The information gathered (field data, preliminary design reports, monthly operating reports, ground water reports, etc.) will serve as the basis for the results presented in the report.

The field evaluation form, Attachment 2, was developed to assist in collection of field data. This form was developed based primarily on EPA publications including

Inspectors Guide for Evaluation of Municipal Wastewater Treatment Plants and NPDES Compliance Inspection Manual. The form is to be used as guidance only and does not necessarily include all items that may need to be evaluated. Certain items in the form may not be applicable to all facilities. Components, systems, and processes not listed in the form should be evaluated in a similar manner. Applicable pages of the field evaluation form should be submitted with the report.

REPORT OUTLINE

Table 1 presents the outline to be used for preparing the operation and maintenance performance report. The following sections discuss the contents of the report.

Title Page

1. The title page should include the following:
2. Type of report (operation and maintenance performance report),
3. Name of the facility,
4. County,
5. Facility's DER identification number, also known as Groundwater Monitoring System (GMS) identification number,
6. Current DER and NPDES (if applicable) permit number(s),
7. Current permit expiration date,
8. Date of the field evaluation, and
9. Date of the report.

Certifications

Operation and maintenance performance reports shall be signed by the permittee and the operator and signed and sealed by a professional engineer registered in Florida. Certifications shall include:

The name, address, and phone number of the permittee, municipality, or county (include the name of a contact person) and a statement, signed by the permittee, that he "has reviewed and is fully aware of the recommendations and schedules included in the report;"

The name, operator certification number, address, and phone number of the lead operator assisting in preparation of the report and a statement, signed by the

operator, that he "has reviewed and is fully aware of the recommendations and schedules included in the report;" and

The name, address, and phone number of the firm and/or professional engineer preparing the report and a statement, signed and sealed by a professional engineer registered in Florida, that "the information contained in this report is true and correct to the best of his knowledge, the report was prepared in accordance with sound engineering principles, and he discussed the recommendations and schedules with the permittee or the permittee's delegated representative and the lead operator and agrees that if the recommended schedules for corrective action are met, the facilities, when properly operated and maintained, will comply with all applicable statutes of the State of Florida and rules of the Department, or for temporary operation permits, that the wastewater facilities, when properly operated and maintained, will discharge an effluent that complies with the limitations specified in the permit application."

Table of Contents

The report should include a table of contents which follows the format of the report outline provided in Table 1. All pages should be numbered and cross referenced in the Table of Contents by page number.

Chapter 1 - Introduction

The introduction should include the following:

1. Permitted capacities and the time frames (e.g., annual average daily flow, maximum monthly average daily flow, three-month average daily flow) associated with the permitted capacities for the treatment plant (including the residuals treatment facilities) and the reuse or disposal system,

2. Reclaimed water or effluent limitations (including the name of the parameter and its units),

3. Brief descriptions of the treatment, residuals, reuse, and disposal facilities,

4. Date facility was placed in service,

5. Dates of modifications (within the last 5 years) plus a description of what was done, and

6. Recommended corrective actions either included in a consent order or made to the facility by the Department within the last 5 years.

Up-to-date flow diagram(s) for the facilities being considered for permit renewal should be attached to the report. Flow lines, tank volumes, and the name and quantity of each component, system, and process should be shown on the flow

diagram(s). Attachment 1 contains a list of the components, systems, and processes, that should be included, when applicable.

Chapter 2 - Physical Condition

A list of each of the components, systems, or processes associated with the treatment plant and reuse or disposal system should be developed. The list should correspond to the flow diagram.

The physical condition of each component, system, and process should be evaluated on a case-by-case basis and the results of the evaluation should be tabulated. At a minimum, the following information should be provided for each:

1. Whether there is evidence of hydraulic or organic overloading and, if so, an explanation,

2. The general condition (including rust, degree of corrosion, wear, etc.),

3. Whether the facilities meet applicable requirements of Rules 17-600.400(1)(b), (2)(a), (2)(b), (4)(a), and (4)(b), F.A.C., and, if not, an explanation,

4. Whether there are physical signs that the treatment unit and associated equipment is operating properly and is expected to continue to operate properly for the permit period and, if not, an explanation, and

5. Whether the unit has adequate safety features and is operated safely and, if not, an explanation.

Chapter 3 - Treatment Efficiency

Each Treatment Unit

The treatment efficiency of each treatment unit may be evaluated by establishing acceptable ranges for appropriate design and operating parameters for each component, system, or process associated with the treatment plant and reuse or disposal system. The design and operating parameters and ranges established should be based on the standard manuals and publications referenced in Rule 17-600.300(4), F.A.C., or as established in the facility's preliminary design report. The time frame associated with each parameter (peak hourly, monthly maximum, monthly average, three-month average, annual average) should be included in the report.

Next, actual values of the parameter should be evaluated to determine if the actual values are within the acceptable design and operating ranges previously established. Factors which affect performance and treatment efficiency, such as hydraulic and organic loadings, seasonal variations in flow, infiltration and inflow, contributions from industrial wastewater and septage, operational flexibility, accumulations of sand and grit, rag build-up, and deterioration of baffles, among others, should be considered in this evaluation.

Current loadings as appropriate for each parameter (BOD_5/$CBOD_5$, TSS, total nitrogen, total phosphorus, etc.) should be used to evaluate the actual values for each unit. Whenever possible, current loadings should be based on the past year's influent monitoring data.

Design and operating parameters chosen for evaluation, acceptable ranges, and actual values of the parameters should be tabulated for each unit. If the actual value of a design or operating parameter for a unit treatment process does not fall within the acceptable range, it should be noted in this section.

Overall

Based on the results of the evaluation of the treatment efficiencies of each unit treatment process, the report should include a statement about whether the overall treatment efficiency of the facilities is adequate to ensure the facilities will be capable of meeting permit limitations during the period for which the operation permit is requested.

If the overall treatment efficiency of the facilities is not adequate, the report should provide the names of the components, systems, or processes that limit the overall treatment efficiency.

Chapter 4 - Performance Trends

Influent

The report should indicate trends in the influent loadings (BOD5/CBOD5, TSS, total nitrogen, total phosphorus, etc.). Influent loadings should be graphed as a function of time, and a copy of the graphs should be included in the report. The graphs should contain sufficient data points to show seasonal variations in flow and influent trends.

A statement should be made about whether each loading is within normal ranges for domestic wastewater. For loadings outside normal ranges, an explanation should be provided. A statement should be made about whether the trend for each loading evaluated is increasing, decreasing, or neither increasing or decreasing, and whether the trend is expected to continue. A statement should also be made about whether the trend for each loading evaluated indicates that the facility will be capable of meeting permit limitations during the period for which the operation permit is requested.

Effluent and Reclaimed Water

The report should indicate trends for all effluent or reclaimed water parameters included in the permit (except for pH and chlorine residual). All such effluent or reclaimed water parameters should be graphed as a function of time, and a copy of the graphs should be included in the report. The graphs should contain sufficient data points to show seasonal variations in flow and effluent or reclaimed water trends.

A statement should be made about whether the trend for each parameter evaluated is increasing, decreasing, or neither increasing or decreasing, and whether the trend is expected to continue. A statement should also be made about whether the trend for each parameter evaluated indicates that the facility will be capable of meeting permit limitations during the period for which the operation permit is requested.

Three-month Average Daily Flows

A statement should be made to indicate whether, beginning July 1, 1991, the three-month average daily flow has exceeded 50 percent of the permitted capacity of the treatment plant or reuse or disposal system. If the three-month average daily flow has exceeded 50 percent of the permitted capacity of the treatment plant or reuse or disposal system, planning for wastewater facilities expansion may be required in accordance with Rule 17-600.405, F.A.C., in a separate report.

Ground Water Quality

If ground water monitoring is required by the permit, the report should indicate trends in ground water parameters. Ground water parameters that must be monitored in accordance with the permit should be graphed as a function of time. A copy of the graphs should be included in the report. The graphs should contain sufficient data points to show ground water trends.

A statement should be made about whether the trend for each parameter evaluated is increasing, decreasing, or neither increasing or decreasing and whether the trend is expected to continue. The report should indicate whether ground water monitoring test results are within acceptable ranges established by Department rules, and if they are not, whether the reclaimed water may be a cause for the results outside acceptable ranges.

Surface Water Quality

If surface water monitoring is required by the permit, the report should indicate trends in surface water parameters. Surface water parameters that must be monitored in accordance with the permit should be graphed as a function of time. A copy of the graphs should be included in the report. The graphs should contain sufficient points to show surface water trends.

A statement should be made about whether the trend for each parameter evaluated is increasing, decreasing, or neither increasing or decreasing and whether the trend is expected to continue. The report should indicate whether surface water monitoring test results are within acceptable ranges established by Department rules, and if they are not, whether the effluent may be a cause for the results outside acceptable ranges.

General

The report should discuss whether any untreated bypasses and discharges or overflows have occurred from the collection system or the treatment facilities under the most recent permit. If so, the reason for the bypass, discharge, or overflow should be discussed. Also, the report should include a discussion about what has been done to prevent such occurrences in the future.

Chapter 5 - Operation and Maintenance Program

Record Drawings

In accordance with Rules 17-600.717 and 17-600.730(4)(b), F.A.C., each domestic wastewater treatment facility must maintain up-to-date record drawings (plans and specifications) which identify modifications that have occurred since the original construction permit was issued. Ensuring the drawings are available to the operator at a convenient location is vital to a good operation and maintenance program. The report should indicate whether up-to-date record drawings are available to the operator at a convenient location. The name and address of the location should be included in the report.

Operation and Maintenance Manual

In accordance with Rules 17-600.720 and 17-600.730(4)(c), F.A.C., each domestic wastewater treatment and effluent disposal or reuse facility must maintain up-to-date operation and maintenance manual(s). The report should indicate whether up-to-date operation and maintenance manual(s) for the treatment and effluent disposal or reuse facilities are available to the operator at a convenient location. The report should provide the name and address of the location.
The report should include the date the last up-date was done to the operation and maintenance manual(s) and indicate whether the manual(s) are revised on a periodic basis to reflect any facility alterations performed or to reflect experience resulting from facility operation. A good time to revise the operation and maintenance manual would be during preparation of the operation and maintenance performance report.

The details of the manual should be consistent with the complexity of the system. The manual should have been developed in accordance with the unique requirements of the individual wastewater facility. The report should indicate whether the manual(s) provide the operator with adequate information and description regarding the design, operation, and maintenance features of the facility involved.

The report should indicate whether the manual(s) include the information required by Rule 17-600.720(1)(b), F.A.C. In accordance with this rule, "The manual shall include basic hydraulic and engineering design criteria for the facility, as well as information and procedures required for normal control and distribution of wastewater, residuals, and effluent within the facility. In addition, information concerning process control and performance evaluation for the facility, as well as equipment and procedural descriptions (including any notification/reporting requirements of appropriate agencies) for emergency operating conditions and listing

of spare parts to have on hand shall be included. Regular maintenance and repair instructions for all equipment; laboratory testing equipment and monitoring procedures; safety and personnel requirements; and a "trouble shooting" problem guide shall be included in the manual."

When applicable, the report shall also indicate whether the manual includes the information required by Rules 17-610.330(2), 17-604.600(2)(f), and 17-28.230(3), F.A.C.

Operation and Maintenance Log

The report should indicate whether the facility maintains an up-to-date operation and maintenance log and whether it includes the information required by Rule 17-602.360(1)(e), F.A.C.

General

Other aspects of the facility's operation and maintenance program that should be evaluated are listed below:

1. Whether the facility is adequately staffed with certified operators in accordance with current Department rules and the certification number of each operator,

2. Whether the facility's maintenance, record keeping, and sampling programs are adequate,

3. Whether all laboratory tests required by Department rules are performed by a laboratory that has been certified by HRS, or, for on-site tests for dissolved oxygen, pH, and total chlorine residual, whether all tests are performed by a certified laboratory or under the direction of an operator certified in accordance with Chapter 17-602, F.A.C.,

4. For Part III Public Access Reuse Systems, whether the facility has established the following, as appropriate:

   a. An operating protocol designed to ensure that high-level disinfection will be met in accordance with Rule 17-610.463, F.A.C.,

   b. A cross-connection control and inspection program in accordance with Rule 17-610.470, F.A.C., and

   c. An industrial pretreatment program in accordance with Rule 17-610.460(4), F.A.C.

Chapter 6 - Collection System Evaluation

The collection system shall be evaluated if treatment plant problems, untreated bypasses or discharges, or overflows result from the operation of the collection and

transmission facilities. Such problems may be caused by excessive infiltration or inflow (I/I), sewers that are under capacity, septic wastewater, introduction of toxic substances, or lack of controls on industrial wastewater discharges to the collection system.

If such problems do not result from operation of the collection or transmission facilities, a simple statement of this fact should be included in the report. If such problems result from operation of the collection or transmission facilities, the collection system should be evaluated in accordance with this section.

Excessive Infiltration or Inflow

As a guideline, I/I should be considered excessive if:

1. Domestic wastewater plus infiltration exceeds 120 gallons per capita per day (gpcd) during periods of high ground water, or

2. The total daily flow during a storm exceeds 275 gpcd, or

3. There are operational problems, such as surcharges, bypasses, overflows, or poor treatment performance, resulting from hydraulic overloading of the treatment works or the collection and transmission facilities during storm events.

The I/I conditions in the sewer system should be determined by analyzing the preceding year's flow records. If adequate flow data is not available, flow data should be obtained by conducting flow monitoring at a single point at the treatment plant during high ground water periods and also during rainstorms. Where there is a likelihood of excessive I/I in a portion of the collection system, that portion should be monitored separately.

If treatment plant problems, untreated bypasses or discharges, or overflows do not result from excessive I/I, a simple statement of this fact should be included in the report. If treatment plant problems, untreated bypasses or discharges, or overflows result from excessive I/I, the report should include recommendations for a sewer system evaluation study and schedules for conducting the study and making necessary repairs.

Septic Wastewater

If treatment plant problems do not result from septic wastewater, a simple statement of this fact should be included in the report. If septic wastewater causes treatment plant problems, the report should identify the problem and provide recommendations and schedules for corrective actions.

Industrial Contributions

When treatment facilities serve nonresidential customers (generally industrial), there is potential for the introduction of pollutants and toxic substances into the treatment plant that:

1. Interfere with plant operation or disposal or use of municipal residuals,

2. Pass through the plant into receiving waters or are otherwise harmful, or

3. Affect plant workers' health and safety.

Typically such treatment plant problems result from the lack of adequate controls on non-domestic wastewater discharges to the collection system. Facilities that receive wastewater from non-domestic sources should have industrial pretreatment controls on such discharges.

If treatment plant problems do not result from the introduction of pollutants and toxic substances into the treatment plant, a statement of this fact should be included in the report.
If treatment plant problems result from the introduction of pollutants and toxic substances into the treatment plant, the operation and maintenance performance report should:

1. Identify the problems, and

2. Provide a schedule for development of industrial pretreatment controls or an industrial pretreatment program or provide a schedule for evaluation of the existing pretreatment program which includes recommendations for corrective actions, as appropriate.

For facilities regulated by Part III of Rule 17-610, F.A.C., the industrial pretreatment program shall be of like nature to the industrial pretreatment program that would be required by EPA if the facility were discharging to surface waters.

Also, when surface water monitoring data or toxicity testing is required by the permit, the report should indicate whether the reclaimed water or effluent is toxic based on the results of the tests. If toxicity exists, plans for conducting a toxicity identification evaluation (TIE) and/or a toxicity reduction evaluation (TRE) should be submitted as part of this report.

Chapter 7 - Problems, Deficiencies, and Corrective Actions

Each problem and deficiency identified in Chapters 2, 3, 4, 5, and 6 should be listed and identified either as needing immediate attention or as a potential problem. Consequences that will result if the problem or deficiency is not corrected in a timely fashion should also be stated.

Recommendations and schedules for corrective actions should be provided for each problem or deficiency identified as needing immediate attention or a potential problem.