

THE EFFLUENCER

VOL. 6

Wastewater Systems Effluent Regulations



Determining Average Daily Effluent Volume

The *Wastewater Systems Effluent Regulations* require the determination of the daily volume of effluent deposited at the end of a wastewater treatment system (final discharge point).

The volume data is used to calculate the average daily effluent volume that determines the monitoring and reporting requirements for each system.

The average daily volume of influent can also be used as the average daily effluent volume. The Regulations allow for this as some systems only have a flow meter installed at the front end of their treatment facilities.

The requirements related to the method of daily volume determination depend on the type of wastewater system.



CONTINUOUS WASTEWATER SYSTEMS

As an owner or operator, you must determine the volume of effluent for each day effluent is deposited. Monitoring equipment must provide either:

- A continuous measure of the volume of the influent; **or**
- A continuous measure of the volume of effluent at the final discharge point;

Note: Volume of effluent is the preferred measurement if available

or

- For systems depositing less than 2,500 cubic meters (m³)/day, a measure of the rate of flow of the influent or effluent upon which the daily volume can be estimated ([subsection 7\(2\)\(b\)](#)).

Note: The rate of flow has to be measured every day.



Process to Estimate Daily Volume Based on Rate of Flow

1. Measure the rate of flow of influent or effluent and the duration of deposit in any chosen unit of measure and time.
2. Calculate the volume by multiplying the measured rate of flow (from step 1) by length of time influent was entering the system or effluent was deposited on that day, converting for unit differences if necessary.
3. Convert the volume to m³, if applicable.

Example of a method of estimation:

1. Influent flow rate: 1,100 L/min & duration of deposit: 18.5 hours
2. Calculate volume: volume = 1,100 L/min x 18.5 h x 60 min/h = 1,221,000 L
3. Convert to m³: 1,221,000 L x 1 m³ ÷ 1,000 L = 1,221 m³

Examples of equipment needed for each type of measure:

1. To measure continuous volume ► flow meter device (ex. ultrasonic flow meter totalizer)
2. To measure the rate of flow ► an open channel (ex. Parshall flume)
** Rate of flow could also be measured using the bucket and stopwatch method using calibrated instruments.*

Equipment Calibration

For continuous systems, in addition to maintaining your monitoring equipment, you must calibrate it at least once a calendar year, with a minimum of 5 months between calibrations. The monitoring equipment must determine the volume or rate of flow within a margin of error of ±15 % ([subsection 9](#)).

INTERMITTENT WASTEWATER SYSTEMS

You must determine the volume of effluent for each day that effluent is deposited by using:

1. Monitoring equipment that provides:
 - a. A continuous measure of the volume of influent; or
 - b. A continuous measure of the volume of effluent at the final discharge point;
Note: Volume of effluent is the preferred measurement if available.

or

 - c. A measure of the rate of flow of the influent or effluent upon which the daily volume can be estimated ([paragraph 7\(2\)\(b\)](#)). See estimation of daily volume based on flow rate above;

or
2. A method of estimation based on generally accepted engineering practices ([paragraph 7\(2\)a](#)), within a margin of error of ±15 % ([subsection 7\(4\)](#)).

Process for a One-time Calculation of the Average Daily Effluent Volume for a Calendar Year for the Identification Report

1. Calculate the sum of all the daily volumes of effluent as determined above; and
2. Divide the total (from step 1) by the number of days in the calendar year (365, except for leap years).

Note: The average daily volume only needs to be calculated once for the identification report. In subsequent monitoring reports, the Effluent Regulatory Reporting Information System (ERRIS) will calculate the average daily effluent volume for a calendar year based on the total volume reported from the previous year.

Example:

1. The sum of the effluent volumes discharged for each day in a given year from the lagoon final discharge point = 73,000 m³
2. Annual average daily volume of effluent = $73,000 \text{ m}^3 \div 365 \text{ days} = 200 \text{ m}^3$

Example of an Accepted Method for Estimating Volume of Effluent Deposited (for Intermittent Systems):

Lagoon Level Volume Estimation

1. Take the following measurements (in metres): the length and width dimensions of the lagoon cell being discharged; and the water level.
2. Calculate the difference in water level before and after discharge.
3. Multiply the length by the width by the difference in water level to estimate of the volume of effluent deposited, in m³.
4. To calculate the average daily effluent volume for the calendar year, divide by the numbers of days in the year until the next discharge. For a lagoon that discharges once per year, divide by 365; for a lagoon that discharges twice per year, divide by 182.5.
 - Measurements for length and width can be obtained by using a digital mapping tool or taking ground measurements.
 - There are resources that can help with the calculation for volume estimation. See [Agriculture and Forestry : Applications & Tools-Gov AB](#) for a potential calculation tool and example.

The following resources provide information on other methods of estimation:

- [US EPA Wastewater Flow Measurement](#)
- [Sampling Guide for Environmental Analysis, Book 7-Quebec](#)

ONE-TIME DEFAULT MEASUREMENT

If the average daily volume of effluent deposited via the final discharge point of a wastewater system cannot be determined for a previous calendar year, you must use the system's average design rate of flow of influent to estimate it ([subsection 8\(1\)](#)). This situation may arise, for example, if a new wastewater system comes into operation after January 1, 2013 and no previous monitoring data is available. The one-time default measurement can also be used if your flow-meter breaks down and volume measurements are not recorded while it is being repaired.

This method can only be used once to determine the average daily flow of influent or effluent ([subsection 8\(2\)](#)). You must determine the average daily volume of effluent using the methods indicated above for all subsequent years.

RECORD KEEPING FOR ALL SYSTEM TYPES

Monitoring equipment

You must record the following information related to the monitoring equipment ([subsection 17\(c\)](#)):

- A description of the equipment, including its type, e.g., open channel portable flow monitor that measures the height of the effluent as it passes over the weir;
- Manufacturer's specifications, year of manufacture and model number;
- Each date on which the equipment was calibrated and its degree of accuracy after each calibration; and
- The date on which the equipment was installed and, if applicable, the date on which it ceased to be used for monitoring and was replaced.

Keep records related to monitoring equipment for at least five years after the equipment is no longer used ([subsection 22\(3\)](#)).

Volume of effluent

You must record the following information related to the volume of effluent deposited from the final discharge point of a wastewater system:

- The date of each day that effluent was deposited;
- The daily volume (m³) of effluent for each day that effluent was deposited, if that volume is determined by a continuous measurement;
- The estimated daily volume (m³) based on the measured rate of flow and the calculations used to estimate the volume; and
- The estimated daily volume (m³) for an intermittent wastewater system that based the volume of effluent on generally accepted engineering practices.

Keep reports and any supporting documentation at least 5 years ([subsection 22\(1\)](#)).

Systems that do not deposit in a given year are not required to measure and report volumes for that year. They are required to submit monitoring reports stating they did not discharge during the reporting period.

Reporting

You must include the average daily effluent volume in the Identification Report in the Effluent Regulatory Reporting Information System (ERRIS). In your annual or quarterly monitoring reports, you must report the total amount of effluent deposited in the reporting period. ERRIS will re-calculate the average daily effluent volume for each reporting year based on the volumes submitted in the previous calendar year. To access ERRIS: <https://ec.ss.ec.gc.ca/>.

FOR ADDITIONAL INFORMATION

Visit the Wastewater website at Canada.ca/wastewater.

If the information you need is unavailable on our website, please contact Environment and Climate Change Canada at eu-ww@ec.gc.ca.

DISCLAIMER

This information does not in any way supersede or modify the *Wastewater Systems Effluent Regulations* or the *Fisheries Act*, or offer any legal interpretation of those Regulations or Act. Where there are any inconsistencies between this information and the Regulations or Act, the Regulations or Act take precedence, respectively. A copy of the Regulations is available at the following website: <https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2012-139/FullText.html>

Cat. No.: En14-495/1-2022E-PDF ISBN: 978-0-660-44184-9 EC22089

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800-668-6767 (in Canada only) or 819-938-3860 or email to enviroinfo@ec.gc.ca.

© His Majesty the King in Right of Canada, represented by the Minister of Environment and Climate Change, 2023

Aussi disponible en français

