

Flow Monitoring & Estimation Methods

Requirements under WSER

Wastewater is the biggest source of pollution in Canada's lakes, rivers, and oceans. To help reduce this pollution, the federal government created the [Wastewater System Effluent Regulations](#) (WSER). These rules, which came into effect in 2012, apply to municipal wastewater systems and help make sure wastewater is treated properly before it is released into the environment.

The WSER outlines sampling, flow monitoring and reporting requirements for wastewater systems to meet. All systems are required to regularly monitor and report on the amount and quality of wastewater released to the environment.

Small systems that do not sufficiently treat their wastewater may apply for a Transitional Authorization (TA). During the TA, small communities may use estimation methods for reporting flows. If eligible, communities should consider applying for a TA.

For small systems that were issued a TA, wastewater flows can be determined using one of the following methods:

- Daily wastewater volumes or rates of flow measured using a flow meter at the final discharge point¹.
- Estimated daily wastewater volumes using generally accepted engineering practices with a margin of error of $\pm 15\%$.

For small wastewater systems without a TA, a flow meter must be used to measure daily wastewater flows.

Flow Estimation Methods

A flow meter will provide real-time measurements of the wastewater flow with a high level of accuracy for reporting. A flow meter will also provide important information used as a basis for the design of future wastewater treatment systems or upgrades.

If a small system with a TA has opted to remove its flow meter, wastewater volumes may be estimated instead. The estimation method used must be a generally accepted engineering method.

These methods include, but are not limited to:

- Historical Wastewater Flow and Population
- Pump Station Run Time Method

The following flow chart can be used to select which estimation method to use. Steps for using each method are provided as part of the flow monitoring spreadsheet tool available with the handout.

Other estimation methods may be used if appropriate for the system and based on generally accepted engineering practices with a margin of error of $\pm 15\%$. You can contact Environment and Climate Change Canada (ECCC) to confirm if an alternative estimation method can be used. They can be reached at eu-ww@ec.gc.ca.

¹ The final discharge point is the point beyond which it is no longer possible to exercise control over the quality of the effluent.

Flow Estimation Methods

Historical Wastewater Flow and Population Data

Pump Station Run Time

What you Need

Historical wastewater data for the system
AND
 System population data (Census or tax-based)

Wastewater pump station that captures >85% of flow to outfall
AND
 Daily pump run time for pump station

Method

The historical wastewater data is used to see how much wastewater is produced per person.
 The amount of wastewater per person is then multiplied by the current population.

The average daily flow is estimated using the pump rate of the pumps and the amount of time the pumps run each day.
 If the pump rate is not known, it can be estimated with a pump draw down test.

When To Use

You have historical wastewater data that was measured with a flow meter.
AND
 Town population stays relatively constant throughout the year

Collection system has pump station near the outfall that takes >85% of flow
AND
 You can measure pump run times
AND
 You can determine pump flow rate for pump station

When NOT To Use

Community population varies throughout the year due to tourism or seasonal workers
OR
 The system has a large industrial user that was added to the system since the historical flow data was collected.

Pump station collects flow for <85% of flow for outfall
OR
 Pump run times are not available
OR
 Pump flow rate can not be determined



These estimation methods may be used for communities with a TA that:

- Do not have, or wish to remove, their flow meter; or
- Do not have resources to maintain their flow meter.

Alternative flow estimation methods may also be used. Contact ECCC if you are considering using a different estimation method.

Systems with Flow Meters – Common Issues & Things to Consider

Flow monitoring with a flow meter is the preferred method for reporting wastewater volumes. Some small systems may have a flow meter installed, but face difficulties using it. Common issues that small systems may experience are listed in the table below. The table also includes things to consider before moving towards estimating flows.

Concern	Things to Consider
You have a flow meter, but may be unsure how to access the data.	<p>This is common for small communities to experience! If you have a flow meter installed in a building or pump station, there may be a transmitter on the wall that records the data. You may be able to record the reading daily, or it may be connected to a computer that records the data.</p> <p>If you have a flow meter installed in a manhole or chamber, it is likely that there is a data transmitter suspended in the manhole. The transmitter may record the data, or it may store the data on a webpage/cloud server.</p> <p>If you have the O&M manual for the flow meter, you can check to see how the data is stored. If you do not have the manual, you can contact the supplier or search the flow meter model online.</p>
You have a flow meter, but have to pay a subscription fee to access the flow data.	<p>Web-based services can be convenient and reduce time spent on reading flow meters, but they can also have recurring costs that add up. Most web-based data services for flow meters require Wi-Fi or telephone connections.</p> <p>To reduce costs, you may be able to use an internal data logger and manually collect the data on a regular basis. If the data logger is suspended in a manhole, it will need to be removed to collect the data. Collecting the data requires using a USB or cable to connect to the transmitter to download the data to a laptop. Storage or battery limitations often require data to be downloaded every month.</p>
You can access your flow data, but are unsure what you are required to report.	<p>Flow meters typically will report instantaneous or totalized flows.</p> <ul style="list-style-type: none"> Instantaneous flow is the amount of water flowing through a pipe at an exact point in time. Totalized flow is the total amount of flow over a longer period of time (typically 24 hours or longer). <p>The monitoring report requires the total volume discharged for the reporting period. This means the flow recorded each day needs to be added together for the number of days in the reporting period.</p> <p>It is important to check the units of your flow meter when taking a reading. For reporting, you are required to provide flows in cubic meters (m³).</p>
You have a flow meter in a manhole, but it is regularly clogged.	<p>Flow meters in a wastewater system will require maintenance. Typical installations may require weekly or monthly cleanings, that are part of regular tasks. If cleanings are required more frequently (daily), the flow meter may need to be moved. Regular cleaning increases maintenance but also impacts the quality of flow data collected.</p> <p>For troubleshooting or other maintenance items, you can refer to the manufacturer's O&M manual for more details, or reach out to the flow meter supplier.</p>

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.