

THE CITY OF CALGARY A GUIDE FOR THE IMPLEMENTATION OF EFFLUENT METERING

In the way a water meter measures water consumed, an effluent meter measures the water that leaves a property to return to the sewer system. For the majority of businesses, it is assumed by The City that 90% of the water used is returned to the sewer system as wastewater. In the case of businesses which consume a large amount of water for production or other uses, and therefore return substantially less than 90%, an effluent meter may provide a more accurate measurement of wastewater return.

The following is a guide for sewer utility customers of The City of Calgary who wish to implement effluent flow metering for the purpose of a partial exemption from sewer utility charges under Subsection 40 of the Wastewater Bylaw 14M2012.

To qualify for the Effluent Metering Program:

- 1) The customer must be a commercial (General Services) customer. This program is not for residential customers.
- 2) The customer must return less than 80% of the metered water quantity to the sewer system, and must use on average 4000 cubic meters of water per month.
- 3) The customer must submit data showing the actual flow ratio to The City's Industrial, Commercial and Institutional Contract Services Coordinator (ICI Coordinator).
- 4) If the above 3 criteria can be met, before an application is submitted, the customer should contact the ICI coordinator to discuss the program.

Once this discussion has occurred, and if it is decided that the customer would like to proceed with the application process,

- 5) To obtain preliminary approval, an application must be submitted to The City's ICI Coordinator. It must include:
 - A summary description of the water usage and typical monthly quantities for both water and wastewater,
 - How the property is serviced and if there are any other sources of water other than from The City, and
 - Detailed sanitary flow measurements showing hourly instantaneous and cumulative flow over a period of 14 days.

The application will be reviewed and the applicant will be advised whether or not they meet the requirements to be considered for the Program.



If preliminary approval is granted,

- 6) Detailed installation plans must be submitted to the ICI Coordinator for final approval via email or hard copy. These plans must include:
- A summary of the proposed meter selection and data logging device(s), and
 - A drawing showing the intended installation plans, stamped by a professional engineer.

The following must be included in the installation plans:

- a) The meter put in place must meet the specifications below:
 - i. Be a Magnetic Flow Meter
 - ii. Be compatible with an ITRON Electronic Readout Transmitter (ERT) for accurate readings and bill generation
 - iii. Be the appropriate size and type to measure flows accurately, including total daily flow, peak flow and low flow rates, within $\pm 1\%$
 - iv. Additional required specifications are attached in Appendix A
- b) The meter must be installed according to the meter manufacturer's specifications in order to achieve the required performance.
- c) A bypass, to be inspected and sealed in the closed position by a City engineer, must be provided to avoid sewer service interruptions should the meter have to be removed temporarily for servicing and/or off-site calibration. **Any future violation of this seal must be reported immediately to the ICI Coordinator.**
- d) The meter is to be calibrated to provide totalized flow readings in cubic meters (m³).
- e) Data outputs must be included in totalized flow readout as well as continuous data logging for trending purposes.
- f) The totalizer readout must be located such that City or ENMAX personnel do not have to enter a confined space (as defined in Alberta Regulation 448/83, Sections 188 through 191, Occupational Health & Safety Act) to obtain an effluent meter reading, and such that it is readily accessible.
- g) Installation of the meter must accommodate the capability of performing drawdown test.
- h) The customer should verify the liquid being converged does not contain entrapped gases that may impair the operation of the meter. When gas bubbles exist in the liquid being measured, magnetic flow meters may not provide an accurate result.

The application will be reviewed and the applicant will be advised whether or not they meet the requirements to be considered for the Program.

No installation should take place prior to receiving this approval.



After installation:

- 7) The customer is to notify The ICI Coordinator when the installation has been completed and of a date that a drawdown test will occur so that, at the discretion of The City, a member of City staff may be present to witness the test.
- 8) A physical drawdown test is completed by the customer, with verification witnessed by representatives of the customer's business, such as the consultant engineer and the meter manufacturer. A City staff member may also be present.

Definition of a drawdown test: A known quantity of fluid that can be accurately determined and is representative of the facility's typical sewer effluent must be discharged through the meter over a specified period of time. These meter readings are then compared to the actual measured quantity discharged to ensure the meter is responding within specified limits. This results in verification of the meter readouts.

- 9) Results of the drawdown test are submitted to the ICI Coordinator.
- 10) If the drawdown tests are not acceptable to The City, the customer will arrange for a re-verification of the instrument within two weeks of being notified. If action is not taken within a timely manner the meter will be removed from the effluent program and the customer will be billed based on water usage.
- 11) In addition to the drawdown test, an electronic verification test is to be completed on the meter and the results are submitted to the ICI Coordinator.

If the drawdown and electronic verification tests are acceptable to The City,

- 12) Final installation must be approved by The City by means of an onsite inspection.

If the installation is approved,

- 13) An approval letter indicating the effective date and formal acceptance of the customer into the Effluent Metering Program will be sent to the customer.
- 14) **Effective the indicated date, billing for wastewater will be based upon the effluent meter readings.**



Ongoing Responsibilities of the Effluent Metering Program:

Effluent Metering Customer
All costs related to the meter and installation of the meter
Immediately informing the ICI Coordinator in writing of any seal violation or reading inaccuracies
Yearly electronic verification and submission of results to the ICI Coordinator
Ensuring installation meets safety and regulatory requirements
Effluent Meter Inspections (full electronic calibration or drawdown if indication of inaccurate reads)

The City is responsible for the accurate monthly reading and billing of the water through the meters.

- a) **Costs:** All costs associated with the purchase, installation, operation, servicing, verification and calibration of an effluent meter are the responsibility of the customer applying for the sewer exemption. The up-front capital costs to install the meter will vary for each customer.
- b) **Notification of Meter Irregularities:** The City must be informed **in writing** of any operating irregularities related to the effluent meter (including data logger) by letter or email to the ICI Coordinator. This includes but is not limited to:
- Meter failure
 - Meter reset to zero
 - Power failure
 - Removal of meter
 - Removal of readout
 - Read out failure
 - Meter or read out reset
 - All other functions that would affect meter reading or function

This letter must include:

Date, name, address, account number, meter number, last available meter reading, current reading, explanation of issue and date issue occurred, proposed corrective action to current issue, proposed timelines for resolution.

- c) **Electronic Verification:** Effluent Meter electronics must be verified for accuracy of reads on an annual basis.
- a. A reminder notice will be sent out annually, prior to the verification due date.
 - b. The verification is to be conducted by a third party approved by The City, preferably an authorized service representative of the meter manufacturer.



- c. A resulting verification report must be submitted to the ICI Coordinator within 60 days from the date of this notice. The minimal annual verification frequency may be increased at the discretion of the customer or City to ensure the meter is performing accurately.
- If the meter verification report is not received by The City's ICI Coordinator within 60 days of this notice, the customer will be removed from the effluent meter program and billed at an assumed 90% return factor of consumption.
- d) Effluent Meter Inspections: The City may require a full electronic meter verification or a full drawdown test if there is indication that the effluent meter is inaccurate. The City may also request a physical inspection of the meter site, as well as information on water use, mechanical drawings, calibration/verification certificates, data logging and related records. The City may connect electronic verification or memory devices to the meter as part of the audit process. Failure to comply may result in the removal from the effluent metering program.

For more information, please contact:

Alexander Uwerhiavwe, M.Eng ., CET, EIT.
Measurement Technologist
The City of Calgary
T:403-975-1253



APPENDIX A

Meter Specifications

Required Effluent Mag-Meter Specifications		
Description		Units
Flow Range	0.03 -12	m/s
Accuracy	+/- 0.25%	
Liner Material	Hard Rubber or PTFE* or better	
Display		
	Instantaneous flow	m ³ /hr
	Totalizer	m ³
Outputs		
	Analog, 4-20	mA
	Digital	
	Pulse, Scalable	mA
Alarms	High/low flow alarm, empty pipe alarm	
Rating	IP67 if above ground level or not in chamber	
	IP68 if meter is below ground level or in chamber	
Data Logging	must be capable of data logging function	