



# Radio frequency remote read water meters

Since 1989, the RM of Macdonald has been extending water pipelines to villages and rural areas across the municipality, and now provides service to virtually the entire municipality with over 1,700 customers. A total of 290 miles of rural water pipeline connects 640 rural and 1,078 urban customers throughout the municipality – a significant expansion from the initial 365 customers in 1989.

With such a rapidly growing and widespread system, the inefficiency of accessing each location to read water meters soon became apparent. Considerable staffing resources were required to obtain meter readings from each location since 37% of customers are located in rural areas. Although the RM of Macdonald had established a system to allow customers to provide meter readings over the telephone, the response rates were insufficient, peaking at approximately 60%. Therefore, this system did not sufficiently alleviate the difficulties of conducting on-site readings. To address this issue, in cases where the customer did not call in a reading for three consecutive quarters, a \$50 charge was established to cover the costs of attending a premise to obtain the meter reading. However, this measure did not reduce the staff time required to obtain meter readings and did not improve the percentage of readings received from one quarter to the next.

A further concern was that water meters are known to decline in accuracy over their lifespan, allowing greater volumes of unre-

corded water to pass through the chamber of the meter. Based on information from the American Water and Wastewater Association, meter accuracy decreases between two and seven per cent over 20 years. Many of the meters in Macdonald were approaching 20 years, with over 900 meters between 11 and 15 years old. The rest of the meters varied in age from the time the water system was established in 1989. The Municipality performed testing on a random sample of the local meters to verify the conclusions of the American Water and Wastewater Association and confirmed that their meters were declining in accuracy.

The growth in the Macdonald Water Distribution System had stabilized, therefore the Municipality began to examine ways of implementing a water management program that would respond to the need to track unaccounted water. Three options were considered:

- 1) *Status Quo* – The loss in revenue from unaccounted water would have to be recovered in order to meet the increasing costs of operating the water utility, resulting in increased rates for all customers.
- 2) *Staged Meter Replacement* – A move towards the ultimate upgrading of all meters over a designated time period would result in an annual increase of approximately \$36.10 to the average customer.
- 3) *Radio Frequency Remote Read Registers* – A complete changeover of the oldest water meters and conversion of newer

water meters would provide an immediate solution to obtaining accurate readings. This option requires some form of financing.

The RM of Macdonald felt they had a responsibility to take the necessary steps to better manage and monitor the water utility. Therefore, Council gave notice of a public hearing regarding a local improvement plan referenced as the Radio Frequency Water Meter project. The proposal was to replace approximately 900 meters installed in the period from 1989 to 1993 that were 11 to 15 years old. The remaining water meters would be converted, allowing all meters in the system to be read remotely. As a result, all meters would be equipped with radio frequency meter interface units that would allow automatic meter reading with a mobile automatic meter reading data collector. The estimated cost of the local improvement and other expenses incidental to the undertaking of the improvement was \$475,000. It was proposed that this amount be financed in part by a contribution of \$100,000 from the existing Water Utility Reserve Fund and the RM of Macdonald would raise the balance by the sale and issuance of a debenture. The initial estimated annual cost to each customer was \$52.30 per year, over a period of five years.

At the public hearing residents expressed opposition to the proposal, including a petition containing 285 signatures. The Council decided that more accurate cost estimates should be pursued in order to fully evaluate



the project impacts. After receiving cost estimates from two major suppliers of water metering equipment, the Municipality found that the overall cost of the project would be \$380,000 – a reduction of \$95,000. Further notice was given to inform residents of the revised estimate to an adjusted amount of \$39 per customer, per year, over a five-year period. A second public hearing was held, with far fewer indications of opposition.

The Municipality decided to move forward with the local improvement project because of the extensive advantages of the radio frequency technology. The system has now been in place for a full year and four meter readings have taken place. With the full year of readings collected the RM of Macdonald now has sufficient data to examine trends and evaluate the water distribution system.

CAO **Tom Raine** says the system is working “flawlessly” with each quarter obtaining readings from all customers. The system is also extremely useful because it provides immediate feedback on meter problems as they arise. Raine estimates that there have been no more than three such problems per quarter, representing a significantly improved reading rate as compared to the previous system. The billing cycle has also been shortened from two weeks to one day from the time the data is input to the printing of water bills. These additional staff hours can now be directed to other municipal priorities; a benefit that is difficult to quantify but greatly appreciated. Overall, the new water meters have been a success and the Municipality is looking forward to the ongoing benefits of the new water meters. §

**Advantages:**

- Non-invasive meter reading means no requirement to access customer homes or property.
- Increased meter reading accuracy resulting in increased revenue.
- Operational efficiencies created by radio frequency technology.
- Dramatic reduction in estimated bills and administrative adjustments.
- Eliminated manual entry of meter reading data into the municipal billing system.
- Staff efficiencies due to minimized reading time and shortened billing cycle.
- Significantly enhanced level of customer service.

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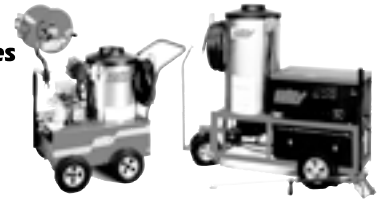
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