

OUR STRINGENT WATER QUALITY STANDARDS

Meeting Regulatory Requirements and Health Canada Guidelines

In 2017, EPCOR met guidelines for all Canadian Drinking Water Quality health-based limits for radiochemical, chemical and physical parameters. Of the 59,915 applicable water quality tests EPCOR conducted, only 94 (< 0.16 per cent) did not meet the requirements of EPCOR's internal water quality standards. None of these tests, however, failed to meet Canadian Drinking Water Guidelines or the AEP Approval-to-Operate water quality parameter limits.

EPCOR notified AEP of water quality events or approval contraventions in 2017 that did not involve a failure to meet drinking water guidelines. Each incident was investigated to determine root causes and corrective actions taken, as per the EPCOR Incident Management standard; a subsequent written report was also produced. The following describe the reported incidents:

- One event where a water sample collected from the distribution system resulted in an *E. coli* positive and total coliform bacterial result. The sample was collected from a kitchen sink in a fire station. As per the *Communication and Action Protocol for Failed Bacteriological Results in Drinking Water*, a set of four resamples were collected (upstream and downstream in the distribution system and two locations at the fire station) and all tested negative for *E. coli* and total coliform. A second set of four resamples all tested negative as well. It was concluded that the original positive sample was collected from a contaminated sample point and there was no contamination of the water in the distribution system.
- Eleven events where water samples collected from the distribution system resulted in a total coliform positive bacterial result. After follow-up testing and investigation according to the *Communication and Action Protocol for Failed Bacteriological Results in Drinking Water*, these were confirmed to be related to sample collection, a contaminated sample point condition or contamination of a replaced fire hydrant; these events were determined not be related to the quality of the water in the distribution system.

EPCOR collected 3,737 samples for bacteriological testing in the distribution system in 2017 and the false positive rate was 0.3% (i.e. 12 samples). This is a relatively low rate for total coliform testing and is typically achieved by EPCOR samplers. Nevertheless, EPCOR continues to emphasize training of water samplers in an effort to further reduce the number for total coliform positive bacteria results in water samples that are determined to be due to sampler error.

In 2016, Health Canada introduced a proposed guideline for two contaminants of emerging concern: Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA). Both PFOS and PFOA are manmade compounds that are used in specialized applications, such as firefighting and fabric/paper treatments, and are very stable and long lasting in the environment. Health Canada is proposing very low maximum acceptable concentrations for both these compounds (0.6 ug/L and 0.2 ug/L). Even though the guideline is not yet in place, EPCOR began monitoring for PFOS and PFOA in raw and treated water in 2017; the results thus far have below detection (< 0.02 ug/L).

The Water Quality Index

The Water Quality Index measures the number of treated drinking water tests that meet EPCOR's internal water quality standards. EPCOR's standards are often more stringent than provincial requirements or Health Canada Drinking Water Guidelines. In 2017, 59,821 out of a total of 59,915 applicable tests on treated water passed EPCOR's internal quality standards.

EPCOR's **Water Quality Index score of 99.84 percent in 2017** was an increase over the 2016 score of 99.73 percent, and well above the target of 99.6 percent set in EPCOR's Performance Based Regulation (PBR), which is established through a City of Edmonton bylaw.

Spring Runoff Program and the Home Sniffing Program

Spring runoff conditions in the North Saskatchewan River vary from year to year and can significantly affect the taste and odour of drinking water. Spring runoff (typically mid-March to mid-April) results in an increase in the turbidity, colour, taste and odour of the raw water supply drawn from the river. During the winter months, our water treatment plants use direct filtration and must transition back to conventional treatment mode of operation prior to spring runoff. This allows us to add powdered activated carbon (PAC) as a taste and odour control measure.

In 2017, spring runoff began February 18 after an unusually warm February. The WTPs converted to conventional treatment and began adding PAC as the ammonia, colour and odour in the raw water increased. The runoff conditions abated in about a week as winter conditions returned and we were able to convert back to direct filtration. Spring runoff conditions returned March 21 with a second increase in raw water ammonia, colour and odour. We stopped adding PAC to control odours April 8 when spring runoff ended.

Home Sniffing Program

This program measures the effectiveness of EPCOR's spring runoff water treatment strategy. A panel of about 100 EPCOR customer volunteers rates the odour of the treated water from the hot and cold taps in their home. A satisfied customer is one who rated the intensity of the odour as 0.5 or less on a scale of 1 to 3. This means the water has either a slight non-objectionable odour, trace odour or no odour at all.

We ran the program from February 19 to May 20, 2017 and each day 46 to 101 volunteer "sniffers" participated. The overall Customer Satisfaction Rating for this period (which included two spring runoff peaks) was 94.46%. This slightly surpassed our internal performance target of 94.4%. The result was lower than the 96.2% Customer Satisfaction Rating of 2016, which was a relatively mild runoff year. The success of spring runoff heavily depends on the conditions of the river water and 2017 was an example of a challenging year.

Performance Based Regulation Requirements

In addition to the Water Quality Index and the Home Sniffing Customer Satisfaction Rating, EPCOR strives to meet other requirements set by the City of Edmonton Performance-Based Regulation (PBR). These measures ensure EPCOR maintains performance in a number of areas.

Performance against the five PBR aggregate measures is summarized in the following table. In 2017, EPCOR maintained the same five aggregate performance measures; however, some of the information used to calculate the measures changed. For example, the number of days where the water treatment plants operated in direct filtration mode was added as a factor in the Environmental Index. This factor will incent efforts to maintain and increase direct filtration operation and thus drive a reduction in solids residuals released to the river. The overall score of 107.6 points indicates consistent high performance when compared with the 2013 to 2016 scores of 106.8, 107.2, 108.7 and 108.5 points, respectively.

EPCOR submits a yearly report to the City of Edmonton on the Performance Based Regulation, which includes detailed information on each of our performance measures.

Performance Measure	Basis	2017 Target Points ¹	Actual Points Earned ¹
System Reliability and Optimization Index	Number of water main breaks, repair duration, water loss factor and energy use	25.0	28.5
Water Quality Index	Percentage of water quality tests that meet or exceed EPCOR internal standards	25.0	25.0
Customer Service Index	Customer service satisfaction for EPCOR Emergency Group and Home Sniffing programs, response time factor and planned construction notification where EPCOR complies with required construction notification procedures	20.0	21.1
Environmental Index	Residential consumption rolling average, environment incident reporting and days operating in direct filtration mode	15.0	16.5
Safety Index	Near miss reporting, work site inspections and observations, lost time frequency rate and injury frequency rate	15.0	16.5
Total		100.0	107.6

¹Bonus points can be earned for exceeding performance measures