

ENERGY PROBE INTERROGATORY #7

INTERROGATORY

References: Exhibit B, Tab 3, Schedule 2; Exhibit C, Tab 1, Schedule 5, Plus Appendix A.

Preamble: The volumetric decrease of $164.9 \times 10^6 \text{m}^3$ in Rate 1 was due to a lower average use per customer totalling $154.8 \times 10^6 \text{m}^3$ and unfavourable customer variance of $10.1 \times 10^6 \text{m}^3$; The volumetric decrease of $125.5 \times 10^6 \text{m}^3$ in Rate 6 was primarily due to a lower average use per customer totalling $91.2 \times 10^6 \text{m}^3$; and unfavourable customer variance of $34.9 \times 10^6 \text{m}^3$.

- a) Please provide a Schedule and Chart showing *as applicable*, for the Rate 01 and 6 Classes the following for 2011-2016:
 - Board-approved or Forecast NAC
 - Actual NAC
 - Normalized DD average and by zone
 - Actual DD average and by zone
- b) Please provide a 6 year graphical trend analysis of Normalized NAC for Rate 01 and Rate 6 rate classes.
- c) Please show Average DD on same chart.
- d) With respect to *“The Rate 1 decline experienced in 2016 could not have been predicted by the historical Trend”* please provide analysis and comments on the factors causing significant trends in consumption and NAC for each class.
- e) Please comment on whether there is evidence indicating structural changes may be required to the forecast models given the decreases in average use.

RESPONSE

- a) b) and c)

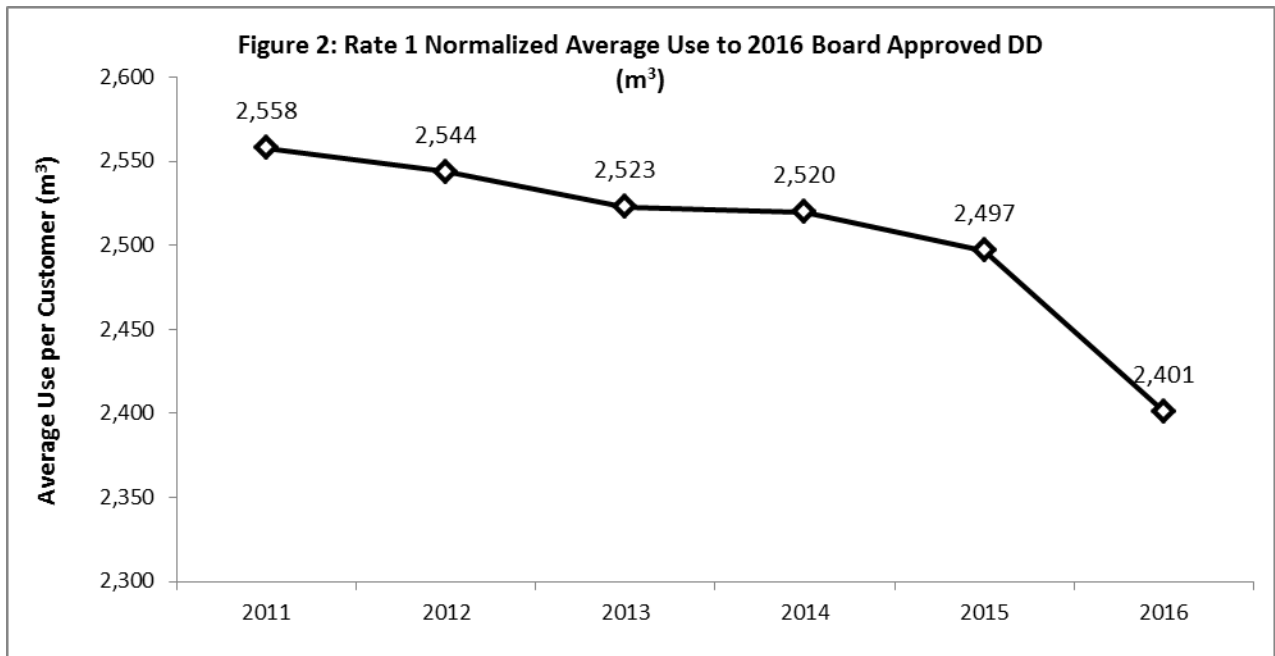
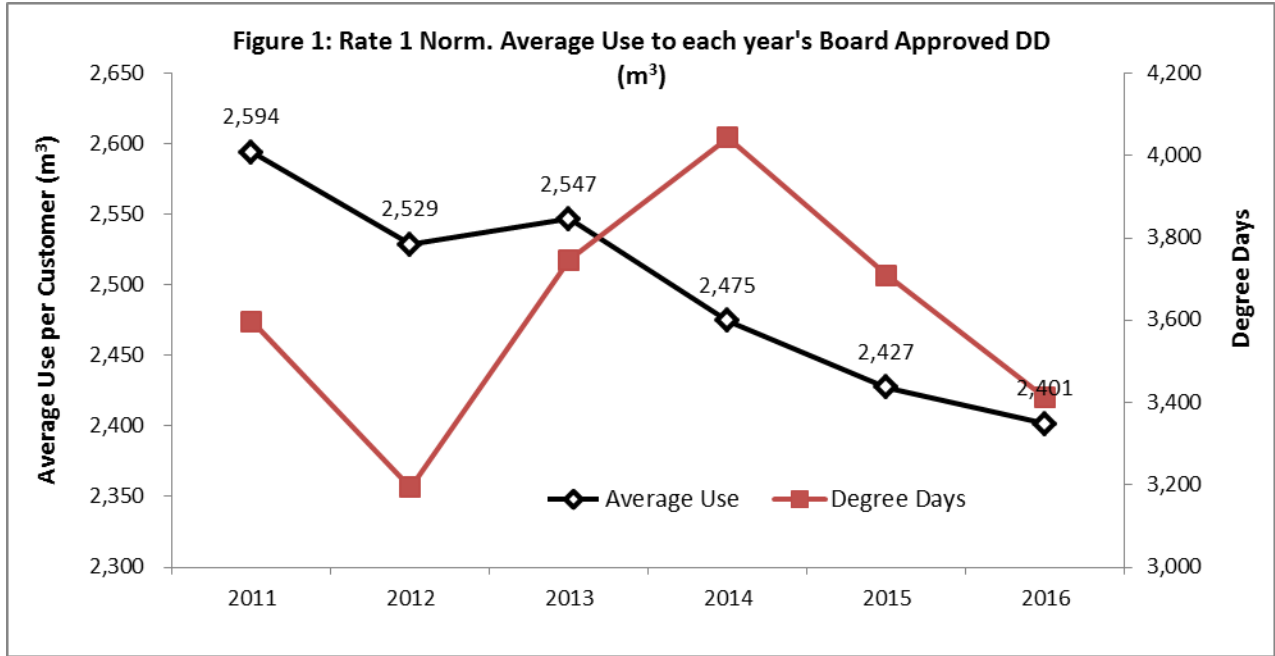
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J. Shem
M. Suarez

Year	Rate 1				Rate 6				Actual Degree Days			Board Approved Degree Days		
	Actual Normalized Average Use Per Customer	Board Approved Normalized Average Use Per Customer	Variance	Variance %	Actual Normalized Average Use Per Customer	Board Approved Normalized Average Use Per Customer	Variance	Variance %	Central	Eastern	Niagara	Central	Eastern	Niagara
	(m ³)	(m ³)	(m ³)	(%)	(m ³)	(m ³)	(m ³)	(%)						
2011	2,594	2,643	(49)	-2%	29,471	28,029	1,442	5%	3,597	4,108	3,334	3,602	4,421	3,447
2012	2,529	2,510	18	1%	28,941	30,122	(1,182)	-4%	3,194	4,048	3,013	3,532	4,343	3,418
2013	2,547	2,568	(22)	-1%	29,878	29,878	(0)	0%	3,746	4,484	3,537	3,668	4,297	3,420
2014	2,475	2,433	41	2%	28,634	28,383	251	1%	4,044	4,552	3,814	3,517	4,243	3,386
2015	2,427	2,419	9	0%	28,600	28,341	259	1%	3,710	4,397	3,548	3,536	4,267	3,376
2016	2,401	2,480	(79)	-3%	28,203	28,753	(550)	-2%	3,412	4,231	3,233	3,617	4,323	3,408
Average Degree Days									3,617	4,303	3,413	3,579	4,316	3,409

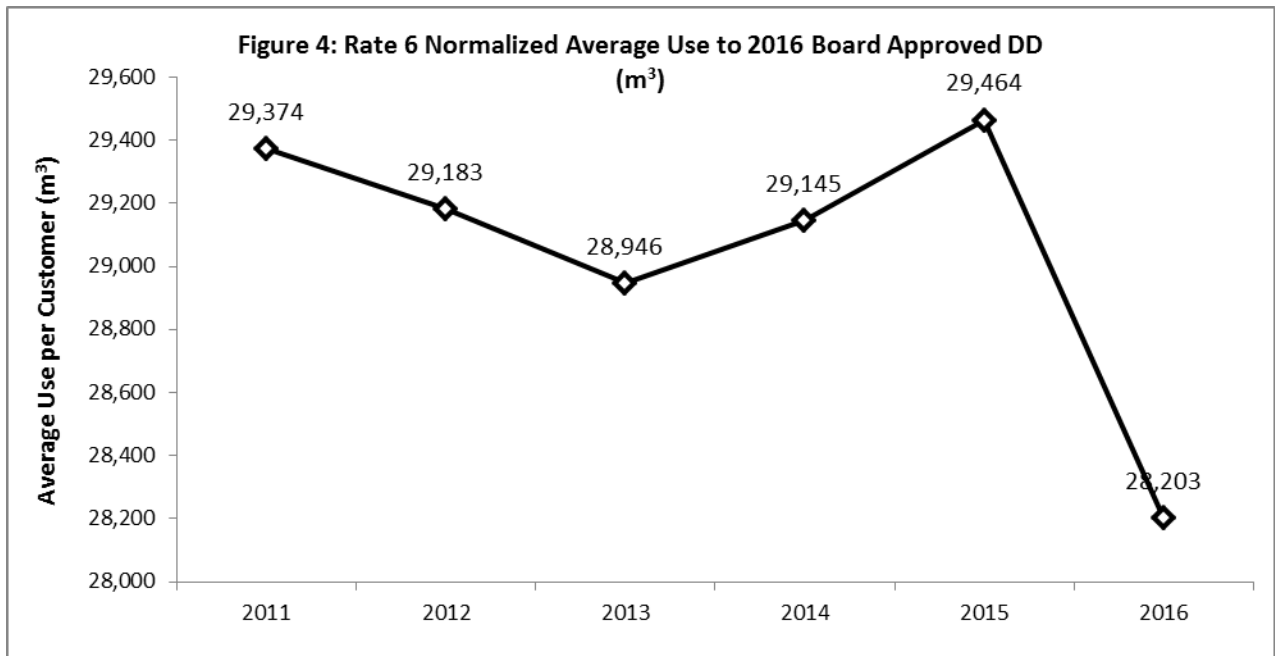
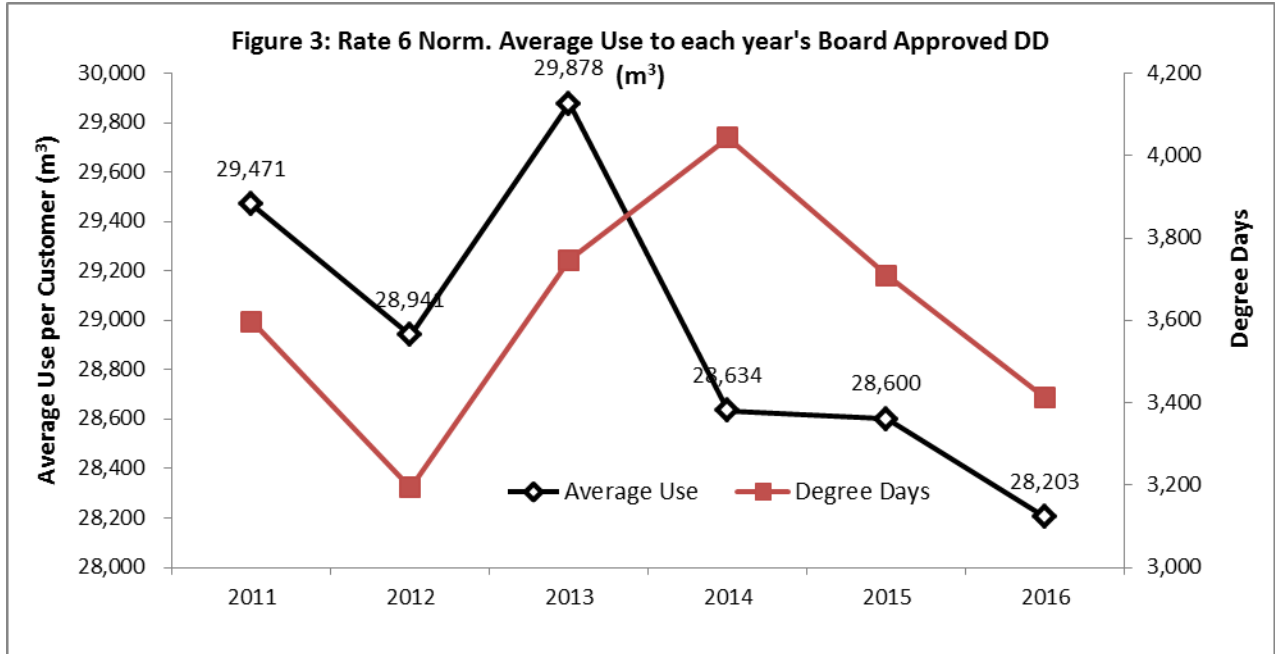
Actual and Board-Approved average uses along with degree days are shown in the table above and in the figures that follow, for the years 2011 to 2016.

Figures 1 and 3 show actual average use normalized to each years' Board-Approved degree days. In contrast, to show the average use trend under consistent weather conditions, Figures 2 and 4 depict average use using 2016 Board Approved degree days for each year.

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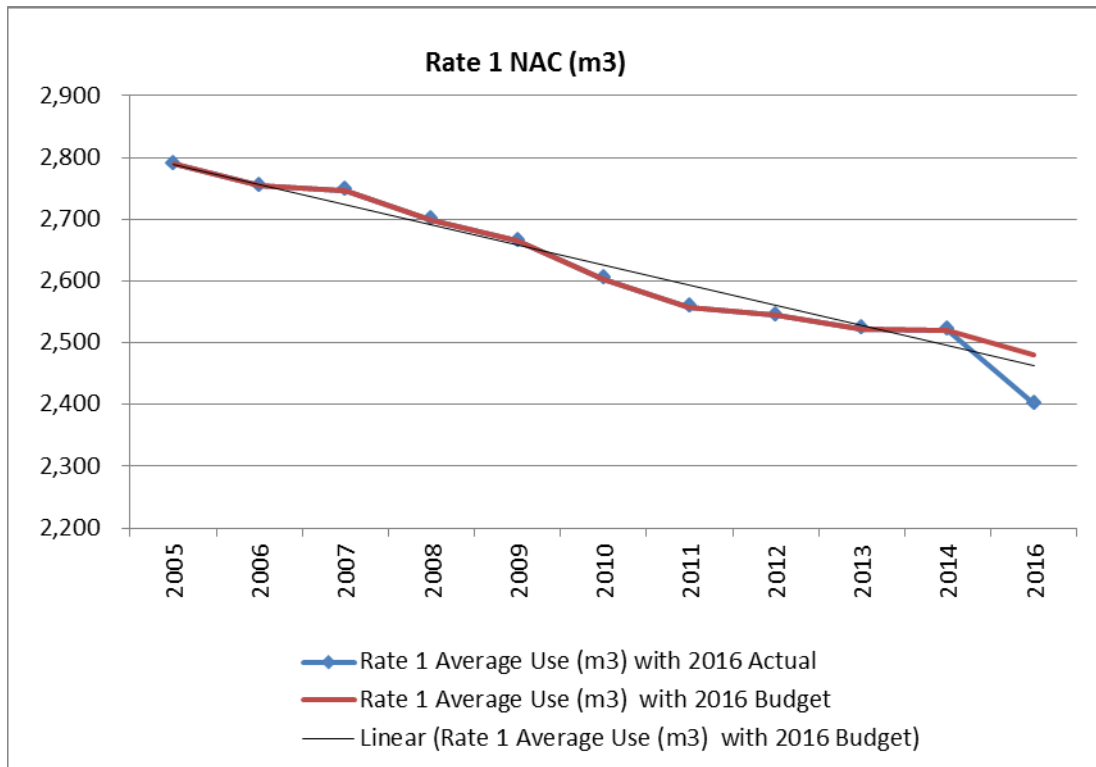


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d) Forecast and historical normalized average use are shown in the following chart for the most recent 10 years. In every case except 2016, the actual normalized average use was aligned with the forecast. Although the 2016 Budget average use is consistent with historical average use, the actual 2016 value is significantly lower. Confidence intervals were calculated around the long-term Rate 1 average use decline rate of 1% and the 2016 rate of average use decline falls outside of the 95% confidence interval, confirming that the 2016 decline experienced could not have been predicted using the historical trend from 1985.



Further, Figures 2 and 4 from the previous pages show the deviation of 2016 results from the most recent historical trend. By expressing average uses normalized to a consistent degree day (2016 forecast), the resulting average use trend neutralizes weather variation from year to year so that a truer picture of the underlying average use trend is made evident. For both Rate 1 and Rate 6, 2016 actual average use is markedly lower.

Please see the response to SEC Interrogatory #4, found at Exhibit I.C.EGDI.SEC.4 for detail on potential contributing factors.

e) As stated in paragraph 12 at EB-2015-0114, Exhibit C2, Tab 1, Schedule 3, the average use models are subjected to a battery of diagnostic tests as part of the forecasting estimation process. These tests are run on the model to check for

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incorrect functional forms, parameter instability, structural breaks, omitted variables, and randomness of residuals. The average use models have been updated with the 2016 actual value and diagnostic testing has indicated that a structural break has indeed occurred in 2016 for some models. Dummy variables have been introduced to correct for this within the 2018 average use forecast development. However, it is anticipated that ongoing analysis with additional observations will make this retrospective assessment more definitive.

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