

1 **Q Please state your name and business address.**

2 A I am William Perea Marcus, Principal Economist of MCPM Economics, 67 Third Street,  
3 Woodland, California, USA 95695.

4 **Q Please provide your qualifications.**

5 A My qualifications are provided in Exhibit WM-1. I have over 38 years of experience in  
6 analyzing energy utilities and have testified before approximately 40 regulatory bodies and  
7 courts in the US and Canada on a variety of issues related to utility regulation including  
8 revenue requirements, rate of return, system planning, and cost allocation and rate design.

9 **Q Have you previously testified before the Régie?**

10 A No.

11 **Q Have you previously testified on issues related to the marginal cost of gas service?**

12 A Yes, on a number of occasions. Marginal cost is used for cost allocation and rate design in  
13 California, and I have testified in cases involving Pacific Gas and Electric Company,  
14 Southern California Gas Company, and the gas operations of San Diego Gas and Electric  
15 Company in cases dating back to 1994, and as recently as March, 2016. I also testified on  
16 marginal costs of Washington Gas Light in Maryland in Maryland PSC Docket No. 8959  
17 and provided a report on Gas Utility Integrated Resource Planning for the Ontario Energy  
18 Board in 1992 which included marginal cost analysis.

19 **Q In the context of Phase 3A, what are long-run marginal costs of operation?**

20 A Phase 3A investigates one critical subset of the utility's marginal costs – the incremental  
21 operating costs associated with serving new customer connections, both on a one-time and  
22 ongoing basis.

23 **Q To set the context for your testimony, are there other long-run marginal costs that are  
24 not included in Phase 3A?**

25 A Yes. Other utility long-run marginal costs not included in Phase 3A are (a) capital and  
26 operating costs caused by the increase in demand arising from new (and possibly existing)  
27 customers, but not at the site of the new connection, (b) other future capital investments

28 (e.g., smart meters), and (c) costs related to long-term needs for corporate overhead.<sup>1</sup>  
29 These additional longer run marginal costs need to be part of the considerations of  
30 profitability of new customer connections in Phase 3B but are not evaluated here in 3A.

31 1. **Q Have you prepared tables comparing your results with those of the last Gaz**  
32 **Métro study and those prepared by Black and Veatch?**

33 A Yes. They are attached as Exhibit WM-2.

34 **Q What is the most important issue where you disagree with Gaz Métro's expert (Dr.**  
35 **Overcast) on the definition of long-run marginal cost of operation of new customer**  
36 **connection?**

37 A I disagree with Dr. Overcast on the philosophical issue of whether to impute long-run  
38 marginal costs of operation to every single newly connected customer. Unlike Dr.  
39 Overcast, I believe that long-run marginal costs of operation should be imputed to every  
40 single newly connected customer even if (a) some of these costs are lumpy (i.e. an  
41 individual customer is too small to affect the level of costs individually, even if a cohort of  
42 new customers may be large enough to have an impact); and (b) not every customer will  
43 undertake the activity that causes the cost (e.g., call the utility's call center).

44 In defense of the proposition that marginal costs are lumpy and therefore not influenced by  
45 the addition of a single customer, Dr. Overcast made the following statements:

46 While Gaz Métro does have preventive maintenance programs for service  
47 lines and mains that are made on a multiyear basis, the expense of one  
48 additional customer can likely be absorbed by the existing staff that  
49 performs these tasks.<sup>2</sup>

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51 However meter reading has more of a stepwise impact on costs in that  
52 additional meter reading costs are incurred only after a certain threshold of

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<sup>1</sup> To briefly set the context, corporate overhead costs would include any employee benefits or employee-related insurance costs (e.g., workers' compensation) not already included in Gaz Métro's estimates, and certain other costs that vary in the long-run with the size of the company's work force or asset base (e.g., human resources). These costs would generally not include more fixed administrative overhead costs (for example, legal, tax, investor relations, executive management).

<sup>2</sup> Overcast Testimony, B-0145, GM-6, Doc 2, p. 5.

53 new customers have been added to the system where the current staff can  
54 no longer handle the additional workload.<sup>3</sup>

55 In several cases, where a single new customer will allegedly not affect the level of costs, a  
56 value of zero has been included (e.g., Dr. Overcast's estimate for meter reading). In other  
57 cases, a range has been estimated of zero to a total number of dollars of cost (e.g., call  
58 center costs).

59 **Q What is the effect of this philosophical disagreement on the estimate of long-run**  
60 **marginal operating costs?**

61 A We can estimate this effect on a preliminary basis by comparing Gaz Métro's costs from its  
62 2015 rate case (R-3879-2014) and Dr. Overcast's analysis, which ended up with much  
63 lower costs than Gaz Métro. Gaz Métro's analysis had a minimum marginal operating cost  
64 per residential customer of \$109.30 in year 1 and \$62.52 in year 2 and beyond. Dr.  
65 Overcast's minimum figures were \$55.88 and \$9.10 respectively, \$54 and \$53 less than the  
66 costs originally estimated by Gaz Métro.

67 **Q What is your position on this issue?**

68 A I disagree with Dr. Overcast that many operating costs are so lumpy that they are not  
69 marginal costs. These costs should generally be averaged when computing long-run  
70 marginal costs, because they arise as a significant number of customers are added over the  
71 time horizon of the customer connection. In a profitability analysis, it could also be  
72 recognized that some of these costs are not incurred every year or ramp up over time.

73 I believe that Dr. Overcast's analysis suffers from the fallacy of composition – that because  
74 one customer might not cause a change in cost, a group of new customers added by Gaz  
75 Métro will also not cause a change in cost. Gaz Métro has added an average of 2,791 rate  
76 D1 customers over the 2012-2016 time frame.<sup>4</sup> The impact of 2,791 customers is likely to  
77 be greater than the individual impact of 1 customer added 2,791 times.

78 **Q How do utilities generally respond operationally to costs that Dr. Overcast considers**  
79 **lumpy?**

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<sup>3</sup> Id., p. 6.

<sup>4</sup> B-0201, GM-8, Doc 5, Responses of Gaz Métro to OC Information Request No. 1, Response to OC information request 5.4.

80 A They tend to respond in more granular ways than Dr. Overcast's theory suggests. For  
81 example, call centers are staffed for the call traffic on a daily and hourly basis, typically  
82 with a mix of full-time, part-time, and even on-call workers. Many utilities hire both full-  
83 time and part-time meter readers, as well as using overtime as workload increases prior to  
84 the re-routing which Dr. Overcast suggests is the only way in which meter reading costs  
85 might increase.

86 **Q What costs do you consider as long-run marginal operating costs of serving new**  
87 **customers?**

88 A There are one-time costs of setting up contracts and accounts for service at a new premises.  
89 These costs are presently part of the \$300 fee collected from each applicant for new service  
90 under 10,950 cubic meters (m3) per year.<sup>5</sup> These costs are not collected from larger  
91 customers on a one-time basis. But in any event, they are marginal costs of that service  
92 that need to be considered in the ultimate analysis of profitability.

93 Then there are ongoing incremental costs of service. While some (meter reading, bill  
94 presentation and payment processing, call center costs) are ongoing, some of the physical  
95 inspection and maintenance costs start to occur later in a project's life (year 2 or even  
96 beyond).

97 With a few exceptions, I believe that the list provided by Gaz Métro from its 2015 rate case  
98 (R-3879-2014) is a good starting point for analyzing these costs, but I disagree with Dr.  
99 Overcast that most of these costs are non-existent or have minimum levels of zero.

100 **Q How has Gaz Métro categorized meter reading costs?**

101 A Dr. Overcast does not include them, because he believes that adding a single customer will  
102 not cause a meter reader's route or time on the job to change.

103 **Q Do you agree?**

104 A No. I believe that meter reading costs should be included on an average cost basis in this  
105 Phase, and I include them. There are costs of reading additional meters (extra walk and  
106 read time including potential overtime), and the addition of thousands of customers a year,

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<sup>5</sup> Gaz Métro Tariff Section 17.1.1.1.

107 particularly if new subdivisions are served, is likely to cause rerouting. It is thus a  
108 reasonable long-run marginal operating cost.

109 **Q Does new technology to automate meter reading affect your conclusion?**

110 A No. In this phase, I believe that current technology is appropriate for analysis. In the  
111 subsequent profitability analysis (Phase 3B) it may be reasonable to consider the potential  
112 for substituting future capital spending on automatic meter reading (AMR) for labor as a  
113 means of reducing the long-run cost. However, the customer connection would cause the  
114 need for some of the post-connection capital spending on AMR. Thus, that additional  
115 capital which reduces meter reading O&M would need to factor into the Phase 3B analysis.

116 **Q How has Gaz Métro categorized call center costs?**

117 A Dr. Overcast states: “Not all customers make calls to the utility so we recommend  
118 changing the minimum range to zero.”<sup>6</sup>

119 **Q Do you agree?**

120 A No. While some customers make zero calls, some also make more than one call. Many  
121 utilities experience an average of more than one call per customer per year.<sup>7</sup> Therefore, the  
122 appropriate long-run marginal cost is not a range but is the average cost to customers of  
123 using the call center. We therefore use Gaz Métro’s figure as both a lower and upper  
124 bound but not as part of a range.

125 **Q How would you address preventive and corrective maintenance of service lines?**

126 A The costs presented by Gaz Métro appear to be the average cost per customer of such  
127 maintenance. Preventive maintenance (leak inspection) occurs periodically, and the  
128 addition of new premises adds to the cost. For corrective maintenance, the vast majority of  
129 customers would have no cost, but some would have a much larger cost than reported in  
130 Tables 2-4 of the Overcast Testimony. Therefore, the minimum of zero and the maximum

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<sup>6</sup> Overcast Testimony, B-0145, GM-6, Doc 2, p. 8.

<sup>7</sup> For example, in 2013, Southern California Gas Company CSRs answered 6,370,000 calls (SCG 2016 General Rate Case Exhibit 11, p. EDG-14) for 5,606,000 active meters (SCG Exhibit 30, p. RMP-4). In 2015, Southern California Edison CSRs answered 7,168,000 calls (SCE 2018 General Rate Case Exhibit 3, p. 119) for 5,033,330 year-end customers (SCE Exhibit 9, p. 69).

131 of the average cost of serving all customers presented by Gaz Métro are incorrect. The  
132 preventive maintenance cost should be the average because it applies to all premises, and  
133 the maximum corrective maintenance cost is actually quite a bit higher than the figures  
134 shown. But from the perspective of calculating long-run marginal costs, I would  
135 recommend that this average cost per customer of service line and main preventive and  
136 corrective maintenance be assumed as both a minimum and maximum cost. While I have  
137 included these costs in the tables, in the profitability analysis one might conclude that some  
138 costs may not occur for several years after the installation.

139 **Q Are there any costs that you would add to the long-run marginal costs of operation of**  
140 **a new customer connection that Gaz Métro has not considered?**

141 A Yes. There is another theoretical issue. Once a dwelling is built and connected to the  
142 system, customers will move in and out of the dwelling. Once the initial set of customers  
143 has moved, costs will be incurred to serve new customers. Specifically, the cost of setting  
144 up new accounts and collection and recovery costs are not just tied to the new customer but  
145 to successor customers. These costs should therefore be added to the long-run marginal  
146 costs of operation considered in Phase 3A.

147 **Q Have you considered the periodic establishment of new accounts?**

148 A As customers move, the utility must set up new accounts periodically. These account set-  
149 up costs are a marginal cost of the new connection because there is a clear nexus to the  
150 dwelling if not to the first customer living in it.

151 Statistics Canada in the 2011 Census (the last one available) provides information that  
152 37.3% of Quebec residents have moved at least once in the last five years and 11.8%  
153 moved in the last year.<sup>8</sup> In Montreal, 15.3% moved in the last year and 45.9% moved in  
154 five years. Gaz Métro estimated in 2011 that 30,400 of its D1 customers moved (slightly  
155 over 10% of its customer base at the time) and that the costs of these moves to Gaz Métro  
156 were \$218 per move for residential customers and \$287 per move for CII customers.<sup>9</sup>

157 When a line extension is involved (instead of an attempt to charge money to each customer

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<sup>8</sup> The reason that the five-year percentage is lower (than 5 times 11.8%) is that some households move more than once.

<sup>9</sup> Gaz Métro, Cause tarifaire 2012, R-3752-2011, GM-14, Doc 1, p. 43.

158 who moves), suddenly the marginal cost becomes only \$9.66 for the new applicant and  
159 nothing for any future customers. We will add the \$9.66 multiplied by 10% of customers  
160 as an ongoing long-run marginal cost for both residential and CII customers.<sup>10</sup>

161 **Q Have you considered collection and recovery costs?**

162 A These costs are also marginal costs, though they may increase to their full amount over  
163 time. Dr. Overcast states:

164 The costs of collections and bad debt are not considered marginal costs  
165 because new customers should be screened for credit worthiness before  
166 being added to the system and there should be no expected costs related  
167 to bad debt.<sup>11</sup>

168 There are three problems with this argument. First, it is incorrect. While Dr. Overcast said  
169 “new customers should be screened for credit worthiness” [emphasis added], a response to  
170 an information request from the Régie confirmed that residential customers are not allowed  
171 to be screened in this manner.<sup>12</sup> Second, circumstances faced by individual customers may  
172 change over time. A creditworthy customer at the time of taking service may not be a  
173 creditworthy customer several years later. Third, as noted above, customers move, so that  
174 the first customer at a site may no longer live there. Therefore, the average collection and  
175 recovery costs should be included as long-run marginal costs.

176 I would recommend including the average of collections and recovery costs as a long-run  
177 marginal cost. In a profitability analysis, it should ramp up by 25% per year from year 2 to  
178 100% in year 5.

179 **Q Would you include bad debt itself in marginal costs?**

180 A No. The cost of bad debt itself is not a marginal cost of serving existing customers, but is a  
181 cost incurred by former customers and is related to revenue rather than to the number of  
182 customers.

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<sup>10</sup> There are also other costs of customer moves, such as special one-time meter readings for some customers that are not included in OC’s cost estimates, and calls to the call center that are implicitly included in OC’s call center cost estimate.

<sup>11</sup> Overcast Testimony, B-0145, GM-6, Doc 2, page 6.

<sup>12</sup> B-0196, GM-8, Doc 1, Responses of Gaz Métro to Régie Information Request No. 5, Response to Régie information request 3.1. “Gaz Métro is currently not allowed, by mandate, to review the credit worthiness of its residential customers.”

183 **Q Are there areas where Gaz Métro has estimated long-run marginal costs that are too**  
184 **high for residential customers?**

185 A Yes. The inspection and maintenance costs for large meters are not reasonable for  
186 residential customers even as high-end estimates. Almost no individually metered  
187 residential or small business customers have large turbine meters or require telemetry.  
188 Very few residential gas meters are inspected or maintained, particularly in the early years  
189 of operation.

190 **Q Do you have any comments on non-residential costs?**

191 A For the most part, non-residential costs should be treated similarly to residential costs. The  
192 one exception is that for large customers, the cost of customer retention should be  
193 included. Major account representatives are assigned to large customers, and they offer the  
194 more complex information and personalized service required by those customers. Some  
195 smaller customers (particularly multi-site and franchise customers) receive personalized  
196 service, so that the customer retention costs for major accounts in the CII group should also  
197 be included, in the range provided by Gaz Métro.

198 I also recommend including the costs of inspecting and maintaining larger meters for non-  
199 residential customers, as Gaz Métro has suggested. I make an adjustment to meter reading  
200 for Major Industries, to include a minimum cost of zero, because those customers who  
201 have more expensive telemetry will not need to incur the lower cost meter reading  
202 expenses.

203 **Q Do you have any comments on the methods used by other jurisdictions?**

204 A After reviewing the scope of this phase, I now think such comments are better provided in  
205 Phase 3B, since the actions of other energy distributors and jurisdictions are guided, at  
206 least implicitly by profitability.

207 **Q Does this conclude your testimony?**

208 A Yes, it does. Thank you.



**William Perea Marcus**  
Principal Economist  
MCPM Economics.

William Perea Marcus has 38 years of experience in analyzing electric and gas utilities.

Mr. Marcus graduated from Harvard College with an A.B. magna cum laude in economics in 1974 and was elected to Phi Beta Kappa. In 1975, he received an M.A. in economics from the University of Toronto.

In January, 2016, Mr. Marcus became Principal Economist for MCPM Economics. MCPM is a successor company to JBS Energy, Inc., where Mr. Marcus previously had served as Principal Economist for 32 years, starting in July, 1984.

Mr. Marcus is the author of the economic analysis contained in the 2030 Low Carbon Grid Study and a related analysis of the economics of replacing the Diablo Canyon nuclear plant with carbon-free alternatives. He is the co-author of a book on electric restructuring prepared for the National Association of Regulatory Utility Commissioners. He wrote a major report on Performance Based Ratemaking for the Energy Foundation.

Mr. Marcus has prepared testimony and formal comments submitted to the Federal Energy Regulatory Commission, the National Energy Board of Canada, the Bonneville Power Administration, the U.S. Bureau of Indian Affairs, U.S. District Court in San Diego, Nevada County Municipal Court; committees of the Nevada, Ontario and California legislatures and the Los Angeles City Council; the California Energy Commission (CEC), the Sacramento Municipal Utility District (SMUD), the Transmission Agency of Northern California, the State of Nevada's Colorado River Commission, a hearing panel of the Alberta Beverage Container Management Board; two arbitration cases, environmental boards in Ontario, Manitoba, and Nova Scotia; and regulatory commissions in Alberta, Arizona, Arkansas, British Columbia, California, Colorado, Connecticut, District of Columbia, Hawaii, Iowa, Manitoba, Maryland, Massachusetts, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, Northwest Territories, Nova Scotia, Ohio, Oklahoma, Ontario, Oregon, South Carolina, Texas, Utah, Vermont, Virginia, Washington, Wisconsin, and Yukon. He testified on issues including utility restructuring, stranded costs, Performance-Based Ratemaking, resource planning, load forecasts, need for powerplants and transmission lines, environmental effects of electricity production, evaluation of conservation potential and programs, utility affiliate transactions, mergers, utility revenue requirements, avoided cost, and electric and gas cost of service and rate design.

From 1975-1978, Mr. Marcus was a case writer for the Kennedy School of Government, Harvard University, where he wrote case studies on energy, environmental, and urban policy and taught benefit-cost analysis.

From July, 1978 through April, 1982, Mr. Marcus was an economist at the CEC, first in the energy development division and later as a senior economist in the CEC's Executive Office. He prepared testimony on purchased power pricing and economic studies of transmission projects, renewable resources, and conservation programs, and managed interventions in utility rate cases.

From April, 1982, through June, 1984, he was principal economist at California Hydro Systems, Inc., an alternative energy consulting and development company. He prepared financial analyses of projects, negotiated utility contracts, and provided consulting services on utility economics.

Table 1: Residential Long-Run Marginal Operating Expenses

Line Description	Gaz Métro Original				Black and Veatch				OC				Note for profitability analysis
	First Year one-time		Ongoing		First Year one-time		Ongoing		First Year one-time		Ongoing		
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
1 Mailing of subscription confirmation letter	\$0.83	\$0.83	\$0.00	\$0.00	\$0.83	\$0.83	\$0.00	\$0.00	\$0.83	\$0.83	\$0.00	\$0.00	
2 Cost of mailing bill			\$8.36	\$8.36			\$8.36	\$8.36			\$8.36	\$8.36	
3 Cost of opening a billing file	\$9.66	\$9.66	\$0.00	\$0.00	\$9.66	\$9.66	\$0.00	\$0.00	\$9.66	\$9.66	\$0.97	\$0.97	10% for moves start year 2 need to consider AMR capital substitution in profitability
4 Cost of reading a meter			\$6.71	\$6.71			\$0.00	\$0.00			\$6.71	\$6.71	
5 Input of a new contract	\$36.29	\$36.29	\$0.00	\$0.00	\$36.29	\$36.29	\$0.00	\$0.00	\$36.29	\$36.29	\$0.00	\$0.00	
6 Cost of a credit check conducted internally	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
7 Annual cost for cashing a payment			\$0.74	\$0.74			\$0.74	\$0.74			\$0.74	\$0.74	
8 Cost of processing a standard customer call			\$12.84	\$12.84			\$0.00	\$12.84			\$12.84	\$12.84	
9 Cost of Bad Debts			\$0.57	\$0.57			\$0.00	\$0.00			\$0.00	\$0.00	
10 Collection and recovery costs			\$2.43	\$2.43			\$0.00	\$0.00			\$2.43	\$2.43	ramp up in 25% increments years 2-5
11 Customer retention costs - Major accounts			\$0.00	\$0.00			\$0.00	\$0.00			\$0.00	\$0.00	
12 Customer retention costs - Major industries			\$0.00	\$0.00			\$0.00	\$0.00			\$0.00	\$0.00	
13 Preventive maintenance - Service line			\$12.88	\$12.88			\$0.00	\$12.88			\$12.88	\$12.88	start in year 3
14 Corrective maintenance - Service line			\$17.99	\$17.99			\$0.00	\$17.99			\$17.99	\$17.99	start in year 3
15 Processing of CRP application	\$0.00	\$23.83	\$0.00	\$0.00	\$0.00	\$23.83	\$0.00	\$0.00	\$0.00	\$23.83	\$0.00	\$0.00	
16 Preventive maintenance - Mains			\$0.22/m				\$0.22/m				\$0.22/m		start in year 3
17 Corrective maintenance - Mains			\$0.37/m				\$0.37/m				\$0.37/m		start in year 3
<b>18 Meters inspection and maintenance costs</b>													
<b>19 Type of meters</b>													
20 Turbine			\$0.00	\$31.68			\$0.00	\$31.68			\$0.00	\$31.68	
21 Spin test for turbine (less than 12 in)			\$0.00	\$79.20			\$0.00	\$79.20			\$0.00	\$0.00	
22 Telemetry			\$0.00	\$118.79			\$0.00	\$118.79			\$0.00	\$0.00	
23 Corrective instruments			\$0.00	\$87.11			\$0.00	\$87.11			\$0.00	\$0.00	
24 Spin test for turbine (12 in and more)			\$0.00	\$0.00			\$0.00	\$0.00			\$0.00	\$0.00	
25 Cost of a cellular line - telemetry			\$0.00	\$0.00			\$0.00	\$0.00			\$0.00	\$0.00	
26 Total without main maintenance	\$46.78	\$70.61	\$62.52	\$379.30	\$46.78	\$70.61	\$9.10	\$369.59	\$46.78	\$70.61	\$62.92	\$94.60	
27 Total with 10 meter main			\$68.42	\$385.20			\$15.00	\$375.49			\$68.82	\$100.50	

Table 2: CII Long-Run Marginal Operating Expenses

Line Description	Gaz Métro Original				Black and Veatch				OC				Note for profitability analysis
	First Year one-time		Ongoing		First Year one-time		Ongoing		First Year one-time		Ongoing		
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
1 Mailing of subscription confirmation letter	\$0.83	\$0.83	\$0.00	\$0.00	\$0.83	\$0.83	\$0.00	\$0.00	\$0.83	\$0.83	\$0.00	\$0.00	
2 Cost of mailing bill			\$8.36	\$8.36			\$8.36	\$8.36			\$8.36	\$8.36	
3 Cost of opening a billing file	\$9.66	\$9.66	\$0.00	\$0.00	\$9.66	\$9.66	\$0.00	\$0.00	\$9.66	\$9.66	\$0.97	\$0.97	10% for moves start year 2 need to consider AMR capital substitution in profitability
4 Cost of reading a meter			\$6.71	\$6.71			\$0.00	\$0.00			\$6.71	\$6.71	
5 Input of a new contract	\$52.62	\$52.62	\$0.00	\$0.00	\$52.62	\$52.62	\$0.00	\$0.00	\$52.62	\$52.62	\$0.00	\$0.00	
6 Cost of a credit check conducted internally	\$17.19	\$17.19	\$0.00	\$0.00	\$17.19	\$17.19	\$0.00	\$0.00	\$17.19	\$17.19	\$0.00	\$0.00	
7 Annual cost for cashing a payment			\$1.75	\$1.75			\$1.75	\$1.75			\$1.75	\$1.75	
8 Cost of processing a standard customer call			\$12.84	\$12.84			\$0.00	\$12.84			\$12.84	\$12.84	
9 Cost of Bad Debts			\$7.77	\$7.77			\$0.00	\$0.00			\$0.00	\$0.00	bad debt itself not incremental cost
10 Collection and recovery costs			\$33.31	\$33.31			\$0.00	\$0.00			\$33.31	\$33.31	ramp up in 25% increments years 2-5
11 Customer retention costs - Major accounts			\$0.00	\$39.05			\$0.00	\$0.00			\$0.00	\$39.05	
12 Customer retention costs - Major industries			\$0.00	\$0.00			\$0.00	\$0.00			\$0.00	\$0.00	
13 Preventive maintenance - Service line			\$12.88	\$12.88			\$0.00	\$12.88			\$12.88	\$12.88	start in year 3
14 Corrective maintenance - Service line			\$17.99	\$17.99			\$0.00	\$17.99			\$17.99	\$17.99	start in year 3
15 Processing of CRP application	\$0.00	\$32.90	\$0.00	\$0.00	\$0.00	\$32.90	\$0.00	\$0.00	\$0.00	\$32.90	\$0.00	\$0.00	
16 Preventive maintenance - Mains			\$0.22/m				\$0.22/m				\$0.22/m		start in year 3
17 Corrective maintenance - Mains			\$0.37/m				\$0.37/m				\$0.37/m		start in year 3
<b>18 Meters inspection and maintenance costs</b>													
<b>19 Type of meters</b>													
20 Turbine			\$0.00	\$31.68			\$0.00	\$31.68			\$0.00	\$31.68	
21 Spin test for turbine (less than 12 in)			\$0.00	\$79.20			\$0.00	\$79.20			\$0.00	\$79.20	
22 Telemetry			\$0.00	\$118.79			\$0.00	\$118.79			\$0.00	\$118.79	
23 Corrective instruments			\$0.00	\$87.11			\$0.00	\$87.11			\$0.00	\$87.11	
24 Spin test for turbine (12 in and more)			\$0.00	\$0.00			\$0.00	\$0.00			\$0.00	\$0.00	
25 Cost of a cellular line - telemetry			\$0.00	\$0.00			\$0.00	\$0.00			\$0.00	\$0.00	
26 Total without main maintenance	\$80.30	\$113.20	\$101.61	\$457.44	\$80.30	\$113.20	\$10.11	\$370.60	\$80.30	\$113.20	\$94.81	\$450.64	
27 Total with 30 meter main			\$119.31	\$475.14			\$27.81	\$388.30			\$112.51	\$468.34	

Table 3: Major Industries Long-Run Marginal Operating Expenses

Line Description	Gaz Métro Original				Black and Veatch				OC				Note for profitability analysis
	First Year one-time		Ongoing		First Year one-time		Ongoing		First Year one-time		Ongoing		
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
1 Mailing of subscription confirmation letter	\$0.83	\$0.83	\$0.00	\$0.00	\$0.83	\$0.83	\$0.00	\$0.00	\$0.83	\$0.83	\$0.00	\$0.00	
2 Cost of mailing bill			\$8.36	\$8.36			\$8.36	\$8.36			\$8.36	\$8.36	
3 Cost of opening a billing file	\$9.66	\$9.66	\$0.00	\$0.00	\$9.66	\$9.66	\$0.00	\$0.00	\$9.66	\$9.66	\$0.00	\$0.00	no moves for major industries
4 Cost of reading a meter			\$6.71	\$6.71			\$0.00	\$0.00			\$0.00	\$6.71	Need to consider AMR capital substitution in profitability. If customer has telemetry does not need a meter read.
5 Input of a new contract	\$36.29	\$36.29	\$0.00	\$0.00	\$36.29	\$36.29	\$0.00	\$0.00	\$52.62	\$52.62	\$0.00	\$0.00	B&V did not explain why contracts are cheaper for Major Industries than CII
6 Cost of a credit check conducted internally	\$17.19	\$17.19	\$0.00	\$0.00	\$17.19	\$17.19	\$0.00	\$0.00	\$17.19	\$17.19	\$0.00	\$0.00	
7 Annual cost for cashing a payment			\$1.59	\$1.59			\$1.59	\$1.59			\$1.59	\$1.59	
8 Cost of processing a standard customer call			\$0.00	\$0.00			\$0.00	\$0.00			\$0.00	\$0.00	
9 Cost of Bad Debts			\$0.00	\$0.00			\$0.00	\$0.00			\$0.00	\$0.00	
10 Collection and recovery costs			\$0.00	\$0.00			\$0.00	\$0.00			\$0.00	\$0.00	
11 Customer retention costs - Major accounts			\$0.00	\$0.00			\$0.00	\$0.00			\$0.00	\$0.00	
12 Customer retention costs - Major industries			\$1,197.16	\$1,197.16			\$0.00	\$0.00			\$1,197.16	\$1,197.16	
13 Preventive maintenance - Service line			\$12.88	\$12.88			\$0.00	\$12.88			\$12.88	\$12.88	start in year 3
14 Corrective maintenance - Service line			\$17.99	\$17.99			\$0.00	\$17.99			\$17.99	\$17.99	start in year 3
15 Processing of CRP application	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
16 Preventive maintenance - Mains			\$0.22/m				\$0.22/m				\$0.22/m		start in year 3
17 Corrective maintenance - Mains			\$0.37/m				\$0.37/m				\$0.37/m		start in year 3
<b>18 Meters inspection and maintenance costs</b>													
<b>19 Type of meters</b>													
20 Turbine			\$31.68	\$31.68			\$0.00	\$31.68			\$31.68	\$31.68	
21 Spin test for turbine (less than 12 in)			\$0.00	\$79.20			\$0.00	\$79.20			\$0.00	\$79.20	
22 Telemetry			\$118.79	\$118.79			\$0.00	\$118.79			\$118.79	\$118.79	
23 Corrective instruments			\$87.11	\$87.11			\$0.00	\$87.11			\$87.11	\$87.11	
24 Spin test for turbine (12 in and more)			\$0.00	\$237.59			\$0.00	\$237.59			\$0.00	\$237.59	
25 Cost of a cellular line - telemetry			\$0.00	\$186.12			\$0.00	\$186.12			\$0.00	\$186.12	
26 Total without main maintenance	\$63.97	\$63.97	\$1,482.27	\$1,985.18	\$63.97	\$63.97	\$9.95	\$781.31	\$80.30	\$80.30	\$1,475.56	\$1,985.18	
27 Total with 100 meter main			\$1,541.27	\$2,044.18			\$68.95	\$840.31			\$1,534.56	\$2,044.18	