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September 18, 2007

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The British Columbia Public Interest Advocacy Centre  
208 – 1090 West Pender Street  
Vancouver, BC  
V6E 2N7

Attention: Ms. Patricia MacDonald, Barrister & Solicitor

Dear Ms. MacDonald:

**Re: Terasen Gas Inc. (“TGI”) and Terasen Gas (Vancouver Island) Inc. (“TGVI”)  
Application for System Extension & Customer Connection Changes Review  
(the “Application”) Project No. 3698472**

**Response to the British Columbia Public Interest Advocacy Centre on behalf of  
the British Columbia Old Age Pensioners Organization *et al* (“BCOAPO”)  
Information Request (“IR”) No. 1**

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On July 31, 2007, Terasen Gas filed the Application as referenced above. In accordance with Commission Order No. G-90-07 setting out the Regulatory Timetable for the Application, TGI and TGVI respectfully submit the attached response to BCOAPO IR No. 1.

If there are any questions regarding the attached, please contact Mr. Tom Loski, Director, Regulatory Affairs at (604) 592-7464.

Yours very truly,

**TERASEN GAS INC. and  
TERASEN GAS (VANCOUVER ISLAND) INC.**

***Original signed by: Tom Loski***

**For:** Scott A. Thomson

cc (e-mail only): Registered Parties

Attachment



Terasen Gas Inc. ("TGI") and Terasen Gas (Vancouver Island) Inc. ("TGV") collectively ("Terasen" or the "Companies") Application for System Extension & Customer Connection Changes Review	Submission Date: September 18, 2007
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**1.0 Reference: Exhibit B-1 p. 8 and Appendix 2 p. 35**

"In recent years the price differential between gas and electricity has narrowed. ... The nature of market-based pricing of natural gas relative to the Heritage-related electricity rates has created a misconception among many consumers and builders that natural gas space and water heating systems are now more expensive to operate than their electric equivalent." (p. 8)

"Taking efficiency into consideration, and the differences in capital costs, natural gas is no longer the obvious low-cost alternative." (p. 35)

1.1 Please reconcile the "misconception" referred to in the first quote with the claim made in the second quote.

**Response:**

The Application (Exhibit B-1) on page 8 and the Application Appendix 2 on page 35 point out that natural gas has lost much, but not all, of the price advantage to electricity. This price advantage eroded because the price of natural gas as a commodity is largely market based and has increased significantly since 2000. This occurred during a period when electricity prices only increased slightly.

The Appendix points out that although there have been efficiency improvements in natural gas appliances, they are not sufficient to offset the increase in the cost of natural gas to allow it to retain the full cost advantage relative to electricity it used to enjoy. Additionally, the capital costs to install natural gas space and water heating systems are generally greater than their electric equivalents, which make the cost advantage enjoyed by natural gas choices more challenging to understand.

Section 3.3 of the Application attempts to point out that the change in the price of natural gas since 2000 has help to create the impression on the part of many consumers and builders that natural gas space and water heading systems are now more expensive to operate than electrical alternatives, something that is not the case. As such this view is misconceived.

1.2 If there is a misconception as referred to above, do the Companies believe it can be addressed through (i) increased public education and awareness initiatives or (ii) partnering with suppliers of natural gas equipment and developers/contractors to be able to clearly show the economic and societal superiority of gas space and water heating systems?

**Response:**

The view by many consumers and builders that natural gas space and water heating solutions are more expensive to operate than their electrical equivalent needs to be addressed on a number of levels. This effort includes public education and awareness,



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and a greater engagement with equipment suppliers and builders and developers, as well as policy makers. The system extension and customer attachment policy changes requested by the Companies in this Application seek to address primarily the economic barriers faced by builders that act to discourage the selection of natural gas.

The changes proposed for in this Application also attempt to take into account competitive changes in the marketplace for energy alternatives as well as government policies. Increased public education and awareness initiatives are generally targeted at consumers and are not addressed in this Application. The Companies are of the view that education alone will not be sufficient to demonstrate economic and societal superiority of gas space and water heating systems.

- 1.3 Please indicate whether the Companies believe that the misconception can only be corrected in the event that a new pricing regime was brought in for electricity in the province.

**Response:**

Overcoming the misconception that natural gas systems and appliances are now more expensive to operate needs to be tackled on a number of levels as indicated in the response to Question 1.2. While a new approach to electricity pricing may help to contribute to overcoming the misconception, such a change would not alter the economic barriers that are an issue with the current system extension and customer connection policy.



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**2.0 Reference: Exhibit B-1 p. 4**

2.1 With respect to Policy Action # 4, have the companies considered offering new rate structures for delivery services that would encourage efficiency and conservation that would also increase the economic benefits of adopting or converting to high efficiency gas equipment for space and water heating?

**Response:**

The Company expects to file an application regarding funding for Energy Efficiency and Conservation programs later this year that will address Policy Action #4 which will increase the economic benefits for customers of adopting or converting to high efficiency gas equipment for space and water heating. The financial mechanisms to address the funding requirements are currently being reviewed.

The Company also submitted an application for tariff changes to allow thermal metering on May 8, 2007. The Company proposed that "The changes to Rate Schedule 1 and the GT&C will allow for the measurement, allocation and individual billing of energy use, from thermal energy hydronic heating systems, on an individual per suite basis within the Vertical Subdivision developments". The Company noted that "Studies in Europe suggested that when residents are given direct control over their energy bill, consumption can be reduced by up to 30%". The application was approved by Commission Order No. G-65-07.



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**3.0 Reference: Exhibit B-1 p. 9**

"The cumulative effect of these changes in the market place is that customers and developers are making sub-optimal decisions both from a cost and a societal perspective (as presented through the BC Government's Energy Plan). It is the belief of the Companies that in order to send the appropriate price signals, mitigate these impacts and ensure that the right decisions are made, a reduction in the upfront connection costs is appropriate and should be made at this time."

3.1 Please provide any estimates that TGI or TGVI have regarding the responsiveness of adoption of/conversion to natural gas (versus electricity) with respect to changes in upfront connection costs. If available, please provide an elasticity estimate.

**Response:**

The Companies do not have an elasticity estimate respecting the potential impact of changes in the upfront connection costs on adoption of/conversion to natural gas, and do not believe such an estimate is reasonably or realistically obtainable. Directionally, and all else being equal, a reduction in these costs will reduce one barrier for builders and developers and for customers currently unwilling or unable to pay these costs.

3.2 Please provide the estimated impacts of the changes the Companies are seeking on (i) new attachments, (ii) revenue requirements, and (iii) rates over the next three years.

**Response:**

At this time the Company can not predict the number of new attachments that will result from the proposed changes. However, the Company believes that these changes along with continued marketing efforts, changes to the BC Hydro Rate Design connection policies, and changes to energy efficiency and attachment policies will result in an increase in customer additions.

Please refer to the response to Question 3.1 as well as BCUC IR No. 1; Questions 2.5, 2.6, 29.1 and 29.2.

Hypothetically Revenue Requirements 2008 through 2010 without consideration for new attachments are as follows:



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**TGI**

<b>Incremental Revenue Requirement</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Return on Rate Base	\$134,039	\$395,643	\$646,402
Depreciation	0	80,808	159,507
Tax	(9,589)	12,136	34,801
<b>Incremental Revenue Requirement</b>	<b>\$124,450</b>	<b>\$488,587</b>	<b>\$840,710</b>

**TGVI**

<b>Incremental Revenue Requirement</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Return on Rate Base	\$43,413	\$128,945	\$212,225
Depreciation	0	29,082	57,942
Tax	(1,200)	10,989	23,568
<b>Incremental Revenue Requirement</b>	<b>\$42,213</b>	<b>\$169,016</b>	<b>\$293,735</b>

Details of the calculations including assumptions can be found in the Table 3.2 following this response.

For TGI Rate impacts would be approximately as follows:

Incremental Revenue Requirement	\$124,450	\$488,587	\$840,710
Total Sales Volumes (based on 2006 volumes)	112,775,000	112,775,000	112,775,000
Increase per GJ	\$ 0.001	\$ 0.004	\$ 0.007

For TGVI rates would not be affected.

Under the current rate setting methodology an increase in revenue requirement would have no impact on TGVI's core market rates, however there would be an increase to the allocated unit cost resulting in a reduction to revenue surplus.



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**Table 3.2**

**TGI**

<b>Assumptions</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Total SLIF Change (Rounded)	\$ 2,535,000	\$ 2,440,000	\$ 2,400,000
Total SLCA Change (Rounded)	\$ 1,105,000	\$ 1,105,000	\$ 1,105,000
Tax Rate	33.00%	33.00%	33.00%
CCA Class 1	4.00%	4.00%	4.00%
Depreciation Rate	2.22%	2.22%	2.22%

	<b>Cost</b>	<b>Capital Structure</b>	
Short-term Debt	4.75%	5.58% *	
Long-term Debt	7.02%	59.41% *	
Equity	8.37%	35.01% *	
		100.00%	

\*Same for all three years based on 2007 Revenue Requirement Application

	Customer Additions Based on the input files for RR		
	<b>3650</b>	<b>3600</b>	<b>3600</b>
Total SLIF	\$2,536,355	\$2,439,390	\$2,396,820

<b>Incremental Revenue Requirement</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Return on Rate Base	\$134,039	\$395,643	\$646,402
Depreciation	0	80,808	159,507
Tax	(9,589)	12,136	34,801
<b>Incremental Revenue Requirement</b>	<b>\$124,450</b>	<b>\$488,587</b>	<b>\$840,710</b>

<b>Incremental Rate Base</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
GPIB Opening	\$0	\$3,640,000	\$7,185,000
Plant Additions	3,640,000	3,545,000	3,505,000
GPIB Closing	3,640,000	7,185,000	10,690,000
Plant Accumulated Depreciation	0	(80,808)	(240,315)
Plant Closing	3,640,000	7,104,192	10,449,685
Mid Year Plant Adjustment	(1,820,000)	(1,772,500)	(1,752,500)
Mid Year Accumulated Depreciation Adjustment	0	40,404	79,754
<b>Mid Year Incremental Rate Base</b>	<b>\$1,820,000</b>	<b>\$5,372,096</b>	<b>\$8,776,939</b>

Opening Accumulated Depreciation	\$0	\$0	\$80,808
Depreciation Expense	-	80,808	159,507
Closing Accumulated Depreciation	0	80,808	240,315
Mid Year Accumulated Depreciation	0	40,404	160,562
Mid Year Accumulated Depreciation Adjustment	\$0	\$40,404	\$79,754

<b>Return on Base</b>			
Debt Interest	\$80,707	\$238,223	\$389,208
Equity Return	53,332	157,421	257,194
<b>Total</b>	<b>\$134,039</b>	<b>\$395,643</b>	<b>\$646,402</b>

<b>CCA</b>			
Opening	\$0	\$3,567,200	\$6,898,612
Additions	3,640,000	3,545,000	3,505,000
CCA Full Year	0	(142,688)	(275,944)
CCA @ 1/2 year	(72,800)	(70,900)	(70,100)
<b>Closing</b>	<b>\$3,567,200</b>	<b>\$6,898,612</b>	<b>\$10,057,568</b>

<b>Tax</b>			
Equity Return	\$53,332	\$157,421	\$257,194
Add: Depreciation	0	80,808	159,507
Less: CCA	(72,800)	(213,588)	(346,044)
<b>Taxable Income After Tax</b>	<b>(\$19,468)</b>	<b>\$24,641</b>	<b>\$70,656</b>
<b>Gross up to Before Tax (1-Tax Rate)</b>	<b>(\$29,057)</b>	<b>\$36,777</b>	<b>\$105,457</b>
<b>Income Tax</b>	<b>(\$9,589)</b>	<b>\$12,136</b>	<b>\$34,801</b>



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**Terasen Gas (Vancouver Island)**

<b>Assumptions</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Total SLIF Change (Rounded)	\$ 785,000	\$ 775,000	\$ 775,000
Total SLCA Change (Rounded)	\$ 525,000	\$ 525,000	\$ 525,000
Tax Rate	33.00%	33.00%	33.00%
CCA Class 1	4.00%	4.00%	4.00%
Depreciation Rate	2.22%	2.22%	2.22%

Capital Structure	Cost	Capital Structure
Short-term Debt	5.00%	4.19% *
Long-term Debt	5.00%	55.81% *
Equity	9.07%	40.00% *
		100.00%

\*Same for all three years based on 2007 Revenue Requirement Application

Customer Additions Based on the input files for RR

	<b>2008</b>	<b>2009</b>	<b>2010</b>
	3650	3600	3600
Total SLIF	\$784,750	\$774,000	\$774,000

<b>Incremental Revenue Requirement</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Return on Rate Base	\$43,413	\$128,945	\$212,225
Depreciation	0	29,082	57,942
Tax	(1,200)	10,989	23,568
<b>Incremental Revenue Requirement</b>	<b>\$42,213</b>	<b>\$169,016</b>	<b>\$293,735</b>

<b>Incremental Rate Base</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
GPIS Opening	\$0	\$1,310,000	\$2,610,000
Plant Additions	1,310,000	1,300,000	1,300,000
GPIS Closing	1,310,000	2,610,000	3,910,000
Plant Accumulated Depreciation	0	(29,082)	(87,024)
Plant Closing	1,310,000	2,580,918	3,822,976
Mid Year Plant Adjustment	(655,000)	(650,000)	(650,000)
Mid Year Accumulated Depreciation Adjustment	0	14,541	28,971
<b>Mid Year Incremental Rate Base</b>	<b>\$655,000</b>	<b>\$1,945,459</b>	<b>\$3,201,947</b>

Opening Accumulated Depreciation	\$0	\$0	\$29,082
Depreciation Expense	-	29,082	57,942
Closing Accumulated Depreciation	0	29,082	87,024
Mid Year Accumulated Depreciation	0	14,541	58,053
<b>Mid Year Accumulated Depreciation Adjustment</b>	<b>\$0</b>	<b>\$14,541</b>	<b>\$28,971</b>

<b>Return on Base</b>			
Debt Interest	\$19,650	\$58,364	\$96,058
Equity Return	23,763	70,581	116,167
<b>Total</b>	<b>\$43,413</b>	<b>\$128,945</b>	<b>\$212,225</b>

<b>CCA</b>			
Opening	\$0	\$1,283,800	\$2,506,448
Additions	1,310,000	1,300,000	1,300,000
CCA Full Year	0	(51,352)	(100,258)
CCA @ 1/2 year	(26,200)	(26,000)	(26,000)
<b>Closing</b>	<b>\$1,283,800</b>	<b>\$2,506,448</b>	<b>\$3,680,190</b>

<b>Tax</b>			
Equity Return	\$23,763	\$70,581	\$116,167
Add: Depreciation	0	29,082	57,942
Less: CCA	(26,200)	(77,352)	(126,258)
<b>Taxable Income After Tax</b>	<b>(\$2,437)</b>	<b>\$22,311</b>	<b>\$47,851</b>
<b>Gross up to Before Tax (1-Tax Rate)</b>	<b>(\$3,637)</b>	<b>\$33,300</b>	<b>\$71,419</b>
<b>Income Tax</b>	<b>(\$1,200)</b>	<b>\$10,989</b>	<b>\$23,568</b>





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3.3 Please indicate whether the situation giving rise to the Companies' proposals is considered to be a short-term, medium-term, or long-term problem.

**Response:**

Prior to the increases in natural gas commodity prices at the start of this decade, natural gas enjoyed a significant competitive advantage. As that advantage lessened, the detrimental impact on demand of arbitrary connection charges was revealed. These charges will be a deterrent at the margin whenever the gap in price with competitive alternatives narrows, and for as long as that gap remains small. Therefore, the issue of connection charges is a long term one that can only be masked temporarily by either decreases in the natural gas commodity price, or increases in the price of electricity and other alternative energies.

3.4 Please indicate whether approval of the proposals would make gas an obviously preferred (to electricity) economic choice for space and water heating in the eyes of a typical residential customer. If not, please indicate by how much electricity rates would have to increase to assure this outcome, other things equal.

**Response:**

Please refer to the response to BCUC IR No. 1, Question17.

Natural gas is today preferred for space and water heating by a majority of British Columbians, and if the individual consumer were making the decision regarding the choice of space and water heating equipment, gas would be the preferred choice. Where the economic decision is made for the ultimate consumer by an engineer, builder or developer, these proposals will help at the margin to ensure that consumer preferences concerning energy are met.

It is difficult to say what increase in electricity rates would trigger a reversal of the current practices. Sometimes, as was the case with natural gas, a directional shift or an increase in volatility is enough to trigger a significant move toward the competitive alternatives. For most heating applications, natural gas remains competitively (i.e. lower) priced with electricity.



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#### 4.0 Exhibit B-1 p. 11, 4.2 New Customer Application Fee

"The current \$85 application fee has been in place since prior to 1996. Since that time, the processes have been streamlined and costs to enrol customers into the system have remained relatively stable or declined. At this time no change to this fee is proposed."

4.1 If known, please indicate whether enrolment costs have declined.

**Response:**

Please refer to the responses to BCUC IR No. 1, Questions 18.1 and 18.3.

4.2 If so, please indicate whether the decline has been material.

**Response:**

Please refer to the responses to BCUC IR No. 1, Questions 18.1 and 18.3.

4.3 If the decline has been material, why have the Companies not proposed to reduce this component of upfront costs?

**Response:**

Please refer to the responses to BCUC IR No. 1, Questions 18.1 and 18.3.



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## 5.0 Exhibit B-1 p. 12, Table 4.1

5.1 Please provide a high level, illustrative example showing the calculation of (i) the PI, (ii) the target service line cost and (iii) the maximum allowance corresponding to the figures shown in this table.

### Response:

#### **P.I. Example**

The Profitability Index is the ratio of the discounted present value of all the forecast net cash inflows over twenty years divided by the discounted present value of the capital costs of attaching customers in the first five years of the main extension. There are many components factored into the calculation of this ratio, but the formula below provides a good summary of the major elements:

$$\text{P.I.} = \frac{\text{NPV (Delivery Margin + Connection Fees - O\&M - SI Charge - Property Tax - Income tax)}}{\text{NPV (Mains, Services and Meter Costs)}}$$

#### **Target Service Line Cost & Maximum Allowance Determination**

The target service line cost was arrived at by running the main extension test for one customer with typical yearly consumption. The Target Service Line Cost was calculated by setting the cost of the main to the prevailing average amount in 1996 (i.e., \$516 in Table 4.1) and iterating the service line cost until the P.I. ratio reached 1.0 (or the NPV was zero). The Target Service Line that resulted from the foregoing step using 1996 data in the SLCA Application was \$475. The prevailing average cost of service lines at that time was \$659. The final step therefore in determining the SLCA was to take the frequency distribution of service line costs and set the upper limit at the level that would reduce the average service line cost to the Target Service Line Cost. The upper limit in 1996 for the cost of service lines that reduced the average service line cost to the target level of \$475 was \$1,100. This series of calculations formed the basis for setting the SLCA at \$1,100 in 1996.



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**Target Service Line Cost**

$$\text{P.I.} = 1.0 = \left\{ \begin{array}{l} \text{NPV (Delivery Margin @ 123 GJ/year (typical} \\ \text{1996 Usage) + Connection Fees - O\&M - SI Charge} \\ \text{- Property Tax - Income tax)} \\ \hline \text{NPV (Mains(= \$516), Service Line \$475 (\$475} \\ \text{determined by iterating to a P.I. of 1.0) and Average} \\ \text{1996 Meter Costs)} \end{array} \right.$$



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## 6.0 Exhibit B-1 p. 13

"In the case of the new main extensions, the MX test already incorporates the expected cost of the new main extension facilities as well as the service line costs in order to determine whether a customer contribution is required. Therefore, applying the SLCA in new main extensions could result in a requirement for a contribution even if the overall MX test results in a profitability index significantly greater than one."

6.1 Please provide a simple example that illustrates this possibility.

### **Response:**

Please refer to the Application, Exhibit B-1, page 24, figure 5.1, for an example that illustrates this possibility.



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**7.0 Exhibit B-1 p. 14, 4.4 Analysis of 2006 Data, Tables 4.2 and 4.3**

7.1 Please indicate whether the Companies have investigated the extent to which the impacts of variations in actual average annual consumption could be mitigated by rate design changes.

**Response:**

The Companies have not investigated the extent to which the impacts of variations in actual average annual consumption could be mitigated by rate design changes as part of this application. However, in a situation such as TGI is experiencing, with declining annual consumption, a declining block structure could potentially have the effect of mitigating that reduction, but it is difficult to reconcile this possible outcome with the desire to promote energy efficiency and conservation. Accordingly the Company does not view that such a rate structure is worthy of significant investigation at this time.

7.2 Please indicate whether the Companies are contemplating a harmonization of rate structures.

**Response:**

The Companies are not contemplating any harmonization of rate structures at the present time, except for harmonization of the extension and connection policies as set out in the Application.

7.3 TGI is experiencing decreasing normalized average use while TGVI is experiencing increasing normalized average use. On a going forward basis, differences in normalized average use are likely to become more pronounced. Do the Companies believe a generic approach will continue to be appropriate?

**Response:**

Given that TGI's annual use rates continue to decrease and that TGVI's annual use rates recently experienced an increase, it is possible that consumption differences between these two regions will narrow over time. Please also refer to the response to BCUC IR No. 1, Question 14.1.

More importantly, although system extension and customer connection tests proposed for both companies follow a common methodology, test inputs, such as the discount rate and system improvement costs, differ from each other and reflect the operating experience of each company. This approach helps to ensure administrative simplicity while still reflecting cost differences experienced in the two companies.



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7.4 Given that TGI and TGVI have different costs of capital and hence different real discount rates, does a common approach make sense?

**Response:**

Please refer to the response to Question 7.3 above.



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**8.0 Exhibit B-1 pp 17-18, 4.5 Connection Fees and Recommendations and p. 19, 5.1.1 2007 MX Test Forecast Outcomes**

8.1 Under the Companies' proposals, please confirm that the rates and charges paid by new customers connecting to existing mains will include a system contribution.

**Response:**

Yes. All customers contribute regularly towards the payment of the system through the rates they pay. For new customers attaching to an existing main, a calculation is made to determine if that customer is an economic attachment. This calculation ensures that customers pay for their share of system improvements either because they are sufficiently economic, or because they pay an additional amount to offset any revenue shortfall.

8.2 Under the Companies' proposals, please confirm that the rates and charges paid by new customers connecting to new mains extensions will include a system contribution.

**Response:**

Yes. All customers contribute regularly towards the payment of the system through the rates they pay. For new customers requiring the extension of a main, a calculation is made to determine if that customer is an economic attachment. This calculation ensures that customers pay for their share of system improvements either because they are sufficiently economic, or because they pay an additional amount to offset any revenue shortfall.

8.3 For each of the Companies separately, please indicate the impact of the proposals on rate base.

**Response:**

Please refer to the responses to BCUC IR No. 1, Questions 29.1 and 29.2.

8.4 In the second last line at the bottom of page 19, please confirm that the phrase "if all negative PI's" should read "if all PI's less than 1."

**Response:**

Yes, this sentence is incorrect and should read "However, if all PI's less than 1 were adjusted ...".





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**9.0 Exhibit B-1 p. 21, Table 5.1**

9.1 Please indicate the inflation index that the Companies used in converting the nominal weighted average cost of capital (after-tax) to a real discount rate.

**Response:**

The Companies have typically used the annual inflation forecast from the TGI PBR plan as the measure of inflation employed in converting a nominal weighted average cost of capital (after-tax) to a real discount rate. The current TGI PBR Plan uses an average CPI based on the forecasts for the coming year of two banks (TD and RBC), the Conference Board of Canada and the BC Ministry of Finance.

9.2 Please confirm that all of the revenue and cost inputs used in the MX test are also in real dollars.

**Response:**

Confirmed.



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## 10.0 Exhibit B-1 pp 26-29, 6 Energy Usage and Efficiency Allowance

10.1 With respect to the proposed volume credits of 5%, 10%, and 15%, please indicate how the Companies derived these credits or otherwise assessed their reasonableness.

### **Response:**

Please refer to the response to BCUC IR No. 1, Question 26.2. The Companies believe that the small changes to volume as noted above were a reasonable signal to customers to encourage efficiency. While the costs to install higher efficient equipment as noted in BCUC IR 1 Question 16.1 will not be overcome by the changes proposed in the application, the signal to the customer is that the Company encourages conservation and as such allocates a volume credit to encourage this behaviour. The Company believed that this was a simple and easily understandable method to show this value of efficiency.

10.2 Please provide the Companies view as to whether these credits may give rise to a subsidy, conferred on the beneficiaries of the credits by other ratepayers.

### **Response:**

Please refer to the responses to BC Hydro IR No. 1, Question 9.1.

10.3 Is it the Companies' view that the energy efficient choices that are proposed to receive volume credits would not otherwise make economic sense (i.e., absent the volume credits)?

### **Response:**

Please refer to the response to BCUC IR No. 1, Question 26.2 and to BC Hydro IR No. 1, Question 9.1.



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## 11.0 Exhibit B-1, MX Test General

11.1 Please provide a simple example illustrating how the MX test would be applied in the case of a new customer connecting to an existing main.

### Response:

The MX test is only used when a main extension is required for the installation of a new service line. For services lines connecting to an existing main, a service line installation estimate is completed that takes into account such things as the construction costs, support costs, an overhead cost allocation, and system improvement requirements. The sum of these costs is compared with the SLCA. If the estimated cost of the installation is greater than SLCA, the customer pays the excess. If the estimated cost of the installation is less than the SLCA, the customer does not make a contribution.

The table below illustrates the use of the proposed test for a service line installation to an existing main. In this example, the customer would not make a contribution.

### Inputs

Company: TGI  
Service Line Installation Fee: \$0  
System Improvement Charge:  
\$0.16/GJ  
# of Attachments: 1  
Annual Consumption: 96.9 GJ/Yr  
Service Line Cost: \$1,000  
Main Extension Cost: \$0  
Meter Cost: \$110/meter



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Test Results:

Year	Direct Costs	Overhead	SLIF	Working Capital	Total Capital	Delivery Margin	Fees	O&M	SI Allowance	Property Taxes	Income Tax	Annual Net Cash Inflow	Discounted Cash Inflow	Discounted Cash Outflow
1	1,110.00	355.20	0	7.33	1,472.53	396.40	85.00	75.00	15.50	32.79	102.19	255.92	245.01	1,472.53
2	0.00	0.00	0	0.00	0.00	396.40	0.00	75.00	15.50	32.79	73.99	199.12	182.51	0.00
3	0.00	0.00	0	0.00	0.00	396.40	0.00	75.00	15.50	32.79	74.75	198.35	174.06	0.00
4	0.00	0.00	0	0.00	0.00	396.40	0.00	75.00	15.50	32.79	75.49	197.61	166.03	0.00
5	0.00	0.00	0	0.00	0.00	396.40	25.00	75.00	15.50	32.79	84.73	213.38	171.63	0.00
6	0.00	0.00	0	0.00	0.00	396.40	0.00	75.00	15.50	32.79	76.88	196.23	151.12	0.00
7	0.00	0.00	0	0.00	0.00	396.40	0.00	75.00	15.50	32.79	77.53	195.58	144.20	0.00
8	0.00	0.00	0	0.00	0.00	396.40	0.00	75.00	15.50	32.79	78.16	194.95	137.61	0.00
9	0.00	0.00	0	0.00	0.00	396.40	0.00	75.00	15.50	32.79	78.76	194.35	131.34	0.00
10	0.00	0.00	0	0.00	0.00	396.40	25.00	75.00	15.50	32.79	87.87	210.24	136.03	0.00
11	0.00	0.00	0	0.00	0.00	396.40	0.00	75.00	15.50	32.79	79.89	193.22	119.69	0.00
12	0.00	0.00	0	0.00	0.00	396.40	0.00	75.00	15.50	32.79	80.42	192.69	114.27	0.00
13	0.00	0.00	0	0.00	0.00	396.40	0.00	75.00	15.50	32.79	80.93	192.17	109.12	0.00
14	0.00	0.00	0	0.00	0.00	396.40	0.00	75.00	15.50	32.79	81.42	191.68	104.20	0.00
15	0.00	0.00	0	0.00	0.00	396.40	25.00	75.00	15.50	32.79	90.42	207.68	108.09	0.00
16	0.00	0.00	0	0.00	0.00	396.40	0.00	75.00	15.50	32.79	82.34	190.76	95.05	0.00
17	0.00	0.00	0	0.00	0.00	396.40	0.00	75.00	15.50	32.79	82.78	190.33	90.79	0.00
18	0.00	0.00	0	0.00	0.00	396.40	0.00	75.00	15.50	32.79	83.19	189.91	86.74	0.00
19	0.00	0.00	0	0.00	0.00	396.40	0.00	75.00	15.50	32.79	83.59	189.51	82.87	0.00
20	0.00	0.00	0	0.00	0.00	396.40	25.00	75.00	15.50	32.79	92.51	205.60	86.07	0.00
<b>Undiscounted tota</b>	<b>1,110.00</b>	<b>355.20</b>	<b>0.00</b>	<b>7.33</b>	<b>1,472.53</b>	<b>7,927.97</b>	<b>185.00</b>	<b>1,500.00</b>	<b>310.08</b>	<b>655.77</b>	<b>1,647.84</b>	<b>3,999.28</b>	<b>2,636.44</b>	<b>1,472.53</b>
<b>PV Totals</b>													<b>2,636.44</b>	<b>1,472.53</b>

**Input Summary**    Direct Cost (main)            0  
                           Direct Cost (service)            1,110

**Ouptut Summary**    PI:                            1.790  
                               Contributor \$            -    per customer



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11.2 Please provide a simple example illustrating how the MX test would be applied in the case of a mains extension.

**Response:**

The MX test takes into account such things as the construction costs, support costs, an overhead cost allocation, and system improvement requirements. If the estimated cost of the installation is uneconomic, the customer pays the shortfall.

The table below illustrates the use of the proposed test for a mains extension. In this example, the customer would not make a contribution because the main extension is considered economic.

**Inputs**

Company: TGI  
Service Line Installation Fee: \$0  
System Improvement Charge:  
\$0.16/GJ  
# of Attachments: 5  
Annual Consumption: 100 GJ/Yr  
Service Line Cost: \$1,000  
Main Extension Cost: \$3,000  
Meter Cost: \$110/meter

