Q. [Net Salvage] – Please explain and justify the negative 128% net salvage recorded for all Transmission accounts in 2009 as set forth on page B-8 of the Gannett Fleming study. The response should explain why such retirements and resulting cost of removal are considered indicative of normal operation. Further, provide all workpapers, assumptions, considerations, and all material reviewed and/or relied upon in sufficient detail to permit verification of the reasonableness of the response..

A. Newfoundland Power owns and maintains 103 transmission lines. Approximately 30% of the transmission assets in service are in excess of 40 years old. The lines are constructed on varied terrain ranging from along city streets and highways, to across country over very rugged terrain. It is normal and expected that retirement costs will vary substantially depending on the particular line or portion of line retired.

In 2009, the majority of the transmission retirement cost was related to the retirement of sections of lines 111L and 24L. These lines were built in 1956 and 1964, respectively. Both lines are situated with sections along a highway and sections across country. These lines are representative of the Company's transmission lines in service. While each line may present its own difficulties with respect to retirement, no issues were encountered during the retirement of these two lines that would make them unique. Attachment A provides the reports filed with Newfoundland Power's capital budget applications supporting the expenditures to rebuild transmission lines 111L and 24L.

The 128% negative net salvage recorded for 2009 principally reflects a ratio of actual removal cost in 2009 to the installed cost of lines built 53 and 45 years earlier. Transmission line 111L, for example, is situated on the Bonavista Peninsula. When this line was constructed in 1956, the average installed cost of a transmission line pole was $174. The current contractor removal cost for poles in the Bonavista area is $190 per pole. Tendering for transmission work results in cost variations from year to year. The 128% ratio is thus reflective of actual cost and is reasonable.

Relatively high negative net salvage ratios reflect the practical reality of retiring assets many years after construction. Attachment B, *Statistics Canada Construction Price Indexes*, indicates that the Construction Wage Rate Index in Newfoundland increased by 26% from 2007 to 2011. Since 2009, construction wage rates in Newfoundland have increased faster than anywhere else in Canada. Based on observed levels of construction inflation, it is reasonable to expect that relatively high net salvage ratios will continue, and may increase further.

The net salvage ratio for a single year is not used in isolation within the depreciation study. Transmission retirement net salvage over the 3 years from 2007 to 2009 fluctuated between -54% and -128% annually. This range reflects retirement of aging transmission lines with varying degrees of difficulty in today's economy. This range is indicative of normal operations.

Transmission Line Rebuild (June 2008)
and
Transmission Line Rebuild (June 2009)

Transmission Line Rebuild

June 2008

Prepared by:

Trina L. Troke, P.Eng.

NEWFOUNDLAND POWER
A FORTIS COMPANY

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1.0 Transmission Line Rebuild Strategy

Transmission lines play a critical role in providing reliable service to a large number of customers. The Company is proactive in ensuring that transmission lines are maintained so as to avoid significant failure.

As part of its 2006 Capital Budget Application, the Company submitted its *Transmission Line Rebuild Strategy* outlining a 10-year plan to rebuild aging transmission lines. The strategy outlined a structured approach to maintaining the Company's transmission line system and prioritized the rebuild of transmission lines based on physical condition, risk of failure, and potential customer impact in the event of failure.

The *Transmission Line Rebuild Strategy* is reviewed and revised on an ongoing basis to ensure that it accurately reflects the latest reliability data, inspection information, condition assessments, as well as the capital requirements within other asset classes. The strategy will continue to change with time to ensure targeted spending on the highest priority transmission lines based on physical condition, risk of failure, potential impact upon customers in the event of a failure, and alignment with corporate goals and objectives.

Appendix A contains the updated Transmission Line Rebuild Strategy Schedule. The cost estimates in this revision have been adjusted to reflect the inflationary increases that have affected both labour and non-labour costs since the original strategy was prepared in 2005. As well, the costs presented in the table now utilize escalation factors to more accurately indicate the estimated cost of the project in the year in which it will take place.

2.0 Transmission Line Rebuild Projects Planned for 2009

In 2009, the Company plans to rebuild a section of transmission line 110L and to rebuild the final section of transmission line 111L. These two transmission lines were exposed to severe ice loading during the December 2007 sleet storm on the Bonavista Peninsula. Customers relying on these lines for electricity experienced power outages that extended for as much as 4 days, before the lines could be reconstructed and electricity supply restored.

Appendix B contains topographic views of each of the lines to be rebuilt. Appendix C contains photographs of the existing lines.

The poles, crossarms, hardware, and conductor on these lines are generally in a poor and weakened condition increasing the risk of power outages and making the lines vulnerable to large scale damage when they are exposed to heavy wind, ice and snow loading.

These lines are more than 50 years old and many of the original poles are deteriorated. Inspections have identified substantial evidence of external and/or internal rotting, insect and woodpecker damage, and cracks and splits in poles, crossarms, cross braces, and other hardware.

The existing conductors are small by today's standards and the steel core of each conductor shows evidence of corrosion which reduces the physical strength and current carrying capacity of the conductor.

2.1 Transmission Line 110L

110L is a 66 kV transmission line built in 1958. The line runs between Clarenville Substation and Lockston Substation on the Bonavista Peninsula. The line has a total length of 79 km and is of single wood pole construction.

110L serves approximately 4,000 customers of the Bonavista Peninsula between Milton and Lockston. This line also connects the Company's Lockston hydro plant to the Island interconnected electrical system.

The conductor is damaged in many places and has been subjected to ice loading since its original installation. The steel core shows evidence of rust and the aluminum strands are corroded which reduces the physical strength and the current carrying capacity of the conductor. This conductor has deteriorated to the point that the line has been de-rated to about one-half of its original current carrying capacity out of concern that it will burn off and fall to the ground.

Since 2001, there have been several outages on this line due to wind and ice conditions causing conductors to slap together. This results in conductor damage and often conductor failure. The most recent occurrences happened in December 2003, April 2004, and December 2007 when ice build-up on overhead conductors caused the line to fail resulting in outages to customers.

In 1966, 17 km of the line was upgraded and between 1972 and 1974, an additional 18 km was upgraded. In 2006 and 2007, the 21 km section of the line that extends between the Company's Lockston substation and Summerville substation was rebuilt. The remaining 22 km of the existing line is still original 1958 construction and is 50 years old.

Based on the condition of this line, it is recommended that another 4.9 km of 110L be rebuilt in 2009 at an estimated cost of $627,000.

The report *Bonavista Loop Transmission Planning*, filed with Newfoundland Power's 2006 Capital Budget application, compared alternatives for addressing transmission line requirements on the Bonavista Peninsula. The analysis determined that the rebuilding of 110L, as recommended in this report, is the most cost-effective alternative to ensure the continued provision of safe, reliable electrical service.

2.2 Transmission Line 111L

111L is a 66 kV transmission line built in 1956. The line runs between Lockston Substation and Catalina Substation, via Port Union Substation, on the Bonavista Peninsula. The line is 31 kilometres in length and is of single wood pole construction. The line serves approximately 1,058 customers on the Bonavista Peninsula. This line also connects the Company's Port Union hydroelectric and diesel plants to the Island interconnected electrical system.

Many of the poles on this line are deteriorated and some are severely decayed. The guy wires are generally corroded and are nearing the point of failure.

The non-standard conductor on this line is damaged in many places and its strands are broken in some locations. Over the years, many inline splices (sleeves) have been installed along the length of the conductor. These inline splices are evidence of repairs made after the conductor failed during various sleet storms in the area, most recently, during a severe ice storm in December 2007.

A 13 kilometre section of this line was approved for reconstruction in the 2008 Capital Budget Application. Based on the overall deteriorated condition of the line, it is recommended that the remaining 17.7 km of the line be rebuilt in 2009. The estimated cost of this work is $2,285,000.

The report *Bonavista Loop Transmission Planning*, filed with Newfoundland Power's 2006 Capital Budget Application, compared alternatives for addressing transmission line requirements on the Bonavista Peninsula. The analysis determined that the rebuilding of 111L, as recommended in this report, is the most cost-effective alternative to ensure the continued provision of safe, reliable electrical service.

Appendix A

Transmission Line Rebuild Strategy Schedule

Transmission Line Rebuilds
2009-2013
($000)

Line	Year	2009	2010	2011	2012	2013
012L KBR-MUN	1950		436			
014L SLA-MUN	1950				147	
015L SLA-MOL	1958				95	
016L PEP-KBR	1950		840			
018L GOU-GDL	1951					689
021L 20L-HCP	1952		705			
023L MOB-PBK	1942		732			
024L MOB-BIG	1964				1,111	
025L GOU-SJM	1954			1,283		
030L RRD-KBR	1959		584			
032L OXP-RRD	1959					458
035L OXP-KEN	1963					809
041L CAR-HCT	1958			2,612		
049L HWD-CHA	1966			377		
057L BRB-HGR	1958				2,556	
068L HGR-CAR	1951					768
069L KEN-SLA	1951				394	
110L CLV-LOK	1958	627	2,396	1,276		
111L LOK-CAT	1956	2,285				
124L CLV-GAM	1964				1,528	3,280
	Total	**$2,912**	**$5,693**	**$5,548**	**$5,831**	**$6,004**

Transmission Line Rebuilds
2014-2020
($000)

Line	Year	2014	2015	2016	2017	2018	2019	2020
013L SJM-SLA	1962				318			
100L SUN-CLV	1964		3.047	2,163				
101L GFS-RBK	1957			1,331	2,071	1702		
102L GAN-RBK	1958				4,488	3,403	2,975	
105L GFS-SBK	1963							2,442
124L CLV-GAM	1964	3,556	1,823					
146L GAN-GAM	1964	2,474	962	3,161				
301L SPO-GRH	1959	170						
302L SPO-LAU	1959					1,970	2,882	
400L BBK-WHE	1967						1,487	2,702
403L TAP-ROB	1960		643					
	Total	**$6,200**	**$6,475**	**$6,655**	**$6,877**	**$7,075**	**$7,344**	**$5,144**

Appendix B

Topographic Maps of Transmission Lines 110L and 111L

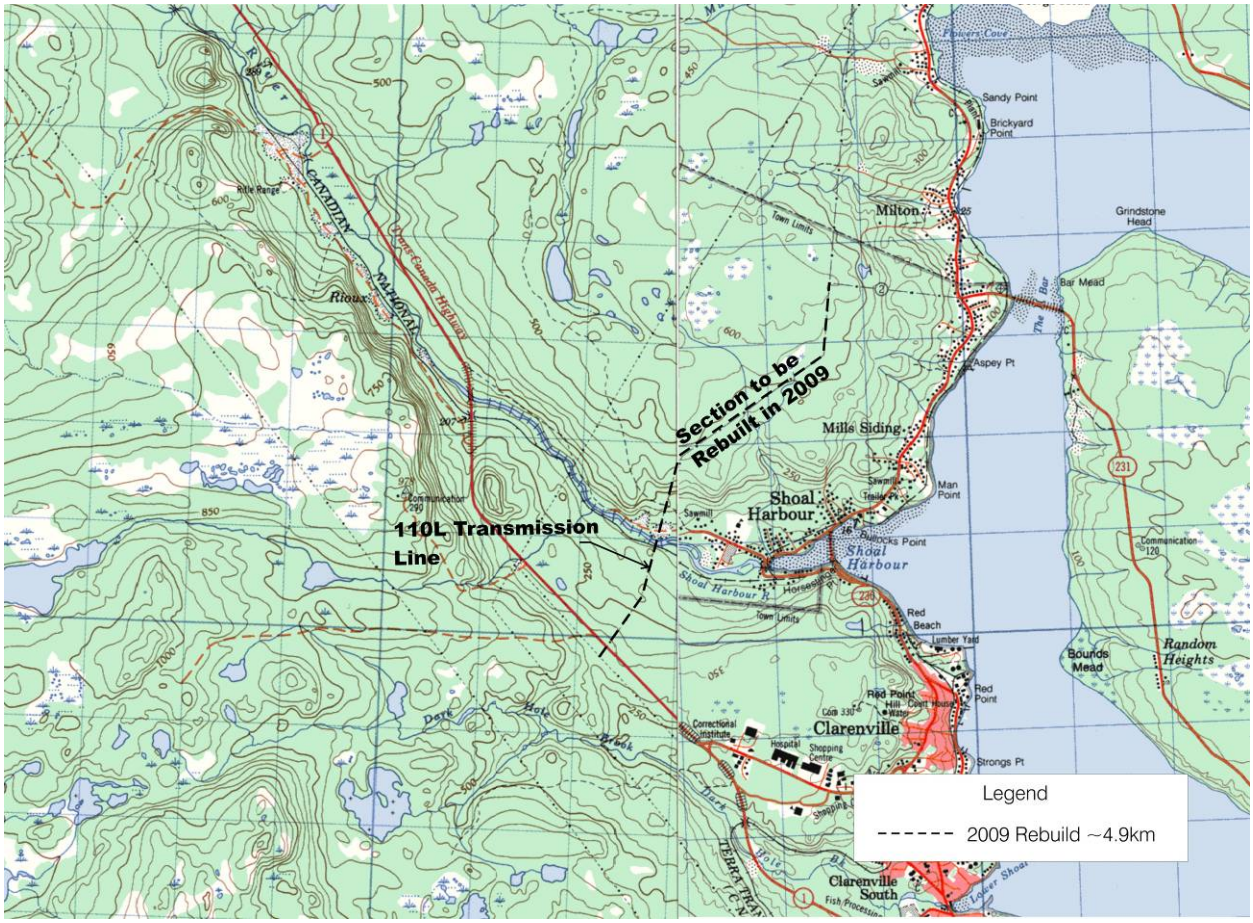

Figure 1 – Topographic Map 110L

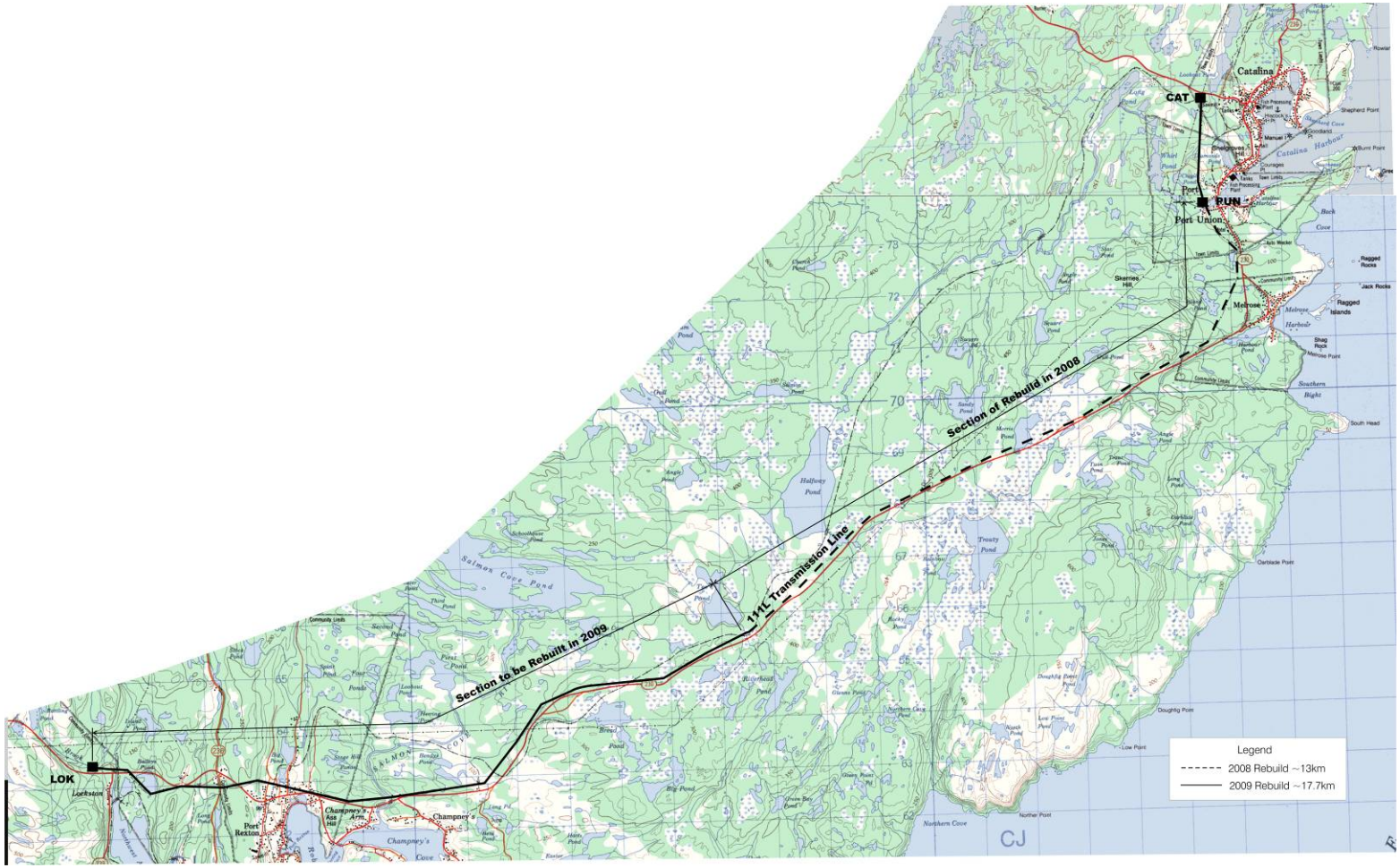

Figure 2 – Topographic Map 111L

Appendix C

Photographs of
Transmission Lines 110L and 111L

Transmission Line 110L

Figure 1 - 110L Ice Storm Damage December 2003

Figure 2 - 110L Broken conductor - ice build up December, 2003

Figure 3 - Deteriorated pole 110L

Figure 4 - Deteriorated pole 110L

Transmission Line 111L

Figure 5 - Deteriorated Pole 111L

Figure 6 - Deteriorated Pole 111L

Figure 7 – Deteriorated Pole (Top Split) 111L

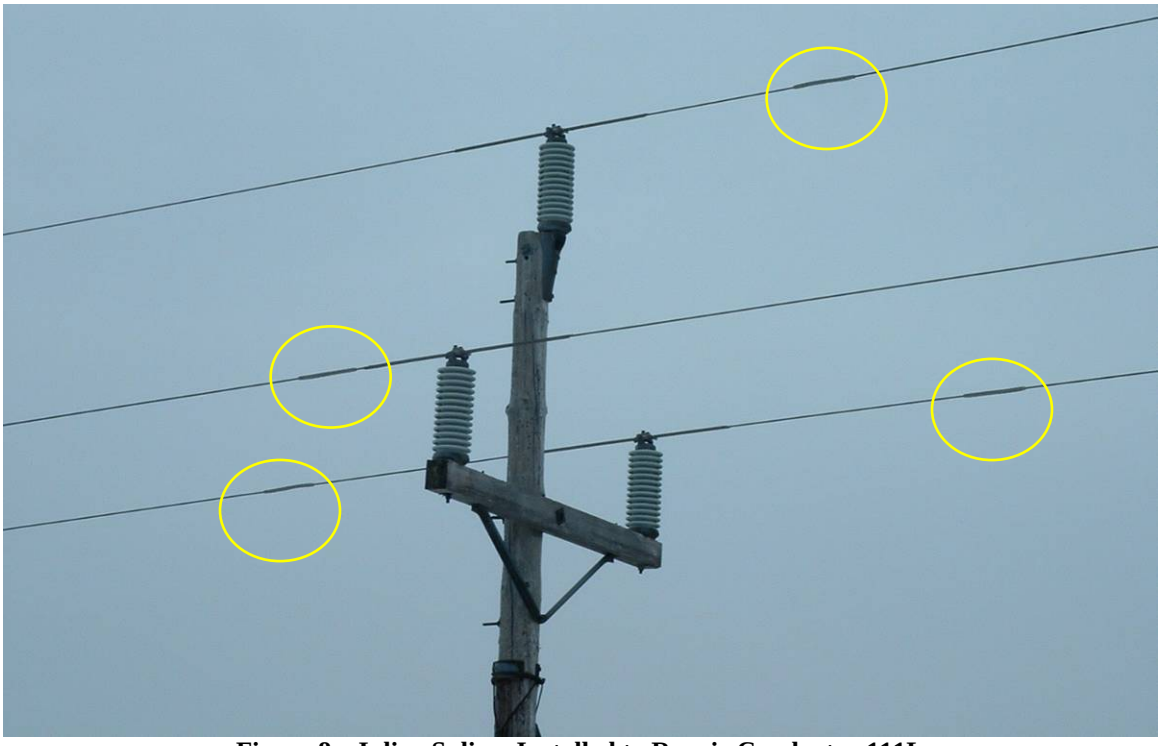

Figure 8 – Inline Splices Installed to Repair Conductor 111L

Figure 9 – Failed Guy Wire and Ice Loading on 111L

Figure 10 - 111L Ice Storm Damage December 2007

Transmission Line Rebuild

June 2009

Prepared by:

Trina L. Troke, P.Eng.

NEWFOUNDLAND POWER
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1.0 Transmission Line Rebuild Strategy

Transmission lines play a critical role in providing reliable electrical service to customers. The Company ensures that transmission lines are maintained in a manner consistent with their critical role in service delivery.

In 2006, Newfoundland Power ("The Company") submitted its *Transmission Line Rebuild Strategy* outlining a 10-year plan to rebuild aging transmission lines. This plan prioritized the investment in rebuild projects based on physical condition, risk of failure, and potential customer impact in the event of a failure.

The *Transmission Line Rebuild Strategy* is regularly updated to ensure that it reflects the latest reliability data, inspection information, and condition assessments.

Appendix A contains the updated Transmission Line Rebuild Strategy Schedule.

2.0 Transmission Line Rebuild Projects Planned for 2010

In 2010, the Company plans to rebuild transmission line 23L and sections of transmission lines 24L and 110L. Appendix B contains topographic views of each of the lines to be rebuilt. Appendix C contains photographs of the existing lines.

These lines are each more than 45 years old and there is deterioration of the poles, crossarms, hardware, and conductor. This makes the lines vulnerable to large scale damage when exposed to heavy wind, ice, and snow loading, thus increasing the risk of power outages. Inspections have identified evidence of decaying wood, worn hardware and damage to insulators. In addition, the steel core of the 110L conductor shows evidence of corrosion which reduces the physical strength and electrical current carrying capacity of the conductor.

2.1 Transmission Line 23L ($826,000)

23L is a 33 kV radial transmission line between Pierre's Brook Plant and Mobile Substation. Constructed in 1942, it is 5.5 km in length and is Newfoundland Power's oldest transmission line connecting the Company's 4.3 MW Pierre's Brook Hydroelectric plant to the Island interconnected system. No customers are directly served by 23L.

Inspections have identified deterioration to poles and crossarms due to decay, woodpecker holes, insect damage, splits and checks, as well as corrosion and wear to hardware. Many of these components are in advanced stages of deterioration and require replacement. A number of the wooden poles are original vintage (67 years old) and have surpassed their normal life expectancy.

Many of the insulators on the line are pin-type (tie-top) and not the more robust line post (clamp-top) insulators that are have been standard for the Company's transmission lines for many years. The conductor is non-standard 3/0 copper.

The justification for conversion of 23L to 66 kV is contained in report ***2.3*** *Convert 23L to 66 kV to Reduce Losses.* The 23L transmission line requires replacement due to its deteriorated condition. It is recommended that it be rebuilt using 66 kV construction standards. This will provided added benefit from a decrease in electrical losses and an increase in energy efficiency.

Recent inspections have determined the transmission line has reached a point where it must be rebuilt to continue to provide safe, reliable operation.

Based on the overall deteriorated condition of the line, the associated safety and reliability concerns, and the energy efficiency benefits associated with this project, it is recommended that the line be rebuilt in 2010 at an estimated cost of $826,000.

2.2 Transmission Line 24L ($1,161,000)

24L is a 66kV radial transmission line between Bay Bulls Big Pond Substation and Mobile Substation. It is 20 kilometres in length and was originally constructed in 1954 and 1964. The H-Frame section constructed in 1954 was completely rebuilt in 2002, and a section of the 1964 vintage single pole section was rebuilt in 2003. Only a 7.7 kilometre section of the original wooden single pole structures remains.

Inspections have identified deterioration due to decay, splits and checks in the poles and crossarms, and corrosion and wear to other hardware. Many of these components are in advanced stages of deterioration and require replacement.

The poles, crossarms and hardware are generally deteriorated and in a weakened state. This combined with the long spans, many in excess of 100 metres, make the line more susceptible to damage and place the line at risk of large scale damage should it become exposed to wind, ice or snow loading.

24L is a critical transmission line as it connects 4,600 customers, 7 hydroelectric plants and 9 privately-owned wind generation units[1] to the Island interconnected system. The copper conductor on this 7.7 kilometre section of transmission line is small in comparison to the Company's standard transmission line conductors. As a result, the electrical losses over this section of line are significant when all generation sources are on-line.

Based on the overall condition of this section of 24L, it is recommended that the remaining 7.7 km be rebuilt in 2010 at an estimated cost of $1,161,000.

2.3 Transmission Line 110L ($2,178,000)

Constructed in 1958, 110L is a 66 kV transmission line between Clarenville Substation and Lockston Substation on the Bonavista Peninsula. The line is 79 km in length and is of single wood pole construction.

[1] This represents a combined generating capacity of approximately 69 MW.

110L serves approximately 4,300 customers on the Bonavista Peninsula between Milton and Lockston. This line also connects the Company's Lockston hydro plant to the main electrical grid.

The conductor is damaged and deteriorated in many places and has been subjected to ice loading since its original installation. The steel core and the aluminum strands are corroded. This reduces the physical strength and the electrical capacity of the conductor. This deterioration is such that the line has been de-rated to about one-half of its original electrical current carrying capacity for safety reasons.

Since 2001, there have been several outages on this line due to wind and ice conditions which cause the conductors to slap together. This results in conductor damage and often conductor failure.

Sections of 110L have already been upgraded. Most recently, the 21 km section of line extending between the Company's Lockston plant and Summerville substation was completely rebuilt. Another 4.9 km section of the line is approved for rebuilding as part of the Company's 2009 Capital Budget Application.

Based on the condition of the remaining sections of the line, it is recommended that another 14.5 km of 110L be rebuilt in 2010 at an estimated cost of $2,178,000.

Appendix A

Transmission Line Rebuild Strategy Schedule

Transmission Line Rebuilds
2010-2014
($000)

Line	Year	2010	2011	2012	2013	2014
012L KBR-MUN	1950		590			
013L SJM-SLA	1962					605
014L SLA-MUN	1950			235		
015L SLA-MOL	1958					131
016L PEP-KBR	1950		730			
018L GOU-GDL	1951				777	
021L 20L-HCP	1952		822			
023L MOB-PBK	1942	826				
024L MOB-BIG	1964	1,161				
025L GOU-SJM	1954		1,443			
030L RRD-KBR	1959			806		
032L OXP-RRD	1959					350
035L OXP-KEN	1963					949
068L HGR-CAR	1951					900
069L KEN-SLA	1951					819
110L CLV-LOK	1958	2,178		1,668	2,910	
124L CLV-GAM	1964			810		
	Total	**$4,165**	**$3,585**	**$3,519**	**$3,687**	**$3,754**

Transmission Line Rebuilds
2015-2021
($000)

Line	Year	2015	2016	2017	2018	2019	2020	2021
041L CAR-HCT	1958		3,553					
049L HWD-CHA	1966						595	
057L BRB-HGR	1958	3,228						
100L SUN-CLV	1964							2,978
101L GFS-RBK	1957				6,012			
102L GAN-RBK	1958					6,356	6,829	
124L CLV-GAM	1964							3,750
301L SPO-GRH	1959		208					
302L SPO-LAU	1959			5,196				
403L TAP-ROB	1960							919
	Total	**$3,228**	**$3,761**	**5,196**	**$6,012**	**$6,356**	**$7,424**	**$7,647**

Appendix B

Topographic Maps of Transmission Lines 23L, 24L, and 110L

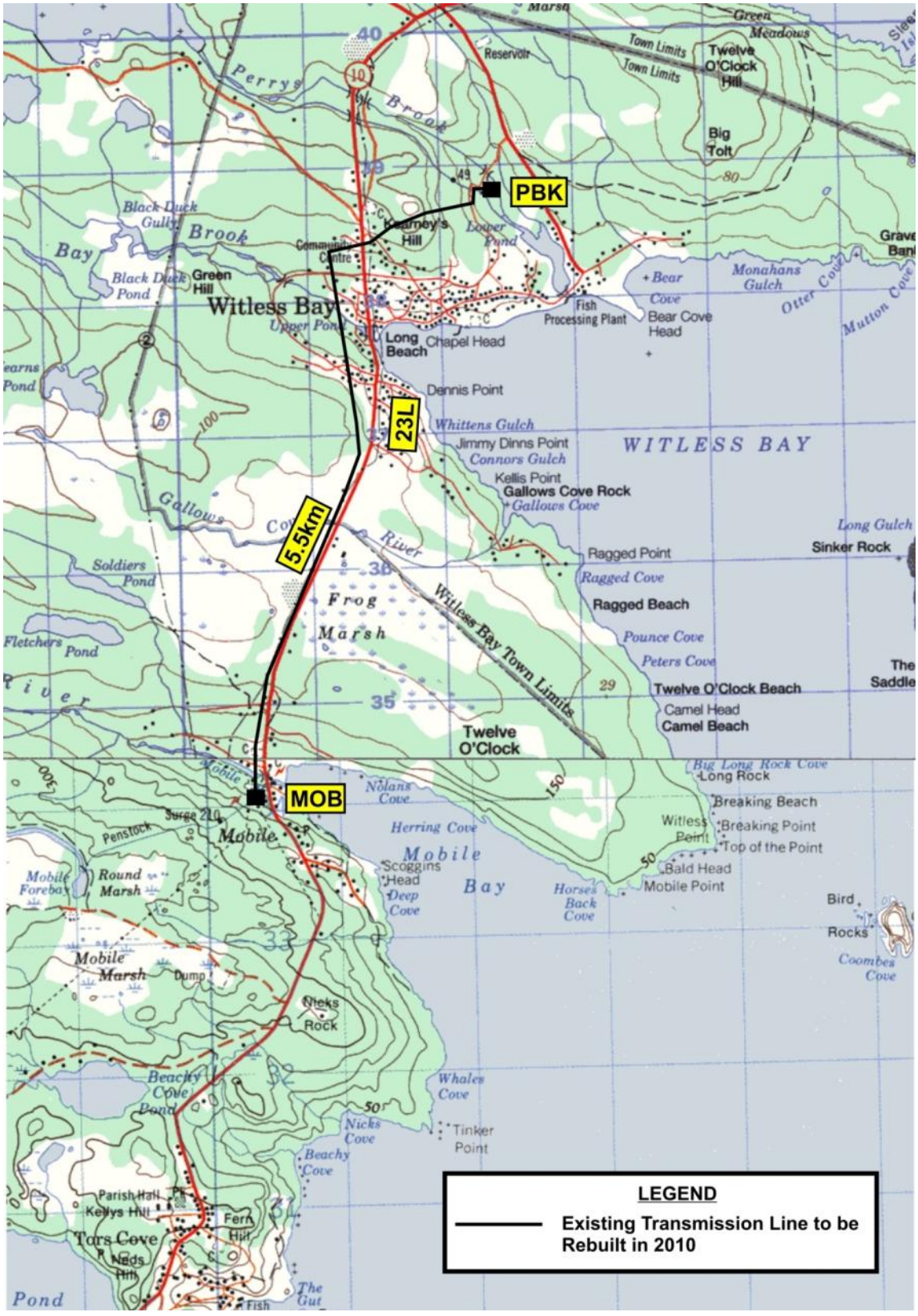


Figure 1 – Topographic Map 23L

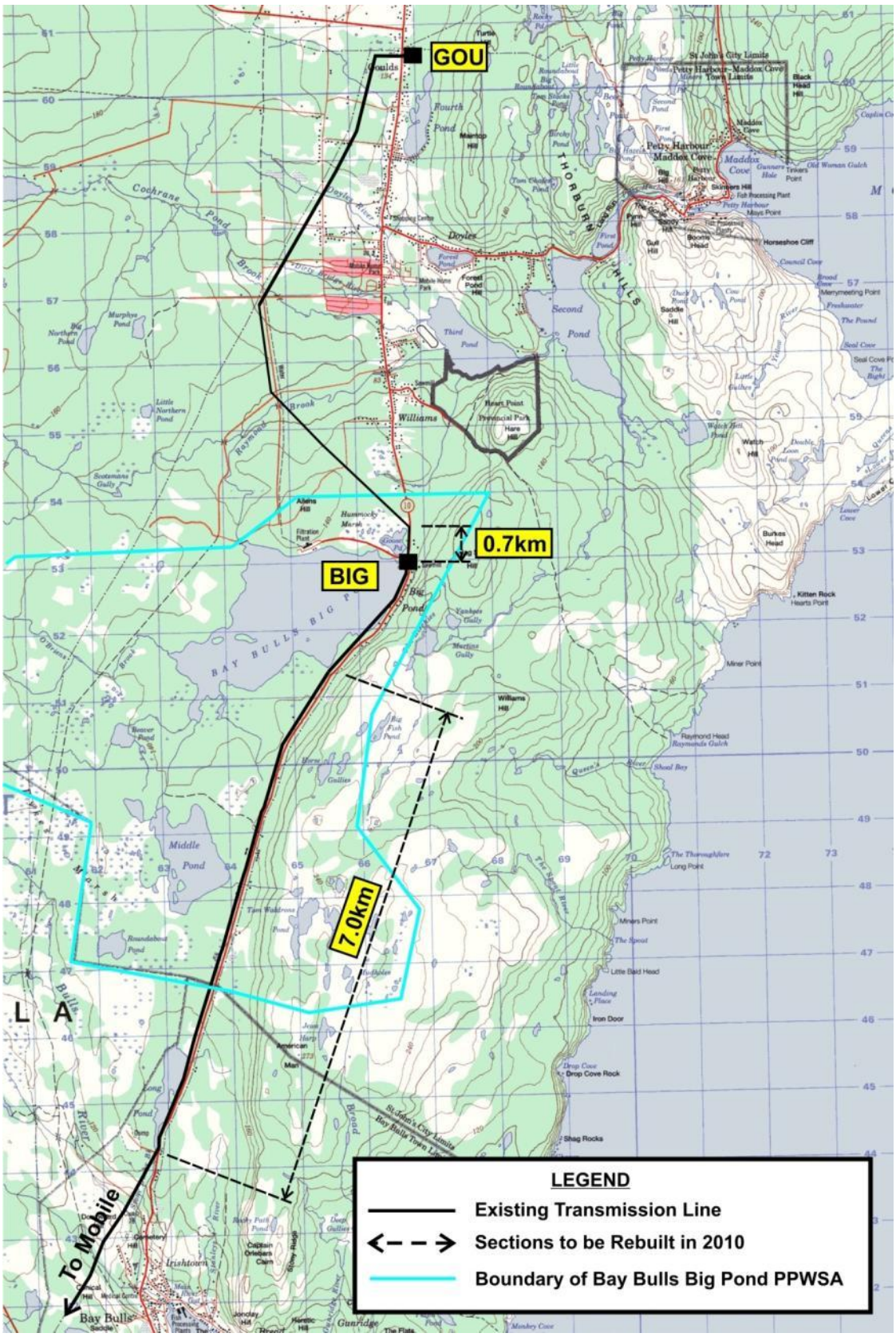


Figure 2 – Topographic Map 24L

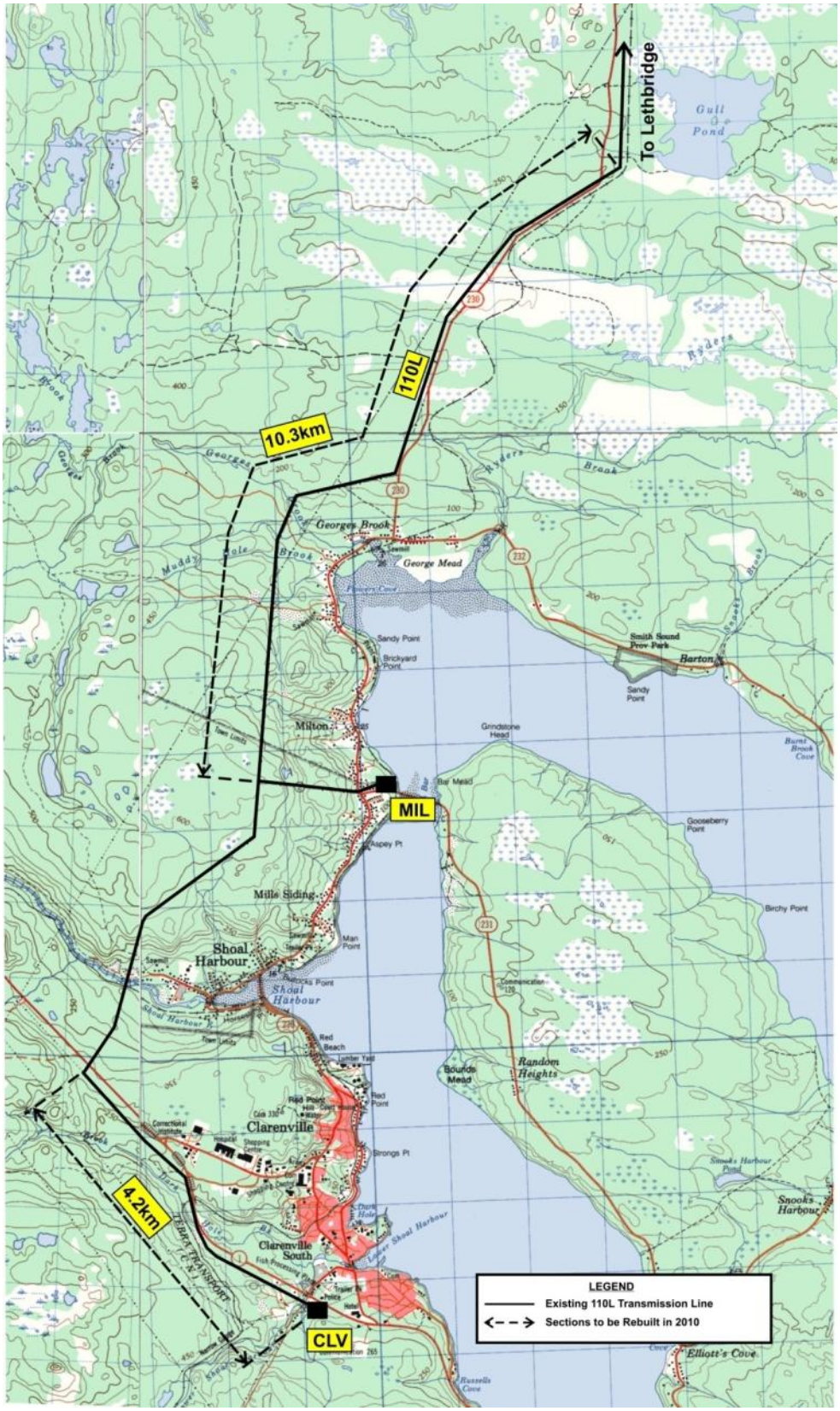
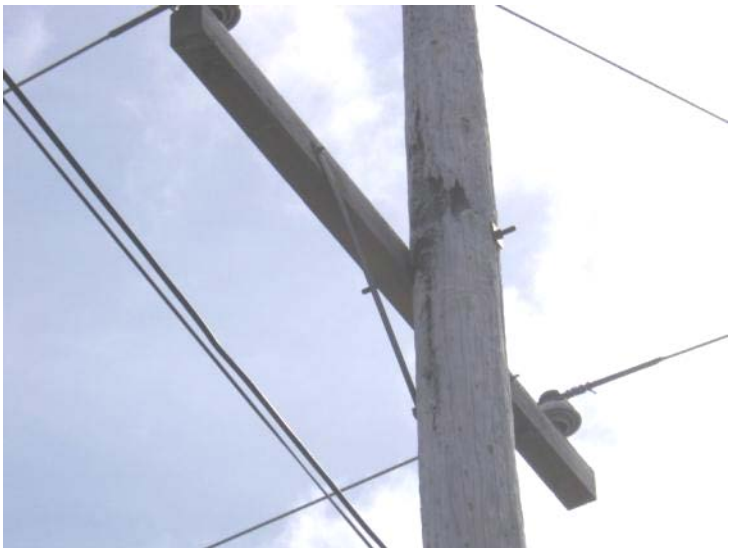


Figure 3 – Topographic Map 110L

Appendix C

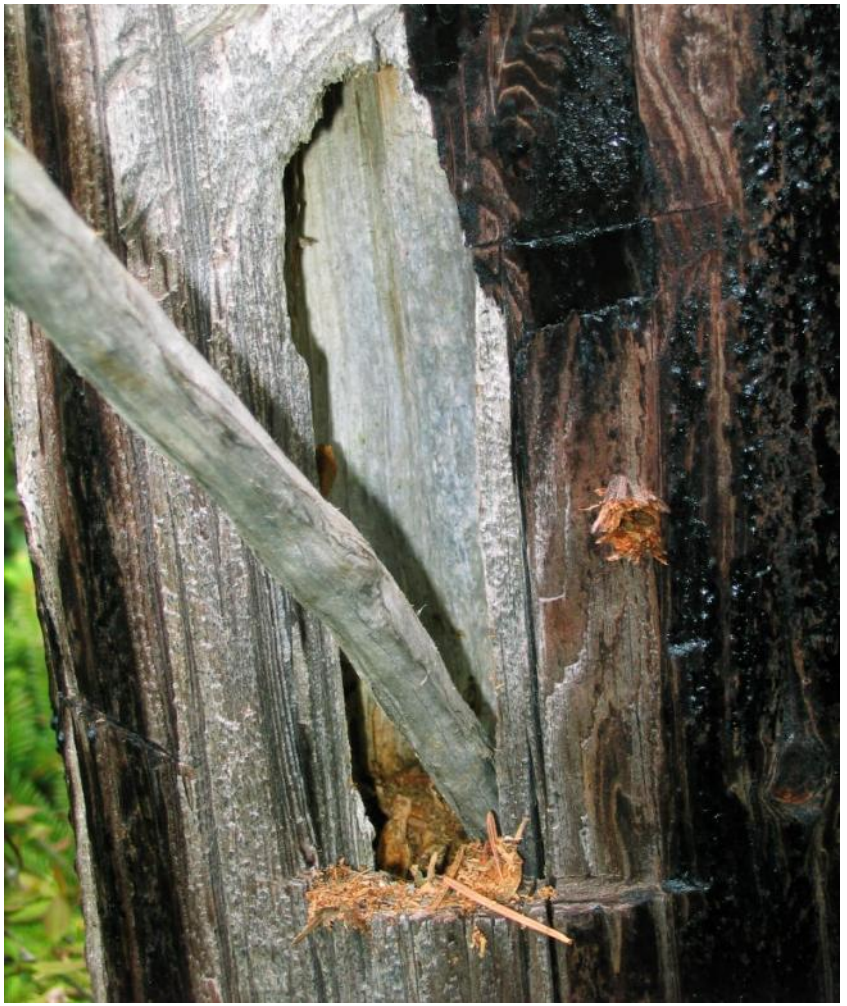
Photographs of Transmission Lines 23L, 24L, and 110L

Transmission Line 23L



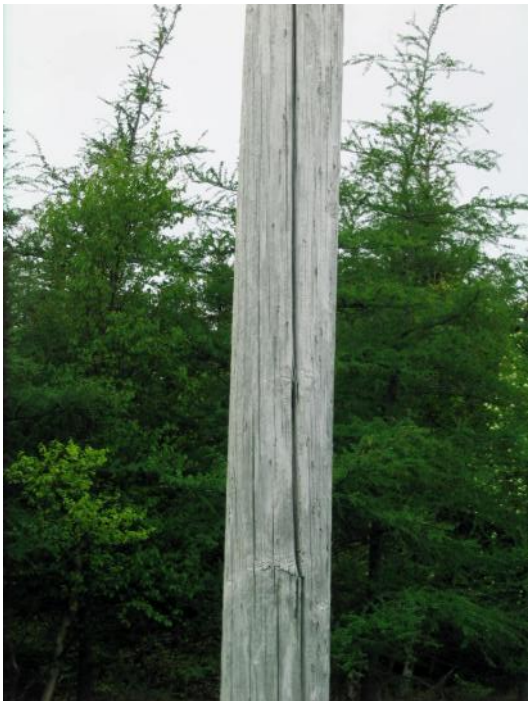
Burn Marks on Pole Caused by Flashover

Woodpecker Hole in Pole



Hole and Rot in Pole

Transmission Line 24L



Deteriorated Pole

Deteriorated Crossarm

Deteriorated Crossarm

Deteriorated Pole

Pole Crack between Bolts

Leaning Insulator

Deteriorated Crossarm

Split Pole

Transmission Line 110L

110L Ice Storm Damage December 2003

110L Broken Conductor - Ice Build Up December, 2003

Deteriorated Pole 110L

Deteriorated Pole 110L

Statistics Canada Construction Price Indexes

Statistique Canada Statistics Canada

Canada

Construction price indexes
(Construction union wage rate index)

	2007	2008	2009	2010	2011
	Construction union wage rate index				
	2007=100				
Canada	**100.0**	**104.9**	**109.2**	**112.6**	**115.4**
St. John's (N.L.)	100.0	105.0	109.1	114.3	125.7
Halifax (N.S.)	100.0	104.2	106.7	110.7	113.6
Saint John (N.B.)	100.0	104.5	107.1	111.7	116.7
Québec (Que.)	100.0	102.9	106.0	107.7	111.4
Saguenay (Que.)	100.0	102.9	106.1	107.8	111.4
Montréal (Que.)	100.0	102.9	106.1	107.8	111.4
Ottawa-Gatineau, Ontario part (Ont./Que.)	100.0	103.9	107.8	110.5	113.3
Toronto (Ont.)	100.0	104.0	107.8	110.7	113.4
Hamilton (Ont.)	100.0	103.9	107.7	110.1	112.6
St. Catharines-Niagara (Ont.)	100.0	103.7	107.8	110.3	112.7
Kitchener-Cambridge-Waterloo (Ont.)	100.0	104.2	108.3	110.9	113.5
London (Ont.)	100.0	103.9	107.6	110.2	112.8
Windsor (Ont.)	100.0	104.5	108.5	111.6	114.3
Greater Sudbury / Grand Sudbury (Ont.)	100.0	104.3	108.2	110.7	113.2
Thunder Bay (Ont.)	100.0	103.8	107.3	109.8	112.2
Winnipeg (Man.)	100.0	107.6	113.7	120.0	122.5
Regina (Sask.)	100.0	110.2	116.8	120.8	126.6
Saskatoon (Sask.)	100.0	110.5	116.9	120.9	126.5
Calgary (Alta.)	100.0	107.6	113.8	120.3	122.4
Edmonton (Alta.)	100.0	108.7	114.9	121.5	123.6
Vancouver (B.C.)	100.0	104.6	108.8	111.6	112.8
Victoria (B.C.)	100.0	104.4	108.7	111.5	113.0
	% change				
Canada	**3.1**	**4.9**	**4.1**	**3.1**	**2.5**
St. John's (N.L.)	7.2	5.0	3.9	4.8	10.0
Halifax (N.S.)	6.2	4.2	2.4	3.7	2.6
Saint John (N.B.)	4.4	4.5	2.5	4.3	4.5
Québec (Que.)	2.8	2.9	3.0	1.6	3.4
Saguenay (Que.)	2.8	2.9	3.1	1.6	3.3

Montréal (Que.)	2.8	2.9	3.1	1.6	3.3
Ottawa-Gatineau, Ontario part (Ont./Que.)	2.4	3.9	3.8	2.5	2.5
Toronto (Ont.)	2.0	4.0	3.7	2.7	2.4
Hamilton (Ont.)	2.0	3.9	3.7	2.2	2.3
St. Catharines-Niagara (Ont.)	2.1	3.7	4.0	2.3	2.2
Kitchener-Cambridge-Waterloo (Ont.)	1.6	4.2	3.9	2.4	2.3
London (Ont.)	2.1	3.9	3.6	2.4	2.4
Windsor (Ont.)	2.1	4.5	3.8	2.9	2.4
Greater Sudbury / Grand Sudbury (Ont.)	2.1	4.3	3.7	2.3	2.3
Thunder Bay (Ont.)	2.1	3.8	3.4	2.3	2.2
Winnipeg (Man.)	1.5	7.6	5.7	5.5	2.1
Regina (Sask.)	..	10.2	6.0	3.4	4.8
Saskatoon (Sask.)	..	10.5	5.8	3.4	4.6
Calgary (Alta.)	3.4	7.6	5.8	5.7	1.7
Edmonton (Alta.)	3.7	8.7	5.7	5.7	1.7
Vancouver (B.C.)	5.7	4.6	4.0	2.6	1.1
Victoria (B.C.)	5.0	4.4	4.1	2.6	1.3

.. : not available for a specific period of time.
Source: Statistics Canada, CANSIM, table 327-0045 and Catalogue no. 62-007-X.
Last modified: 2012-09-20.