MARITIME ELECTRIC
A FORTIS COMPANY

November 1, 2019

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Island Regulatory & Appeals Commission
PO Box 577
Charlottetown PE C1A 7L1

Dear Commissioners:

2020 Capital Budget Application – Docket UE20730
Response to Interrogatories from Commission Staff

Please find attached the Company's response to Interrogatories from Commission Staff with respect to the 2020 Capital Budget Application filed on August 23, 2019.

Yours truly,

MARITIME ELECTRIC

Gloria Crockett

Gloria Crockett, CPA, CA
Manager, Regulatory & Financial Planning

GCC42
Enclosure

I N T E R R O G A T O R I E S

Responses to Interrogatories
from
Commission Staff

2020 Capital Budget Application
UE20730

Submitted November 1, 2019

The Island Regulatory and Appeals Commission (the "Commission") in assessing the reasonableness of the 2020 Annual Capital Budget submitted by Maritime Electric Company, Limited ("Maritime Electric"), requests that Maritime Electric respond to the following interrogatories:

IR-1 Please provide an analysis which shows the actual expenditures compared to the approved Capital Expenditures for the 2018 and 2019 fiscal year. For the 2019 fiscal year, please ensure to provide the actual expenditure to date and the proposed expenditure for the remainder of the fiscal year.

RESPONSE:

IR-1 - Attachment 1 – pages 1 and 2 to this response provide a summary of the 2018 Capital Expenditures compared to the approved capital budget for 2018. This summary aligns with page 2-1 of the 2018 Capital Variance Report filed with the Commission on February 28, 2019. Further details with respect to project expenditure variances are outlined in the report.

IR-1 - Attachment 1 – page 3 to this response outlines the 2018 projects deferred from 2018 and expected to be completed in 2019. This information was also provided in Appendix I of the 2018 Capital Variance Report filed on February 28, 2019. This attachment includes 2018 actual expenditures, year-to-date spending to September 30, 2019, and the current forecast for the total 2019 expenditures on these projects. The current forecast variance from the approved capital budget for these projects as well as comments on the status of these projects is provided as well.

IR-1 - Attachment 2 to this response provides the Capital Expenditure Forecast for 2019. This includes the actual expenditures year to date (as of September 30, 2019) and the current forecast total expenditures for these projects as well as the current forecast variance from the approved budget. Commentary on the status of these projects and reasons for identified variances are provided in the "Notes" column.

Projects that cannot be completed by the end of the year and expected to be carried over to 2020 based on delays due to vendor delivery times, process delays, vendor recommendations for deployment, and resource availability have been identified in IR-1 - Attachment 2 to this response where they are known. Additional carryovers to 2020 may be identified in Q4.

IR-2 Are there any projects from the 2019 proposed capital expenditure program which have been carried forward into the proposed 2020 capital expenditures?

RESPONSE:

The 2020 Capital Budget Application does not include any capital projects that were approved by the Commission for 2019 in Order UE18-09.

The 2019 Capital Budget Variance Report will identify the 2019 projects that will be carried over to 2020 because they cannot be completed by the end of the year as a result of delays due to vendor delivery times, process delays, vendor recommendations for deployment, and resource availability. This report will be filed with the Commission on or before February 28, 2020.

IR 1 – Attachment 2 identifies the following projects that the Company is currently forecasting to carryover to 2020:

Project ID	Description	Budget	Forecast 2019 Expenditures	Proposed Carryover to 2020	Comments
4.3 a.	CT 3 Turbine Overhaul	$ 1,235,000	$ 148,000	$ 1,087,000	The Company was notified in Q3 that due to resource constraints of the vendor and OEM, General Electric, the project would have to be subcontracted to a third party in order to complete the work in the agreed upon timeline for 2019. The suggested subcontractor does not have a test cell on site to complete testing of the CT before returning it to the Company. The Company has decided to postpone the completion of the CT3 overhaul project until 2020 when it can be completed and tested by the OEM as planned.
5.8	Transportation Equipment	$ 1,642,000	$ 1,052,000	$ 590,000	Final payments due on delivery for two larger Aerial Bucket trucks that were ordered in Q1 but vehicle delivery will be in 2020 due to longer than 12 month delivery periods.
6.1 c.	Substation Engineering and Environmental Assessments	$ 263,000	$ 60,000	$ 203,000	Delays in progress on obtaining EIAs for Clyde River (originally New Haven) and O'Leary projects.
7.2 c.	Network Access Control	$ 80,000	$ 4,000	$ 76,000	Availability of IT resources which are focused on cybersecurity priorities.
7.2 g.	Internal Audit Software	$ 75,000	$ 10,000	$ 65,000	Recommendation from the Vendor due to deployment timelines.
Total		**$ 3,295,000**	**$ 1,332,000**	**$ 2,021,000**	

Additional carryovers to 2020 may be identified in Q4.

IR-3 In the proposed 2020 Annual Capital Budget, there appears to be some projects which will span several fiscal years. Please provide an estimate of those projects over their entire life. Please ensure to show expenditures on an annual basis (i.e. 2020, 2021, etc.).

RESPONSE:

The table below provides the annual budgets for proposed 2020 capital projects that span more than one year. The budget amounts in 2021 and 2022 are estimates. Projects will be subject to a formal RFP process and costs may vary from current estimates.

Project ID	Project Description	Budget Year and Amount					Project Total
		2019	2020	2021	2022	2023 and Beyond	
5.6 e	Smart Meters	-	$ 300,000	TBD	TBD	TBD	TBD
6.1 b	Substation Communications Upgrade	-	$ 932,000	$ 350,000	-	-	$ 1,282,000
6.1 c	O'Leary Interconnection	-	$ 170,000	$ 3,862,000	$ 5,203,000	-	$ 9,235,000
7.1 b	180 Kent Street Elevators	$ 226,000	$ 250,000	-	-	-	$ 476,000

Project 5.6 e - Smart Meters

The Company believes now is the appropriate time to further investigate the deployment of Advanced Metering Infrastructure ("AMI").

The implementation of AMI would be a multi-year project including the replacement of all Maritime Electric customer meters, the implementation of a meter data management repository as well as the supporting infrastructure and a new billing system that can support time-of-use billing.

The proposed budget for 2020 would be used to assess the business case for an AMI deployment. If a favorable business case is supported, the Company will develop a multi-year budget and timeline for deployment in 2020 which would form the basis for capital budget requests in future years. This will all be done with the assistance of a third party consultant that specializes in Smart Meter and AMI implementations. The Company will select a partner that has a proven track record of successful AMI implementations and with the depth of expertise required to identify all possible benefits of the solution.

Maritime Electric's existing RF meter system implemented from 2004 to 2015 was supported by a business case based on the investment reducing labour and transportation costs. The business case for AMI will require quantifying the additional customer benefits of time-of-use rates price signalling, load management and the potential for off-peak electric vehicle charging. It will also explore the potential for and economic attributes of time-of-wind rates as wind represents approximately 25 percent of the energy supply mix.

6.1(b) - Substation Communications Upgrade

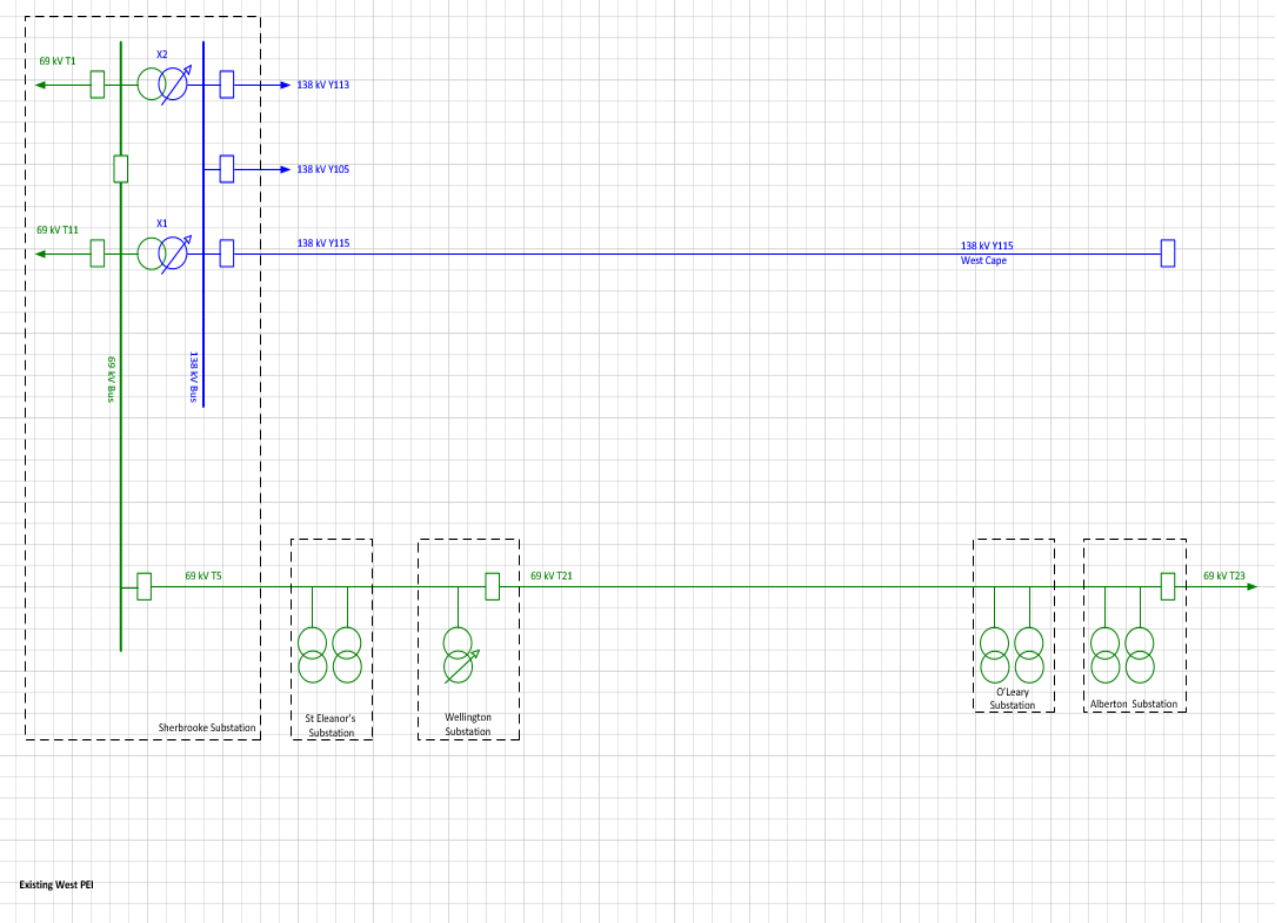
Maritime Electric's existing OT communications network infrastructure is comprised of devices which are at, or nearing, the end of their supported life cycle. Furthermore, the infrastructure does not offer the capacity to support critical cybersecurity enhancements. These enhancements include the implementation of network monitoring software that will scan and alert on suspicious network traffic. Other cyber improvements will include the ability to segment the OT network into

smaller subnetworks thus reducing the attack surface of the network. The new infrastructure will also support the implementation of detailed event logging so that all historical network activity can be traced.

Prior to procuring the devices required for this update, a new detailed network architecture will be developed for the core substation communication sites on a site-by-site basis. This architecture will provide redundancy, improve reliability, enhance performance and will be capable of supporting cybersecurity requirements by deploying next generation utility grade hardware. The proposed project will be completed over a two year period. Year one, 2020, will see all core substations upgraded at an estimated cost of $932,000. The 2021 Budget Application will include the Company's proposal to upgrade the remaining spur substations at an estimated cost of $350,000. The project was estimated based on the proposed IMP Solutions network architecture using list pricing from vendors. IMP Solutions support during installation and commissioning is also included in these estimates.

6*.1(c) - O'Leary Interconnection*
The Integrated System Plan filed with IRAC on October 27, 2017 identified the need to connect Y-115 and T-21 in 2027 to improve voltages in Western PEI; however, the Company is proposing to advance the project because the interconnection will also improve power quality and reliability for customers in Western PEI. Currently, the 12,000 distribution customers in the western portion of Prince Edward Island are fed via radial 69 kV transmission lines. The average annual customer hours of outage for customers fed from these transmission lines from 2009 to 2018 was 149,900 hours, which is above average.

The existing Western PEI transmission system is shown below.

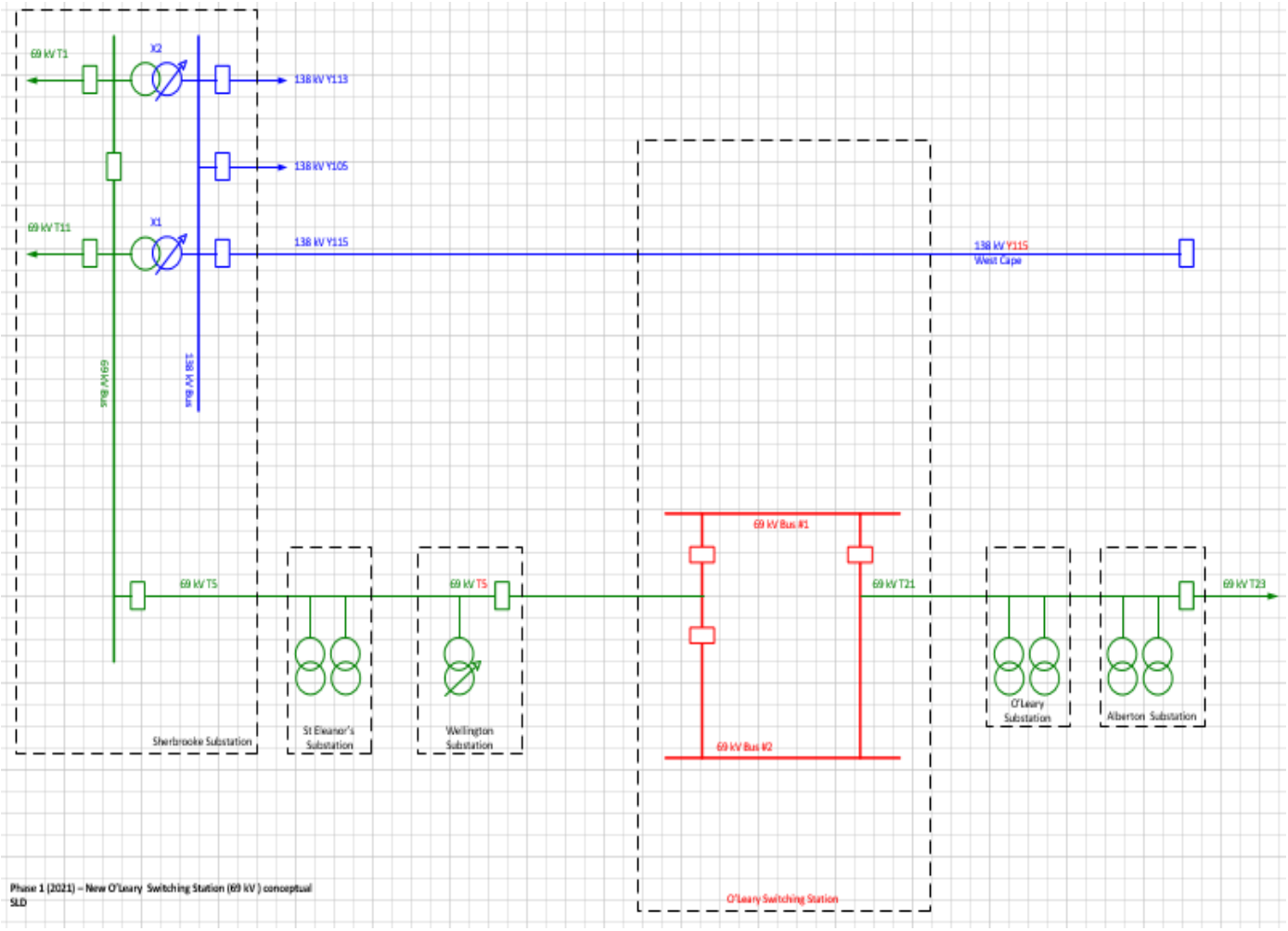


The proposed interconnection will significantly improve reliability in the area. Different tap locations were analyzed for their reliability benefit and it was determined that placing the autotransformer as close to the O'Leary Substation as possible will have the greatest reliability increase. This means the impact of a 69 kV transmission outage will be reduced significantly as customers will be supplied by the 138 kV transmission system as well. Analysis has shown the average annual customer hours of outage in Western PEI will be reduced by 38 per cent from 149,900 hours to 92,900 hours.

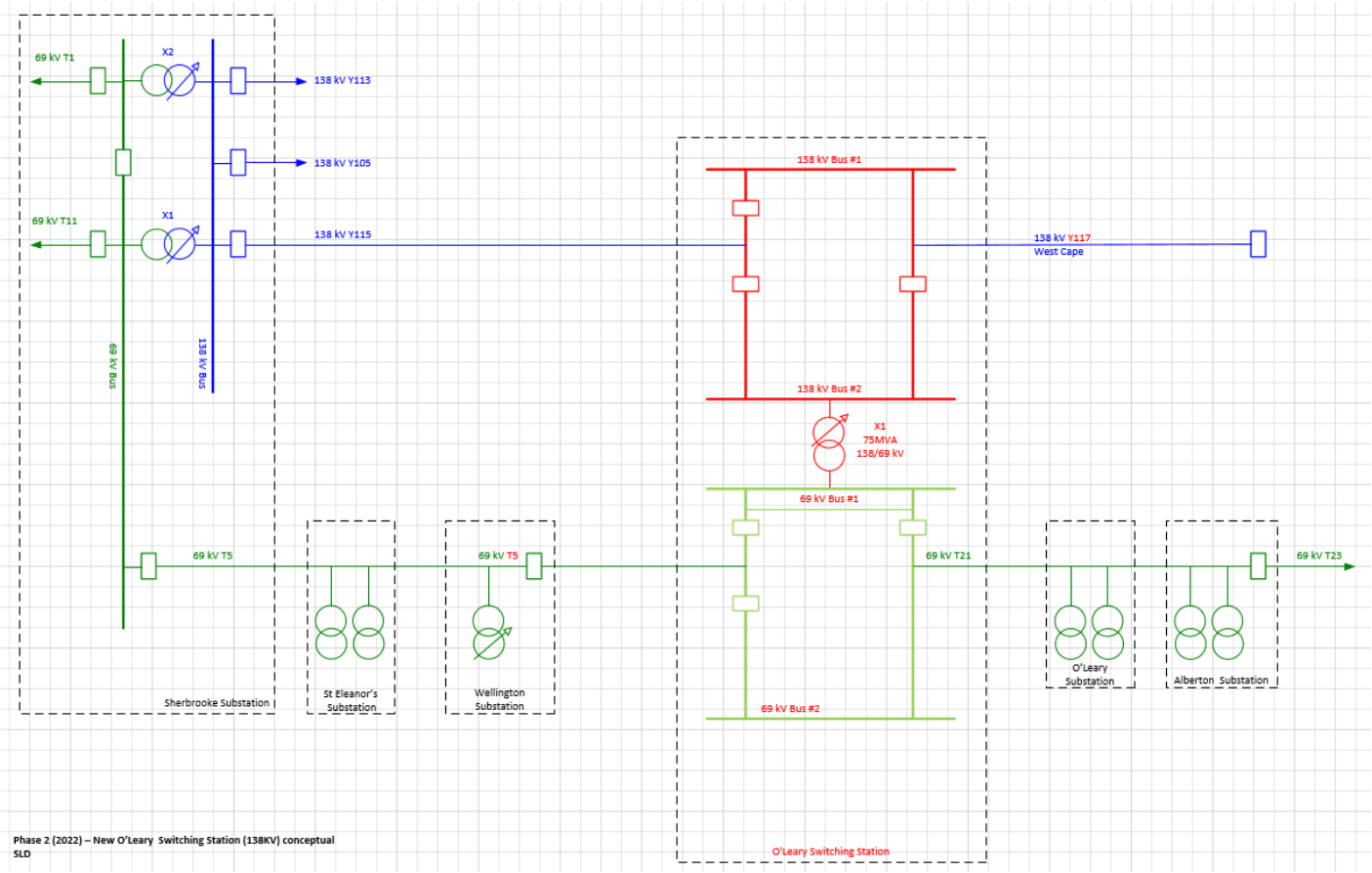
Along with reliability improvements, the four wind farms around North Cape will have better access to the 138 kV transmission system and the two existing lines will be paralleled reducing losses. The exact improvement in losses is yet to be evaluated.

The proposed 2020 budget of $170,000 is for the acquisition of land near the current O'Leary Substation and completion of a preliminary engineering design of the Substation.

In 2021, the Company will propose construction of Phase 1 of the Interconnection with the installation of the 69 kV equipment shown in the following Single Line Diagram:


69 kV T1
X2
138 kV Y113
138 kV Y105
69 kV T11
X1
138 kV Y115
138 kV Y115
West Cape
69kV Bus
138 kV Bus
69 kV T5
69 kV T5
69 kV Bus #1
69 kV T21
69 kV T23
69 kV Bus #2
Sherbrooke Substation
St Eleanor's Substation
Wellington Substation
O'Leary Substation
Alberton Substation
O'Leary Switching Station
Phase 1 (2021) – New O'Leary Switching Station (69 kV) conceptual SLD

Phase 2 of the project will be proposed in 2022 and includes the installation and interconnection of the 138 kV equipment shown below in the Single Line Diagram.



A breakdown of the annual cost estimates are shown in the following table:

Year	O'Leary Transmission Interconnection Project	Annual Cost Estimates*
2020	Land Purchase and Engineering Study	$ 170,000
2020	**Subtotal**	**$ 170,000**
2021	Phase 1 Site Clearing and Earth Works for 69 kV Equipment	$ 313,000
	Gravel	$ 172,000
	Cable Tray and Conduits	$ 119,000
	Foundations	$ 418,000
	Ground Grid and Fence	$ 110,000
	Substation Fence	$ 52,000
	Steel	$ 227,000
	69 kV Breakers	$ 222,000
	69 kV Switches	$ 135,000
	Potential Transformers and Station Service Equipment	$ 145,000
	Control Building, Generator, Yard Lighting and Security	$ 650,000
	69 kV Bus Work	$ 450,000
	Engineering and Project Management	$ 110,000
	Contingency	$ 100,000
	138 kV Transmission Line (3 km)	$ 639,000
2021	**Subtotal**	**$ 3,862,000**
2022	Phase 2 Site Clearing and Earth Works for 138 kV Equipment and Autotransformer	$ 285,000
	Gravel	$ 169,000
	Cable Tray and Conduits	$ 119,000
	Foundations	$ 456,000
	Ground Grid	$ 110,000
	Substation Fence	$ 52,000
	Steel	$ 220,000
	69 kV Breaker and Disconnect Switch and 138 kV Disconnect Switch for the Autotransformer	$ 135,000
	138 kV Breakers	$ 330,000
	138 kV Switches	$ 216,000
	Potential Transformers and Station Service Equipment	$ 171,000
	138 kV Bus Work	$ 450,000
	Control Building Equipment	$ 200,000
	Oil Containment for Autotransformer	$ 80,000
	45/60/75 Autotransformer	$ 2,000,000
	Engineering and Project Management	$ 110,000
	Contingency	$ 100,000
2022	**Subtotal**	**$ 5,203,000**
	Project Total	**$ 9,235,000**

* The annual costs for 2021 and 2022 are based on current pricing from vendors on similar projects. Final pricing will be subject to a formal RFP process in the year of construction and may vary from current estimates.

7.1 b. - 180 Kent Street Office Building Elevator – Phase 2

The proposed 2020 capital budget project is the continuation of a multi-year project approved in the 2019 Capital Budget for the replacement and modernization of the elevators at 180 Kent Street office building. The project includes the purchase of the Gen2 elevator system which will meet today's safety and mobility standards and use regenerative technology. This puts energy back into the operation, resulting in lower operating costs and efficiency improvements over the current system. Replacement of one elevator unit was approved in 2019 Capital Budget Application Order UE18-09 and the proposed 2020 capital budget item is for the second unit to be replaced.

I N T E R R O G A T O R I E S

Section IR-1

ATTACHMENTS

I N T E R R O G A T O R I E S

Section IR-1

Attachment 1

2018 Capital Budget Variance

	2018 Capital Budget Evidence Reference	2018 Approved Budget UE17-03 A	Actual Expenditures 2018 B	Proposed Carryover to 2019 C	Total Expected Project Expenditures D = B + C	Forecast Variance from Approved Capital Budget E = D - A
4.0 Generation	*p. 9*					
4.1 Charlottetown Plant Buildings and Services Projects		125,000	110,031		110,031	(14,969)
4.2 Charlottetown Plant Boiler Projects	*p.10*	125,000	3,963		3,963	(121,037)
4.3 Charlottetown Plant Turbine-Generator Projects		1,311,000	700,908	50,000	750,908	(560,092)
4.4 Borden Plant Projects						
a. Miscellaneous Combustion Turbine Improvements	*p. 13*	106,000	117,225		117,225	11,225
b. Miscellaneous Buildings and Services Improvements	*p. 13*	54,000	33,576		33,576	(20,424)
b. CT1 Battery Bank and Charger Replacement	*p. 13*	50,000	34,964		34,964	(15,036)
		210,000	185,765	-	185,765	(24,235)
		1,771,000	**1,000,667**	**50,000**	**1,050,667**	**(720,333)**
5.0 Distribution						
5.1 Replacements due to Storms, Collisions, Fire and Road Alterations						
a. Replacements due to Storms, Fire and Collisions	*p. 14 & App B*	945,000	2,021,598		2,021,598	1,076,598
b. Replacements due to Road Alterations	*p. 14*	487,000	760,623		760,623	273,623
		1,432,000	2,782,221		2,782,221	1,350,221
5.2 Distribution Transformers	*p. 15 & App C*	2,989,000	3,267,447		3,267,447	278,447
5.3 Services and Street Lighting						
a. New Overhead and Underground Services	*p. 16*	3,596,000	4,276,687		4,276,687	680,687
b. Street and Area Lighting	*p. 16*	788,000	835,511		835,511	47,511
		4,384,000	5,112,198		5,112,198	728,198
5.4 Line Extensions	*p. 17*	3,310,000	2,622,794	715,000	3,337,794	27,794
5.5 Line Rebuilds						
a. Single Phase and Three Phase Rebuilds	*p. 18- 19 & App D*	2,698,000	3,413,967		3,413,967	715,967
b. Distribution Line Refurbishment	*p. 20*	660,000	598,988		598,988	(61,012)
c. Porcelain Cutout Replacement Program	*p. 20 & App E*	945,000	269,071		269,071	(675,929)
		4,303,000	4,282,026		4,282,026	(20,974)
5.6 System Meters	*p. 22 - 24*	591,000	532,047	22,000	554,047	(36,953)
5.7 Distribution Equipment						
a. System Equipment	*p. 25-26*	1,533,000	1,515,749		1,515,749	(17,251)
b. Meter Shop Equipment	*p. 27*	28,000	20,033		20,033	(7,967)
c. Line Equipment	*p. 27*	200,000	171,542		171,542	(28,458)
		1,761,000	1,707,324		1,707,324	(53,676)
5.8 Transportation Equipment	*p. 28*	1,343,000	739,707	605,000	1,344,707	1,707
Sub-total		20,113,000	21,045,764	1,342,000	22,387,764	2,274,764
Less: Customer Contributions		(400,000)	(677,905)		(677,905)	(277,905)
		19,713,000	**20,367,859**	**1,342,000**	**21,709,859**	**1,996,859**

2018 Capital Budget Variance

	2018 Capital Budget Evidence Reference	2018 Approved Budget UE17-03 A	Actual Expenditures 2018 B	Proposed Carryover to 2019 C	Total Expected Project Expenditures D = B + C	Forecast Variance from Approved Capital Budget E = D - A
6.0 Transmission						
6.1 Substation Projects						
a. Mount Albion Substation	*p. 29 -30*	1,338,000	1,227,960	110,000	1,337,960	(40)
b. Mount Albion Transformer	*p. 30*	822,000	342,404	480,000	822,404	404
c. O'Leary Power Transformer	*p. 30-31*	100,000	164,029		164,029	64,029
d. 69 kV Breaker Replacement Program	*p. 31*	460,000	458,462		458,462	(1,538)
e. Crossroads Control Building	*p. 31*	117,000	3,417	114,000	117,417	417
f. Miscellaneous Projects	*p. 31*	39,000	39,225		39,225	225
		2,876,000	2,235,497	704,000	2,939,497	63,497
6.2 Transmission Projects						
a. 69 kV and 138 kV Switch Program	*p. 32*	500,000	499,115		499,115	(885)
b. Transmission Line Refurbishment	*p. 32*	813,000	812,536		812,536	(464)
c. T-2 Line Extension to the New Mount Albion Substation	*p. 33*	141,000	72,368	70,000	142,368	1,368
d. Y-109 Extension	*p. 33*	1,910,000	1,909,435		1,909,435	(565)
		3,364,000	3,293,454	70,000	3,363,454	(546)
		6,240,000	**5,528,951**	**774,000**	**6,302,951**	**62,951**
7.0 Corporate						
7.1 Corporate Services						
a. Recurring Annual Capital Requirements	*p. 34*	150,000	137,888		137,888	(12,112)
b. West Royalty Service Centre Upgrade Plan	*p. 34-35& App G*	940,000	692,130	248,000	940,130	130
		1,090,000	830,018	248,000	1,078,018	(11,982)
7.2 Information Technology						
a. Hardware Acquisitions	*p. 36*	232,000	232,074		232,074	74
b. Purchased Software and Upgrades	*p. 36*	295,000	349,653		349,653	54,653
c. Business Network Security Review	*p. 36*	65,000	68,495		68,495	3,495
d. Meter Reading System	*p. 37*	148,000	150,994		150,994	2,994
e. Turbine Maintenance Software	*p. 37*	60,000	4,758	55,000	59,758	(242)
f. Customer Self Service	*p. 37-38*	150,000	105,827	44,000	149,827	(173)
g. Security Enhancements	*p. 38*	75,000	80,292		80,292	5,292
h. Email and Database Software Enhancements	*p. 38*	49,000	9,246	40,000	49,246	246
		1,074,000	1,001,339	139,000	1,140,339	66,339
		2,164,000	**1,831,357**	**387,000**	**2,218,357**	**54,357**
Sub-total		**29,888,000**	**28,728,834**	**2,553,000**	**31,281,834**	**1,393,834**
8.0 Capitalized General Expense	*p. 39*	527,000	475,368		475,368	(51,632)
9.0 Interest During Construction	*p. 40*	400,000	432,111		432,111	32,111
TOTAL		**$ 30,815,000**	**$ 29,636,313**	**$ 2,553,000**	**$ 32,189,313**	**$ 1,374,313**

2018 Projects Carried Over to 2019								
Original Project Year-ID	**Description**	**2018 Approved Budget UE17-03**	**Actual Expenditures 2018**	**Proposed Deferral to 2019**	**September 30, 2019 YTD Expenditure**	**Forecast as of September 30, 2019**	**Forecast Variance from the Approved Capital Budget**	**2019 Notes**
2018-4.3 (a)	Alterations to the Reverse Osmosis Water Treatment Plant	$ 50,000	$ 8,320	$ 50,000	$ -	$ (8,320)	$ (50,000)	The Company has decided to cancel this project as it is reviewing alternatives that may be more cost effective and align with future plans for the CT3 balance of plant building requirements.
2018-5.4	Brookside Drive to Hazelbrook Extension	411,200	-	411,000	82,290	715,000	303,800	Construction of the Trans Canada Highway to Brookside Drive Project commenced and is expected to be completed in Q4. The Brookside Drive Project is now forecast to cost $300,000 more than budgeted based on updated costing information from the construction survey and the added complexity of working in an area with high volume traffic. To offset this forecast increase, the Trans Canada Highway to Mount Herbert Project has been cancelled.
2018-5.4	TCH to Mt Herbert Extension	303,500	-	304,000	-	-	(303,500)	Project cancelled due to the Brookeside Drive Project forecast increase noted above.
2018-5.6(a)	Bridge Meter Pilot Project	50,000	28,128	22,000	22,050	22,050	178	Project complete.
2018-5.8	Transportation Equipment	1,343,000	739,707	605,000	5,177	605,000	1,707	The reel trailer and two aerial bucket trucks were delivered in Q3 2019 and payments will be processed in Q4.
2018-6.1(a)	Mount Albion Substation	1,338,000	1,227,960	110,000	401,552	110,000	(40)	Approximately $190,000 of YTD charges of $401,552 relate to the 2019 Substation Modernization Program. These expenditures have been transferred to the 2019 substation Modernization Program in October 2019.
2018-6.1(b)	Mount Albion Transformer	822,000	342,404	480,000	470,318	480,000	404	Project complete.
2018-6.1(e)	Crossroads Control Building	117,000	3,417	114,000	5,413	114,000	417	Construction of the Crossroads building has begun and is expected to be substantially completed by year end.
2018-6.2(c)	T-2 Line Extension to Mount Albion Substation	141,000	72,368	70,000	185,744	186,000	117,368	The Mount Albion Extension to Substation project has been completed with a budget overage of $117K due to a) extra costs incurred to build temporary structures for coordination of rotation and phasing prior to and during substation commissioning and b) extra work resulting from the construction survey details that identified the need to relocate a section of T2 in order to properly align the three distribution circuits exiting the substation. A 2019 project to rebuild a section of Howlan Road has been cancelled and a portion of the approved dollars for that project will offset the over budget variance in this project.
2018-7.1(b)	West Royalty Service Center Upgrade plan	940,000	692,130	248,000	261,463	268,000	20,130	West Royalty Service Center Upgrade Plan completed. The increase over budget relates to land grading around the Fabric Storage Building.
2018-7.2(e)	Turbine Maintenance Software	60,000	4,758	55,000	46,575	55,000	(242)	Project complete.
2018-7.2(f)	Customer Self Service	150,000	105,827	44,000	46,616	46,616	2,443	Project complete.
2018-7.2(h)	Email and Database Software Enhancements	49,000	9,246	40,000	5,200	40,000	246	The Email and Database Enhancement Project is in progress with email portion in production and the database portion expected to be in production in December.
		$ 5,774,700	**$ 3,234,265**	**$ 2,553,000**	**$ 1,532,398**	**$ 2,633,346**	**$ 92,911**	

I N T E R R O G A T O R I E S

Section IR-1

Attachment 2

Maritime Electric
Capital Expenditure Forecast
For the Period Ended September 30, 2019

Project Description	2019 Annual Capital Budget Section	Actual to Sept 30, 2019	Approved Budget - 2019 UE18-09	Approved SBR UE19-07	TOTAL Approved Budget - 2019	Forecast Capital Expenditure 2019	2019 Forecast Carryover to 2020	Total 2019 Forecast	Variance - Budget Vs Forecast	Notes
			A	B	C = A + B	D	E	F = D + E	G = F - C	
Generation										
Charlottetown Plant Buildings and Services Projects	4.1	$ 47,359	$ 171,000	$ -	$ 171,000	$ 171,000	$ -	$ 171,000	$ -	The ECC Roof Work was completed late in Q3. A report has been received on the ECC SCADA Simulator project and 4 software solutions are currently being evaluated. A decision on a software package will be made in the near term however this project may require a carryover to 2020 for completion.
Charlottetown Plant Boiler Projects	4.2	1,000	8,000	-	8,000	8,000	-	8,000	-	
Charlottetown Plant Turbine-Generator Projects	4.3	147,121	1,424,000	-	1,424,000	337,000	1,087,000	1,424,000	-	One week before the CT3 Overhaul Project was to begin, the project vendor and OEM, General Electric, notified the Company that it would have to subcontract the work to a 3rd party to complete the project in the agreed upon timeline for 2019. In addition to the added risk of subcontracting the work versus having the work completed by the OEM, the suggested subcontractor does not have a test cell on site to complete testing of the CT before returning it to Maritime Electric. For these reasons, the Company has decided to postpone the completion of the CT3 Overhaul Project until 2020 when it can be completed and tested by the OEM. Approximately $148k has already been committed on this project to date. Turbine Electronics parts (Project 4.3b) will be ordered in Q4 and are expected to be delivered before year end.
Borden Plant Projects	4.4	19,398	143,000	-	143,000	50,000	-	50,000	(93,000)	Replacement Automatic Voltage Regulator for CT2 was installed and commissioned during the CT2 annual outage between May 21 to June 7. The forecast has been reduced based on year to date experience. The remaining budget is provisional in nature and replacements only occur as required. The forecast has been lowered accordingly.
Subtotal - Generation		**$ 214,878**	**$ 1,746,000**	**$ -**	**$ 1,746,000**	**$ 566,000**	**$ 1,087,000**	**$ 1,653,000**	**$ (93,000)**	
Distribution and Transmission										
Replacement due to Storms, Collisions, Fire and Road Alterations	5.1	$ 1,820,307	$ 1,418,000	$ -	$ 1,418,000	$ 1,995,000	$ -	$ 1,995,000	$ 577,000	Expenditures on system alterations to accommodate road and bridge work is forecast to be over budget by $577,000. This overage is due to a higher than normal volume of work in 2019 which included the following projects: North Lake Bridge replacement, Searletown (Leards Pond) bridge and realignment, Anglo Tignish (Shea's Pond) bridge replacement, Victoria Cross roundabout, Millboro road work, Grand River roundabout, Cornwall (Terry Fox Complex) intersection, Bypass Highway (Cornwall) roundabouts, overpasses and road modifications, St. Peters Road/Norwood Road intersection, Mason Road roundabout, Stratford Road modifications, Northridge Parkway roundabout, and Granville Street (Summerside) roundabout.
Distribution Transformers	5.2	3,726,440	4,168,000	-	4,168,000	4,741,000	-	4,741,000	573,000	PEI housing starts, under construction and completions have increased significantly in 2018 and 2019. In 2018, according to the Canada Mortgage and Housing Corporation, housing starts for PEI increased by 72% over the previous 4 years. In 2019, housing starts are forecast to increase by 78% over the previous 4 years compared to an estimated 58% increase used at the time the 2019 capital budget application was prepared. In the past 12 months in PEI, there have been 1438 housing starts compared to 1124 the previous 12 months ending in June 2019. This increase in housing construction coupled with rebuilds and other construction growth increased the demand for polemount and padmount transformers in 2019. The variance is reduced from $762,000 in Q2 to $573,000 in Q3 as the total padmount order will not arrive until 2020.
Services and Street Lighting	5.3	3,511,562	4,375,000	-	4,375,000	4,667,000	-	4,667,000	292,000	Variance reflects above average housing starts and related demand for new services as detailed in the "Distribution Transformers" note directly above. Expenditures on street lighting are tracking on budget.
Line Extensions	5.4	2,075,527	2,928,000	-	2,928,000	3,505,000	-	3,505,000	577,000	customer driven line extension in Brudenell that was not known at the time of the capital budget submission. A corresponding customer contribution of $190,000 is forecast for this project (see Contributions forecast below). Reliability driven line extensions in West Royalty is underway and the Bonshaw Circuit (West River Bridge) project is scheduled to begin in Q4.

Maritime Electric
Capital Expenditure Forecast
For the Period Ended September 30, 2019

Project Description	2019 Annual Capital Budget Section	Actual To Sept 30, 2019	Approved Budget - 2019 UE18-09	Approved SBR UE19-07	TOTAL Approved Budget - 2019	Forecast Capital Expenditure 2019	2019 Forecast Carryover to 2020	Total 2019 Forecast	Variance - Budget Vs Forecast	Notes
			A	B	C = A + B	D	E	F = D + E	G = F - C	
Line Rebuilds	5.5	3,632,346	4,245,000	560,500	4,805,500	4,633,500	-	4,633,500	(172,000)	YTD expenditures on completed rebuild projects are approximately $110,000 over budget as a result of being slowed by weather and/or hazardous line conditions (includes completed projects in Northport, Union Road, North Carleton Road and Crapaud). The rebuild project in Iona is currently underway. The Distribution Line Refurbishment Program is forecast to be over budget by approximately $230,000 associated with unanticipated deteriorated conductor replacement related to eastern cedar pole removals, and unanticipated realignment of aged sections of Inkerman and Euston circuits in the West Royalty Substation corridor which is being completed to accommodate the new West Royalty Substation 3rd Circuit (see related note in "Line Projects" below). To accommodate these over budget rebuild projects, the Howlan Road project has been cancelled and the approved $512,700 budget for this project will be applied against the budget overages noted above. This leaves an under budget variance of -$172,000. $55,000 of this is being used to offset the over budget variance in 2019 transmission line projects (Section 6.2) below and the remaining $117,000 is being used to offset the overage on the Mount Albion Extension Project noted in the 2018 carryover section below.
System Meters	5.6	535,785	655,000	-	655,000	655,000	-	655,000	-	Expenditures are in line with YTD forecasts; Work continues on the Bridge Meters for Load Research project. Of the 185 Watt Hour Bridge meters, all have been received, 44 have been installed and the remainder are scheduled for a November installation. The integration of the Demand Bridge Meters into the MECL meter reading software has been challenging but progressing & once successfully tested, the remaining meters will be installed.
Distribution Equipment	5.7	1,306,249	2,033,000	-	2,033,000	2,033,000	-	2,033,000	-	YTD distribution equipment purchases and installations are on budget.
Transportation Equipment	5.8	802,379	1,642,000	-	1,642,000	1,052,000	590,000	1,642,000	-	Purchase orders have been issued for all small and large Vehicles in the approved 2019 Capital Budget. Two Aerial Bucket trucks were ordered from Posi-Plus in Q1 but vehicle delivery will be in 2020 due to longer than 12 month delivery periods. Progress payments have been made and the balance of approximately $590,000 will be paid when the vehicles are delivered in 2020 resulting in the identified carryover.
Substation Projects	6.1	2,824,355	5,002,000	-	5,002,000	5,495,000	203,000	5,698,000	696,000	Project 6.1(c) - Substation Engineering and Environmental Assessment will have a carryover of $203,000 to 2020 based on the progress to date on obtaining the Environmental Impact Assessments for the Clyde River (originally New Haven) and O'Leary projects. The details related to the forecast variance of $696,000 are provided in a separate tab "Note 1 - Lorne Valley Substation" .
Line Projects	6.2	1,613,702	2,325,000	-	2,325,000	2,380,000	-	2,380,000	55,000	Extra work to refurbish and relocate 41 and 43 within the West Royalty substation corridor to accommodate the new 25 kV circuit (5.4b - West Royalty Substation 3rd Circuit project) was identified after budget approval. As this extra work was not planned for in the West Royalty Substation 3rd Circuit budget, it is being carried out under "Line Projects" as transmission line refurbishment. This is justified on the basis that these sections of line are over 40 years old with vintage components in need of replacement. This results in an over budget variance of $55,000 that is being offset by a portion of the budget for the Howlan Road Rebuild (see Section 5.5 above) which has been cancelled.
		$ 21,848,652	**$ 28,791,000**	**$ 560,500**	**$ 29,351,500**	**$ 31,156,500**	**$ 793,000**	**$ 31,949,500**	**$ 2,598,000**	
Less: Customer Contributions		(538,097)	(400,000)	-	(400,000)	(590,000)	-	(590,000)	(190,000)	Variance relates to a customer contribution of $190,000 toward 5 km 3-phase line extension (Budget section 5.4).
Subtotal - Distribution and Transmission		**$ 21,310,555**	**$ 28,391,000**	**$ 560,500**	**$ 28,951,500**	**$ 30,566,500**	**$ 793,000**	**$ 31,359,500**	**$ 2,408,000**	
Corporate										
Corporate Services	7.1	$ 124,627	$ 573,000	-	$ 573,000	$ 573,000	$ -	$ 573,000	$ -	
Information Technology	7.2	765,148	1,211,000	-	1,211,000	1,070,000	141,000	1,211,000	-	All IT Projects are in progress or scheduled for the remainder of 2019 with the exception of two. The implementation of Internal Audit Software has been deferred to early 2020 based on recommendations from the Vendor ($65k). As well Network Access Control software ($75k) has been displaced by other Cybersecurity priorities and will be deferred to 2020. Phase 2 of the Customer Service Contact Center enhancements is underway with a completion date of December. All Line trucks have been upgraded to new laptops, the remainder of the project will focus on Contractor Crews which is expected to be completed in Q4.
Subtotal - Corporate		**$ 889,775**	**$ 1,784,000**	**$ -**	**$ 1,784,000**	**$ 1,643,000**	**$ 141,000**	**$ 1,784,000**	**$ -**	
Sub-total		**$ 22,415,208**	**$ 31,921,000**	**$ 560,500**	**$ 32,481,500**	**$ 32,775,500**	**$ 2,021,000**	**$ 34,796,500**	**$ 2,315,000**	
Capitalized General Expense	8.0	432,330	527,000	-	527,000	527,000	-	527,000	-	
Interest During Construction	9.0	336,300	429,000	-	429,000	429,000	-	429,000	-	

Maritime Electric
Capital Expenditure Forecast
For the Period Ended September 30, 2019

Project Description	2019 Annual Capital Budget Section	Actual To Sept 30, 2019	Approved Budget - 2019 UE18-09	Approved SBR UE19-07	TOTAL Approved Budget - 2019	Forecast Capital Expenditure 2019	2019 Forecast Carryover to 2020	Total 2019 Forecast	Variance - Budget Vs Forecast	Notes
			A	B	C = A + B	D	E	F = D + E	G = F - C	
Capital Projects Carried Over from Prior Years	Appendix I - 2018 Variance Report	1,537,559	2,613,000	-	2,613,000	2,700,000	-	2,700,000	87,000	- The 2016 Substation Automation Project is underway and expected to be completed before year end. - The Company has decided to cancel the Reverse Osmosis Water Treatment Plant Project as it is reviewing alternatives that may be more cost effective as and align with future plans for the CT3 balance of plant requirements. - Construction of the Trans Canada Highway to Brookside Drive Project commenced and is expected to be completed in Q4. The Brookside Drive Project is now forecast to cost $300k more than budgeted based on updated costing information from the construction survey and the added complexity of working in an area with high volume traffic. To offset this forecast increase, the Trans Canada Highway to Mount Herbert Project has been cancelled. - The Bridge Meter Pilot Project is complete. - Transportation equipment carryovers (a reel trailer and two aerial bucket trucks) were delivered in Q3 2019 and payments will be processed in Q4. - The Mount Albion Transformer Project is complete. - The Mount Albion Substation Project is complete. Approximately $190k of YTD charges of $401,552 relate to the 2019 Substation Modernization Program. These expenditures have been transferred to the 2019 Substation Modernization Program in October 2019. - Construction of the Crossroads building has begun and is expected to be substantially completed by year end. - The Mount Albion Extension to Substation project has been completed with a budget overage of $117K due to a) extra costs incurred to build temporary structures for coordination of rotation and phasing prior to and during substation commissioning and b) extra work resulting from the construction survey details that identified the need to relocate a section of T2 in order to properly align the three distribution circuits exiting the substation. A 2019 project to rebuild a section of Howlan Road has been cancelled and a portion of the approved dollars for that project will offset the over budget variance in this project. - The West Royalty Service Center Upgrade Plan has been completed with a budget overage of $20k which relates to land grading around the Fabric Storage Building. - The Turbine Maintenance Software and the Customer Self Service Carryover Projects are completed and in production. The Email and Database Enhancement Project is in progress with email portion in production and the database portion expected to be in production in December. In summary, the forecast variance of $87,000 for 2018 carryover projects is made up of -$50K for the Reverse Osmosis Water Treatment Plant, +$117K for the Mt Albion Extension and +20K for the WRSC Upgrade Plan.
				-						
Total		**$ 24,721,397**	**$ 35,490,000**	**$ 560,500**	**$ 36,050,500**	**$ 36,431,500**	**$ 2,021,000**	**$ 38,452,500**	**$ 2,402,000**	

Note 1 - Lorne Valley Substation

Section 6.1 - Substation Projects
a. Lorne Valley 69 kV Switching Station Expansion

Item	Estimate	Revised Forecast	Difference	Notes
Grubb, strip topsoil and dispose of off site	$ 27,000	$ 47,148	$ 20,148	Increase in tree clearing required.
Supply, place subsoil, Class "A" and Class "D" gravel	126,500	350,330	223,830	Increase in subsoil quantities for grading issues. The quantity of Class D gravel was increased and Class "A" was decreased due to design of ground grid. It was determined in the grounding study that the native soil resistivity would require a custom grade of Class "D" gravel to ensure the safety of personnel in the station.
Supply and place geotextile material, topsoil, seeding, compaction and concrete testing	29,000	56,913	27,913	Increase in topsoil required due to elevated station base. This will alleviate erosion.
Supply and install straw bale check dams, culvert	16,000	6,285	(9,715)	Decrease in runoff mediation required due to land elevations.
Circuit Breaker Foundation	45,500	76,554	31,054	Increase in unit cost plus two extra foundations required due to bus layout and prep for future expansion.
Cable tray footing (sonotubes)	10,000	10,131	131	-
Switch Foundations	75,000	96,470	21,470	Budget based on 4 dead-end structures each with two smaller foundations and each dead-end had a separate switch with a foundation. The final design incorporated the three foundations together to optimize the substation layout. These foundations required extra rebar, concrete, and labor to construct as laid out in the note below.
Dead End Structure Foundations	120,000	149,104	29,104	
Ground grid and fence grounding	62,000	108,650	46,650	Increase in material quantity & cost. Design was more extensive due to soil conditions.
Cable trench and covers	88,000	41,143	(46,857)	Decrease as a result of savings on trench and install due to reduced quantity required.
Electrical PVC conduits	55,000	45,820	(9,180)	Decrease due to less conduit required.
Substation fence	22,000	51,163	29,163	Increase due to price increase plus larger footprint.
69 kV Breakers	268,000	277,000	9,000	Increase due to 2019 pricing & exchange rate.
69kV Disconnect Switches	384,000	243,235	(140,765)	Decrease due to better switch pricing.
Potential transformers, Service Transformers and Transfer Switches Equipment	248,000	203,651	(44,349)	Decrease due to savings in exchange rate variances in station service voltage transformers and lower cost potential transformers/voltage transformers.
Generator, Yard Lighting and security	110,000	59,385	(50,615)	Decrease due to savings on generator & equipment purchased.
Control Building, PCT (protection control teleprotection) and Communication Equipment Panels	336,000	566,987	230,987	The detailed protection and control design requires 12 panels, which is different from the preliminary design that required 8 panels. The preliminary design combined the protection and control for transmission lines, capacitor banks and breakers in one panel. The detailed design will have protection and control panels for each transmission line, capacitor bank and breaker. The detailed design provides improved reliability for operation and maintenance compared to the preliminary design. The protection and communication panels will be designed and built in house to help reduce the cost.
69kV Transmission Line Termination Structure	83,000	122,000	39,000	Original estimate included steel only and now also includes foundations.
High Voltage Buswork and Insulators	377,000	391,882	14,882	Increase in installation cost.
Steel Structures for Bus Work c/w foundations	118,000	515,885	397,885	Increase due to increases in concrete supply & installation costs (see below for further details).
Consultant Design	120,000	96,265	(23,735)	Decrease in consultant fees.
Contingency	100,000	-		Included in other line items above
Total Cost	**$ 2,820,000**	**$ 3,516,000**	**$ 696,000**	***

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The budget for the Lorne Valley 69 kV Switching Station Expansion was developed in 2018 based on previous projects and adaptations to the conceptual design required for this station. In 2019, the tenders for the civil contract went out in early spring and closed May 9th. The bids went to 7 local contractors and only 2 submitted bids.

has been large increases in the cost for this type of work. Some of these increases include concrete cost, labour rate, rebar, select borrow fill, class A and class D gravel, lumber and plywood for the forms and fuel for the heavy equipment and trucking. The increase in fuel affects the earthworks equipment from bulldozers to excavators. The trucking for the substation stone is delivered from the mainland via the bridge to Lorne Valley as the stone that is required for this station is not a stock item for the local contractors. There was also a considerable increase in the amount of subsoil fill required due to the elevation changes in the land where the site is being constructed. The amount of fill required in the final design increased by 4600 tones over what was budgeted in the conceptual design.