

**LWRF 2017 and 2018 Annual Reports
and ERA 2017 and 2018 Filing**

December 10, 2019

Mr. Robert Laking, Chair
Yukon Utilities Board
Box 31728
Whitehorse, Yukon Y1A 6L3

Dear Mr. Laking:

Re: Low Water Reserve Fund (“LWRF”) 2017 and 2018 Annual Reports, and 2017 and 2018 Energy Reconciliation Adjustment (“ERA”) Filing

This correspondence provides Yukon Energy Corporation’s (“Yukon Energy” or “YEC”) Annual Report summarizing Low Water Reserve Fund (“LWRF”) and Energy Reconciliation Adjustment (“ERA”) activities up to December 31, 2017 and December 31, 2018 based on actual results. This material was prepared pursuant to Yukon Utilities Board (“YUB” or “the Board”) directions as provided in Order 2018-10, 2019-04 and 2019-08, and is consistent with Yukon Energy’s September 23, 2019 Compliance Filing regarding Order 2019-04.

The following information is attached with this correspondence:

- **Attachment 1** – LWRF Calculations for 2017 and 2018 based on Board Order 2019-08 and Balance Updates.
- **Attachment 2** – 2017 and 2018 ERA Filing.
- **Attachment 3** – Update on 2019 Forecast Water Conditions.

In Order 2018-10, the Board directed that YEC create a deferral account, the LWRF, that “records the variance between actual thermal generation fuel costs (based on volume only) and the GRA forecast thermal generation fuel costs (based on volume only) that are due to changes in water conditions”. The Board also directed (paragraph 323) that YEC amend the Diesel Contingency Fund (“DCF”) term sheet to comply with the above directions, including a requirement for Board approval of any drawdown of the LWRF and for any rider to replenish the LWRF; and to transfer the balance in the DCF in its entirety to the LWRF (paragraphs 324-325). The following are noted with regard to the direction provided in Order 2018-10:

- The DCF fund amount was last approved for December 31, 2016. All funds in the DCF as of January 1, 2017 are transferred to the LWRP effective that date, as per the LWRP Term Sheet. The opening balance of LWRP for 2017 starts with 2016 DCF closing balance as reviewed in the tables below.
- Due to the Board Order 2018-10 direction that 2017 test year revenue requirement reflect actual grid loads, grid generation and fuel costs no payments into or out of the LWRP occurred in 2017 other than interest and Rider E rebates. Based on Board direction in Order 2018-10, the 2017 DCF Annual Report and the 2017 ERA Final Report provided to the Board on April 13, 2018, as revised in response to UCG-YEC-2-39 Revised – Attachment 1, are now no longer valid for 2017.¹

In Board Order 2019-04 the Board noted that “incremental generation due to incremental load must be removed from the LWRP calculations because this is a risk borne by the utility”, and directed that YEC follow a four step process with regard to the calculation of the LWRP (see Order 2019-04 pages 9- 10). Yukon Energy has addressed this direction in its December 10, 2019 Compliance Filing to Order 2019-04 and Board Order 2019-08 which includes an amended LWRP Term Sheet [Attachment 2.1-1].

A summary of each of the documents attached to this correspondence follows.

Attachment 1: LWRP Calculations and Balance as of December 31, 2017 and December 31, 2018

Attachment 1, Table 1 provides LWRP calculations and balance for 2017 and 2018 actuals, and Attachment 1, Table 2 provides a LWRP Continuity Schedule.

Board Order 2019-02 set Rider E to 0.00 cents/kW.h effective April 1, 2019. The LWRP balance is expected continue to be within +/- \$8 million, and therefore no Rider E calculation is provided in this filing.

In summary, the tables in Attachment 1 indicate as follows regarding the annual LWRP calculations and balance for 2017 and 2018:

¹ YEC notes that 2017 DCF Annual report provided on April 13, 2018 as revised in UCG-YEC-2-39 Revised Attachment 1 [YEC’s 2017/18 GRA] erroneously showed 2017 opening balance at \$5.770 million. The accurate opening balance is \$9.485 million as provided in Table 2 of 2016 DCF Annual report [filed with the Board on April 5, 2017], which provided final balances for 2012, 2013 and 2014 consistent with the Board’s approval of these balances in Section 2.4 of Appendix A to Board Order 2015-06.

- 2017 actuals:
 - Due to Board Order 2018-10 direction that the 2017 test year revenue requirement reflect actual grid loads, grid generation and fuel costs, no payments into or out of the LWRF occurred in 2017 other than interest and Rider E rebates.
- 2018 actuals:
 - Based on actual annual load for 2018, and the LWRF Term Sheet in the December 10, 2019 Compliance Filing to Order 2019-04 and Order 2019-08, the LTA thermal actual requirement for 2018 at forecast load is 18.733 GW.h with 15.511 GW.h LNG (Table 1, L17)².
 - The forecast LTA thermal generation requirement for 2018 was 16.355 GW.h, including 1.636 GW.h diesel and 14.720 GW.h LNG³ (Table 1, L18).
 - The resulting overall gap between forecast and estimated actual thermal generation for the 2018 GRA forecast load equals 2.378 GW.h (Table 1, L19), including 1.586 GW.h diesel and 0.792 GW.h LNG. The resulting payment required from LWRF to YEC for 2018 is \$0.534 million (Table 1, L20).⁴
- LWRF balances:
 - 2017
 - Based on YUB 2018-10 direction, the DCF balance at December 31 2016 is transferred to the LWRF [\$9.485 million as provided in Table 2 of 2016 DCF Annual report filed with the Board on April 5, 2017].
 - No incremental thermal generation charges into or out of the LWRF [revenue requirement for the 2017 test year is based on actuals].
 - Less Rider E rebates for 2017 at \$2.861 million.
 - Add interest charged to the balance at \$0.086 million.
 - Closing balance of \$6.710 million.
 - 2018
 - Opening balance of \$6.710 million.
 - Incremental thermal generation charge at \$0.534 million [YEC withdraws from LWRF, as per Attachment 1 Table 1].
 - Less Rider E rebates for 2018 at \$2.874 million.
 - Add interest charged to the balance at \$0.076 million.
 - Closing balance of \$3.379 million.

² In this Compliance Filing, LNG is assumed to displace 90% of the 2018 expected long-term average thermal requirements, subject to not exceeding total thermal less estimated diesel at forecast load.

³ The diesel and LNG mix in the GRA forecast was based on 10% diesel and 90% LNG.

⁴ Based on 2017/18 GRA average fuel costs at \$0.1467 per kW.h for LNG and \$0.2633 per kW.h for diesel as approved by YUB in Order 2018-10.

- Jan-April of 2019
 - The Rider E rebates for January 1 through March 31 of 2019 at \$0.853 million resulting in balance of \$2.526 million at April 1, 2019.

Attachment 2: 2017 and 2018 ERA Filing

Attachment 2, Table 1 provides the 2017 and 2018 actual ERA Filing and notes as follows:

- 2017 actuals:
 - No ERA is applicable for 2017 due to Order 2018-10 direction that 2017 test year revenue requirement reflect actual grid loads, grid generation and fuel costs.
- 2018 actuals:
 - Based on preliminary actuals, 2018 wholesales over GRA forecast results in added YEC costs of \$1.464 million and added YEC revenues from increase in wholesale of \$1.844 million. As a result, the change in revenues exceeds the change in costs, and no ERA amount is payable to YEC.

Attachment 3: Update on Forecast Water Conditions for 2019

Attachment 3 provides an update on forecast water conditions for 2019 as at mid-September and notes as follows:

- Aishihik Lake water level as of September 19, 2019 was 0.33 m below the historic median level largely due to lower snowpack over the winter of 2018/19. However, Aishihik watershed has experienced higher than average inflows in August and September 2019. If the average inflows continue in 2020 it is expected that Aishihik Lake will refill to just above the 25th percentile line by the end of the summer of 2020.
- Marsh Lake has experienced lower than average inflows over the summer of 2019. However, even with lower than average inflows, Marsh Lake has reached the Full Supply Level. Assuming average inflows into the Marsh Lake during remainder of the year, it is expected that Marsh Lake will draw down to just above the Low Supply Level by May 2020 and with average inflows in 2020 it is expected that Marsh Lake will refill to above the Full Supply Line by the summer of 2020.
- The elevation of Mayo Lake, as of September 17, 2019, was 663.49m which is only 0.24m above Low Supply Level. This is the lowest lake elevation observed on record for this time of year, largely due to low snowpack in the Mayo Lake watershed over the winter of 2018/19. In addition, Mayo Lake has experienced very low inflows

over the summer of 2019. Therefore, Yukon Energy submitted and was approved an emergency water licence amendment to reduce summer flows to 6 m³/s which stopped the decent of Mayo Lake. Assuming low inflows into Mayo lake continue for the remainder of 2019, it is expected that Mayo Lake draw-down below the original Low Supply level of 663.25m but stay above the emergency water licence Low Supply level of 662.90m by May 2020.

If you have any questions regarding the above please contact the undersigned.

Yours truly,

A handwritten signature in black ink, appearing to read 'Ed Mollard', written in a cursive style.

Ed Mollard, CPA, CGA
Chief Financial Officer
Yukon Energy Corporation

ATTACHMENT 1: LWRF CALCULATIONS AND BALANCE UPDATES FOR 2017 AND 2018

Table 1: LWRF Calculations for 2017 and 2018

Table 1: LWRF calculations for 2017 and 2018		2017	2018	Notes
Line No				
L1a	Diesel Fuel Cost per kW.h	26,743	26,333 cents/kW.h	
L1b	LNG Fuel Cost per kW.h	17,790	14,668 cents/kW.h	GRA Application Average Fuel cost (2017/18 GRA Application)
L1c	GRA YIS firm Load forecast	446,458	420,265 MW.h	
L1d	GRA LTA Thermal Generation forecast	13,261	16,355 MW.h	
Calculation of Thermal Cost to Charge (Refund) LWRF				
<i>Assumptions</i>				
L2	YEC Grid load	446,458	450,086 MW.h	Actual
L3	Fish Lake	7,103	5,458 MW.h	Actual
L4=L2+L3	Total Grid load	453,561	455,544 MW.h	
<i>Assumed Actual Generation Sources</i>				
L5	YECL Fish Lake	7,103	5,458 MW.h	Actual
L6	YEC Hydro	431,951	412,771 MW.h	assumed actual (L2-L7-L8)
L7	YEC Thermal	14,474	37,316 MW.h	Actual
	<i>Diesel</i>	4,618	7,186 MW.h	Actual
	<i>LNG</i>	9,856	30,130 MW.h	Actual
L7a	<i>YEC Diesel/LNG charged to capital, RFID and maintenance</i>	1,213	1,361 MW.h	Actual
L7a1	<i>Diesel</i>	995	1,003 MW.h	Actual
L7a2	<i>LNG</i>	218	358 MW.h	Actual
L7b=L7-L7a	<i>YEC Net Diesel/LNG</i>	13,261	35,955 MW.h	Actual
L7b1	<i>Diesel</i>	3,623	6,183 MW.h	Actual
L7b2	<i>LNG</i>	9,638	29,772 MW.h	Actual
L7b3=L7b1/L7b	<i>Diesel % of total net thermal</i>	27%	17%	
L8	YEC Wind	33	- MW.h	Actual
L9	Total Grid load	453,561	455,544 MW.h	
<i>LTA Expected Generation Sources</i>				
L10	YECL Fish Lake (expected)	7,103	8,391 MW.h	Based on YEC forecast in 2017/18 GRA [2017 is based on actuals].
L11	YEC Wind (expected)	33	- MW.h	
L12=L9-L10-L11	YEC Grid load net of expected Fish Lake and Wind	446,425	447,153 MW.h	
L13=L12-L1c+L11	Load Variance	0	26,889 MW.h	
L14	LTA Thermal Generation at Actual Load	13,261	31,391 MW.h	Estimated based on LWRF Term Sheet
L15=L17/L14	Actual Thermal Generation as % of LTA Thermal Generation at Actual Load	100%	115%	
L16=L1d*L15	Estimated Actual Thermal Generation at Forecast Load	13,261	18,733	
L17=L16	Estimated Actual Thermal Generation at Forecast Load	13,261	18,733 MW.h	
L17a	Diesel	3,623	3,221 MW.h	Total thermal less LNG below. 90% of total thermal, subject to not exceeding total thermal less estimated diesel forecast load.
L17b	LNG	9,638	15,511 MW.h	
L18=L1d	Forecast YEC Net Thermal Generation	13,261	16,355 MW.h	
L18a	Diesel	3,623	1,636 MW.h	
L18b	LNG	9,638	14,720 MW.h	
L19=L17-L18	YEC Thermal Generation to be included in LWRF	-	2,378 MW.h	
L19a	YEC Diesel Generation to be included in LWRF	-	1,586 MW.h	
L19b	YEC LNG Generation to be included in LWRF	-	792 MW.h	
L20=L1axL19a+L1bxL19b	Incremental YEC Thermal Generation Cost to Charge (Refund) LWRF (\$000s)	\$0	\$534	

Table 2: LWRF Continuity Schedule

Line	Activity	2017 (\$000s)	2018 (\$000s)
A	Opening Balance ¹	\$9,485	\$6,710
B	Incremental Diesel Generation Cost to Charge/(Refund) ² to LWRF	\$0	\$534
C=B	Total LWRF operation for YEC		
	YEC pays to LWRF	\$0	\$0
	YEC withdraws from LWRF	\$0	(\$534)
D=A+C	LWRF Balance after Annual Operation	\$9,485	\$6,176
E	Interest on LWRF Balance ³	\$86	\$76
F=D+E	LWRF Balance after Interest charge	\$9,571	\$6,253
G	Rider E (Rebate)/Collections [January - December]	(\$2,861)	(\$2,874)
H=F+G	LWRF Ending Balance	\$6,710	\$3,379
I	LWRF (Rebate)/Collections January - March 31, 2019		(\$853)
J=H+I	LWRF Balance, After (Rebate)/Collections to March 31		\$2,526
K	LWRF Cap ⁴		+/-8000
L=J-K	LWRF Rebate/(Collections) Required		\$0

Notes:

1. Opening Balance is based on 2016 DCF ending balance as provided in DCF 2016 Annual Filing.
2. Based on calculations in Table 1.
3. Per the March 11, 1996 letter recording the settlements [provided as Exhibit B-16 in the 2008/2009 GRA] the DCF fund is to attract interest based upon the short/intermediate term bond rates in which the Companies may invest the fund and any negative balances would only attract interest at the lowest short-term borrowing rate available to the Companies through a line of credit.
4. LWRF cap based on LWRF Term Sheet, YEC 2017-18 GRA Compliance Filing, Appendix 2.1, Attachment 2.1-1.

ATTACHMENT 2: 2017 and 2018 ERA FILING

Table 1: ERA Determination for 2017 and 2018

	2017	2018	
A Wholesales Variance for AEY (MW.h)			
Actual wholesales	328,426	332,270	A1
GRA approved wholesales assuming Fish Lake LTA generation	328,426	314,700	A2 [See note 1]
Fish Lake generation adjustment (expected LTA less actual)	0	2,933	A3 [See note 2]
Change in wholesales for ERA	0	14,637	A4=A1-A2-A3
B YEC Cost Impact per kW.h change in Wholesales			
Losses (%)	8.06%	9.34%	B1 [Actuals]
Total YEC's actual generation net of secondary (MWh)	446,493	450,086	B2 [See note 2]
GRA approved firm load forecast (MWh)	446,493	420,265	B3 [See note 1]
YEC incremental generation relative to GRA approved (MW.h)	0	29,821	B4=B2-B3
YEC's actual Thermal Generation not funded by LWRF (MWh)	13,261	33,577	B5 [See note 2]
GRA LTA Thermal Generation (MWh)	13,261	16,355	B6 [See note 1]
YEC Incremental thermal generation relative to GRA approved (MWh)	0	17,222	B7=B5-B6
Incremental thermal generation for incremental total generation (%)	0.00%	57.75%	B8=B7/B4
Thermal Generation cost per GRA (\$/kW.h)	0.2024	0.1583	B9 [See note 2]
YEC thermal cost change (\$/kWh wholesales)	0.0000	0.1000	B10=B9*B8*(1+B1)
C YEC Revenue Impact per kW.h change in Wholesales			
Rate Schedule 42 Energy Charge (\$/kW.h wholesales)	0.08298	0.08298	C1
Average YEC rider applicable to AEY retails (\$/kWh wholesales)	0.01975	0.02636	C2 [See note 3]
D Net thermal cost impact on YEC (\$000)			
Wholesale Change: Cost Impact (YEC thermal generation costs)	0	1,464	D1=A4*B10
Wholesale Change: Revenue Impact (YEC revenues)	0	1,844	D2=A4*(C1+C2)+A3*C1
Cost change>revenue change ("Yes"=1, "No"=0)	1	0	D3=is D1>D2 (absolute)
ERA Charge (rebate) to AEY [Net added cost (cost saving) for YEC]	0	0	D4=D3*(D1-D2)

Notes:

- 2017 is based on actuals as per YUB Order 2018-10; 2018 forecast as directed by YUB in Order 2018-10 [both subject to 2017/18 GRA Compliance Filing approval].
- Please see LWRF calculations in Table 1 for actual thermal generation numbers. B5 for 2018 equals actual 2018 thermal less LWRF funded water availability impacts at forecast load. 2017 thermal cost reflects actual weighted average costs.
- YEC Rider J revenues include actual Rider J [pre-2017/18 GRA] plus increase in Rider J based on YEC's 2017/18 GRA Compliance Filing. Average Rider is estimated total Rider J revenues [including 2017/18 GRA increase] from AEY retail customers divided by wholesales net of Fish Lake adjustments.