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IN THE MATTER OF YUKON ENERGY CORPORATION – VICTORIA GOLD CORPORATION GROUP POWER PURCHASE AGREEMENT

Before the

YUKON UTILITIES BOARD

November - December, 2017

FINAL ARGUMENT OF JOHN MAISSAN

Final Argument introductory comments

In this written final argument the Yukon Utilities Board is referred to as the "Board", Yukon Energy Corporation as Yukon Energy, Victoria Gold Corporation Group as VGC, and ATCO Electric Yukon as AEY. Interrogatory responses (IR) will be referenced by their identifying numbers.

In this argument I address both issues in which I generally agree with the applicant, Yukon Energy, and issues on which I have concerns. My silence on issues and requests of Yukon Energy in this argument are not to be interpreted as agreement with, or disagreement with, Yukon Energy's request or position. I leave these matters to the Board to address based on all the information on the record.

For my convenience I present this argument in two main sections – Matters of agreement and Matters of concern.

In my view it is appropriate for Yukon Energy to be providing power service to VGC through the YIS. One significant reason is a reduced level of greenhouse gas (GHG) emissions compared to the mine providing on-site diesel or LNG power generation to meet its requirements. Other reasons are explored below.

Matters of agreement

1. Summer hydro surplus on grid

Yukon Energy has stated (in public discussions on Yukon Energy's Integrated Resource Plan (IRP)) that the Yukon integrated power system (YIS) has a long term average annual hydro energy surplus of about 30 GWh, mainly in summer. A very large portion of this energy, if not all, could be used by VGC (and / or other mainly summer electrical loads, industrial or other). VGC's reduced electrical load for a period of 90 days each winter reduces the proportion of thermal generation that would otherwise be required to meet their needs.

2. Proposed rates

The capital contributions being required of VGC appear to be reasonable based on the YIS system improvements and adjustments required to provide a stable power quality and reliability on the YIS while serving VGC. The proposed fixed monthly cost to VGC also appears to be consistent with the Alexco PPA which received Board approval. The demand and energy costs proposed are consistent with Rate Schedule 39. However, as outlined in "Matters of concern" section of this argument, there is a need to have a Board approved Yukon Cost of Service (COS) study completed.

3. Opportunities for new renewable energy sources

The VGC electrical load over a period of about 10 years will provide an opportunity for Yukon Energy to advance new renewable energy sources in an expeditious manner and with limited long-term risk to non-industrial ratepayers. As outlined in Yukon Energy's IRP there are up-rates possible at the existing hydro plants. As well there is the possibility of installing a battery based energy storage system that can help meet peak load requirements and provide renewable energy in place of thermal energy (and other potential grid benefits such as providing spinning reserve and assisting in the integration of new intermittent renewable energy sources). The PPA also provides an opportunity to launch the long awaited Independent Power Producer (IPP) Policy to secure new renewable energy sources. These modest scale options present limited long-term risk to the ratepayers while providing renewable energy to displace GHG emitting thermal generation.

There would also be an opportunity to secure larger amounts of renewable energy through larger projects, whether developed by IPPs or by Yukon Energy, but these will require more careful analyses for ratepayer risk exposure.

Although the YIS has had a hydro surplus of about 30 GWh per year based on long term average water records, the below average water availability at Mayo Lake in the fall of this year (2017) has shown how very close to the margin of using all of its hydro energy the YIS is. The reduction of about 4 MW in the Mayo hydro plant output is significantly increasing the thermal generation requirements on the YIS, both for peaking and for energy. This underlines to need to take advantage of the 10-year VGC load opportunity to increase our renewable energy supplies.

<u>Matters of Concern</u>

4. Transmission lines proposed are not the lowest cost for Yukon ratepayers

The Stewart Crossing Keno City Transmission Line Project (SKTP) at 138 kV and with H-frame structures is a "nice to have" for the YIS if someone else will pay for it. It would be a speculative investment for one or more as yet non-existent industrial power customers beyond Keno City. If any portion of this line is built at ratepayer expense, it would not justifiable compared to the alternative of a 69 kV line on single pole structures. Between Stewart Crossing and the Mayo hydro plant there is a relatively new 69 kV power line designed to carry about 10 MW to Mayo. This will not be adequate to carry the required power for VGC and other customers with the Mayo hydro plant out of service (as it may need to be from time to time in the non-winter period). Building and operating a 138 kV line in parallel with the 69 kV line is overkill. Either a parallel 69 kV line with a higher carrying capacity or reconductoring the existing line for a higher carrying capacity would be lower cost solutions.

While the need to replace or rebuild significant portions of the existing 69 kV line between the Mayo substation and Keno City is not in dispute, a rebuilt 69 kV line with a higher carrying capacity would adequately serve the needs of VGC and the existing customers beyond the McQuesten substation, including Alexco. The ratepayers should not be on the hook for the speculative additional investment required for a 138 kV H-frame power line between the Mayo hydro plant and the McQuesten substation. Such a line would only become justifiable with the addition of a second industrial customer the size of VGC or larger beyond Keno City.

Should government money not be available for the SKTP, Yukon Energy has as its default option a 138 kV H-frame power line between the Mayo substation and the McQuesten Substation to be paid for by ratepayers. Since this facility will have a 65-year life (JM-YEC-1-9) and VGC would be sharing in its costs only during its 10 year projected life, the remaining ratepayers would be on the hook for the remaining 55 years.

Recommendation: that the Board orders Yukon Energy, if it must implement the default transmission option, to implement the substantiated lowest cost option.

5. Risks to ratepayers downplayed

While Yukon Energy has calculated the net benefits to all ratepayers during the operation of VGC there are a number of potential risks to ratepayers that have been downplayed or not calculated. These include:

a) The annual cost to ratepayers of the default new transmission line option between the Mayo hydro plant and the McQuesten substation after the 10 year projected life of VGC (JM-YEC-1-9(b));

b) The risk of increased fuel costs as no inflation factors were used in the fuel requirements for thermal generation (JM-YEC-1-7). Over the past 10 years (the same time period as the projected life of the VGC mine) there have been significant fluctuations in the price of fossil fuels. A greater than proportionate share of the increase in the price of fuels would be borne by the non-industrial customers who caused the increase in fuel consumption. With thermal generation at about 89 GWh in 2021 (Table 3 Revised) it would take an increase of only about $0.10 per litre of diesel equivalent to increase costs by $1.9 million or more thus offsetting the calculated $1.93 million benefit of VGC;

c) The addition of the VGC to the YIS will result in a substantially higher diesel peaking requirement. Yukon Energy's response to JM-YEC-1-3 (Tables 2 and 3) indicates that in the 2020-2021 winter about 21.51 MW of diesel peaking will be required (105.21 projected peak less 70.5 MW hydro and less 13.2 MW of LNG = 21.51 MW of diesel required). This calls into question the 90% LNG : 10% diesel mix that Yukon Energy assumed in calculating the increased costs of serving VGC (JM-YEC-1-7) that is used in (Table 3 Revised). Thus, potential cost impacts to all ratepayers was not fully and objectively discussed;

d) It is possible that the YIS protection schemes will need to be adjusted between summer and winter (JM-YEC-1-13 (c)). This and potentially similar future operating costs (e.g. transmission line brushing) have the potential to add costs to other ratepayers disproportionally.

6. COS study required

Far too much time has elapsed since Yukon Energy and AEY have provided a joint Yukon COS study and analysis that the YUB supports. This calls into question and confuses the issue of whether Rate Schedule 39 and the proposed YEC-VGC PPA is fair to VGC and all other ratepayer classes. This adds needless confusion and cost to the process of setting fair rates for VGC through the PPA.

Yukon Energy points out in the application (page 5), that there is a high percentage of electric heat being installed in new residential and commercial construction. The upward pressures on the electricity system are only going to increase as the federal carbon tax is implemented. Some existing homeowners using oil are switching to electric heat as insurance companies get fussy about the oil tanks in service.

While, according to recent federal government information, the carbon tax is being implemented first in the fall of 2018 at $10 per tonne, it will increase to $20 per tonne in January 2019. So probably $30 per tonne in January 2020, the first full year of service to VGC. In response to climate change and the carbon tax more and more people are changing their habits to reduce fossil fuel consumption. Electricity is an obvious substitute choice for many applications.

Load patterns of residential and commercial electricity consumption are thus changing, and it is important to capture the effect of these changes in an updated COS.

In addition to the requirement for a Board approved COS study as use patterns change, it gets increasingly important for Yukon Energy and AEY to shift their DSM programming to peak demand management. The thermal generation and peak load issues are quite clearly illustrated in 5 (c) above and in Table 3 (revised) of the application. Regrettably the Board decided peak demand focused DSM unmerited in the AEY (Yukon Electric) 2013 GRA process, but with the significant demand growth since 2013, I strongly encourage the Board to reconsider and to order accelerated peak demand focused DSM programming in any future GRAs, including the Yukon Energy GRA currently before the Board.

Respectfully submitted,

John Maissan
December 22, 2017