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December 2, 2016

BY COURIER (2 COPIES) AND RESS

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street, Suite 2700, P.O. Box 2319
Toronto, Ontario M4P 1E4

Dear Ms. Walli:

Re: EB-2016-0152 – Ontario Power Generation ("OPG") - Payment Amounts

Enclosed please find a Notice of Motion by Environmental Defence in the above matter.

Yours truly,

Kent Elson

Encl.

cc: Applicant and parties in EB-2016-0152

ONTARIO ENERGY BOARD

EB-2016-0160

IN THE MATTER OF the *Ontario Energy Board Act*, 1998, S. O. 1998, c. 15, Schedule B;

AND IN THE MATTER OF an application by Ontario Power Generation (OPG) pursuant to section 78.1 of the *Ontario Energy Board Act*, 1998 for for payment amounts for the period from January 1, 2017 to December 31, 2021.

NOTICE OF MOTION

Environmental Defence will make a motion to the Ontario Energy Board ("Board") on December 16, 2016, at the offices of the Board, 2300 Yonge Street, 25th Floor, Toronto, Ontario.

PROPOSED METHOD OF HEARING: This motion is to be heard orally.

THE MOTION IS FOR:

1. An order that OPG provide full and adequate responses to Environmental Defence interrogatories 27-30, 33, 35, and 39 and undertakings JT1.17 (parts G, I, and J) and JT2.05.

THE GROUNDS FOR THE MOTION ARE:

Overview and Relevance

2. This motion concerns the costs that OPG seeks to recover from consumers for the Pickering Nuclear Generating Station ("Pickering"). Those costs are extremely high, amounting to approximately **$7.5 billion** over the test period.[1] Pickering's non-fuel operating costs per kWh are the highest of all nuclear stations in North America and its forced loss rate is 6.5 times the North American average and 13.3 times the top

[1] JT2.2.

quartile.[2] All of Environmental Defence's questions relate to whether the costs sought by OPG to operate Pickering are just and reasonable.

3. Although there are many ways to assess the reasonableness of Pickering's costs, Environmental Defence is focusing on reasonableness vis-à-vis a proxy for a "market price," namely the least-cost generation alternative to Pickering. Rate setting often strives to be a surrogate for a competitive market. Based on that principle, Pickering should not receive costs on a per MWh basis that are higher than the least-cost alternative. In the very least, this proxy for a "market price" should be considered when approving the rates relating to Pickering. To make that argument, Environmental Defence seeks to test the evidence that has been filed by OPG in this proceeding relating to the purported net benefit of Pickering vis-à-vis alternatives.

4. This "market price" argument applies after August, 2018, at which point the Clarington Transformer Station will be completed. Pickering is currently needed in order to keep the lights on in the Eastern GTA. But after the Clarington Transformer Station is built, Pickering is just one of the potential options to meet demand. At that point, Environmental Defence believes Pickering's costs should be capped at the level of the least expensive alternative.

5. Environmental Defence is *not* asking this Board to decide system planning issues or to decide whether Pickering should continue operate. OPG has mistakenly assumed that this is what Environmental Defence is seeking to do, perhaps due to the references to "alternatives." However, again, that is *not* the case. Environmental Defence is seeking information about the cost of other generation options as part of an assessment of the reasonableness of the costs sought by OPG, *not* in an attempt to obtain an order that other alternatives be pursued instead of Pickering.

6. OPG has suggested that Pickering would provide $300 million in net benefits based on an IESO assessment that was filed. This would suggest that it is the least cost alternative. However, that assessment is invalid and out of date, including because:

[2] OPG 2015 Nuclear Benchmarking Report, p. 69 & 100 [F2-1-1, attachment 1].

a. It considers only one alternative, building new gas plants, and ignores a suite of lower-cost alternatives including greater use of non-firm intertie transactions, demand response, capacity auctions,[3] Quebec firm power imports, and so on;

b. It underestimates Pickering's costs;

c. It relies on old gas price forecasts, which have subsequently dropped significantly;

d. It fails to account for Pickering's high forced outage rates; and

e. It assumes the appropriate benchmark for cost-benefit purposes is Pickering's continued operation to 2020 rather than to August 31, 2018.[4]

7. Many of Environmental Defence's questions relate to these alleged problems with this net benefit analysis.

8. This overriding question for the Board in this motion is whether Environmental Defence is allowed to argue that the costs sought by OPG are unreasonable based on its "market price" argument and based on a critique of the cost-benefit analysis evidence filed in this proceeding. OPG has declined to answer a significant number of interrogatories relating to those issues. Those specific interrogatories and undertakings at issue are discussed in detail below, with the first four most important interrogatories/undertakings addressed first.

ED Interrogatory #39

9. This interrogatory asked that the IESO's net-benefit analysis regarding Pickering be recalculated based on a comparison with a different alternative. The IESO compared Pickering to one option: building new gas plants. Instead, we asked that Pickering be compared to a combination of an electricity trade agreement with Quebec plus the next least-cost sources. We asked that this be done for August 31, 2018, forward.

10. OPG declined to provide a response. Environmental Defence raised this question again at the technical conference and OPG responded as follows:

[3] See Issue 6.5, IESO response to GEC #56.
[4] According to the IESO's analysis, the net benefit of the Pickering extension is substantially lower if the reference point is 2018, not 2020. See F2-2-3, Attachment 1, page 61.

> OPG declines to respond to this request on the basis of relevance. As explained in JT1.17(n), the purpose of this proceeding is not to consider system planning or to determine whether Pickering should continue to operate. Furthermore, as noted in JT1.17(m), as a practical matter, there is no basis for assuming an August 31, 2018 shut-down date.[5]

11. OPG's refusal is not justified. As noted in paragraphs 2 to 8 above, Environmental Defence is *not* asking the board to determine whether Pickering should continue to operate as suggested by OPG. Instead, it is legitimately testing the net-benefit evidence filed by OPG. It is also legitimately seeking information to support its argument that Pickering's costs should be capped at a proxy for a "market price," namely the least-costly generation alternative. Again, August 31, 2018, is a key date because by that time Pickering will simply be one among many generation options to keep our lights on, and therefore should have its price set with reference to the cost of other generation options (i.e. a market price proxy).

12. The IESO also noted that hydro power imports from Quebec are insufficient as a sole alternative to Pickering because Quebec has a capacity shortfall during their winter peak.[6] However, that is no reason that an analysis cannot be done using a combination of alternatives including as much cheap Quebec hydro power as possible plus the next least-cost alternatives during Quebec's winter peak (when summer peaking jurisdictions such as Ontario tend to have available capacity). This is precisely what Environmental Defence requested – a comparison with a combination of the least-cost alternatives.

13. Finally, it is worthy to note that in October, 2016, Ontario signed an agreement with Quebec for 2 TWh per year of power at a cost of 5 cents per kWh according to news reports. Ontario's total import capability from Quebec is 16.5 to 18.5 TWh. This deal with Quebec was completed following the IESO's net-benefit analysis of Pickering and had not been reflected in that analysis.

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[5] JT1.17, attachment P.
[6] Schedule 7 ED-039.

ED Interrogatory #35

14. Part (a) of this interrogatory refers to the IESO's statement that there is "ongoing contingency planning in case Pickering extended operations does not proceed."[7] Environmental Defence sought a description of the contingency plan. No response was provided on the basis that the consideration of options is still ongoing and the "costs and other attributes of options will be better defined as the planning further progresses."[8] However, a description of the current iteration of the contingency plan could be provided. This discussion of other options will be relevant to Environmental Defence's contention that the costs of Pickering should be set with reference to the cost of other generation options (i.e. the market price argument discussed above).

15. Part (b) of this interrogatory requests a comparison of the cost and benefits of operating Pickering beyond August 31, 2018 versus meetings Ontario's peak day generation requirements with a set of cost-effective alternatives.[9] OPG declined to answer this on the following grounds:

> [T]he requested information is not relevant to deciding the issue before the OEB regarding the cost of Pickering Extended Operation. As the OEB has recognized in several prior decisions, the purpose of this proceeding is to establish payment amounts and not to decide system planning issues or determine whether specific generation facilities should continue to operate.[10]

16. Again, as noted in paragraphs 2 to 8 above, Environmental Defence is *not* asking the Board to determine whether Pickering should continue to operate as suggested by OPG. Instead, it is legitimately testing the net-benefit evidence filed by OPG. It is also legitimately seeking information to support its argument that Pickering's costs should be capped at a proxy for a "market price," namely the least-costly generation alternative.

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[7] Ex. F2-2-3, Attachment 1, Page 10.
[8] Schedule 7 ED-035.
[9] Those alternatives are: "a) curtailing natural gas-fired electricity exports; b) procuring more demand response resources; c) procuring more energy efficiency resources; d) importing renewable energy from neighbouring jurisdictions; and e) procuring more Made-in-Ontario green energy; and f) by the least-cost combination of options (a) to (e) inclusive."
[10] JT1.17, attachment N.

ED Interrogatory #30

17. This interrogatory requested that the IESO's cost-benefit analysis of Pickering Extended Operations be recalculated based on the IESO's best *current* estimates of the key variables listed in the interrogatory. Although the IESO has stated that it has not updated its assessment, that is not a justification for not doing so. The IESO has not stated that it would be overly onerous to plug updated variables into its model to provide a more current assessment. This would clearly be relevant, both to a legitimate testing of the evidence filed on the record and to Environmental Defence's "market price" argument.

18. There are a number of ways in which the cost-benefit analysis is clearly out-of-date and requires an update. For example:

    a. Ontario signed an agreement in October 2016 with Quebec for 2 TWh per year of power at a cost of 5 cents per kWh. This occurred long after the cost-benefit analysis was completed. This would clearly impact the net cost/benefit of Pickering as well as the cost of a suite of alternatives to Pickering.

    b. Gas prices have dropped significantly. The IESO's current gas price forecasts are 43% lower for January 2017 and 21% lower for December 2024 as compared to those used in the cost-benefit analysis.[11]

    c. OPG has provided evidence in this proceeding showing that the actual Pickering OM&A costs are over **5 times** higher than the OM&A costs included the cost/benefit analysis for the test period. This is highly relevant; the IESO noted that Pickering Extended Operations would not be cost-effective it its costs were 15-22% greater than the estimates provided by OPG. They are, in fact, over 500% greater. The actual OM&A costs for the test period and those included in the cost/benefit analysis are compared below:

	2017	2018	2019	2020	2021	Total
Pickering OM&A Included in Cost/Benefit Analysis (per ED#28)	$35	$79	$145	$218	$987	$1,464
Actual Pickering OM&A (per JT2.4)	$1,429	$1,491	$1,529	$1,474	$1,524	$7,447

[11] Schedule 7 ED-028; Schedule 7 ED-029.

19. The cost/benefit analysis is very out of date. Environmental Defence asks that the model re recalculated with updated variables (including the assessment relative to Pickering to 2018 at F2-2-3, attachment 1, p. 42). To clearly communicate which variables have been updated, Environmental Defence asks that the actual underlying spreadsheets be provided.

Undertaking JT2.05

20. OPG undertook to reconcile Pickering's total OM&A cases with the costs that were included in the cost/benefit analysis of Pickering. The undertaking included an agreement to: "provide a table of the Pickering costs that were not included for the purposes of … this cost-benefit analysis, along with an explanation as to why they were not included".[12]

21. OPG did not provide the requested table showing the costs that were not included in the cost-benefit analysis. This is necessary to reconcile the total OM&A figures with those included in the analysis.

22. OPG also did not fully list or justify the costs excluded from the cost/benefit analysis. For example, for 2021, approximately $644 million in operating costs were excluded.[13] The items that are listed and discussed in the undertaking response add up only to $141 million, which leaves the vast majority of the excluded costs unidentified and unexplained. Furthermore, OPG only address 2021 whereas in other years the excluded costs are even high (e.g. $1,642 in 2019).[14]

23. The OM&A numbers are central to the cost/benefit analysis. Environmental Defence requests a complete response, including a full reconciliation table as requested and an explanation for each cost item that is excluded from the cost/benefit analysis.

ED Interrogatory #27

24. This interrogatory requested the electronic spreadsheets underlying the economic assessment of Pickering. The spreadsheets were not provided. These spreadsheets are

[12] Technical Conference Transcript Day 2, p. 35, lns. 15-20.
[13] See JT2.5 and JT2.4.
[14] See JT2.5 and JT2.4.

relevant as they would allow Environmental Defence to recalculate the economic assessment based on a set of assumptions that it believes to be more accurate. It is not onerous to provide these spreadsheets as they already exist and this would greatly assist in testing the evidence put forward by the applicant.

ED Interrogatory #28

25. In part (b) Environmental Defence asked for Pickering's available capacity at the time of Ontario's annual peak demand. The response included this information for the years 2015 – 2019. Environmental Defence requests the information for 2020 – 2024 as well. Although these dates are partly outside the test period, they are relevant because they match the period covered by the IESO's net benefit analysis. That analysis can only be properly tested if intervenors can explore all the years covered by the original analysis.

ED Interrogatory #29

26. This interrogatory asked for the IESO's "best current estimates" of the input assumptions for its Pickering extension study and for the responses to be fully justified. The response contained some specific gaps that Environmental Defence requests be addressed:

    a. In part (b) Environmental Defence asked for the IESO's best "current" estimate of Pickering's forecast *available* capacity at the time of Ontario's annual peak demand. The response (i) provides the *installed* capacity figures for 2020 and 2022-2024, which fail to account for expected forced outages, and (ii) provided figures from the "Ontario Planning Outlook" report without confirming that those are the latest and current figures. Environmental Defence asks that those issues be addressed and that the IESO state their methodology and assumptions for calculating Pickering's available capacity at the time of Ontario's peak demand as requested in the interrogatory.

    b. In part (d) Environmental Defence asked for the IESO's best "current" estimate of the avoided generation by fuel type as a result of Pickering's extended operation. The IESO provided the "original" estimates that they provided in response to ED

#28. Environmental Defence requests the best current estimate or a justification as to why the estimate has not changed.

c. In part (e) Environmental Defence asked for the IESO's best "current" estimate of Pickering's forced outage rate, but the IESO referred again to its original estimate. Environmental Defence requests the best current estimate or a justification as to why the estimate has not changed.

d. In part (f) Environmental Defence asked for the IESO's "current" best estimate of the "available" capacity of new gas-fired peaking capacity as a percent of its installed capacity. In its response it stated that its "Indicative Capacity Contribution" is 89%. We request confirmation that this is identical to "available" capacity.

e. In part (g) Environmental Defence asked for the IESO's "best current estimate" of Pickering's fuel and operating costs per kWh, but the IESO did not provide it. As noted above, there is a huge disparity between the "incremental" costs that OPG provided to the IESO for its cost/benefit analysis and Pickering's total costs as provided by OPG in this proceeding. In light of this disparity, Environmental Defence requests the IESO's best current estimate, or a justification as to why its estimate has not changed.

f. In part (h) Environmental Defence asked for the IESO's "best current estimate" of Pickering's incremental capital expenditures, but the IESO did not provide it. Environmental Defence requests this information

g. In part (l) Environmental Defence asked for Ontario's incremental peaking capacity requirements if Pickering is not extended. Environmental Defence requests confirmation that the figures provided are indeed the current estimates versus the original estimates used in the cost/benefit analysis.

h. In part (m) Environmental Defence asked for the IESO's best estimate of meeting the NPCC resource adequacy criterion by: a) domestic supply sources; b) demand response resources; c) energy efficiency resources; and d) electricity imports from neighbouring jurisdictions. OPG and the IESO declined to provide this

information and merely repeated that the cost of new gas-fired peaking capacity is used as a "proxy" for the costs of the other options. This answer is not satisfactory since the cost of some or all of these options could be significantly lower. For example, the maximum capacity shortage will be 2,316 MW and according to the IESO, Ontario has the ability to import 5,200 MW from neighbouring jurisdictions. Imports are just one example of the alternative options that are less expensive than the cost of new gas-fired peaking capacity.

ED Interrogatory #33

27. This interrogatory asked for information about the quantity and price/cost of surplus baseload generation and curtailed wind, water and solar generation due to Pickering's extended operation. OPG declined to answer this based on relevance.[15] However, this information is relevant to the market price issue discussed above (i.e. whether Pickering is the least cost alternative to meet our electricity needs and hence whether all its costs should be included in rates).

28. The forecasts of surplus generation and curtailed generation will help determine how much of Pickering's forecast generation will be displacing Ontario gas-fired generation to meet our domestic electricity needs. This will help determine feasibility of water power imports from Quebec and energy efficiency investments as potential alternatives in a cost-benefit analysis of Pickering (because it may not be necessary to assume that 100% of Pickering's forecast generation would need to be replaced).

29. The forecast revenues from Pickering's electricity exports and the forecast cost of curtailed water, wind and solar generation are also needed to properly assess and test a cost-benefit analysis of Pickering.

Undertaking JT1.17 G (Re ED Interrogatory #28)

30. Undertaking Response JT1.17, Attachment G, states that the Pickering extended operations cost benefit analysis assumes the following forced outage rates for Pickering between 2016 and 2022:

[15] JT1.17, attachment M.

a. Between 7.0% and 7.2% for units 1 & 4; and

b. 4% for Units 5 – 8.

31. Environmental Defence asks that a more fulsome response be provided which explains how those figures were derived, especially in light of the following:

a. According to the IESO's *Ontario Margin Reserve Requirements: 2016 -2020* (December 21, 2015), the available capacity of thermal generating units are derived using an "analysis of a rolling five-year history of actual forced outage data" (p. 10);

b. Pickering's average forced outage rate between 2010 and 2015 was 8.5% (Issue 5.1, Board Staff Interrogatory #83);

c. Pickering's rolling average forced loss rate in 2014 as defined by OPG's 2015 Nuclear Benchmarking Report was 10.8% [Response to ED #28 (e)]; and

d. Pickering's average forced outage rate between 2006 and 2015 was 12.38% (ED #19).

Undertaking JT1.17, Attachment I (re: ED Interrogatory #34)

32. OPG undertook to provide the following information: "for the years 2021 to 2024 inclusive: please provide for each year the IESO's estimate of: a) Pickering's installed capacity; and b) available capacity at the summer peak. Please describe the IESO's methodology and show its calculations for calculating the difference between installed and available capacity." This was not done and no explanation was provided as to why not. According to the IESO's *Ontario Reserve Margin Requirements: 2016-2020,* (December 21, 2015), the available capacity of thermal generating units are derived using an "analysis of a rolling five-year history of actual forced outage data" (p. 10). Environmental Defence asks that the requested information be provided.

Undertaking JT1.17, Attachment J (re: ED Interrogatory #36)

33. Environmental Defence asked for the MW adjustments made to account for the forced outage rates of Pickering and, if no adjustments were made, for this be reconciled with the IESO's *Ontario Reserve Margin Requirements: 2016 – 2020* report, which states:

"Equivalent forced outage rates (EFOR) of existing units are derived based on analysis of a rolling five-year history of actual forced outage data." [p. 10]

34. The data provided showed that the Pickering's available capacity for 2016, 2019, and 2020 equals its installed capacity (i.e. no adjustments were made for forced outage rates). Environmental Defence asks that this be reconciled with the *Reserve Margin* report.

Conclusion

35. OPG has put forward an IESO analysis purporting to show that Pickering will provide $300 million in net benefits despite being the most expensive nuclear station in North America in terms of non-fuel operating costs and despite the very high test period costs of $7.5 billion.[16] Environmental Defence respectfully submits that it should be permitted to test and challenge this evidence because it has been put forward in support of OPG's application and because it is relevant to Environmental Defence's contention that the costs for Pickering should be capped at the level of the least-cost alternatives as a proxy for a market price.

THE FOLLOWING DOCUMENTARY EVIDENCE will be used at the hearing of the motion:

a. Evidence on the record in this proceeding; and

b. Any further evidence as counsel may advise and the Board may permit.

Date: December 2, 2016

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[16] JT2.2; OPG 2015 Nuclear Benchmarking Report, p. 69 [F2-1-1, attachment 1].