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November 3, 2013

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Subject: Wabagishik Rapids GS - Proposed Waterpower Project Part II Order Request

Further to my letter of November 1, 2013, I am providing my promised additional comments on the Environmental Report (ER) and in support of my request that a Part II order be issued for the proposed waterpower project at Wabagishik Rapids. The Environmental Report for the Wabagishik Rapids GS is deficient for the following reasons:

1) Contaminated Sediments

While it is well known that there are contaminated sediments in the lake (a 1986 MOE Sediment Study for Wabagishik Lake reported sediments containing heavy metals such as nickel (24 times above the severe effect level (SEL), copper (5 times above the SEL), arsenic (3 times above the SEL); lead (1.5 times above the SEL), iron and manganese exceed the SEL, and zinc, chromium and cadmium were elevated levels). The Environmental Report largely dismisses this issue without collecting any recent data. This is a serious oversight as the impoundment and operation of the facility may interact with the sediments in ways that re-suspend and mobilize contaminants, possibly impairing water quality, aquatic life and public waters used for drinking and swimming. The ER suggests that the contaminated sediments will not be a concern but the rationale is weak. The rationale for stating that there will be no effect needs further explanation; for instance, how will sudden operational increases in ramping effect sediment re-suspension and release of contaminants into the water column. More concerning is that this site is within the Sudbury area where there has been historical sulphur and metal deposition. For this reason there is the potential for sulphate-mediated¹ release of several metals known to be contained in the sediments of the lake. The planned daily water level fluctuations of + or – 5 cm in the lake and + or – 15 cm downstream of the facility are more than enough to cause concern, yet this important issue has been completely ignored.

¹ Szokan-Emilson et al. (2013) Drought-induced release of metals from peatlands in watersheds recovering from historical metal and sulphur deposition. Biogeochemistry DOI: 10.1007/s10533-013-9919-0.

2) Fish Passage, Spawning and Fish Species at Risk

It is proposed that the waterpower facility be constructed in the middle of Wabagishik Rapids which provide important spawning areas for walleye, the threatened Lake Sturgeon (a population that should be managed for recovery, not for additional stress), and a variety of other species.

The report notes that significant areas of this important spawning area will be lost due to the construction, footprint and operation of the facility. There have been no movement studies of fish species in the area impacted; therefore, it is impossible to determine the nature and extent of impact of the facility in the upstream areas due to the presence of the barrier, and any statements made regarding passage impacts are speculative at best. For instance, the presence of Lake Sturgeon has not been confirmed recently in Wabagishik Lake, they have been found immediately downstream area and there is no reason to think that the lake did not form part of the historical sturgeon habitat. Further, there are anecdotal accounts of sturgeon in the lake, but this has not been investigated further. As the province has a mandate to restore Lake Sturgeon in Ontario, it is disappointing to see the upstream habitat in the lake essentially written off without more detailed investigation and study. Like many areas in the province, the sturgeon population in this watershed is highly fragmented by existing dams and waterpower facilities, and appears to be quite small and fragile. Therefore, the probability of finding the species in the lake at such low abundance levels are very poor unless the sampling is quite intense. More intensive field work is required to ascertain the presence or absence of sturgeon in the lake currently, and a thorough investigation of historical records and anecdotal accounts should be carried out to see if they were present historically. This will enable effective evaluation of the impact of the dam on the potential to recover the species in these waters. Ontario's recovery strategy for Lake Sturgeon recommends:

- 1.3 Assess impediments to Lake Sturgeon recovery on a local scale and implement appropriate actions. Where feasible, remove existing threats (e.g., low head barriers).

The ER does not provide an adequate assessment of potential impacts and impediments to Lake Sturgeon recovery in upstream habitats. It seems likely that sturgeon formerly used the lake and it has not been adequately determined that periodic movements to the lake and back does not occur now. Recovery of sturgeon in the lake may be highly feasible, but the likelihood of recovery will be significantly diminished if passage is obstructed by the facility with no mitigation.

Fragmentation by dams and hydroelectric facilities has been identified as a key threat to the recovery of Lake Sturgeon in Ontario's Recovery Strategy for Lake Sturgeon, yet no provision for fish passage has been contemplated in the ER. Instead, possibly additional habitat fragmentation appears to be the planned approach, before conclusively verifying by telemetry, other assessment techniques, and a thorough historical records search that sturgeon are not and never have been in the lake, and that upstream and downstream movements between the river and lake do not occur.

The proposed replacement of spawning substrate downstream does nothing to address the potential fragmentation threat to recovery if sturgeon do, or formerly did, use upstream habitats. Nor does it address the potential threat to maintenance and sustainable management of the important walleye population if there is a connection between lake and river.

Moreover, the potential for successful replacement of spawning substrate in other areas downstream of the planned facility has not been examined carefully within the ER, it just seems to be assumed it will be effective without any further analysis. The ER states that if the substrate is not used, then it will be addressed later in negotiation with agencies. This approach will be highly problematic as the baseline data is weak and minimal concerning the extent of existing use, existing hatching success, existing survival or mortality rates, and existing production of walleye and sturgeon populations. Given the foregoing, it is difficult to conceive of how evaluation of success will be determined; this needs to be clearly defined prior to final approval of this ER. Otherwise the door has been opened to continuous debate over the need for further mitigation. The proposed evaluation criteria only examine the use of the new spawning areas and successful egg deposition and hatching. However, there is no indication of how many fish need to use the sites and no assessment of changes in the post-operational abundance and productivity of the species appears to be planned. I find these criteria overly vague and not particularly useful in evaluation of the success of compensation strategies.

A much more thorough analysis of impacts, a very careful examination of mitigation potential, and development of detailed, effective mitigation strategies are required, especially for the threatened Lake Sturgeon and the important walleye population (this species can also be severely impacted by dams and waterpower facilities). The potential for an important connection between the river and lake for walleye has been largely dismissed without any information on movement patterns. For instance, while it may be true that recruitment to the lake may be minimal at the larval stage, recruitment to the lake from walleye hatched in Wabagishik Rapids is still probable from older year classes or larger size classes that are able to negotiate the rapids at certain times of the year. This is another important gap that must be analyzed much more carefully before accepting the ER. The ER suggestion that the movement between lake and river by walleye is minimal is highly speculative and lacks supporting evidence.

Given the present information in the natural heritage report, it is certainly feasible that both walleye and sturgeon could find their way upstream and use the habitats in the lake, I recommend that further field work (telemetry etc.) be carried out to find out in certainty that sturgeon and walleye do or do not access upstream waters. In addition, it seems fairly certain to me that nothing would have prevented sturgeon from using upstream waters in the past; hence, my suggestion that a thorough review of historical documents be undertaken to see if sturgeon historically used the upstream reaches and lake. It is probable that sturgeon and walleye have been reduced in the area by previous habitat disruptions (e.g., dams, habitat destruction, exploitation etc.).

If there is an important connection between the lake and river for walleye and sturgeon, this must be determined before any decision on provision of fish passage is made as there could be significant harm to the river and lake fish stocks. In addition, there is a need to assess the past and present abundance of sturgeon much more carefully and intensively before the potential effects of the dam on sturgeon recovery in the watershed can be evaluated. As sturgeon recovery is mandated in the province, it seems logical to evaluate the potential effects of the

project on sturgeon recovery. To do this, there is a need to effectively identify past and present occurrence of the species both above (including the lake) and below the rapids. Historical presence-absence can be ascertained effectively by reviewing historical records, ATK and local knowledge. Use of anecdotal information is a valid approach^{2,3} and should be gathered in all such projects where species recovery is needed. As there is some anecdotal information to suggest sturgeon have been encountered in the lake, this should be further explored prior to approval of the ER. Similarly, the potential movement of walleye above and below the proposed structure needs to be ascertained in detail. The lack of data concerning the upstream and downstream movements of walleye and sturgeon is a significant gap that needs to be filled; otherwise, the effectiveness of mitigation and compensation plans cannot be assessed.

Xeneca believes that MNR should be able to meet its fisheries management objectives without the provision of fish passage. However, there is little rationale provided and of course this ignores the provincial recovery strategy for Lake Sturgeon which, among other objectives, recommends removing threats such as low head barriers, not adding additional threats, and to increase abundance by habitat improvement. While passage may be a critical factor in the assessment of impacts, it is treated very lightly, indicating that final agreement will be achieved on this matter with the MNR during the permitting and approval process. This is far from satisfactory as there will be little or no opportunity for public consultation during, for instance, the issuance of LRIA permits and approvals; traditionally, this process involves little or no public consultation. Moreover, this is unacceptable given the potential serious impact on the recovery of threatened sturgeon population and the sustainable management of the walleye population. The impacts must be more clearly identified and the proposed approach to mitigation described in far more detail within the ER, in full consultation with the public. Writing this ER without identifying the significance of such important impacts, and carefully evaluating the potential effectiveness of mitigation and compensation options regarding such important issues is an abrogation of responsibilities of the proponent, and I recommend that the agencies do not approve this ER until the appropriate data are collected, and mitigation-compensation options explored and developed satisfactorily and transparently, rather than allowing this to go behind closed doors without further consultation with the public. The environmental costs of being wrong are potentially very serious.

3) Cumulative Effects

The cumulative effects of the many existing and planned developments have not been adequately identified nor have the impacts been adequately assessed. For instance, the cumulative effects of existing dams-waterpower facilities, the three additional proposed hydroelectric facilities planned for upstream of the Wabagishik Rapids site; the City of Sudbury Wastewater Treatment Facilities (which release treated, undertreated and untreated effluent), the heavily contaminated sediment; as well as the planned and existing mines and other operations taking water and releasing effluent into the Vermilion River Watershed need to be assessed in the context of the addition of effects due to the Wabagishik Rapids GS on aquatic life, water quality, water quantity, and other uses. For instance, sturgeon and walleye

² Pauly, D. 1995. Anecdotes and the shifting baseline syndrome in fisheries. *Trends in Ecology and Evolution* 10:420.

³ Pinnegar, J.K. and G.H. Engelhard. 2008. The 'shifting baseline' phenomenon: a global perspective. *Reviews in Fish Biology and Fisheries* 18:1-16.

populations already appear to be fragmented and otherwise compromised by the existing facilities in the system; the impacts of further fragmentation by additional one, two or three facilities should be carefully evaluated, as should the potential for mitigation before approvals are issued for any future waterpower facility or dam.

For instance, the proposal potentially further fragments existing or potential habitat for Lake Sturgeon and walleye without giving due consideration to the potential past or current presence of sturgeon upstream of the planned facility (the potential for sturgeon inhabiting upstream reaches and the lake is acknowledged briefly, but seems to have been dismissed by vague references to larval drift and compensation downstream without the data to verify the potential upstream movements, potential upstream-downstream recruitment to the lake or river, and the possible effects on the river and lake fisheries by disrupting the aforementioned). Further, there is little description of what impact the other proposed waterpower facilities will have on sturgeon productivity survival, recovery and sustainable management of both species. For instance, what will be the total cumulative impact of all existing and proposed dams/hydroelectric facilities on the local sturgeon and walleye populations (including fragmentation)? How will the impacts be mitigated and what will be the probability of successful mitigation or compensation? The potential cumulative impacts on the province's wish to recover the sturgeon and maintain the existing walleye population need to be more clearly identified.

Existing and past stressors on Lake Sturgeon should have been identified within the watershed (e.g., logging, water quality, water quantity, fragmentation impacts), and their past and ongoing effects on sturgeon and walleye should have been clearly identified. Then the additional impacts due to this and other proposed facilities should be described in the context of existing ongoing effects.

While a brief mention of cumulative effects occurs within the ER, an adequate cumulative effects assessment has not been done for aquatic valued ecosystem components and the threatened sturgeon in the system. In light of the Divisional Court decision respecting Lafarge, and the provinces own commitment to an ecosystem approach and cumulative effects assessment, these gaps make the current ER strongly deficient; among other issues, the statement of environmental values (SEVs) states:

- The Ministry adopts an ecosystem approach to environmental protection and resource management. This approach views the ecosystem as composed of air, land, water and living organisms, including humans, and the interactions among them.
- The Ministry considers the cumulative effects on the environment; the interdependence of air, land, water and living organisms; and the relationships among the environment, the economy and society.

Given the foregoing gaps in information and analysis, the MOE and other agencies will have a difficult task in evaluating cumulative effects on the recovery sturgeon and sustainable management of walleye, and could declare this ER deficient and issue a Part II order on this basis alone.

The agencies seem to have bought into a vague compensation scheme that relies on details to be negotiated later, after the ER has been approved, with no apparent opportunity for further

public consultation. If this is the case, agencies and the proponent are accepting a high degree of risk as there is no certainty that the compensation plan will adequately compensate for the habitat destruction and potential fragmentation of habitat and fish by the project (much less compensate for all the potential upstream habitat that will be lost by preventing access), nor is there any reasonable analysis or assurance in the ER that the compensation scheme will even work effectively. There is certainty, however, that any recruitment of fish from downstream habitats to upstream habitats will be eliminated by the barrier if no passage is provided, and to date there appears to have been only a cursory evaluation of this possibility. Clearly, both walleye and Lake Sturgeon have been impacted in this watershed by past fragmentation and the cumulative effects on these species by additional barriers must be considered at the watershed scale, in addition to the effects at the local scale. It is recommended that this evaluation be undertaken before approval of the ER. The information within the ER concerning the risks associated with entrainment and mortality are weak and buried in the report – certainly large fish like sturgeon are highly susceptible to turbine mortality and this should be quantified more carefully for both sturgeon and walleye. Past experience suggests that screens do not always work and pose serious operational difficulties so this needs to be evaluated more carefully before accepting this as an effective mitigation scheme. The cumulative effects of dams and waterpower facilities are well known and documented, the risks of serious impacts are high, especially with the information gaps at hand.

4) Impounding Effect on Water Quality

There has been minimal treatment of the effect of the impoundment and operation of the facility on water quality. For instance, impounding water can exacerbate the effects of elevated phosphorus, leading to algal blooms etc. Since seasonal increases in nutrients can be expected, this needs thorough study and reporting. This issue has not been addressed in the current ER, especially in light of predicted effects of climate change in reducing summer water availability. The effects of the impoundment on water quality needs a thorough review in the context of climate change. All we are told is that the flushing rate will not change, but water will be held back 12-18 hrs. As water quality is known to be impaired under similar retention times (e.g. Dunnville Dam reservoir), it is uncertain how this conclusion was arrived at. This needs further elaboration and explanation as it is clear that nutrient rich water enters upstream of the proposed facility from sewage effluent etc., and algal blooms have already been noted in these waters. The potential for the impoundment of water to exacerbate the problem remains possible unless more data can be presented.

While the ER seems to define the headpond as only extending from the dam to the outlet of the lake, it is apparent that all of Wabagishik Lake will function as a headpond for the facility and this should be clearly acknowledged in the report. Currently the definition of the headpond is inconsistent and confusing. There was no assessment of the natural heritage values or valued ecosystem components in the lake, despite the fact that the entire lake will be influenced by the dam. I consider this to another significant gap in information that should be filled before approval of the report. As noted earlier, important connections between the lake and river ecosystems probably exist and it is difficult to evaluate the impacts of the proposed facility without the relevant data.

5) Mercury

As the ER notes, there is the potential for increased mercury levels with impoundment. The ER acknowledges this potential, suggests a monitoring approach, but does little to assure me that mitigation of any elevations in mercury post impoundment will be possible or effective. And of course Wabagishik Lake must be included in this assessment as it is essentially used as an impoundment for this project. Much more evaluation of this important issue is recommended prior to approving the ER.

6) Downstream Effects

I am particularly concerned by the proposed operating regime – it appears that on a daily basis large sections of the river downstream of the facility would be dewatered only to be impacted by a sudden release of water when the turbines are turned on at peak demand hours.

Flow velocity would instantly jump from the environmental flow of 5, 6.5 or 8 cms to 25, 26.5 or 28 cms. Such extreme fluctuations in flow probably do not occur on a regular or daily basis at this site, nor are the fluctuations likely as sudden. The environmental impacts of sudden and frequent changes are poorly evaluated within the ER, including the effects of sudden changes in flow, erosion, high turbidities and sediment loads on aquatic life and the channel morphology. Issues of public safety for boaters and fishermen may also arise and should be addressed in the report. I fail to understand how the report came to the conclusion that there would be no noticeable erosion on Wabagishik Lake, and the evaluation of erosion, scour and shoreline stability effects downstream of the dam are inadequate to ascertain biotic and physico-chemical effects. The downstream effects of the proposed operational regime need to be more carefully described in the context of existing conditions. My concern is escalated when I note that 1954-1993 data from Lorne Falls is used as baseline. In light of climate change predictions it is likely that these data do not represent expected baseline conditions in the future and this should be factored in to the analysis.

Sadly, this proposal seems to be treated largely as another *one off* despite the existing facilities in the watershed, and despite the additional facilities planned for this watershed. As numerous waterpower facilities (small or large) on a watershed are known to have significant cumulative environmental effects^{4, 5, 6, 7}, this approach to the ER is unacceptable and data deficient from a cumulative effects point of view alone. I must add that this poor treatment of cumulative effects and the *one off* approach is an excellent example of how Ontario found itself with so many species at risk and other significant environmental headaches. Having reviewed the Class Environmental Assessment Report and supporting

⁴ Abbasi, T. & Abbasi, S.A (2011). Small hydro and the environmental implications of its extensive utilization .Renewable and Sustainable Energy Reviews, 15, 2134-2143

⁵ Uttley, J. (2012). http://e-futures.group.shef.ac.uk/publications/pdf/183_17.%20Jim%20Uttley.pdf

⁶ Gower, T., A. Rosenberger, A. Peatt, and A. Hill. 2012. Tamed Rivers: A guide to river diversion hydropower in British Columbia. Prepared for Watershed Watch Salmon Society. 64 pages

⁷ Baxter, R. M., 1977, ENVIRONMENTAL EFFECTS OF DAMS AND IMPOUNDMENTS: Annual Review of Ecology and Systematics, v. 8, p. 255-283

documentation for the proposed Wabagishik Rapids GS, I have found several other serious shortcomings and data gaps that prevent effective identification and evaluation of the environmental impacts. As stated in my 1 November 2013 letter, I am therefore requesting a Part II Order be issued to elevate this proposal to an Individual Environmental Assessment. Please replace my earlier letter of November 1, 2013 as there were several important typographical errors contained in it.

Sincerely,

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