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April 14, 2015

## MEMORANDUM

**TO:** Dorothy Moszynski, Project Evaluator, Environmental Approvals Branch (EAB),  
Ministry of Environment and Climate Change (MOECC)

**FROM:** Rosanna White, Environmental Planner/EA Coordinator, Northern Region (NR),  
MOECC

**RE:** Marter Proposed Waterpower Project - MOECC NR Comments on Xeneca's responses to  
MOECC Comments on the Environmental Report

Thank you for the opportunity to comment on the responses provided by Xeneca Power Development Inc.'s (Xeneca) to MOECC's letter of April 3, 2014 which provided comments on their Environmental Report (ER) for the Marter Township proposed waterpower project. Xeneca responded to MOECC's comments in a letter dated June 17, 2014. If you require copies of either of these letters for reference please let me know.

The purpose of this memo is to provide Northern Region comments in the areas of environmental assessment, surface water and hydrology. With respect to comments on aboriginal consultation, I understand that the review of that component of the June 17 Xeneca response letter is being carried out by the Environmental Approvals Access and Service Integration Branch (EAASIB) in Toronto. As a result, these NR comments do not provide input regarding the adequacy of Xeneca's responses to the aboriginal consultation components of our April 3, 2014 letter.

I would also take this opportunity to comment on Xeneca's approach with respect to the provision of "sound scientifically-based rationale" (p. 1, June 17, 2014 letter) for some of their conclusions in the ER. Xeneca states that they have provided this type of rationale for any issues "where consensus could not be reached with agencies on issues framed by unformed or incomplete policy" and that this approach is based on advice from MNR and accepted by MOECC (letters from MNR June 6, 2013 and MOECC, June 14, 2013).

MOECC notes that Xeneca has taken a broad interpretation of these 2013 Ministry letters as these were specific to an approach for addressing the hydrologic zone of influence for their projects. While it may be appropriate in certain cases for a proponent to provide rationale as to why they do not need to further study a topic, the Class EA states that “where the information is of significance to the proposal, the gap will need to be addressed” (p. 34) in relation to the identification of potential effects. The comments provided in the following sections identify areas where Xeneca would still need to provide additional information in support of their final ER in keeping with the requirements of the Class EA.

## **ER COMMENTS AND RESPONSES**

The following section provides a summary of MOECC Northern Region’s (NR) concerns that were identified in our April 3, 2014 letter, the proponent’s response to each issue and then MOECC NR’s reply for each issue. Technical comments are presented first, followed by Class EA process comments.

Having reviewed Xeneca’s June 17, 2014 letter, remaining issues for the Ministry include:

- the proposed minimum flows for the project;
- the potential mercury-related impacts of the project; and
- certain Class EA process issues.

### **1. TECHNICAL COMMENTS**

#### **1.1 MINIMUM FLOW**

**MOECC Comment on ER (April 3, 2014 letter):** “As identified in our comments (Oct. 19, 2012, July 3, 2013 and Nov. 25, 2013), MOE has requested scientific rationale for the proposed minimum flows for this project in variable flow reaches 1 and 2. As this information has not yet been fully provided, Xeneca will need to initiate additional discussions with MOE and the Ministry of Natural Resources (MNR) to reach consensus on this topic. As stated previously by MOE, proposed minimum flows will need to meet the objective of providing for the continuity of the natural functions of the river as required by MOE’s mandate under the Ontario Water Resources Act (OWRA).”

**Xeneca Response (June 17, 2014 letter):** *Please see Attachment I for a detailed discussion on minimum flows.* (MOECC NOTE – Attachment I is 17 pages long therefore only an excerpt has been provided here. Please refer to the document: “Attachment I – Minimum Flow Discussion” for Xeneca’s full response.)

*Excerpt from Xeneca Response in Attachment I: “Within the Final ER, Xeneca has provided an environmental effects assessment of Flow Reach 1 (Tailrace to Misema Confluence) and Flow Reach 2 (Misema Confluence to Englehart) concluding that the proposed minimum flows will not result in any significant effects on the environment. An assessment of the hydrology of the proposed minimum flow is included in Annex I of the Final ER (see reports titled: (i) Blanche Hydropower Sites – Hydrology Review – October 6, 2009; Hatch; (ii) Marter Township Hydro Project, EA Hydrology Memo – March 3, 2011; Hatch; (iii) Hydrologic Regime Assessment Table, Marter Township (02JC008 Synthesized) – Blanche River; (iv) Assessment of Pre and*

*Post Project Flow Variability Blanche River, ON (WSC 02JC008) (Version 2) – August 22, 2013; ORTECH Consulting Inc.; (v) Analysis of Water Survey of Canada Gauge Station 02JC008 (Blanche River, ON) and Ontario Ministry of Natural Resources Temporary Gauge Station (Hwy 624) – August 23, 2013; ORTECH Consulting Inc. and (vi) Analysis of Downstream Minimum Flows for the Marter Township Project – October 18, 2013; ORTECH Consulting Inc.) The insignificant effect on the environment together with the hydraulic assessment (Annex I) comprises Xeneca’s scientific rationale for the proposed minimum flows. The following sections (divided in Flow Reach 1 and Flow Reach 2) with information extracted from the Final ER, summarize how the proposed minimum flows continues to meet the MOE’s mandate under the OWRA.”*

**MOECC Reply:** The information presented in Xeneca’s “Minimum Flow Discussion Paper” does not provide sufficient rationale to alter flows as extensively as they are proposing for the Marter Township project. The hydrology comments related to the proposed minimum flows for the project are summarized below.

- 1) The minimum flows proposed for the bypass reach and Variable Flow Reach-1 are well below the subsistence flows (95% exceedance flows) that occur under natural conditions. For Variable Flow Reach-2 the proposed values are close to subsistence flows for the summer months only. For winter months the values are less than the subsistence flows. Subsistence flows are infrequent naturally occurring low flow events of long duration (occurring over seasons). These flows maintain sufficient water quality and provide sufficient habitat and connectivity to prevent direct mortality of aquatic species and ensure survival of organism populations capable of recolonizing the river system once normal baseflow returns (Metcalf et al. 2013).

The length of the proposed bypass reach is approximately 200m, and the length of Variable Flow reach-1 is 2 km starting from the tailrace of the proposed Marter Project to the confluence of the Misema River. The length of Variable Flow Reach-2 is 13.8 km from the confluence of the Misema River downstream to the Englehart River confluence. Table 1 on p. 5 provides a comparison of Xeneca’s proposed minimum flows to monthly Q95 and Q80 flow values (80% exceedance flows).

- 2) Please note that Q95 flows may occasionally be considered as acceptable subsistence flows for the bypass reach but are not considered acceptable for the reach below the tailrace. For acceptable minimum flows below the tailrace monthly Q80 values are often considered. Q80 values are close to base flows which are the portions of the total stream flow that is contributed by persistent and slowly varying sources between precipitation events (i.e. groundwater, lakes, wetlands). Temporally variable base flow conditions in rivers are important for maintaining ecosystem function.
- 3) Xeneca undertook wetted perimeter analysis to provide rationale for the proposed minimum flows. Using this approach wetted perimeters (the distance along the stream bottom from the wetted edge on one bank to the wetted edge on the other bank) under different flows were evaluated. This approach is mostly suitable for assessing riffle habitats for benthic productivity assessment in the bypass reach, not for assessing suitability of habitat for the valued ecosystem components identified in Variable Flow Reaches 1 and 2. The wetted perimeter approach also does not provide information on longitudinal connectivity of the habitat.

**Table 1.** Comparison of Xeneca’s proposed minimum flow values to monthly Q95 and Q80 flow values (80% exceedance flows)

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Q95 at Marter site (m <sup>3</sup> /s)*	3.10	2.80	2.80	3.80	7.50	5.00	2.80	1.80	1.60	2.20	4.60	3.80
Q95 below Misema confluence, considering influence of Misema operation (m <sup>3</sup> /s)*	8.1	6.0	5.2	14.5	15.1	4.8	2.5	1.7	2.0	2.7	10.5	8.8
Q80 at Marter Site**	3.37	2.83	2.79	9.56	17.7	8.03	3.58	2.25	2.13	4.31	6.98	5.07
Q80 below Misema confluence, considering influence of Misema operation***	9.00	6.60	6.35	31.6	22.82	9.81	4.53	3.82	3.92	8.67	16.94	14.02
Proposed minimum flows for the bypass reach	0.00	0.00	0.00	0.50	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00
Proposed minimum flows for Variable Flow Reach 1	0.50	0.50	0.50	Run-of-river	Run-of-river	Run-of-river	0.50	0.50	0.50	0.50	0.50	0.50
Proposed minimum flows for Variable Flow Reach 2	2.3	2.3	2.3	Run-of-river	Run-of-river	Run-of-river	2.3	2.3	2.3	2.3	2.3	2.3

\*data source: minimum flow discussion report (attachment 1 to Xeneca’s June 17, 2014 response to MOECC);

\*\* data source: Hatch hydrology memo of March 3, 2011

\*\*\* MOECC’s hydrologist analysis of the Blanche River daily flows starting from 2004 to 2012.

In summary, there is environmental risk associated with the proposed minimum flows for this project. This is due to the potential to cause considerable environmental damage from the proposed minimum flows during intermittent operations as follows:

- 1) A long river reach of approximately 14 kilometres would be impacted;
- 2) A total of 18 fish species including lake sturgeon, walleye and brook trout reside in that reach;
- 3) There would be deprivation of natural flows for a prolonged period of time - 19 hours a day for 135 days in a year;
- 4) Flow variability over a day would be substantial, from 0.5 m<sup>3</sup>/s to 10.4 m<sup>3</sup>/s, whereas natural variability during the low flow period is very negligible;
- 5) There could be safety concerns to recreational canoeists and boaters due to variable flows and fluctuating levels; and
- 6) The complexity of the harmonization plan with the Misema Generating Station. According to the proposed harmonization plan, most of the time Xeneca will have to operate outside peaking hours in order to provide proposed minimum flows below the Misema confluence. There is potential for cumulative impact on the Blanche River below the Misema confluence if there is any problem with the two operations being synchronized with respect to minimum flows.

NR recommendations with respect to minimum flows:

- (1) For better protection of the natural function of the river, the proposed minimum flows should be revised upward close to monthly Q95 for the bypass reach and close to monthly Q80 values for the Variable Flow Reaches below the tailrace (Variable flow Reaches 1 and 2).
- (2) If Xeneca wishes to adhere to the current proposed minimum flows, an appropriate scientific analysis supporting those flows would have to be provided. A two-dimensional habitat assessment could be an appropriate approach in that respect where suitability of the habitat for the impacted species would be evaluated considering substrates and hydraulic properties (depth, velocity) of the river in the x-y plane.
- (3) Effects on the thermal regime of the river (diurnal water temperature variation) will have to be simulated separately using outputs of the hydraulic model into a water temperature simulation model.

## **1.2 PREDICTION OF MERCURY IMPACTS**

**MOECC Comment on the ER (April 3, 2014 letter):** “In keeping with the requirements of Section 4 of the Waterpower Class EA which requires the identification and assessment of potential effects of the project, it is the Ministry's expectation that Xeneca assess the potential for the release of methyl mercury as a result of the Marter Township proposal. Your assessment should be scientifically and technically defensible. More specific guidance about this is provided in the attached Table 2. MOE is available to discuss this issue and the related guidance should this be necessary.”

***Xeneca Response (June 17, 2014 letter):*** “*The potential for the release of methyl mercury, and its impacts on human health, piscivorous fish, and fish consuming wildlife was assessed by:*

*1) Establishing the current (pre-development) concentrations of total and methyl mercury in water and fish tissue in the project area, consistent with the principles of MOE's guidance document titled "From Class EA to Permit to Take Water: A Guide to Understanding the Ministry of the Environment's Technical Requirements for Waterpower" (Draft - January, 2012)1 ;*

*2) Considering observed mercury increases in large-scale impoundments and experimental flooding in other areas in northern Canada;*

*3) Modelling the potential peak concentrations of mercury in fish tissue at the proposed Marter Township facility following development;*

*4) Examining the likely exposure of humans, piscivorous fish and fish consuming wildlife to fish potentially impacted by increased methyl mercury in the project area;*

*5) Including mitigation measures, monitoring plans and adaptive management measures for potential mercury increases in fish, in both the construction and operation phases; and,*

*6)A Waterpower Class Environmental Assessment (EA) style net effects and significance assessment, based on the preceding elements."*

Xeneca also provided a "Methyl Mercury Discussion" paper as a separate attachment to their June 17, 2014 letter.

**MOECC Reply:** The review comments provided here focus on water quality and fish tissue impacts related to this project. MOECC's response to the "Methyl Mercury Discussion" paper is also provided in this section.

One of the key areas where insufficient data has been collected and analysis is lacking has to do with prediction of the potential for methyl mercury, released from both the construction and operation of the generating station, to impact on water quality and to accumulate in tissues of fish.

In their June 17, 2014 letter, Xeneca's assessment concludes that impacts to human health will not be significant as few sport fish are present in the project headpond area. The Ministry of Natural Resources and Forestry (MNR) has provided results of surveys that show the Blanche River to support a diverse sport fishery including walleye, pike, sauger, sturgeon, small mouth bass and brook trout. In light of MNR's data, Xeneca's assessment of the fishery in the Blanche River suggests that the fishing effort and/or the timing of Xeneca's survey were inadequate. Xeneca's conclusion of insignificance of impacts is therefore based on insufficient information. The fish survey and characterization of the fishery in the Blanche River in the area of the proposed project site will need to be redone before the EA is complete in order to have an appropriate baseline from which to predict methyl mercury impacts.

## **MOECC Response to Methyl Mercury Discussion Paper**

### **Current Mercury Concentrations in Surface Water**

Though it is written in Xeneca's comments that 2012 and 2013 seasons provided a pre-development description of the water quality in the Blanche River, the actual report referenced is missing some of the seasonal water quality data for 2012. Summer 2012 and fall 2012 water quality data is missing temperature, conductivity, pH, dissolved oxygen, and turbidity values. Low level mercury analysis (total and methyl) is also missing for summer 2012. The Ministry's recommendation for baseline water quality data is a minimum of 2 years (3 times per year to capture different watershed conditions). This has not been fulfilled for some key parameters, such as mercury. Additional water quality sampling will need to be completed to meet the Ministry's minimum recommended baseline data set. This work will need to be done as part of the Class EA process in order to more accurately characterize the existing conditions with respect to water quality parameters.

In its guidance documents and in comments and recommendations on the Draft ER, the Ministry has proposed three locations for baseline water quality monitoring: upstream of influence of the reservoir, area of the proposed reservoir, and within 500 meters of the tailrace discharge. Xeneca has provided water quality data for a single site. Data for the different locations should be collected as tributaries and differing riverbed and shoreline substrate compositions can be confounding factors when comparing baseline and operational water quality data. Baseline water quality data should be collected at three separate locations as described above.

### **Current Mercury Concentrations in Fish Tissue**

As stated above, baseline fish tissue analysis lacked proper representation of the species present in the Blanche River. It did not include higher trophic level piscivores such as northern pike or walleye. Collection of these species is essential in understanding the potential for project related mercury impacts. Further, the analysis did not fulfill some the Ministry's recommendations for completion of such analysis:

- **Large Fish Collection:** at least one of the species must be a piscivore with 20 individuals to be analyzed per species
- **Forage Fish Collection:** information on fish species, age of fish and length of fish used in composite samples should be provided.

The collection of a robust number of fish is essential in order to compare pre-development and post-development fish tissue concentrations.

## **Predictive Mercury Modelling**

Lack of proper characterization of the Blanche River, in terms of the fish species present does not allow for an evaluation of the potential increase in mercury fish tissue concentrations for most of the sport fish present. The fish tissue data used in the modelling is not representative of current conditions in the river, adding to the already high uncertainty of the results. Once an appropriate fish survey and fish tissue analysis is conducted, the modelling exercise should be repeated.

A more certain prediction than that presented to date is necessary to determine if the Blanche River project can go ahead under the currently proposed operational regime as once high levels of methyl mercury in fish tissue are detected, these cannot be reversed within a short period of time. A decline in fish tissue methyl mercury concentrations may take decades.

MOECC review of other waterpower projects that include predictive modelling for fish tissue accumulation suggest that the Harris model can under predicts impacts. The Ministry recommends that a number of models be used to predict increases in methyl mercury concentrations, and that a discussion of the merits and weaknesses of each model be presented.

## **Potential Impacts of Methyl Mercury**

As stated above, Xeneca's assessment, that impact on human health is limited due to a very low production system for piscivores, is erroneous based on MNRF's data showing a diverse sport fishery in the Blanche River.

In Table 1 of *Attachment II - Methyl Mercury Discussion* a number of fish consuming species, including piscivorous fish are shown to have moderate to high potential for impacts from the Marter project, based on an approximate home range and the relative amount of diet that is comprised of fish. This is at odds with the concluding statement that the effect of the Marter Project on piscivorous fish and fish consuming wildlife is insignificant.

## **Mitigation**

As part of the mitigative measures for the project, Xeneca proposes monitoring to identify potential increases in fish tissue methyl mercury levels. A data set that accurately represents baseline conditions is required to correctly identify any increases in methyl mercury concentrations from the construction and operation of the water power facility. As stated above, additional water quality data will need to be collected to ensure the minimum water quality data set as recommended by the Ministry forms the baseline characterization. As well, the fish survey and fish tissue analysis will need to be redone to accurately reflect the current fish populations and their methyl mercury tissue concentrations to allow for a correct assessment of any future increases.

## Summary

Current conclusions about potential impacts are based on limited baseline data and inadequate analysis. Additional data must be collected to allow for predictions with a higher level of certainty regarding potential impacts and evaluation of effects during operational monitoring. Specifically the following further work is required:

- Additional water quality data should be collected to allow for the minimum 2 years of seasonal data (3 times per year) for the parameters and at locations recommended by the Ministry.
- Predictive modeling should be completed following an adequate characterization of the fish species present within the Blanche River in the area to be influenced by the project and quantification of methyl mercury fish tissue concentrations for the key species. The Ministry recommends that a number of models be used to predict increases in methyl mercury concentrations, and that a discussion of the merits and weaknesses of each model be presented.

## 2. CLASS EA PROCESS COMMENTS

### 2.1 CONSULTATION

**MOECC Comment on ER (April 3, 2014 letter):** “Consultation on the proposed project with interested persons is a cornerstone of the Class EA process. Additional consultation will be needed with the public and Aboriginal groups as the final proposal gets refined in relation to minimum flows and once there is more information on potential impacts from methyl mercury and any other issues that remain to be addressed.”

***Xeneca Response (June 17, 2014 letter):*** “All reports, sampling programs and conclusions relating to methyl mercury and minimum flow issues (please refer to Operating Plan and hydraulic modelling) are contained within the final ER and have been released to the public for their review and comment.

*In addition, Public Information Centre (PIC) sessions were held in which minimum flow and the issue of methylmercury were discussed; the detailed slides presented at these meetings are included in the Final ER in Appendix L (public consultation) and M (Aboriginal consultation.)”*

**MOECC Reply:** As identified in the technical comments provided in section 1 of this memo, further information is required from MOECC with respect to minimum flows, the prediction of methyl mercury effects as well as potential water quality effects once adequate baseline information is gathered. It is also of note that both the MNRF and DFO comment letters identified topic areas where additional baseline or other information was needed with respect to the ER. As a result, there may be a need for further public and Aboriginal consultation in support of the final ER.

## 2.2 POTENTIAL EFFECTS

**MOECC Comment on ER (April 3, 2014 letter):** “The Class EA requires proponents to assess the potential effects' of the project on the environment and to confirm these as part of the assessment phase of the process. While many potential effects have been identified and confirmed, there remain some that need to be addressed more fully. With respect to MOE's mandate these relate to minimum flow issues and the potential for impacts on both methyl mercury water and fish tissue mercury concentrations.

With respect to confirming the potential effects of the project as required on p. 38 of the Class EA, Section 7 of the ER deals with potential effects and discusses the work undertaken related to these. This section of the ER is written in a general way such that it does not adequately describe or quantify all the potential effects from the proposed project. Three examples of this are provided in Table 1 for reference. Additional detail and data should be provided in this part of the ER to confirm the potential effects of the project. The Class EA requires that the ER "be complete and detailed enough to demonstrate the potential impacts of a project and identify any potential proposed impact management measures". (p. 38, Waterpower Class EA). While three examples are provided in Table 1 to substantiate MOE's comment, this is also a general comment that applies throughout section 7 of the ER.”

***Xeneca Response (June 17, 2014 letter):*** “Please see minimum flow document provided under Attachment I for a full discussion on minimum flow and methyl mercury document provided under Attachment II for a full discussion on methyl mercury effects.”

**MOECC Reply:** Please refer to NR's reply in the technical comments section of this letter. MOECC has outlined there the scientific reasons for which Xeneca's response on the above matters is not yet adequate.

## 2.3 NET EFFECTS

**MOECC Comment on ER (April 3, 2014 letter):** “Section 4.3.1 of the Class EA outlines an approach to assessing effects. Since potential effects have not been fully identified and confirmed, the evaluation of net environmental effects is incomplete. From the documentation presented, all effects have not been fully identified, assessed and consulted upon.”

***Xeneca Response (June 17, 2014 letter):*** “While mitigation measures can typically reduce/minimize the level of an effect, the effect cannot always be eliminated completely. A more precautionary approach is to assume that some level of effect may remain even after mitigation measures are applied. Some impacts are unavoidable, but the goal is to ensure that any potential negative impacts will not be significant. The net effects after mitigation and their associated significance are characterized in Table 29.

*Xeneca submits that the Marter final ER meets or exceeds the requirement of the OWA Class EA. No further studies or consultation are necessary.*

*Where appropriate, Adaptive Management strategies will be applied should monitoring results indicate an unexpected effect is occurring.”*

**MOECC Reply:** The above response from Xeneca addresses a different comment than that expressed above in our April 3, 2014 letter with respect to Section 4.3.1 of the Class EA. The comment that MOECC was making above is a broader comment to say that, until there is a more complete assessment of all potential effects of the project (for example, once additional information and analyses are provided), that it is premature to make an overall assessment of the net effects for the proposed project.

#### **2.4 CONCLUSION (Xeneca's June 17, 2014 letter)**

With respect to Xeneca's concluding comments in their June 17, 2014 letter, I would note that this section of their letter refers to a project other than the Marter Township project. This is an error on their part as they are referring to MOECC's letter regarding The Chute and Third Falls waterpower projects rather than the Marter Township project.

In summary, that concludes the NR comments on the Xeneca letter of June 17, 2014. As discussed throughout this memo, NR has identified that further information remains to be provided in certain key areas by the proponent in support of the final ER. If you have any questions or require clarification regarding these comments, please feel free to contact me.

Signed by Kathy McDonald

for

Rosanna White

c: Paula Allen, MOECC  
Don Hamilton, MOECC  
Caroll Leith, MOECC  
Donna Bigelow, MOECC