November 17, 2017

Peter Madden
Regulatory Compliance Lead
Lower Churchill Project

Dear Peter,

RE: Headpond Water and Sediment Sampling Program – December 19, 2017 Update

1.0 INTRODUCTION

In order to provide additional monitoring coverage of possible changes in methyl mercury concentrations in water during headpond formation, the provincial government requested an additional sampling program be implemented by Nalcor. Nalcor provided a program description to government and engaged Amec Foster Wheeler to implement the sampling program. This memo provides an update on information regarding the headpond water and sediment sampling program related to additional results. This memo provides a brief summary of lab results as of November 30, 2017.

2.0 SAMPLING PROGRAM

Sampling began on October 14, 2016 in an attempt to capture existing, natural methyl mercury concentrations before any headpond formation. Following re-impoundment in February 2017, a weekly sampling regime has been ongoing for all 11 sample locations (Figure 1) as per WRMD request. Water and sediment samples have been analyzed for total mercury, dissolved methyl mercury, and total methyl mercury as well as other parameters known to affect methyl mercury generation and transport.

3.0 HEADPOND FORMATION

Headpond formation was initiated again in early February 2017, with the first set of impoundment samples being collected February 6, 2017. Water levels at the time of last reported samples within this summary (November 27, 2017) were approximately 22.5 m elevation.

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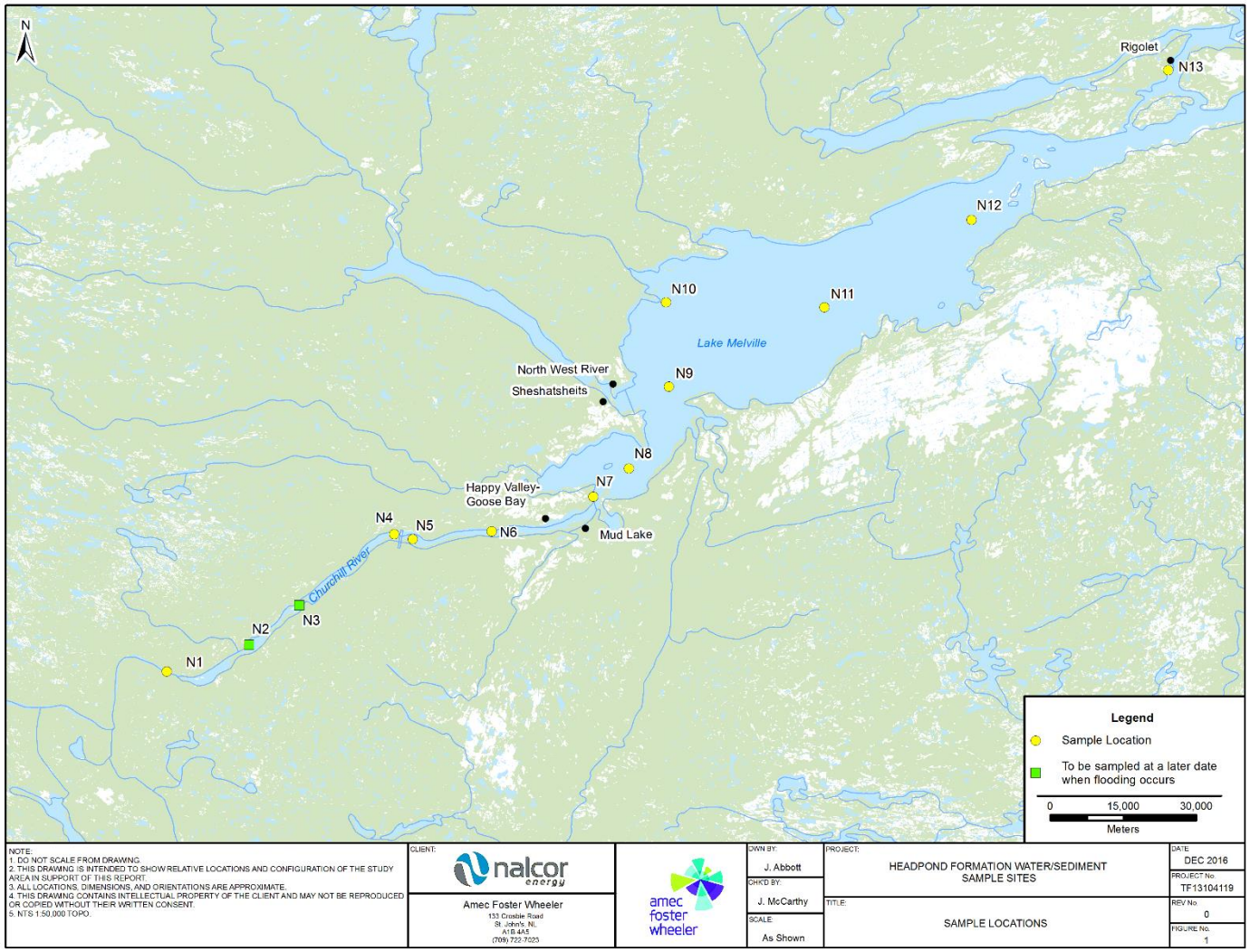

Figure 1: Map of sample locations, Lower Churchill River to Rigolet

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4.0 SUMMARY RESULTS

Sampling has continued throughout, and beyond, initial headpond activity to document any potential changes in natural, background methyl mercury in water and any potential changes due to flooding (Table 1). Each sample location is currently sampled on a weekly basis.

Table 1: Total number of samples collected from each sample site, as of November 30, 2017

Sample ID (ongoing)	Sample ID (from original plan)	Date of First Sample Collection	Number of Samples Collected
N1	1	Oct. 14, 2016	55
N2[1]	2	Oct. 14, 2016	2
N3[1]	3	Oct. 14, 2016	2
N4	4	Oct. 14, 2016	52
N5	5	Oct. 14, 2016	54
N6	-	Dec 20, 2016	43
N7	7	Oct. 14, 2016	48
N8	-	Dec 20, 2016	32
N9	8	Oct. 14, 2016	37
N10	-	Dec 20, 2016	32
N11	10	Oct. 14, 2016	40
N12	-	Dec 20, 2016	31
N13	11	Oct. 14, 2016	45

[1] Sample sites located above headpond elevation will be completed upon reservoir formation

Sampling has been ongoing with the last series of samples presented within this summary being collected on November 27, 2017. Results up to and including this week are pending analytical laboratory analysis.

As an example of the results within the dataset, a summary of existing mean monthly total methylmercury results (with 95% confidence intervals) from several sample sites is provided in Figure 2. Site N5 is located directly downstream of Muskrat Falls and N8 (Goose Bay) is the first sample site within the Goose Bay / Lake Melville estuary downstream of the lower Churchill River. Site N8 was added to the sampling regime on the week of December 20, 2016. These sites would be anticipated to be the first to show any indication of downstream increases or transport in total methylmercury related to flooding. Also shown are the results for the upriver control site (Grizzle Rapids – Site N1 in Figure 1) which is located upstream of any reservoir influence. Figure 3 provides the results of dissolved methylmercury for the same sample sites and times.

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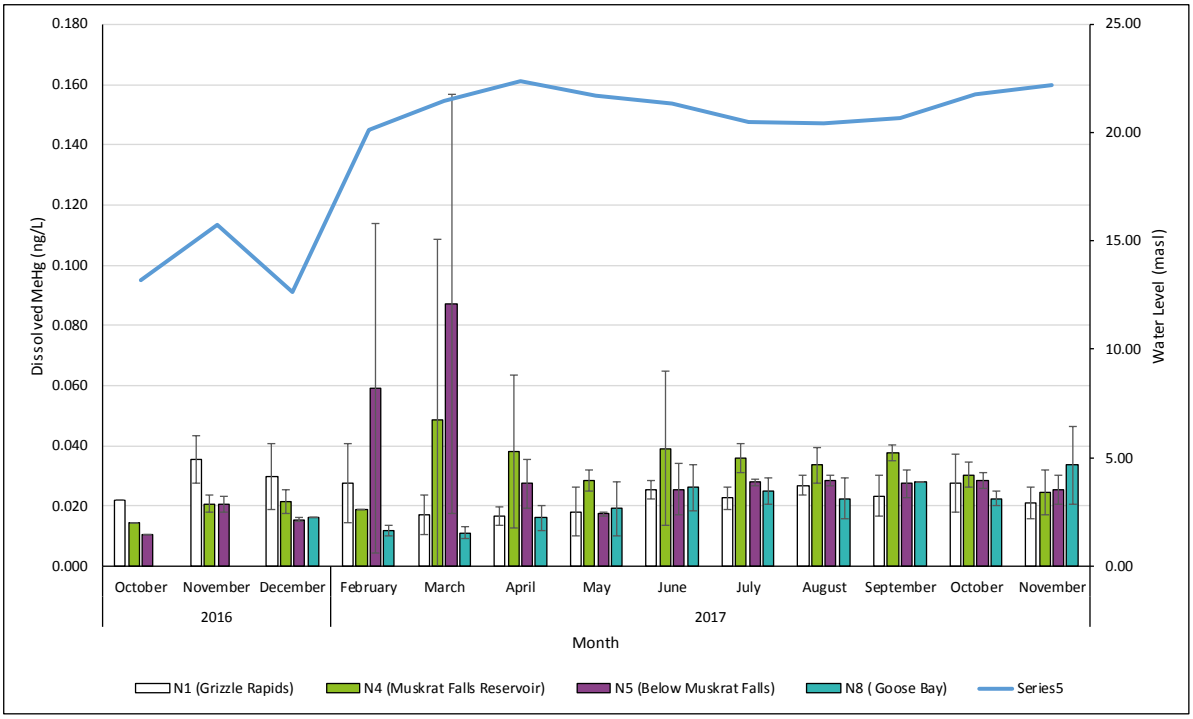

Water elevation data from October 14-November 18, and April has been provided by Environment Canada (Station Number 03OE015). Data post November 18 has been provided by Nalcor. Missing dates have been estimated based on data provided by Nalcor. For calculation purposes, values below MDL are included as the MDL (0.010ng/L)

Figure 2: Mean monthly total methylmercury concentration (ng/L) at various sample sites. 95% confidence intervals also shown.

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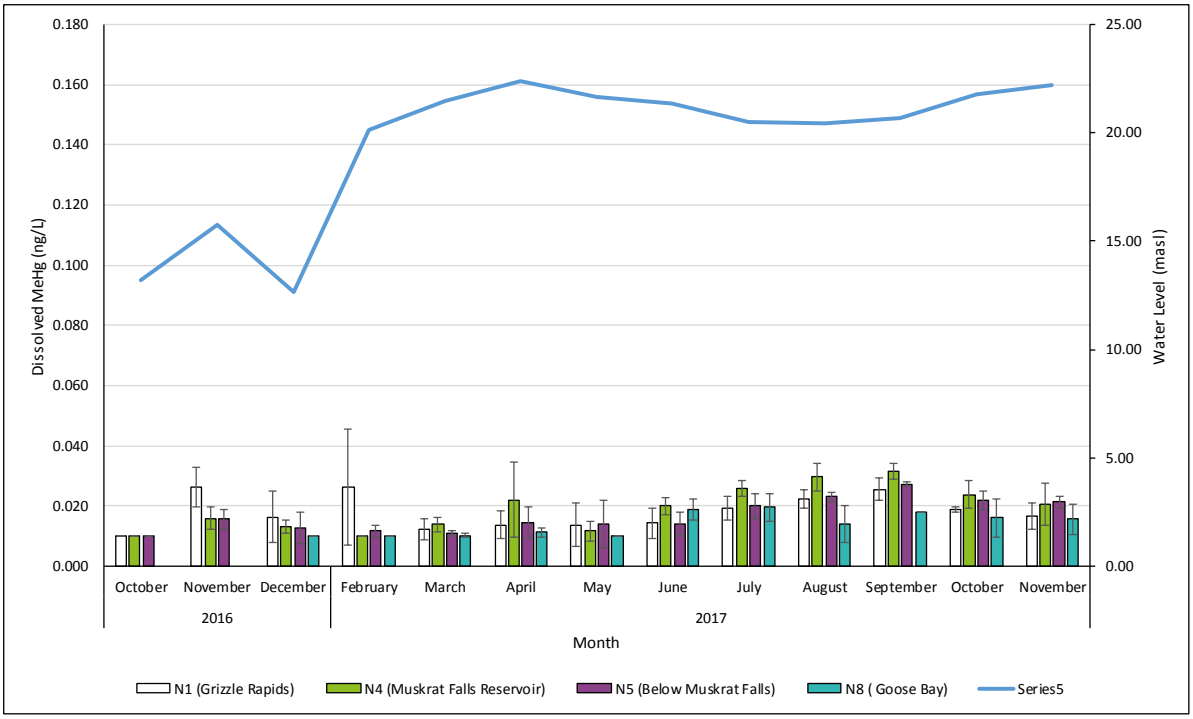

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Figure 3: Mean monthly dissolved methylmercury concentration (ng/L) at various sample sites. 95% confidence intervals also shown.

As noted, these graphs include a select number of representative sites sampled and the accompanying spreadsheet contains all data to date. The higher concentrations of total methylmercury recorded during several weeks in February-March, 2017 within N4 (headpond) and N5 (below Muskrat Falls) were likely the result of increased total methylmercury bound to particles within suspended sediments; Figure 4 shows Total Suspended Sediment (TSS) concentrations. Increases in total mean methylmercury concentrations at various sample sites occurred during the same weeks as increases in TSS were detected. This is supported by dissolved methylmercury concentrations (Figure 3) which did not show any similar increases and therefore methylation due to flooding caused by bacteria activity was not evident.

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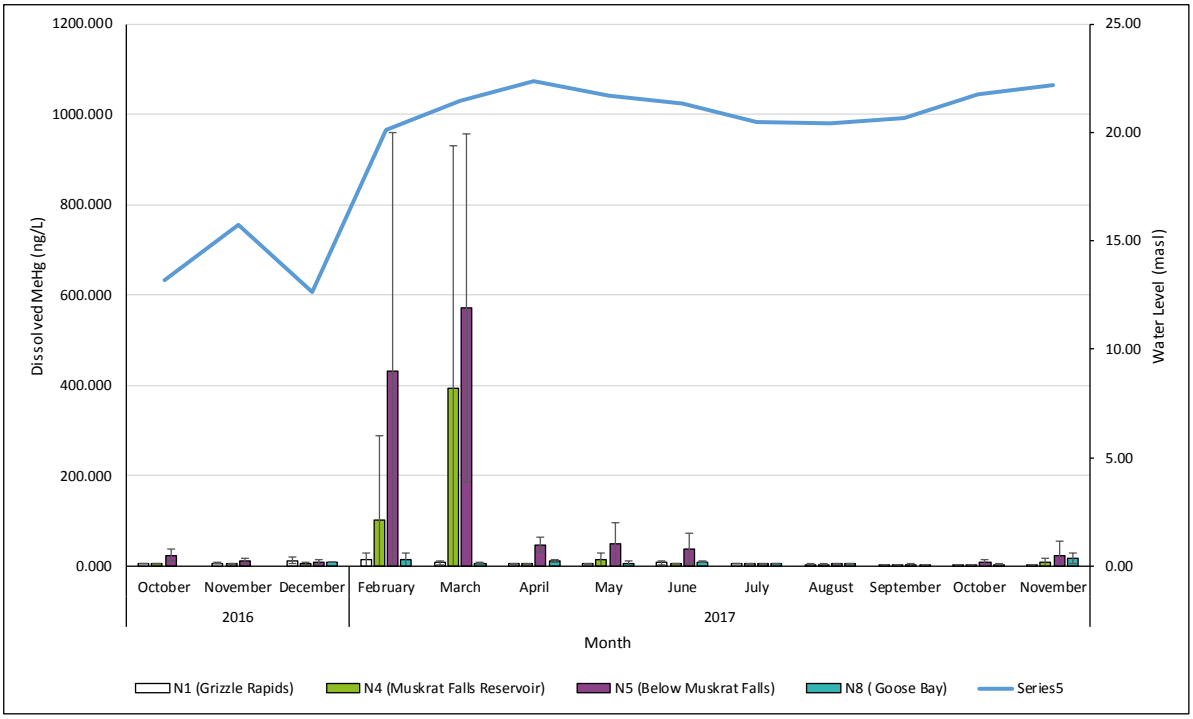

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Figure 4: Mean monthly Total Suspended Sediment (TSS) concentration (mg/L) at various sample sites. 95% confidence intervals also shown.

As indicated in the figures, concentrations of total and dissolved methylmercury measured within sample stations have generally remained low. During a period of several weeks in February-March, some total methylmercury concentrations increased within stations N4 (MF Reservoir area) and N5 (below Muskrat Falls); however, concentrations did not show a similar pattern farther downstream (N8 – Goose Bay). Similarly, during the warmer sampling period (June – August), a slight increase in total and dissolved methylmercury concentrations was observed within all stations shown in Figures 2 and 3. Highest concentrations were recorded within the headpond station, which could have been caused by increased microbial activity and increased access to flooded material within the headpond. However, these slight increases do not appear to be transported downriver as most concentrations within Goose Bay (N8) remained similar to those at the upriver control/baseline (N1). Any cumulative trend in downstream methylmercury concentrations is not evident.

The highest concentration of total methylmercury measured to date is 0.560 ng/L at the outflow of Goose Bay (N9). This concentration was localized to the area of N9, with no similar spikes being recorded in nearby sample locations. It was also noted by the lab that there was evidence of vegetative matter in the sample prior to analysis. Corresponding dissolved methylmercury was below laboratory detection limits. Most total methylmercury concentrations have remained below 0.050 ng/L. The lab's accredited detection limit for both total and dissolved methylmercury is 0.010 ng/L. All results to date for all

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parameters tested have been provided to Nalcor and government and are available. As more data becomes available, it will be provided as quickly as possible.

If you have any questions, or require any further information, please feel free to contact me at your convenience.

Yours sincerely,

Amec Foster Wheeler Environment & Infrastructure,
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