



Agnico Eagle Mines Limited – Meadowbank Division
Whale Tail Pit Water Quality and Flow Monitoring Plan
RESPONSES TO REGULATORS REVIEW

October 26 2018



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ENVIRONMENT AND CLIMATE CHANGE CANADA (ECCC)

Interested Party:	Environment and Climate Change Canada (ECCC)	Rec No.:	ECCC#1
Re:	Monitoring Parameters		

Comment:

Monitoring of field pH and field temperature is not specifically mentioned in the monitoring program.

Recommendation:

ECCC recommends including field pH and field temperature in the monitoring program.

Agnico Eagle's Response to Recommendation:

Agnico Eagle thanks ECCC for this recommendation. However, this revision of the Water Quality and Flow Monitoring Plan was completed to align with recently issued Water Licence 2AM-WTP1826 requirements. Field pH and field temperature are not part of Water Licence 2AM-WTP1826 requirements.



Interested Party:	Environment and Climate Change Canada (ECCC)	Rec No.:	ECCC#2
Re:	TSS/Turbidity regression curve		

Comment:

Field measurements of turbidity will be used as a real-time surrogate for measuring total suspended solids (TSS) during dike construction and dewatering. Monitoring details are provided in the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering. This plan indicates that the site specific TSS-turbidity relationship developed at Meadowbank will be used to guide the Whale Tail monitoring program. ECCC advises that ongoing calibration of the TSS-turbidity relationship will be important to correct for potential differences in particle sizes and shapes between the Meadowbank and Whale Tail sites.

Recommendation:

ECCC recommends incorporating ongoing calibration of the Whale Tail TSS-turbidity relationship into the monitoring program during dike construction and dewatering.

Agnico Eagle's Response to Recommendation:

The TSS-turbidity relationship was developed using paired data collected across a range of TSS sources and concentrations. Agnico Eagle is confident that the TSS-turbidity relationship developed will be adequate.



Interested Party:	Environment and Climate Change Canada (ECCC)	Rec No.:	ECCC#3
Re:	Group 2 Parameters		

Comment:

Group 1 is inaccurate in listing the major ions and nutrients in brackets as total metals; for clarity, list the total metals separately.

Recommendation:

For clarity, ECCC recommends that Group 1 parameters list the total metals separately from the major ions and nutrients.

Agnico Eagle's Response to Recommendation:

Agnico Eagle thanks ECCC for this recommendation. However, this revision of the Water Quality and Flow Monitoring Plan was completed to align with Water Licence 2AM-WTP1826 requirements. Agnico Eagle agrees with ECCC's comments, but Group 1 is listed as per Water Licence 2AM-WTP1826.



Interested Party:	Environment and Climate Change Canada (ECCC)	Rec No.:	ECCC#4
Re:	Attenuation pond post-treatment characterization		

Comment:

The use of Group 1 parameters will not accurately characterize the attenuation pond post-treatment. Monitoring of Group 2 parameters on a weekly basis would allow full characterization.

Recommendation:

For full characterization, ECCC recommends monitoring the attenuation pond weekly post-treatment using Group 2 parameters.

Agnico Eagle's Response to Recommendation:

Agnico Eagle thanks ECCC for this recommendation. However, this revision of the Water Quality and Flow Monitoring Plan was completed to align with recently issued Water Licence 2AM-WTP1826 requirements. The monitoring requirements for station "Attenuation pond post-treatment characterization" are parameters from Group 1.



Interested Party:	Environment and Climate Change Canada (ECCC)	Rec No.:	ECCC#5
Re:	Attenuation pond post-treatment characterization		

Comment:

Effluent from the sewage treatment plant will be discharged to the Whale Tail Pit attenuation pond. As post-treatment discharge from the attenuation pond will be directed to Mammoth Lake, Biological Oxygen Demand5 (BOD5) and bacteriological parameters should be monitored/controlled at either the sewage treatment plant or the attenuation pond prior to release to Mammoth Lake.

Recommendation:

ECCC recommends adding BOD5 and bacteriological parameters to the monitoring program for either the sewage treatment plant effluent or the attenuation pond post-treatment.

Agnico Eagle's Response to Recommendation:

Agnico Eagle thanks ECCC for this recommendation. However, this revision of the Water Quality and Flow Monitoring Plan was completed to align with recently issued Water Licence 2AM-WTP1826 requirements. BOD5 and bacteriological parameters are not listed as monitoring requirements for either the sewage treatment plant or the attenuation pond prior to release to Mammoth Lake.



CROWN-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA (CIRNAC)

Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#1
Re:	Figure 2-1		

Finding:

The current plan does not include sampling stations in Mammoth Lake immediately downstream of the drainage from the WRSF. As a consequence, there are no mechanisms to confirm that post-closure WRSF seepage discharges to the lake are environmentally protective.

Recommendation:

To address this deficiency, we recommend that at least two additional stations be added to the plan within the vicinity of the discharge point (e.g., at 30 m and 60 m from the location where the WRSF enters Mammoth Lake). Sampling of the stations should be consistent with other surface water receivers of effluent (sampling frequency, analytes, depths, etc.). The sampling should begin in Year 1 of operations (to provide adequate baseline) and continue throughout the post-closure monitoring phase.

Agnico Eagle's Response to Recommendation:

As discussed during the technical hearing and reviewed by ECCC, acting as expert on receiving environment, sampling in the receiving environment is part of the Whale Tail Core Receiving Environment Monitoring Plan (CREMP) addendum and not the Water Quality and Flow Monitoring Plan. As part of CREMP, five (5) water quality stations are located in Mammoth Lake. Each will be sampled five (5) times per year (3 open water, 2 through ice). One station will be located approximately 200-300m downstream of the drainage from the WRSF. The CREMP program is part of Water Licence 2AM-WTP1826, the results will be part of the annual report for the Meadowbank and Meliadine projects, and it will continue to be updated with the Whale Tail pit project.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#2
Re:	Figure 2-1		

Finding:

The current plan does not include sample collection from STWT- 1 (Whale Tail Lake North Basin) during Year 1.

Recommendation:

We recommend that sampling from Station STWT- 1 begin in Year 1 to monitor the progression of water quality response while dewatering the North Basin.

Agnico Eagle's Response to Recommendation:

Baseline data have been collected in Whale Tail Lake North Basin and presented as part of the FEIS. Sampling during dewatering will be conducted as per Water Licence 2AM-WTP1826 requirements Schedule I Table 2 station "ST-DD-1 to TBD".



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#3
Re:	Figure 2-2		

Finding:

With the exception of Figure 2-1, no water quality sampling stations are identified for the flooded South Basin of Whale Tail Lake.

Recommendation:

We recommend that two sampling stations be added to evaluate potential water quality impacts within the basin and that the monitoring continue throughout the operational life of the project, including post-closure.

Agnico Eagle's Response to Recommendation:

As the flooded South Basin of Whale Tail Lake is considered receiving environment, monitoring requirements for this lake are part of Whale Tail CREMP addendum and not the Water Quality and Flow Monitoring Plan. As per the CREMP, there are five (5) water quality stations within Whale Tail Lake South Basin. These will be sampled five (5) times each per year (three (3) times during open water and two (2) times through ice). The CREMP has been approved under Water Licence 2AM-WTP1826.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#4
Re:	S.2.3.4		

Finding:

The Plan states that post-closure monitoring to confirm physical and chemical stability is planned until 2046.

Recommendation:

We recommend that two sampling stations be added to evaluate potential water quality impacts within the basin and that the monitoring continue throughout the operational life of the project, including post-closure.

Agnico Eagle's Response to Recommendation:

Agnico Eagle thanks CIRNAC for its recommendation. The duration of the post-closure monitoring has been defined in the hearing. The closure monitoring will define the stability of the water prior to reconnecting the Whale Tail north basin to Whale Tail south basin and Mammoth Lake.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#5
Re:	S.3.1		

Finding:

The Plan indicates that non-contact water discharged from diversion ditches and other surface water drainages will be sampled. However, no sampling stations are identified.

Recommendation:

While we appreciate that the exact locations of non-contact water sampling stations are subject to change, we recommend that the Plan identify the key drainage paths/catchments and approximate station locations that are likely to be incorporated into the sampling regime.

Agnico Eagle's Response to Recommendation:

Agnico Eagle thanks CIRNAC for this recommendation. Finalization of non-contact water sampling stations will be completed once construction is finalized and steady-state operations have commenced.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#6
Re:	S.3.1		

Finding:

The Plan states that runoff from the Waste Rock Storage Pond will be sampled prior to discharge from Mammoth Lake. We assume this is in error and that sampling would occur prior to discharge to Mammoth Lake.

Recommendation:

The text should be revised accordingly.

Agnico Eagle's Response to Recommendation:

CIRNAC is correct. The change has been made to the Water Quality and Flow Monitoring Plan enclosed with this response package.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#7
Re:	Table 3-1		

Finding:

The table indicates groundwater wells will be sampled only once per year.

Recommendation:

Based on the importance of characterizing the groundwater regime during the short operational period of the mine, we recommend that the sampling frequency be increased such that wells are sampled and groundwater levels measured once per month during periods in which the wells are unfrozen. This is necessary to validate current assumptions regarding groundwater flows and quality in the vicinity of the pit.

Agnico Eagle's Response to Recommendation:

As per Water Licence 2AM-WTP1826, monitoring requirements for groundwater are stated in Schedule I Table 2: "Groundwater wells (to be determined) as required under Groundwater Monitoring Plan". As per the approved Groundwater Management Plan, groundwater is to be sampled from Whale Tail Pit sumps and seeps from the pit walls. This is consistent with practice at Meadowbank.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#8
Re:	Table 3-1		

Finding:

The Plan indicates sampling from the WRSF seepage pond (ST-WT-3) will occur four times per year, when water is present in the pond.

Recommendation:

We recommend that two of the annual sampling events at station ST-WT-3 coincide with: 1) the end of freshet; and 2) the timeframe in which the active zone has penetrated to its greatest depth (assumed to be August). In addition, each of the four sampling events should occur at least two weeks apart. Samples should also undergo toxicity testing during periods when the WRSF seepage pond discharges directly to Mammoth Lake without treatment (i.e., the postclosure phase).

Agnico Eagle's Response to Recommendation:

Agnico Eagle agrees with completing two of the annual sampling events at station ST-WT-3 at the end of freshet and when the active zone has penetrated to its greatest depth (assumed to be in August). Agnico Eagle agrees to complete the four (4) sampling events at this station at least two (2) weeks apart. The revised Water Quality and Flow Monitoring Plan is enclosed with this response package.

Agnico Eagle does not agree with CIRNAC post-closure toxicity testing recommendation. Monitoring requirements at post-closure will be determined in the Final Closure Plan.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#9
Re:	Table 3-1		

Finding:

The Plan indicates that water collected in the Whale Tail Pit or pit sump (ST-WT-4) will be analyzed four times per year. Given the importance of accurately characterizing future pit water quality, more frequent sampling is justified.

Recommendation:

We recommend that sampling and analysis occur monthly whenever water is reporting to the pit (including flooding during closure). Further, all water volumes pumped from the pit should be measured.

Agnico Eagle's Response to Recommendation:

Agnico Eagle does not agree with the sampling frequency portion of this recommendation. Agnico Eagle will follow monitoring requirements provided in Water Licence 2AM-WTP1826 as discussed during the Whale Tail Pit project hearings.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#10
Re:	Table 3-1		

Finding:

The title of the table indicates that the reported criteria are for water quality within Whale Tail Pit. However, we assume it is intended to apply to discharges to Mammoth Lake from the diffuser, as stated in the text.

Recommendation:

The title should be adjusted accordingly. Further a separate table summarizing the required post-closure water quality criteria for the flooded Whale Tail Pit should be provided. Where applicable, those criteria should be based on compliance with the Site- Specific Water Quality Objectives (SSWQO) derived for the site (as opposed to MDMER).

Agnico Eagle's Response to Recommendation:

Agnico Eagle is assuming CIRNAC is referring to Table 3-4 and not Table 3-1 in this recommendation. If so, CIRNAC is correct, the title of the table should indicate that the reported criteria are for discharge from the Mammoth Lake diffuser. The revised Water Quality and Flow Monitoring Plan is enclosed with this response package.

As for the post-closure portion of this recommendation, Agnico Eagle does not agree with CIRNAC's recommendation and the required post-closure water quality criteria table will be determined in the final Water Licence and included in the Final Closure Plan.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#11
Re:	Table 3-1		

Finding:

While the current plan includes sampling of water collected in the base of the pit (i.e., ST-WT-10), no stations are provided to differentiate between different sources of loadings to the pit.

Recommendation:

We recommend that monitoring of pit seep quality be incorporated into the plan, particularly in the vicinity of lithologies with high ARD/ML potential.

Agnico Eagle's Response to Recommendation:

Agnico Eagle does not agree with this recommendation. This requirement is not part of Water Licence 2AM-WTP1826 monitoring requirements. Also, this is not logistically feasible.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#12
Re:	S.3.1.2.3		

Finding:

The current Plan states that discharge from Mammoth Lake shall not exceed effluent quality limits stipulated in Table 3.4 and based on criteria established in Whale Tail Pit Type A Water Licence 2AM-WTP1826.

Recommendation:

We assume the criteria are intended to apply to discharges to Mammoth Lake and recommend that the text be revised accordingly.

Agnico Eagle's Response to Recommendation:

Agnico Eagle agrees with this recommendation. The revised Water Quality and Flow Monitoring Plan is enclosed with this response package.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#13
Re:	NA		

Finding:

The current Plan does not include Effluent Quality Criteria (EQC) for discharges to Mammoth Lake during the post-closure phase (e.g., passive discharge from the WRSF seepage pond).

Recommendation:

We recommend that post-closure EQC for the WWRSF be explicitly stated.

Agnico Eagle's Response to Recommendation:

Agnico Eagle does not agree with this recommendation. As per discussions held during the technical hearing and final hearing, EQCs are not necessary at this time. All criteria will be defined as part of the Final Closure phase.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#14
Re:	Table 3-6		

Finding:

The stated criteria are not consistent with the revised MDMER values.

Recommendation:

The criteria should be revised to be consistent with the applicable MDMER values.

Agnico Eagle's Response to Recommendation:

Agnico Eagle will comply with criteria stated in Water Licence 2AM-WTP1826.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#15
Re:	S.3.3		

Finding:

The Plan states that results of the annual monitoring will be compared to the FEIS water quality predictions to determine if conditions are similar to predicted. Based on the important uncertainties related to surface water quality and the short duration of the proposed operation, annual comparisons are insufficient.

Recommendation:

We recommend that the comparisons be performed and reported on a quarterly basis. This will facilitate a more rapid identification of potential emerging concerns and, where necessary, management plans can be implemented more expediently.

Agnico Eagle's Response to Recommendation:

Agnico Eagle does not agree with this recommendation. As per discussions held during the hearings, this is typically completed every two (2) years, but Agnico Eagle agrees to complete it every year. The updated Water Quality Forecast will be provided annually as part of the annual report. Agnico Eagle feels there are no important uncertainties related to surface water and annual updates to the Water Quality Forecast are sufficient.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#16
Re:	Figure 3-1 & S.5.3		

Finding:

The Plan indicates that the NWB, CIRNAC Inspector and KIA will be informed if water concentrations exceed applicable criteria (i.e., regulatory thresholds). However, no commitments are made to inform regulators if trigger levels have been reached.

Recommendation:

To ensure regulatory authorities are aware of emerging issues, we recommend that the same parties are also informed when trigger levels are reached.

Agnico Eagle's Response to Recommendation:

Agnico Eagle does not agree with this recommendation. As per the CREMP, internal triggers have been defined as:

“early warning criteria that may lead to action. Exceedance of a trigger value does not necessarily imply that an adverse effect may be expected. The triggers may be based on absolute numbers or statistical criteria”.

To the contrary, thresholds are legal requirements or regulatory guidelines under which Agnico Eagle is allowed to operate.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#17
Re:	S.3.3.2.1		

Finding:

The section indicates that water samples will be collected 3 m from the surface. Under some circumstances, there is a need to collect samples from additional depths (i.e., to characterize vertical profiles and potential water quality stratification).

Recommendation:

We recommend that depth profile samples be collected at additional intervals throughout the vertical water column. A minimum of four vertical interval samples should be collected from at least one station in the post-closure flooded pit. A minimum of two vertical interval samples should be collected in the vicinity of effluent discharge locations in Mammoth Lake (i.e., near the diffuser and postclosure WRSF seepage pond discharge locations). In addition, at least one sampling event at each of the vertical interval sampling stations should occur in open-water and under-ice conditions each year.

Agnico Eagle's Response to Recommendation:

Agnico Eagle does not agree with this recommendation. This section of the Water Quality and Flow Monitoring Plan refers to the CREMP program. The CREMP plan has been approved as per the Water Licence process and Agnico Eagle is committed to comply with the approved plan.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#18
Re:	S.3.3.2.1		

Finding:

The section indicates that annual average concentrations (6- month mean) will be compared to trigger values to determine need for action (rather than results from individual sampling events). This approach could result in exceedances of the trigger values and associated environmental impacts without any actions being taken to rectify the situation.

Recommendation:

Given the short operational life of the mine and current uncertainties regarding water quality from the WRSF and the pit, we recommend that results from individual sampling events be compared to the applicable trigger values and reported when any exceedances occur.

Agnico Eagle's Response to Recommendation:

Agnico Eagle does not agree with this recommendation. This section of the Water Quality and Flow Monitoring Plan refers to the CREMP program. The CREMP plan has been approved as per the Water Licence process and Agnico Eagle is committed to comply with the approved plan.



Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#19
Re:	General		

Finding:

Pages 15 to 19 of the PDF file are repeats of previously presented information.

Recommendation:

The Plan should be revised accordingly.

Agnico Eagle's Response to Recommendation:

Agnico Eagle agrees with this comment. The revised version of the Water Quality and Flow Monitoring Plan is enclosed with this response package.