Beaver Dam Gold Mine Technical Review Requirements: Round 1, Part 1 August 11, 2017

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NSE 1-1	Darrell Taylor	NSE	Section 6.3.2	The report should further identify whether any other surface water uses exist in the vicinity, including any water withdrawals through approvals or otherwise. This should be clarified, with distance from any such withdrawal or water use determined, and potential for impact assessed.	Identify any other surface water uses that exist in the project vicinity including water withdrawals.
NSE 1-2				Identification of any nearby public or municipal drinking water supplies would have been helpful, but none are known in the immediate area. Water supply for the nearby Native Reserve should be identified with assessment of any potential effects included.	Identify and describe the water supply for the Beaver Lake Community.
NSE 1-3				The Metal Mining Effluent Regulations (MMER) are cited for compliance as well as the CCME FWAL guidelines. It needs to be recognized that these are intended to be applied in ways other than proposed in the report. The CCME FWAL guidelines (and associated guidance on naturally occurring substances) should be used in assessing level of protection, significance of impacts to surface waters, and in all receiving water related monitoring - for all 3 aspects of the project (i.e. Beaver Dam Mine, haul road and Touquoy Mine site). Parameters included would relate to all potential substances of concern from activities at this mine.	Provide information regarding application of CCME FWAL guidelines to assess the level of protection and significance of impacts to surface water and in all receiving water related monitoring. Include all three aspects of the project (i.e. Beaver Dam Mine, haul road and Touquoy Mine site). Parameters included would relate to all potential substances of concern from activities at this mine.
NSE 1-4				Groundwater/ surface water interaction was suggested in the previous EA report for the Touquoy Moose River mine, visa vis the potential for being hydraulically connected. As the mine pit and Moose River is only separated 70 meters physically, any chance of hydraulic connection would seem to underscore the need for additional information: - regarding how the proponent plans to adequately and safely dispose of tailings, to employ suitable mitigation measures, and to ensure surface waters are protected - all to support the contention that surface waters would not be significantly affected. It is important to ensure any potential effects on groundwater from this proposed operation do not negatively impact surface water resources and associated water uses in any of the nearby watercourses.	See request NSE 1- 5 a, b and NSE 1-1 and 1-2.
NSE 1-5			Section 6.3.2	Section 6.3.2 of the Summary Report states that; “There are potential impacts to surface water quality as a result of the storage of Beaver Dam tailings in the exhausted Touquoy open pit mine but it should be noted	a) Provide a plan to protect down-stream or down-gradient water resources (and expected water uses) from disposal of tailings from the Beaver Dam Mine at Touquoy.

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				that these are restricted to the surface water in the exhausted pit only. The flooded pit will be a lake setting separated physically from the nearby Moose River." It is unclear how impacted water in the constructed 'lake' would not migrate through either groundwater or runoff during storm events to impact other nearby water resources. The contention that there will be no significant impacts to nearby surface waters such as the Moose River do not appear to be well supported, and the scientific rationale to come to this conclusion seems weak. I would suggest more information is needed with respect to providing a defensible plan to protect down-stream or down-gradient water resources (and expected water uses) from disposal of tailings from the Beaver Dam Mine.	b) Provide information regarding migration of groundwater, or runoff from in the pit that would impact surface waters.
NSE 1-6	Gordon Check	NSE		There are a number of potential deficiencies in information regarding the proposed Beaver Dam Mine site. The main ones of concern include groundwater dewatering and flow information; mine tailings geochemistry; soils/sediment/water chemistry for metals including arsenic; the potential migration of these parameters in the environment; and the long-term safe disposal and management of tailings materials considering appropriate contingencies.	Conduct 3D groundwater flow computer modelling for the Beaver Dam site. Groundwater modelling should follow industry standards including proper model calibration and sensitivity analysis. As the interaction between groundwater and surface water is key, an appropriate model that incorporates this interaction should be chosen.
NSE 1-7				Flow maintenance in the Cameron Flowage and downstream should be considered in light of developing better flow estimates. Minimum base flow requirements should be determined and considered as well as possible flow fluctuations based on site interactions with surface water and groundwater. Flow maintenance conditions should be proposed that will not negatively impact ecological and human uses for Cameron Flowage and downstream waters. The impact of potentially increased precipitation events/intensity in relation to climate change should be evaluated with regards to the effects of increased flow events.	Provide information on minimum base flow requirements for Cameron Flowage to maintain ecological and human use. Provide flow maintenance measures.
NSE 1-8				The design for Beaver Dam ore processing includes CIL (carbon in leach) to remove gold using cyanide. Modification to pH in the test may be necessary if it is known that tailings materials are proposed to be in contact with water of a different pH (for example, possibly at the Touquoy Mine site). Leachability testing should be done for a full suite of metals parameters.	a) Provide potential leachability of both the site mine tailings and rock in the exposed ore pit. b) Undertake Bench scale tests of mine tailings/ore from the site with pH appropriate leaching procedures such as The Synthetic Precipitation Leaching Procedure (SPLP).

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					c) Describe the life-cycle process of cyanide addition, recovery and environmental management. d) Provide contingency planning for potential failures related to cyanide recovery and proposed open pit disposal in water.
NSE 1-9	Melanie Haggart	NSE	Section 2.2.3.1	Touquoy Processing and Tailings Management Facility: This section states, regarding use of the Touquoy open pit for Beaver Dam tailings disposal, the pre-development *"…mini-pit provides a habitat for introduced trout which suggests that water quality will not be an issue when the open pit refills. It is noted that at the time of the Provincial EARD, water contained within the mini-pit, itself located within the proposed open pit, had a pH of 7.92 (non-acidic) and arsenic content of 0.032mg/L (well below MMER limit of 0.5mg/L). This suggests that natural water quality in the final pit after reclamation will probably be similar*".	a) How the conclusion was reached that water quality in the final pit will be similar? b) Why is it expected that water quality will be similar after Beaver Dam tailings disposal into the Touquoy open pit? c) What science-based methodology was used to predict that the water quality in final pit containing tailings and water from Beaver Dam processing with associated parameters that were not introduced to the mini-pit, such as the by-products of the reagents used during ore processing (cyanide, copper sulphate), and crushed rock with associated arsenic-bearing minerals with a much higher surface area than in their natural state in the rock, will be similar to the water quality in the mini pit? (It is understood that the mini-pit is a bedrock excavation from which loose rock was removed and which filled only with groundwater / rainwater / snowmelt runoff. (See also questions on Section 6.4.6.2 and Section 8.5.3.1.2). d) What science-based methodology was used to determine whether or not it may be necessary to manage the water in the final, tailings-containing Touquoy pit to prevent an adverse effect on the environment?
NSE 1-10			Section 2.6	Alternatives to the Project	a) What alternatives to disposal of Beaver Dam tailings in the Touquoy open pit have been considered? b) What are the factors considered in selecting disposal in the open pit versus other potential alternatives, e.g., expansion of the Touquoy tailings management facility (TMF) or creation of a new TMF for Beaver Dam tailings?

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					c) Why is disposal in the Touquoy open pit the preferred alternative to other potential alternatives? d) How do the environmental effects in the short term and long term (after closure) differ between the alternatives? e) How are potential long term environmental management costs factored into the evaluation of economic feasibility?
NSE 1-11	Melanie Haggart	NSE	Section 6.3.6.3	Fresh water demand	a) During the transition from use of reclaimed water from the Touquoy TMF to use of reclaimed water from seepage from the proposed tailings disposal in the Touquoy open pit, will there be a period of time where there is insufficient reclaimable water from either the Touquoy TMF or the proposed open pit tailings disposal to supply the 'normal' quantity of reclaimed water to the mill? b) If so, how long will it last and what is the expected increase in fresh water demand during this period? c) Where will this water come from – Square Lake? Scraggy Lake? d) There seem to be inconsistencies between sections of the document. (see comments below on Section 8.5.2.1.3). Section 6.3.6.3 states that the amounts for this surface water use and time period have been previously identified in this document, however I can't locate it. In what section is this information provided? e) Has a revised water balance for the Touquoy site arising from the Beaver Dam development, at each stage of the project, been developed and what does it show?
NSE 1-12			Section 6.4.6.2	Touquoy pit tailings deposition	a) What is the basis of the prediction that 'potential impacts would be minor in nature and ….within a short radius of the flooded pit?'

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					b) What is the radius involved and how does it relate to the expected final distance of the pit wall to the Moose River and/or other watercourses and drainage channels? c) What is the expected hydraulic gradient around the flooded pit during various times of year and why would discharge to surface watercourses of impacted groundwater not be expected? d) Provide the details of studies and/or modelling upon which this is based (as referenced in Ausenco 2015 as cited elsewhere in the EIS). e) Are mitigative measures required to ensure this prediction is true, and if so what measures? f) How will those measures be maintained in the long term (including indefinitely, after mine closure)?
NSE 1-13	Melanie Haggart	NSE	Section 8.5.3.1.2	Reagents	a) What is the basis of the prediction that residual reagent (i.e. cyanide) introduced to the tailings during ore processing will be degraded and hydrolyzed… similarly in the Beaver Dam tailings stored in the Touquoy open pit (as to what is expected in the Touquoy TMF)? b) Has this been modelled? c) What is the effect of the difference in the surface area of the TMF from the surface area in the open pit at the elevation at which tailings disposal would occur? d) What would be the effect of ongoing disposal during winter ice cover over this reduced surface area? e) Would the expected accumulation of residual reagents in tailings pore water occur at higher concentrations within tailings

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					deposited over a reduced surface area compared to when spread laterally within a TMF with a larger surface area? f) How long will seepage out of these tailings take and what is the expected timeline for this pore water seepage to infiltrate to groundwater surrounding the pit? g) At what concentrations would seepage be expected to arrive in groundwater and are the concentrations of these reagent and their byproducts higher than around the TMF?
NSE 1-14	Melanie Haggart	NSE		For processing of Touquoy ore and disposal in the TMF, there is a water treatment facility at the discharge point into the polishing pond to treat for arsenic, which will also assist in reducing metal-cyanide complexes.	Is a similar facility anticipated for water in the open pit after Beaver Dam tailings disposal and if not, why?
NSE 1-15				For processing of the Touquoy ore, it was predicted during EA that copper would be elevated at the discharge point and would continue to be elevated a long way downstream in the receiving water. The Ausenco (2015) report referenced in the EIS shows that copper reagent demand in the Inco-SO2 process for cyanide detoxification will be twice as high for Beaver Dam ore as for Touquoy ore.	a) Will dissolved copper be correspondingly higher in water discharged to the open pit with Beaver Dam tailings than in water discharged to the Touquoy TMF? b) Ammonia was also predicted to be somewhat elevated at the discharge of the polishing pond for Touquoy ore in more recent modelling. Has the potential water quality in the open pit and in the pore water in the open pit been predicted by modelling, including for arsenic, metal-cyanide complexes, copper, ammonia or any other parameters? c) Has the potential for Beaver Dam tailings to be acid-generating been sufficiently evaluated to determine whether or not acid generation is a concern? What are the details of this evaluation? d) What is the expected water quality (for the specific parameters identified above) in the open pit including both surface water and tailings pore water resulting from Beaver Dam tailings deposition?

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					e) What is the potential effect of these parameters on receiving water including seepage to groundwater directly from tailings pore waters? f) Is it likely that management of the water quality in the pit to prevent an adverse effect on the environment could be necessary?
NSE 1-16	Melanie Haggart	NSE		The analysis references work conducted in 2007 citing minimal groundwater / surface water interactions around the Touquoy pit.	Could this evaluation of minimal interconnection between the pit and surface water and groundwater have changed since 2007 in consideration of the most up to date understanding of the geology and hydrogeology of the pit area and the pit design, including current design expectations of distance between the pit wall and the river?
NSE 1-17				The throughput rate of ore processing has increased since 2007 predictions due to an increase in the ore reserve estimates and it is understood that this led to pit re-design (expansion) since that time. More recent modelling of surface water and groundwater interaction and prediction of surface and groundwater quality impacts arising from use of the pit for tailings disposal was apparently conducted, as referenced in Chapter 20, Section 2.1.1.4 of Ausenco 2015 as cited in the EIS.	a) Provide the details of the assumptions, methods, and results of this more recent modelling. Are mitigative measures required based on the predictions of this modelling? b) If so, what measures and what is their effect on the surrounding environment including Moose River, groundwater, and any discharge points of open pit water? c) How will those measures be maintained in the long term (including indefinitely, after mine closure)? d) Is there a need for collection of additional hydrogeological data around the open pit to update the groundwater flow model to support deposition of tailings in the open pit for the Beaver dam operations (as per Ausenco 2015 recommended additional work?) e) Does modelling upon which predictions of groundwater / surface water interactions (quality and / or quantity) and a conclusion made in the EIS of 'no significant adverse effects' at the open pit (with Beaver Dam tailings disposal) take into account the fault

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					that runs across the open pit from southwest to northeast and separates ore bearing rock from non-ore bearing rock that was used as borrow for Touquoy TMF construction? f) Does modelling need to take into account localized zones of highly fractured slates with higher hydraulic conductivity that are intercalated with quartzites in the area of the Touquoy development, as found during construction of the Touquoy TMF, leading to TMF design changes, and modelled by Stantec in 2016 as part of seepage predictions for the revised TMF design? g) What are the possible fault-related and/or localized hydrostratigraphic differences in predicted groundwater / surface water quantity and quality interaction in the vicinity of the open pit when used for tailings disposal, compared to the assumptions used during modelling in 2007 and compared to the assumptions used in more recent models (as described in Ausenco 2015), and what are the uncertainties that those differences may introduce to the predictions in the EIS?
NSE 1-18	Melanie Haggart	NSE	Section 6.4.7	This section references the groundwater monitoring network in place at the Touquoy facility under existing approvals, which do not include authorization for disposal of Beaver Dam tailings in the open pit.	a) Has the existing groundwater monitoring program including well network design (well placement, screen intervals, etc), parameters being monitored, and monitoring frequency around the Touquoy open pit, been reviewed to evaluate if it is adequate to monitor the potential effects of Beaver Dam tailings disposal into the open pit? b) What additional wells should be placed, in what locations, with what design and what additional parameters should be added to monitoring to reflect the modified plans for the open pit? c) How far in advance should any changes in the monitoring program be made, prior to the start of disposal of Beaver Dam tailings, to ensure adequate baseline data are available to monitor and detect whether or not the prediction of 'no significant adverse effect' to groundwater or surface water from the proposed disposal is correct for all parameters, including

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					those that would not be expected to be of concern without tailings disposal into the open pit?
NSE 1-19	Melanie Haggart	NSE	Section 8.5.2.1.3	Surface Water Quality and Quantity Cumulative Effects Assessment – Effects of Other Projects in the Area: Touquoy Gold Project: - this section references effects of Touquoy as including 'excessive water withdrawal from Square Lake' and discusses durations and relative volumes of water withdrawal from Square Lake, with conclusions. Cumulative surface water quantity effects of the two projects together are not described.	a) Is water withdrawal from Square Lake actually part of the Touquoy project and/or is it anticipated? b) Is water withdrawal from Square Lake part of the Beaver Dam project? c) What are the potential cumulative effects on water quantity on the proposed project water source(s) due to the combination of the Beaver Dam project and the Touquoy projects?
NSE 1-20			Section 8.5.3.1.3	Groundwater Quality and Quantity Cumulative Effects Assessment, - Effects of Other Projects in the Area: Touquoy Gold Project	a) Does this section take into account changes in TMF design made during 2016/17? b) If not, what changes in the conclusions are expected based on the updated design which eliminated the grout curtain in fractured bedrock, and revised predictions of seepage to groundwater through fractured bedrock? c) How does this affect the assessment of cumulative effects upon groundwater of the combination of the Beaver Dam project and the Touquoy project?
NSE 1-21	Bernie Matlock	NSE	Page 35	The report indicates that the water quality and fish habitat in the mini-pit at the Touquoy Mine site is a good prediction of water quality in the Touquoy pit after filling with tailings. The report also states that acid generation of tailings will be "*eliminated*".	Provide a technical justification for this prediction based on the changes in water quality that might be expected with tailings deposition.
NSE 1-22				During the life of the Touquoy Mine, blasting will be conducted and the presence of potential bedrock faulting could result in a situation where there is loss water cover over the pit tailings and increased potential for acid generating conditions to change pit water chemistry.	What contingency plans could be employed to prevent this situation?
NSE 1-23			Page 207		a) If the flooded Touquoy pit is considered *"physically disconnected*" from Moose River, where will this natural lake (tailings filled pit) discharge upon final reclamation?

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					b) If there is a physical disconnection of the pit, will this result in all pit water migrating into the groundwater regime to potentially impact groundwater quality? c) If the pit overtops surface water, as occurred with the mini-pit, how and where will water be conveyed, what is the expected impact on the receiving stream and will the stream be capable of accommodating hydraulic changes?
NSE 1-24	Bernie Matlock	NSE	Page 52	Page 52 indicates the Touquoy Pit is not expected to fill with water during the mine life.	a) Provide the water balance and technical information to demonstrate the expected storage volume of tailings, runoff and groundwater in the pit over the life of the project. b) What is the capacity of the Touquoy pit for the volume of tailings anticipated to be generated? c) What are the contingency plans if the pit is filled with tailings and/or water prior to end of project life?
NSE 1-25				An evaluation of metal leaching capability of water overlying Touquoy pit tailings should be completed as eventually upon reclamation or earlier, the supernatant water from the pit may need to be discharged to the environment. Arsenic in runoff from historic abandoned gold mines is known to be an environmental concern.	a) Will the filling of the pit compromise or effect the natural treatment of wastewater in the pit, particularly natural cyanide destruction which is a component of the current treatment process in the tailings management facility of the Touquoy mine site? b) What are the expected cyanide concentrations anticipated in the pit wastewater and groundwater during operation? c) What operation, maintenance and surveillance tools will be used to manage the potential environmental impacts resulting from the handling of Beaver Dam tailings?
NSE 1-26			Page 154	Page 154 of the report relates to the potential for acid rock drainage generation and states *"… there are areas that will require specific handling and disposal due to sulphur content"*.	a) Provide details on the "areas" that require specific handling and disposal, and what these handling and disposal plans might be? b) What specific acid rock drainage plans will be employed to manage areas of the deposit and mine wastes generated from potentially acid generating rock?

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NSE 1-27	Bernie Matlock	NSE	Page 164	The statement "*Recent analysis of six ore and waste rock samples showed that two exceeded the 0.40 % sulphur threshold and thus an acid generating potential in excess of acid consuming potential.*" It is unclear how these results relate to Table 6.2.3. The proponent should be aware that the threshold described, in this case, be used as general guidance tool and that additional analysis, including *kinetic test* results for the acid generating potential, be conducted to determine acid rock drainage mitigation plans.	Provide kinetic test results for the acid generating potential.
NSE 1-28				The report also suggested that waste rock be evaluated every 100,000 tonnes for acid generating conditions. If waste rock from the mine will be used for haul road construction a more extensive program for evaluation of potential acid generating conditions should be presented, as reuse along the haul road could represent less controlled conditions in close proximity to surface water receptors.	Justify this evaluation frequency both for controlled conditions of disposal within the mine footprint and reuse for haul road construction outside the mine footprint.
NSE 1-29				Acid-base accounting samples and results should be presented for the sections of the haul route which will be disturbed, particularly along portions of the route which are documented to disturb the Halifax Formation geology which has potential to produce acid rock drainage when disturbed.	Please provide the technical justification or test results which indicate that acid generation and/or metal dissolution will not be an environmental issue. Should testing be completed provide testing locations.
NSE 1-30				Baseline monitoring at the Beaver Dam should be undertaken prior to construction activities, which includes the development of any borrow pit for aggregate. Page 57 the report indicates that there is no plan to have "connectivity" between the flooded Beaver Dam pit and Cameron flowage.	a) How will this be achieved based on the low hydraulic conductivity of pit bedrock? b) If the pit does overflow, what is the ultimate plan and discharge location for the overflow from the Beaver Dam mine pit and what are the expected impacts?
NSE 1-31				If the Touquoy pit is expected to be filled with tailings and the tailings impoundment has a reasonable contingency of being used for the project during the life of the Beaver Dam Mine project, this will impact the both the reclamation plans and reclamation schedule for the Touquoy Mine site. This plan could delay reclamation of the Touquoy tailings impoundment. New revised reclamation plans will need to be submitted for approval.	What changes are expected in the reclamation plans at the Touquoy mine site as a result of the Beaver Dam Mine project?

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NSE 1-32	Bernie Matlock	NSE		Wetland Impacts	a) Please provide the justification for constructing what appears to be settling pond(s) and drainage structure within wetlands. b) How will these structures be constructed within wetlands
NSE 1-33			Section 6.3.5.2	*Thresholds of the Determination of Significance* should also consider CCME FWAL other than just total suspended solids.	Consider CCME FWAL to determine thresholds of significance.
NSE 1-34			Section 6.4.5.2	*Thresholds of the Determination of Significance* should also consider NSE Environmental Quality Standards for groundwater. Loss of surface water in Cameron Flowage to the Beaver Dam pit is identified as a possible impact, but a threshold should also be offered in this section or the same section on Surface water.	Provide a threshold for determining significance of loss of surface water to Cameron Flowage.
NSE 1-35				Metal Mining Effluent Regulations	a) Is the Beaver Dam mine project expected to be subject to the Metal Mining Effluent Regulations? b) If so, at what stage in project development is this expected to occur? (i.e. exceeding 50 m^3 per day discharge)?
NSE 1-36			Table 3.4-1	Groundwater: Table 3.4-1 states: "…geological conditions predict minimal effect on the receiving environment"	Elaborate on this statement in light of the disposal of tailings in the mined out Touquoy pit.
NSE 1-37			Page 207	Page 207 mentions the possible impact of the Touquoy pit filling seepage on surface water.	a) What impacts are expected and how can they be mitigated? b) What is the potential for seepage of contaminants from the open pit to the groundwater systems? c) A model predicting the anticipated impacts to groundwater and surface water systems (such as Moose River) should be provided.
NSE 1-38			Page 229	Page 229 indicates that the bedrock is relatively impermeable and will reduce the loss of contaminants from the tailings filled pit into the groundwater. Copper and cyanide levels in pit wastewater are predicted to be within MMER levels.	a) The MMER levels, generally exceed freshwater and drinking water standards, could these levels within pit water still negatively impact groundwater and surface water receiving environments? b) Provide the design concept of the wastewater recycle system from the Touquoy pit including tailings discharge system to the Touquoy pit and the seepage water recycle from the Touquoy pit to the mill. What leak or spill contingencies are proposed?

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NSE 1-39				The Beaver Dam Mine project will require construction of the haul road prior to the mining and transport of ore to the Touquoy Mine. At that time, there may be limited availability of aggregate from the Beaver Dam Mine prior to full scale mining.	a) How much aggregate will be required to construct the haul roads? b) How much is available from the Beaver Dam mine and how much will need to be accessed elsewhere? c) If another quarry source is required, where will the aggregate be obtained? d) Are authorizations required from the regulatory agencies to transport aggregate, possibly large tonnage transport, over provincial roadways? e) If so, what authorizations are required and what are the plans to obtain these authorizations? f) What is the anticipated location of historic tailings that were generated from the past mine site activities? g) Do these areas need to be investigated and will the project have an impact on these areas?
NSE 1-40				The Accidents and Malfunctions section does not address the Touquoy Mine site.	Provide an updated Accidents and Malfunction Plan to address new activities at the Touquoy site.
NSE 1-41	Rachel Bower	NSE	Page 161	Historic Tailings at Beaver Dam (BD) –One sentence on page 161 indicates that there are no indications of historical tailings at BD. It is not clear what is meant by “no indications”.	a) What assessment was completed to come to this determination that historical tailings are not a factor at BD?
				More information is required to fully evaluate the Touquoy pit as a suitable disposal location for BD tailings. More in depth assessment of geology, hydraulic connectivity to Moose River, chemical composition/characteristics of the BD tailings, protection measures for Moose River etc. would need to be considered.	b) What is the long-term management strategy to ensure the groundwater and surface water is protected from potential migration of beaver dam tailings? c) Will the tailings fill the Touquoy pit to surface or will there be open water at surface? Please demonstrate how this was determined.

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					d) If there is open water at surface in the Touquoy pit, how will that water be managed to ensure it doesn't overtop? e) If the tailings in the Touquoy TMF require treatment before entering Scraggy Lake, how was it determined that treatment will not be required for the BD tailings? Perhaps there is treatment planned but, further clarification is required. f) If there is treatment planned for the BD tailings in the Touquoy pit, where will the final discharge point be and which watercourse will it enter?
NSE 1-42	Rachel Bower	NSE		Dust suppression is currently an on-going and unresolved issue at the Touquoy Mine. Further mitigation measures need to be considered.	Provide a dust suppression plan for the Beaver Dam Mine site, haul road and addition mitigation measures for the Touquoy site.
NSE 1-43	Brent Cox	NSE		Groundwater and Surface Water Baseline Data – The Department intended on ensuring that the proponent collect a minimum of 1 year of baseline data prior to any construction at the Touquoy site. Due to a discrepancy in the Industrial Approval, the proponent began collecting this information 3 months prior to construction. There is concern that this will be inadequate to detect any changes in the groundwater/surface quality.	a) Will the tailings fill the Touquoy pit to surface or will there be open water at surface? Please demonstrate how this was determined. b) If there is open water at surface in the Touquoy pit, how will that water be managed to ensure it doesn't overtop? c) If the tailings in the Touquoy TMF require treatment before entering Scraggy Lake, how was it determined that treatment will not be required for the BD tailings? Perhaps there is treatment planned but, further clarification is required. d) If there is treatment planned for the BD tailings in the Touquoy pit, where will the final discharge point be and which watercourse will it enter? e) There is no mention of whether TIR is in acceptance of the proposed plan to use highway as a haul road between the two sites. Has this plan been approved?

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				Refers to the presence of a prefabricated office and workshop on site. However, there is no discussion of solid waste management or wastes generated by the workshop (oil/fuel spills are addressed). That being noted, "general waste management" is noted repeatedly in the check list.	Provide information regarding all wastes and waste management at the workshop.
NSE 1-44	Brent Cox	NSE		One of the proponent's response to key issues raised during stakeholder engagement (Table 3.4-1) indicated …." *Leaching of metals is not expected, e.g., arsenic is expected to be within baseline conditions. Acidic runoff is not anticipated to be a concern. Surface water management and monitoring will be in place to identify trends*" .... Suggestion is that baseline conditions (specifically arsenic) are naturally elevated. Also, ore extraction could expose large areas of fresh bedrock to acidic producing environment.	Was sufficient baseline data collected (away from the former mine operations) to establish that elevated occurrences are not attributed to former mine operations?
NSE 1-45			Section 6.2.2	Baseline soil/sediment analytical results are compared to CCME SQG (soil) and CCME ISQG/PEL (sediment). While this comparison is reasonable for Federal requirements; from a provincial perspective, results should also be compared to Tier 1 EQS. Tier 1 EQS soil/sediment exceedances as trigger for adverse effect should a release occur (as with surface water – Section 6.3.5.2). Baseline surface water analytical results are compared to CCME FWAL and MMER. While this comparison is reasonable for Federal requirements; from a provincial perspective, results should also be compared to Tier 1 EQS.	Compare baseline soil/sediment and surface water analytical results to Tier 1 EQS.
NSE 1-46			Section 6.4.5.2	…" *An effect on groundwater quality would include exceeding the applicable CCME groundwater quality criteria.* "…	Identify Tier 1 EQS soil/sediment exceedances as trigger for adverse effect should a release occur (as with surface water – Section 6.3.5.2).
NSE 1-47			Section 6.4.7	…" *This includes a comparison of data with baseline levels and accepted water quality guidelines, such as CCME Water Quality Guidelines for the Protection of Aquatic Life.*" … While this comparison is reasonable for Federal requirements; from a provincial perspective, results should also be compared to Tier 1 EQS	Compare groundwater quality results to Tier 1 EQS.

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NSFA 1-1	John MacMillan	NSFA	Table 7-1 Page 87	Priority Species and speckled trout	a) Why were speckled trout (brook trout), NS Provincial Fish, the most important sport fish in the province, not included as a priority species? b) Priority Species: What criteria was used to classify priority species?
NSFA 1-2				A lime doser will be constructed downstream from Cameron Flowage on the Killag River to improve water quality and benefit trout and Atlantic salmon. At the meeting, (July 24, 2017) concern was expressed regarding the additional of water to Cameron Flowage during mining operations. If increased, additional water volume will need to be treated by the Killag doser and more lime (increased expense) may be required to reduce acidity to a level that is suitable for Atlantic salmon.	a) Will this result in larger flow rates in the Killag River? b) Will acid be liberated by the mine operations and could this result in an exacerbation of the acidity issue in the Killag River and downstream areas?
NSFA 1-3				During the overview presentation of the Beaver Dam Mine operations (24 July), assurances were given that the extraction of ore is an acid consuming process and the pH of water used in this process will improve (less acidic)	a) Will this improvement in water quality be short-term? b) Will the water that is used in mining operation be treated with limestone? c) Can an explanation be provided as to how the mining of this site will result in reduced acidity of the water that is used in the mining process?
NSE 1-48	S. Vervaet M. Seaboyer	NSE	Section 6.1.3.4	In paragraph 1 the proponent suggests conducting additional baseline monitoring prior to construction, including $PM_{2.5}$, PM_{10}, SOx, VOCs & NOx; however, no detail has been provided.	Provide proposed monitoring locations identified on a map along with seasonal wind roses. The proposed baseline monitoring locations should be informed, in part, by results of air dispersion modelling (see comments below).
NSE 1-49			Section 6.1.3.4 Section 6.1.7.2	Paragraph 2 states that “There will likely be negligible impacts to the residential area due to the surrounding topography, the surrounding forested area, and the distance to the nearest residential area”. No air dispersion modelling was provided to support this conclusion.	a) Complete an inventory of expected air contaminants from this project which includes both air contaminants regulated under the NS *Air Quality Regulations* and any others of concern (e.g. metals, volatile organic compounds etc.). Conduct air dispersion modelling of these contaminants using a model acceptable to the Department.

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				Paragraph one states that Atlantic Gold will take steps to minimize GHG emissions by "… considering the use of more fuel-efficient vehicles and equipment". Procuring and operating low emission/energy efficient vehicles/equipment such as tier 4 generators, haul trucks and other heavy duty machinery, could reduce emissions from the proposed activities. This practice falls in line with the Canadian Council of Ministers of the Environment's (CCME) principle of Keeping Clean Areas Clean (KCAC) And Continuous Improvement (CI), and would help reduce GHG emissions and potential impacts to human receptors and other valued components.	b) Is the proponent committing to following the practice of using Best Available Technology Economically Achievable (BATEA) as an air emissions mitigation measure?
NSE 1-50	S. Vervaet M. Seaboyer	NSE	Section 6.1.7.2 Table 6.2-8, 8.3-1, Section 6.2.3.2.1	Paragraph 3 indicates that "minimal volumes of water will be re-used on site for dust suppression purposes, as required." If the proponent is expecting to use water from the settling pond for dust suppression, then the water should be periodically analyzed for metals and other contaminants of concern to ensure water is safe for distribution on the roads. Using water containing high levels of contaminants on roads could impact other valued components through water runoff and suspension/transportation of road dust. A proposed monitoring/mitigation strategy to address the above concern should be provided.	Should the dust suppression requested in Comment NSE 1-42 intend to use water from the settling pond, provide mitigation/monitoring measures to address potential contaminants.
NSE 1-51				Table 6.2-8 outlines the Residual Environmental effects for Geology, Soil and Sediment Quality, but does not include the potential Project Valued Component Interaction of the atmospheric environment and subsequently other valued components. This should be included as there is potential for exposed sediment containing elevated levels of arsenic, mercury and other metals, as indicated in section 6.2.3.2.1, to track around the site and become suspended in dust during the construction/operation phases. This could impact the atmospheric environment and other identified valued components such as flora and fauna habitat, and human health & socio-economic conditions (Table 8.3-1 Page 634).	Provide appropriate compensation and mitigation measures to address exposed sediment containing elevated levels of arsenic, mercury and other metals of concern.
NSDNR 1-1	M. Elderkin	NSDNR Wildlife		The document does not provide sufficient evaluation, data or analysis on the duration, geographic extent and impact of residual effects of habitat loss (both qualitative and quantitatively) beyond the five-year operating life of the project on wetland function(s), wildlife (including turtles, moose	Please provide data and analysis on the cumulative effects incurred through overt loss of wetlands, loss of wetland function, toxics transfer and release in food chains supported with modelling. A twenty-year timeline for this modelling is recommended.

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				birds) and water. Consideration of these variables is required for a project such as this one, given the short operating duration (5 yrs), but with a large geographic area of impact extended over a long-term that can be reasonably inferred to be negatively affected.	
NSDNR 1-2				Baseline loading(s) of arsenic, mercury etc. present in blood/tissues of non-migratory long-lived species within the project footprint and area surrounding are not provided in the EA. These data are necessary to monitor impacts of toxins on wild species that may be elevated through exposure of toxic laden soils and transfer of them through water (and other pathways).	Provide baseline blood analysis for turtles, fishes and aquatic furbearers (otter, mink) as a precursor for monitoring at five year intervals on a twenty-year time horizon (5 sampling iterations in total).
NSE 1-52	Sara Rumbolt	NSE Environmental Health and Food Safety Branch	Section 2.1, 8.5.11.1.1, 6.1.3.6, Figure 2.1-2 Table 6.13-5, Section 6.1.2, 6.13.1 6.1.3.6, 6.11.6	Residential property and the people associated with them regardless if they are seasonally occupied or not are considered receptors. They should be clearly identified including duration and time of year occupied and factored into all assessments regarding risks to human health as appropriate. Risk to human health is not established using only permanent residences as receptors and the omission of seasonal receptors can underestimate impact to human health. Potential impacts to human health were insufficiently assessed in the submission provided by the proponent. As previously mentioned above, receptors were not appropriately identified and therefore were not assessed appropriately for potential health impacts associated with noise, dust, air quality, food, and potable water impacts. Occupational Health & Safety legislation is not appropriate for use for the assessment of risk to the health of the public as it does not provide necessary protection to vulnerable persons. The Department of Labour and Advanced Education should assess claims in regard to worker safety.	a) Identify all receptors as described in comments (attached) submitted by the Environmental Health & Food Safety Branch of NSE. b) Assess and report potential impacts to all receptors. These include but are not limited to, noise, dust, air quality, food, and potable water impacts.
NSE 1-53			Section 2.3.2.4, 6.1, 6.12, 6.1.6.3.1	Improvements to assessment of adverse health effects associated with noise is recommended. Workplace Health & Safety legislation cannot be used to evaluate risk to public health and any evaluation of the risk to site workers should be made to the Department of Labour and Advanced Education.	Complete noise modelling to include seasonal receptors located in association with the mine site and the haul road.

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NSE 1-54	Sara Rumbolt	NSE Environmental Health and Food Safety Branch	Section 6.4.1,6.43, Tables 6.4-1, 6.4-2	Potable water use was not established for all receptors. As seasonal residences/cottages have been identified in the project area in closer proximity than the 5.5km distance to the nearest well referenced. This suggests that data in relation to the water supplies associated with these properties has not been collected or assessed.	a) Establish the type and characteristics of all receptor's portable water supplies (dug wells, drilled wells and surface water). Provide a mitigation plan for these water supplies.
			Section 2.1.3, 2.3.3.1, 6.3.1	Baseline information should be established regarding socio-economic use of recreational water for primary recreational activities (i.e. swimming, activities involving potential or likely submersion of a person in water) in the area of impact for the project.	b) Identify recreational water usage in the area that could be adversely affected by the project.
NSE 1-55	Neil Morehouse	NSE Wetlands		The report states compensation will take the form of 1:1 on the ground restoration and "other secondary forms of compensation". Compensation should be equivalent to 2 ha of restored wetland: 1 ha altered wetland, with a preference for on-the-ground wetland (or wetland function) restoration within the affected watersheds and/or those that provide shoreline stabilization functions, followed by on-the-ground wetland restoration opportunities elsewhere in the province. Evidence of effort to identify these wetland restoration opportunities should be provided to NSE. Only where there are significant barriers to completing the required on-the-ground restoration within a reasonable time frame (3 years from alteration completion) will other secondary forms of compensation be considered at this time.	Please provide a preliminary wetland compensation plan.