

Environmental Protection Operations Directorate
Prairie & Northern Region
9250 49 Street
Edmonton, AB T6B1K5

ECCC File: 4194-10-5/3295

CIAR Reference: 80140



June 24, 2022

via email at: <email address removed>

Wajeeha Siddiqui
Impact Assessment Agency of Canada
1145-9700 Jasper Avenue
Edmonton, AB. T5J 4C3

Dear Wajeeha Siddiqui,

Re: Request for Comments on the Round 2 Information Request Responses and Final Views on the Lynn Lake Gold Project (Technical Review Round 3)

Environment and Climate Change Canada (ECCC) has reviewed the Round 2 Information Request Responses for the above-noted Project as requested by the Impact Assessment Agency of Canada's June 9, 2022 letter. Our input attached reflects IRs for which we had recommendations to make, on topics not related to caribou. We will send our caribou-related comments early next week. Our input is based on ECCC's mandate in the context of the *Species at Risk Act (SARA)*, the *Migratory Birds Convention Act 1994 (MBCA)*, the *Canadian Environmental Protection Act 1999 (CEPA)* and the pollution prevention provisions s.36(3) the *Fisheries Act (FA)*.

The Agency's June 9, 2022 letter also requested Final Views which ECCC is preparing.

Please contact Marcus Edino at <contact information removed>

if you need more information.

Sincerely,

<Original signed by>

Margaret Fairbairn
A/Regional Director, Environmental Protection and Operations Directorate
Prairie Northern Region

cc: Gillian Brown, A/Head, EA South, EPOD, ECCC
Marcus Edino Environmental Assessment Officer, EA South, EPOD, ECCC



Attachment 1 – Technical Review of Round 2 Information Request Responses – Lynn Lake Gold Project

Information Request Responses - Technical Review Optional Feedback Form

Objective: Taking into account the information provided in the Round 2 Information Request responses from Alamos Gold Inc., please identify any areas in the responses to the Information Requests that require further information to understand the potential environmental effects of the Project, and the significance of those effects to the components of the environment.

Please provide us with your comments on the Information Request responses by **June 23, 2022**

IR Number	Context and Rationale	Specific Question / Comment	Expert Group
Identify which Round 2 Information Request response your comments are related to (e.g. IAAC-R2-04 to IAAC-R2-06)	<p>Identify if the concerns raised in technical review Round 2 have been addressed.</p> <p>Provide applicable background or rationale for the comment provided, or information requested, including why it is important for understanding the effects of the Project, particularly as it pertains to Section 5 of CEEA 2012 and potential impacts to rights.</p>	Please provide your comment and/or ask a specific question, request specific additional information, or clarification.	
IAAC-R2-04	<p>Per the Proponent’s response to Information Request (IR) IAAC-R2-04 and Table IAAC-R2-04-1 Preliminary Adaptive Management Measures, the Aquatics Effects Monitoring Plan includes monitoring of fish tissue concentrations, with a corresponding threshold described as follows:</p> <ul style="list-style-type: none"> <i>Mercury concentrations in exposure area that are >0.5 mg/Kg wet weight and statistically higher than mercury</i> 	<p>ECCC recommends that the Proponent provide:</p> <ol style="list-style-type: none"> Comparisons of the proposed fish tissue concentration threshold against relevant guidelines and baseline concentrations, and Rationale to support the proposed fish tissue concentration thresholds. If pre-project tissue concentrations of mercury are not comparable to reference area levels, then the threshold could include 	WQ

	<p><i>concentration in fish tissue in reference area.</i></p> <p>The proposed fish tissue concentration threshold of >0.5 mg/kg total mercury is 15 times higher than the CCME methylmercury tissue residue guideline. No rationale was provided to support the proposed threshold. Therefore, it is unclear whether the proposed threshold would provide an early indication of project-related effects.</p>	<p>comparisons to baseline and use detection of upward trends to trigger adaptive management measures.</p>	
IAAC-R2-18	<p>Insufficient information has been provided to demonstrate that treatment of wastewater will render loadings from the Waste Water Treatment Plant (WWTP) negligible. The response does not discuss wastewater discharge loadings, nor associated effects on aquatic productivity. Therefore, the potential effects of wastewater loadings are unclear.</p>	<p>ECCC recommends that the Proponent:</p> <ol style="list-style-type: none"> 1. Provide the WWTP effluent target numbers for TSS, BOD5, ammonia, phosphorus, and coliforms, if available; 2. Confirm that wastewater effluent will be non-acutely lethal at end-of-pipe; 3. Estimate or quantify:(1) environmental loadings from WWTP discharges, and (2) increased productivity in the receiving environment due to the wastewater inputs; and 4. Describe how the WWTP operations (including WWTP discharges, environmental loadings, and associated increases in productivity) inform the effects assessment, and whether conclusions about predicted effects of WWTP effluent on the environment have changed. 	WQ
IAAC-R2-23 IAAC-R2-39	<p>Per the Proponent’s response to IR IAAC-R2-23, should water quality concentrations approach those predicted for the Upper-Case scenario at the Gordon site, the proposed contingency measures involve source control, treatment, and</p>	<p>ECCC recommends that the Proponent:</p> <ol style="list-style-type: none"> 1. Prioritize other proposed contingency options (i.e., source control and treatment) over extending the exposure-area footprint (i.e., discharging contact water to the Hughes River); and 	WQ

	<p>discharging collection pond contact water to the Hughes River. The response states that the purpose of pumping contact water to the Hughes River is to discharge contact water to a watercourse with much higher assimilative capacity than Farley Lake. Using this option would entail another Final Discharge Point (FDP) and would extend the exposure-area footprint. ECCC suggests that higher priority be given to source control and treatment, rather than adding a new receiver. It is also noted that the Proponent's response to IR IAAC-R2-39 indicates that pit water will be pumped to the Hughes River during construction. However, it is unclear whether the potential effects associated with discharging contact water to the Hughes River have been assessed.</p>	<p>2. Clarify whether the potential effects associated with discharging contact water (from Gordon site collection pond, from existing pits during construction, and any other proposed discharges) to the Hughes River have been assessed. If not, the potential environmental and human impacts of such discharges should be assessed (including residual and cumulative effects) prior to inclusion of these measures.</p>	
<p>IAAC-R2-26 IAAC-R2-28</p>	<p>Additional information regarding phosphorus is required to support a better understanding of phosphorus predictions and potential effects. The Proponent's response to IR IAAC-R2-26 clarifies that the Parameter of Potential Concern (POPC) screening criteria were applied to predicted water quality concentrations in the downstream receiving environment, and further clarified that concentrations represent the entire watercourse/waterbody. Noting that whole watercourse/waterbody concentrations were screened, it is also important to consider whether changes to phosphorus concentrations could potentially affect the trophic status of the receiving environment. However, trophic conditions are not discussed in Chapter 9 (Assessment of Potential Effects to Surface</p>	<p>ECCC recommends that the Proponent provide the following:</p> <ol style="list-style-type: none"> 1. Clarify whether the water quality model predictions and effects assessment regarding phosphorus are based on assessment of the total phosphorus fraction. If they are not, provide a rationale for the approach used. 2. Identify all potential sources of phosphorus loadings, including any loadings associated with the fertilizer amendments discussed in response to IAAC-R2-30. 3. Describe the trophic status of the aquatic environment for baseline and project conditions, including consideration of total phosphorus concentrations and loadings. 	<p>WQ</p>

	<p>Water) of the Environmental Impact Assessment (EIS), nor in subsequent submissions.</p> <p>The Proponent's response to IR IAAC-R2-28 does not indicate whether phosphorus predictions and conclusions refer to the total phosphorus fraction. As noted in the CCME phosphorus guidance framework, total phosphorus (TP) is the only meaningful measurement of phosphorus for water. Since sediment-bound phosphorus can accumulate in the receiving environment, it is important to consider the potential effects of phosphorus loadings, such as eutrophication and oxygen depletion. However, it is unclear whether this aspect has been considered as phosphorus loadings are not discussed. It is also unclear whether the assessment considered the potential for changes to the baseline trophic status from all project-related loading sources. Relevant guidance is provided in the CCME framework, including total phosphorus trigger ranges based on the trophic status of the baseline condition or reference sites.</p>	<ol style="list-style-type: none"> 4. Discuss potential project effects associated with total phosphorus concentrations and loadings, including potential eutrophication effects. 5. Considering total phosphorus concentrations and loadings, discuss how potential changes to the trophic status of the aquatic environment will be mitigated and monitored, and how CCME's total phosphorus trigger ranges will inform the project. 	
<p>IAAC-R2-26</p> <p>IAAC-R2-08</p>	<p>The Proponent's response to IR IAAC-R2-26 clarifies that receiving environment water quality predictions represent whole waterbody/watercourse concentrations. The water quality model assumed that the effluent loading or seepage loading was instantaneously mixed with water in the receiver. Modeled concentrations therefore imply a uniform distribution of discharge parameters across the receiver. However, in reality, water quality</p>	<p>ECCC recommends that the Proponent provide the following:</p> <ol style="list-style-type: none"> 1. Water quality predictions (full baseline/project parameter list) for the edge of mixing zones under Expected Case and Upper Case scenarios, for each project phase. Identify predicted exceedances. 2. Discuss the edge-of-mixing-zone predictions and describe the potential effects. 	<p>WQ</p>

	<p>parameters will not be distributed evenly within the receiving waterbody/watercourse. Instead, an effluent plume will extend from each Final Discharge Point (FDP) into the receiving environment, with parameter concentrations highest near the point of discharge. Therefore, whole-lake predictions underestimate parameter concentrations and effects near the discharge. The Proponent's response to Information Request IAAC-R2-08 indicates that the water quality within project mixing zones has not been modeled but can be estimated by the modeled chemistry in the effluent discharges. Per the response, no effluent is expected to be acutely lethal to fish and aquatic biota within the mixing zones in Gordon and Farley lakes at the Gordon site or in the Keewatin River at the MacLellan site.</p> <p>As water quality at the edge of mixing zones has not been characterized, parameter concentrations and potential effects at the edge of mixing zones are unknown and cannot be adequately assessed. Parameter exceedances predicted by the whole-waterbody/watercourse model are expected to increase near the mixing zone. Additionally, it is possible that some parameters that do not exceed guidelines on a whole-lake basis may exceed guidelines near the mixing zone.</p>		
IAAC-R2-30	The response to IR IAAC-R2-30 discusses potential pit lake treatment options, including the use of fertilizer amendments to remove	ECCC recommends that the Proponent clarify whether the fertilizer amendments discussed in Response IAAC-R2-30 could potentially result in elevated discharge nutrient	WQ

	contaminants. It is unclear whether fertilizer amendments could potentially contribute to increased environmental concentrations and loadings of nutrients.	levels or loadings in the receiving environment. If so, describe how the water quality estimates and environmental assessment conclusions take into account any potential increases in nutrient levels and environmental loadings associated with the use of fertilizer amendments.	
IAAC-R2-02	For both the MacLellan and Gordon sites, there is limited information on hydraulic conductivities at depth and all numerical modelling simulations appear to have focussed on the uppermost portion of the aquifer. The Groundwater Management and Monitoring Plan (GMMP), provided in the Proponent's Table IAAC-R2-02-3, does not specify depths at which water quantity and quality monitoring will occur and whether there is a plan to monitor groundwater quantity and quality at greater depths. Considering that contaminant transport can occur at greater depths and that the extent of fracturing and hydraulic conductivities seems largely unknown, more information from this zone would be useful in understanding contaminant transport. Given that the groundwater flow model goes to 115 m depth, and hydraulic testing has been done to 80 m depth, groundwater quantity and quality should be monitored at intervals down to those depths in some wells.	ECCC recommends the Proponent: <ol style="list-style-type: none"> 1. Specify in the GMMP the depths that groundwater quantity and quality monitoring will occur and 2. Include monitoring for groundwater quantity and quality at multiple depths. 	CS-GW
IAAC-R2-12bi	The proponent states that seepage from the ore stockpiles will be captured by open pit dewatering at both sites. Once dewatering is halted at the end of operations, particle tracking is shown to lead	ECCC recommends the Proponent provide additional details on how groundwater contamination will be prevented once dewatering ceases.	CS-GW

	<p>from source areas to several water bodies. Depending on local recharge rates, the local hydrogeological context, and whether the sources of contamination remain present upon closure of the mine, it is conceivable that dilution estimates are overestimated. Thus, once dewatering ceases, groundwater could eventually reach some surface water bodies where water quality guidelines could be exceeded.</p>		
IAAC-R2-12bi	<p>The proponent uses average predicted concentrations when referring to expected guideline exceedances.</p>	<p>ECCC recommends that, as discussed in IAAC-R2-27, maximum predicted concentrations should also be considered for certain receptors.</p>	CS-GW
IAAC-R2-12-c,	<p>In the Proponent's response, it is stated that during closure, remaining ore will be processed and the ore stockpiles will be rehabilitated thus appearing to eliminate sources of contamination. It is not clear how the contamination source areas will be rehabilitated or managed.</p>	<p>ECCC recommends that the Proponent clarify:</p> <ol style="list-style-type: none"> 1. Whether removal of the ore stockpiles will leave residual mineralized materials, and how this area will be rehabilitated; and 2. If there are residual post-closure potential sources of contamination, how this will be managed in order to prevent groundwater contamination. 	CS-GW
IAAC-R2-27	<p>The Proponent states that seepages will be conveyed to collection ponds (during operation) or pit lakes (at closure) where they will be mixed with other contact water (e.g., mine water) and monitored prior to discharge.</p> <p>Based on Maps no 8-26 and 8-29 (EIS volume 1, chapter 8, Gordon site) groundwater contamination does not always go to pit lakes,</p>	<p>ECCC recommends that the Proponent clarify:</p> <ol style="list-style-type: none"> 1. How contaminants will be prevented from entering groundwater upon site closure, and 2. How transport of contaminants in groundwater to surface waters will be prevented. 	CS-GW

	<p>especially after closure. There is a significant portion of the particle traces that end up in Farley Lake (Gordon site) and Minton Lake (MacLellan site). If sources of contamination remain on site, there is a high likelihood that groundwater movement will lead to contamination moving to surface waters.</p>		
IAAC-R2-75	<p>In the response to IR IAAC-R2-75, the Proponent provides a rationale for why a liner should not be used beneath the Tailings Management Facility (TMF), Mine Rock Storage Area (MRSA), etc. The Proponent proposes collection ditches (around the TMF and mine waste sites) and grouting of the bedrock and acknowledges that in the short term the liner would be better for protecting groundwater and surface water but more risky in terms of stability and risks of embankment failure.</p>	<p>ECCC recommends that the Proponent:</p> <ol style="list-style-type: none"> 1. Consider what additional mitigation measures, beyond grouting bedrock and creating collection ditches, could be put in place to prevent the effects of groundwater contamination on surface water bodies. 2. Discuss how such measures would prevent contamination of groundwater and surface water bodies. 	CS-GW
IAAC-R2-02	<p>The Surface Water Monitoring and Management Plan (SWMMP) provides some details on how surface quantity effects will be confirmed using a “before-after-impact-control” study. Such studies are meant to confirm if an impact to a stream is due to a regional effect (in which case the control station would also be impacted), or is related to the project (where we would not find an impact in the control station). The SWMMP goes on to describe the hydrometric station locations. However, it is unclear if the sites meant to act as control locations are already established. A major component of successful reference studies is establishing a relationship</p>	<p>ECCC recommends that the Proponent establish the control stations as soon as possible to ensure that there is sufficient pre-development data to create a relationship with onsite stations.</p>	MSC

	<p>between the onsite stations (i.e. stations that will be impacted by the project) and the reference (i.e. un-impacted) sites using concurrent datasets from when they were both un-impacted. This relationship is impossible to establish without a concurrent, pre-development, dataset from both reference and impacted stations.</p>		
IAAC-R2-71	<p>The water balance assumes the distribution of precipitation throughout the years is constant (e.g. July will always have the most precipitation) and prorates each month to obtain their 25 year wet and dry scenarios. This inherently precludes any assessment of short term droughts, where the distribution of precipitation may not follow the monthly mean values from the reference period (1980-2010). In addition, the water balance uses evaporation estimates from a 2002 PFRA report which are neither recent (and thus are not ideal for the project's operation phase) nor do they account for the increased temperatures expected from climate change (and thus are not acceptable for the project's closure phase).</p> <p>When the proponent discusses climate change (PDF p. 82 in Vol3), they concede that summer precipitation will likely be reduced, temperature will increase, and the risk of drought or more extreme drought will increase. The infrastructure most exposed to risk from the environment (i.e. climate change) is the Tailings Management Facility (TMF) in the closure phase. While the TMF will be 75% capped, it is unclear if a standing pond is necessary in the remaining area</p>	<p>ECCC recommends the Proponent:</p> <ul style="list-style-type: none"> A. Discuss the vulnerability of the TMF to extreme drought in the closure phase, particularly how the partial capping will affect this vulnerability. B. Discuss the hazard posed by summer months that are drier than the prorated monthly means (e.g. evaluate the driest summer on record) as well as increased evaporation from climate change. C. If a vulnerability exists (part A) and the hazard is greater than initially assessed (part B): <ul style="list-style-type: none"> i. Re-evaluate the closure phase water balance for the TMF, ii. Discuss the new risk of dry tailings in the closure phase, iii. Discuss any associated monitoring, mitigation, or design changes. 	MSC

	to ensure anoxic conditions in the tailings. The risk of dry tailings from extreme summer drought and/or climate-affected drought has not been assessed.		
IR-IAAC-R2-90	<p>The Proponent states in their response to the IR that alternative mitigation measures will be implemented to reduce dust emissions during high wind conditions or if ambient air quality monitoring indicates ambient PM concentrations are greater than the Manitoba AAQC as follows:</p> <ul style="list-style-type: none"> • <i>“Increase frequency of watering on unpaved roads and arid surfaces</i> • <i>Apply water spray on stockpiles and TMF dry bank areas if visible dust events are observed</i> • <i>Cover inactive stockpiles with a tarp</i> • <i>Build wind fences around stockpiles and the TMF dry bank areas if visible dust events are observed”</i> <p>If water is applied as a dust mitigation measure there may be potential for acid leaching and/or leaching of other contaminants from stock piles or TMF dry bank areas. The Proponent should assess the potential for leaching and consider use of other measures to mitigate dust emissions from these surfaces as needed.</p>	ECCC recommends that the Proponent clarify what potential exists for acid leaching and/or leaching of other contaminants as a result of spraying water on stockpiles or the TMF dry bank areas as a dust mitigation measure.	AQ
IR-IAAC-R2-91a	In their response to IR-IAAC-R2-91a the Proponent states that NO ₂ monitoring is not required due to projected CAAQS 1-hour exceedances limited to the overnight hours at locations where receptors are not likely to be present during these times. Furthermore, the Proponent states that proposed	ECCC recommends that the Proponent conduct NO ₂ monitoring to verify predictions and implement adaptive management as necessary.	

	<p>monitoring locations in Lynn Lake and Black Sturgeon Reserve are not representative of the areas that receive the highest model-predicted NO₂ concentrations. Thus, the Proponent proposes a 2-month continuous ambient air quality monitoring program at the work camp for the MacLellan site.</p> <p>ECCC is in agreement that the work camp location at the MacLellan site will capture higher NO₂ concentrations than locations in the Lynn Lake town site and the Black Sturgeon Reserve.</p> <p>The Proponent states that for receptors where predicted NO₂ concentrations exceed the 2025 1-hour NO₂ CAAQS (79 µg/m³) these exceedances would occur during winter overnight hours when people would be unlikely to be present at these locations. ECCC notes that during the early winter months when even the midday sun angle is still very low, diurnal changes in NO₂ concentrations will be very weak, thus receptors will still be exposed to relatively high NO₂ concentrations at other hours of the day.</p> <p>In response to ECCC's concerns about the warm bias in winter months for the CALPUFF model, the Proponent states that an ECCC-</p>		
--	---	--	--

	<p>approved modelling plan was followed which exploits CALPUFF's complexity.</p> <p>ECCC agrees that CALPUFF is a complex and powerful dispersion model, and that the Proponent has followed an ECCC-approved modelling plan. However, even with CALPUFF's complexity, there are still limitations with capturing surface-based temperature inversions that occur at small vertical scales. The residual uncertainties associated with using numerical models, as well as the use of monitoring data from proxy stations, guide ECCC to recommend long term continuous monitoring of NO₂.</p>		
IAAC-R2-89 Part c	<p>While Appendix F describes the methods used in the construction phase calculations, it does not discuss the uncertainties related to them. As the construction emissions formed the basis for the decommissioning phase calculation, any uncertainties related to the construction phase estimates are further compounded in the decommissioning estimate. Using the ECCC and NRCan values worst-case or most conservative scenarios does not directly imply a low level of uncertainty.</p>	<p>ECCC recommends the Proponent further describe the implications of uncertainties behind the emissions of the construction and decommissioning phases, how these implications have been accounted for, the distribution of the uncertainties, and how they have been mitigated.</p>	ETD