Lynn Lake Gold Project: MacLellan Mine Plan Amendment Notice of Alteration / Notice of Change

Federal Information Request Responses

July 31, 2025

Prepared for:

Alamos Gold Inc.

Prepared by:
Stantec Consulting Ltd.

Stantec

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Introduction

The Impact Assessment Agency of Canada (IAAC) provided information requests (IRs) on July 11, 2025, for the Lynn Lake Gold Project (LLGP) Notice of Change (NOC) – MacLellan Mine Plan Amendment, submitted by Alamos Gold Inc. (Alamos) on June 25, 2025. Upon review of the NOC, IAAC has determined that additional information is required to proceed with the analysis of this proposed alteration. The MacLellan Gold Mine is regulated under the federal Decision Statement issued under Section 54 of the *Canadian Environmental Assessment Act*, 2012 (issued March 5, 2023, and amended July 28, 2024) and the conditions stipulated therein.

Alamos confirms that the IRs provided for this NOC have been fully addressed and answered as clearly and succinctly as possible. A fulsome response to the IRs is provided in the following sections in reference to the original request. Attachments to the responses, as applicable, are provided in **Appendix A**.

Alamos has undertaken the following while responding to the IRs:

- Considered the context and rationale for the required information for each IR.
- Provided additional information (wherever possible) to address uncertainty and to provide clearly defined, detailed follow-up program measures, including additional proposed mitigation measures.
- Presented complete or summarized information and discussion within the IR responses, rather than limited responses referencing applicable reports.

A total of 17 IRs were received (NOC-IR-1 through NOC-IR-17) and responses are provided in the following tables. Alamos is committed to discussing and resolving any further IRs throughout the NOC review process and welcomes any phone discussion, if and as required to clarify points.

Additionally, Alamos and Stantec identified during preparation of these IR responses, that one of the maps in the NOC showed the incorrect location for the Sewage Treatment Plant (STP). **Appendix B** provides the corrected map, as well as the English and French (translated) versions of previously requested maps for inclusion in IAAC's EA Report. The assessment content of the NOC already reflects this move that was made (for potential aesthetic [odour/perception] concerns for those in the camp) and accordingly, only the map was incorrect. We apologize for not noticing this location mistake prior to the official submission.

Response to IAAC NOC IR-1

ID:	**NOC IR-1**
Topic	Administrative
Expert Department or Group:	IAAC
NOA/NOC reference:	Glossary, s. 3.2.4.2.2 surface water quality
Information Request:	**Context/Rationale:** The submission defines Mt as metric tonnes in multiple glossaries and in section 3.3.4.2.2 surface water quality on p. 63: "the updated estimate of ore was 39.7 metric tonnes (Mt) which was 48% greater than the estimate in the EIS model (26.8 Mt)." However, the generally accepted meaning of Mt is a megatonne, equivalent to one million metric tonnes, and its use in the submission seems to be consistent with this usual definition. **Request for Additional Information:** Confirm that Mt refers to megatonnes and not metric tonnes.
Response:	Mt is million tonne(s). The definition used in the Notice of Alteration/Notice of Change is incorrect (typo).
Attachment	No.

Response to IAAC NOC IR-2

ID:	**NOC IR-2**
Topic	Administrative
Expert Department or Group:	IAAC
NOA/NOC reference:	Comparison map provided on May 16, 2025
Information Request:	**Context/Rationale:** It is noted that the updated PDA does not completely overlap with the original PDA, in that there are sections of the original PDA that are not included in the updated PDA. If work for this project has already been carried out in a particular area, that area cannot be excluded from the updated PDA. **Request for Additional Information:** Confirm that no work has been carried out in areas of the original PDA that are outside of the proposed updated PDA.
Response:	No work has been conducted in areas of the original PDA that are outside of the proposed updated PDA.
Attachment	No.

Response to IAAC NOC IR-3

ID:	**NOC IR-3**
Topic	Air Quality and Noise, Indigenous Health and Current Use of Lands and Resources for Traditional Purposes
Expert Department or Group:	IAAC
NOA/NOC reference:	Appendix C, p.5 Appendix D, p.4
Information Request:	**Context/Rationale:** The submission states "In the air quality dispersion model, the production years with the highest production rates are considered representative of the worst-cases for air emissions. Therefore, in the assessment update, Year 5 of the MacLellan site operation and Year 3 of the Gordon site operation are selected." (p. 5 of Appendix C)" and "In the noise model, production year with the highest production rates represents the worst-case noise emission scenario due to higher equipment quantity and activity level. In this assessment update, Gordon site operation Year 3 and MacLellan site operation Year 5 were selected for the noise model." (p. 4 of Appendix D) However, according to table 3.1, years 6-9 are expected to involve mining more total material (33,000,000 kt each year vs 30,687,449 kt) and peak ore production occurs in year 4 (7,507,386 kt vs. 2,728,607 kt). **Request for Additional Information:** Clarify the definition of "mining rate" and explain why year 5 was chosen as the model year for the air quality dispersion model and the noise model. Alternatively, provide updated analyses using data from a year with peak material handling or peak ore production, whichever is more conservative.
Response:	Table 3.1 (in Appendix F) relates to the water quality modeling and has a different notation of the mine years of operation: the year numbering is shifted with two years, it starts with Year 1, which corresponds to Year -2 in the air quality assessment (Appendix C) and in the noise impact assessment (Appendix D). It should be noted that Year 5 in the air quality and noise assessments corresponds to Year 7 in Table 3.1. Air contaminant emissions were evaluated by quantifying the emissions for a “worst-case” year of operation at both the Gordon and MacLellan sites. The worst-case years coincide with the highest production rates (kilotonnes per year [kt/y]) for total material mined and moved/transported, <u>which includes rehandle of ore from stockpiles</u>. The peak in total material moved/transported will result in the highest use of on-site diesel fueled equipment and the highest air and noise emissions. **Year 5 was determined to be the**

ID:	NOC IR-3
	worst-case year of operation for the MacLellan site (33,941 kt/y of total material mined and moved including rehandle of ore from stockpiles). The total material mined and moved/transported for each year of mine operation was based on the mine production schedule from the updated Project design information, including: • Feasibility Study Update, NI 43-101 Technical Report for the Lynn Lake Project. Issue date: August 22, 2023 • Capital and Operating Cost Estimate - Gordon 13Apr2023 V1.9 update 13Aug2023.xlsx (spreadsheet) • Capital and Operating Cost Estimate - MacLellan 13Apr2023 V1.9 update 13Aug2023.xlsx (spreadsheet) Based on the mine production schedule for the MacLellan site, the total material mined including rehandle at the MacLellan site for Year 5 includes ore to mill (1,602 kt/y), ore to stockpile (1,214 kt/y), overburden (0 kt/y), non-PAG waste (19,844 kt/y) and PAG waste (11,281 kt/y), in total 33,941 kt/y. The total material mined including rehandle is the highest in Year 5 (33,941 kt/y) and reduces to 33,362 kt/y in Year 6, and then to 21,024 kt/y in Year 9. Based on the mine production schedule, the total material mined including rehandle at the Gordon site for Year 3 includes ore to mill (1,501 kt/y), ore to stockpile (1,446 kt/y), overburden (0 kt/y), Non-PAG waste (7,454 kt/y) and PAG waste (5,600 kt/y), in total 16,001 kt/y. In addition, the maximum air emissions will result in the year with the highest number of operating mining equipment fleet units. Based on the 2023 Feasibility Study Update, Table 16-16, the highest number of major equipment fleet units at the MacLellan site is in Year 5 to Year 10, including 16 139-tonne haul trucks. Based on the 2023 Feasibility Study Update, Table 16-18, the highest number of major equipment fleet units at the Gordon site is in Year 2 to Year 6 including 12 63-tonne haul trucks. Noise emissions also have been assessed based on noise sources for a “worst case” year of operations at both the Gordon and MacLellan mine sites. The worst-case years deemed as the highest production rates (kt/y) for total material mined and moved/transported including rehandle or ore from stockpiles. In accordance with the updated Project design information: • Feasibility Study Update, NI 43-101 Technical Report for the Lynn Lake Project. Issue date: August 22, 2023 • Capital and Operating Cost Estimate – Gordon 13Aug2023 V1.9 update (Excel Spreadsheet) • Capital and Operating Cost Estimate – MacLellan 13Aug2023 V1.9 update (Excel Spreadsheet)

ID:	**NOC IR-3**
	According to Table 1-3 "Summary of Quantities for Lynn Lake Gold Project Mine Plan" of the 2023 Feasibility Study, and Capital and Operating Cost Estimate for MacLellan and Gordon sites, the total production materials mined including rehandle are the sum of Mill (MacLellan site), stock, waste NPAG, and waste PAG. As a result, the highest total material mined and moved/transported at MacLellan site is Year 5 (33,941 kt), at Gordon site is Year 3 (16,001 kt); instead, at MacLellan site, the total materials mined and moved/transported reduce year by year from Year 6 to Year 9 (i.e., Y6 33,362 kt, Y7 33,184 kt, and Y9 21,023 kt). In addition, Table 16-16 and Table 16-18 of 2023 Feasibility Study list the major equipment fleet sizes at the MacLellan and Gordon sites, respectively, the quantities of major equipment are at the highest numbers from Year 5 at MacLellan stie and Year 3 at Gordon site. These major equipment fleets represent the operating noise sources, i.e., noise emission contributors, at the Project sites; the highest fleet numbers will produce the most noise and vibration impact to the surrounding environment at the Project sites. Therefore, Year 5 of the MacLellan site and Year 3 of the Gordon site operation were selected in the noise and vibration modeling assessment, respectively.
Attachment	No.

Response to IAAC NOC IR-4

ID:	**NOC IR-4**
Topic	Erosion & Sedimentation, Fish and Fish Habitat
Expert Department or Group:	ECCC
NOA/NOC reference:	p.106 (section3) 3.3.5.4.1 Change in Fish Habitat
Information Request:	**Context/Rationale:** As per the updated assessment of effects, additional surface water is expected to flow from the pit to a concrete spillway, and then into the tributary labelled KEE3-B1 post-closure (see ECCC comment #2). This tributary has already been accounted for in the Fisheries Act Authorization application as the destruction of fish habitat and therefore would not be required to continue functioning as fish habitat should the Authorization be issued. The Proponent states that “Larger flows in tributary KEE[3]-B1 post-closure, particularly those during spring freshet, are expected to result in a wider, deeper, and potentially more braided channel between the open pit and the Keewatin River than currently exists between East Pond and the Keewatin River.” In order for a channel to become wider and deeper, a loss of bed and bank material must occur. Therefore, sedimentation downstream into the Keewatin River is anticipated by the Proponent, yet it is not explicitly acknowledged and no mitigation measures for this pathway of effect are provided. Increased sediment load into the Keewatin River has the potential to cause harmful alteration or disruption of fish habitat. **Request for Additional Information:** Provide additional information on the potential impacts to fish habitat from increased sediment load in the Keewatin River due to increased flows in tributary KEE3-B1 post-closure, and corresponding mitigation measures if needed.
Response:	The reviewer is correct to note that the larger flows predicted to occur in tributary KEE3-B1 are likely to increase erosion of the channel banks and channel bottom and, therefore, increase sediment loading from tributary KEE3-B1 to the Keewatin River during post-closure. No mitigation measures are proposed by Alamos to reduce this potential effect on fish and fish habitat in the Keewatin River for the following reasons: 1) the amount of sediment mobilized from tributary KEE3-B1 is anticipated to be small because the hydraulic characteristics of the creek (i.e., gradient <1%, frequent beaver dams, wetland riparian area) will reduce the sheer stresses created by the increased discharge; 2) the frequency and duration of higher sediment loading from KEE3-B1 to

ID:	**NOC IR-4**
	the Keewatin River are anticipated to be limited to the spring freshet in the initial years (e.g., <5 years) following overflow from the pit lake, after which, sediment loading is anticipated to decrease after the smaller sediments have been flushed from the creek and the channel geometry has adjusted to the larger peak flows; and 3) tributary KEE3-B1 drains into the Keewatin River at a wide (~400 m) depositional area (see Google Earth screen shot below) where fine sediments (e.g., silt and sand) are already present and where the benthic invertebrate and fish communities using this area are adapted to (or prefer) these conditions. Additionally – as noted in NOC IR-5 - the harmful alteration, disruption, or destruction (HADD) of the habitat in tributary KEE3-B1 will be offset by the fish habitat offset plan submitted as part of Alamos' Fisheries Act Authorization application.  *Figure NOC IR-4.1 Confluence of Tributary KEE3-B1 and the Keewatin River.*
Attachment	No.

Response to IAAC NOC IR-5

ID:	**NOC IR-5**
Topic	Erosion, Fish and Fish Habitat and Aquatic Species
Expert Department or Group:	DFO
NOA/NOC reference:	Subsection 3.3.4.2 Table 3.7
Information Request:	**Context/Rationale:** The results of the updated water balance on the flowrate at node QM04 indicate that the flowrates in tributary KEE3-B1 will increase significantly in some months, including increased flowrates of up to 391%. When compared to the 89% increase identified within the Environmental Impact Statement (EIS), a 391% increase in flowrate would potentially alter the hydraulics of the discharge environment. This may lead to increased velocities and the potential for erosion of the stream bed and banks within the receiving environment. This may result in permanent changes in the stream morphology, which in turn could potentially impact fish, fish habitat and other aquatic species. The mitigation strategies outlined in Condition 3.11 (Sub-Conditions 3.11.1 and 3.11.2) may not be sufficient to address the potential effects of erosion due to increased flow rates. Under Section 3.3.5.3 on page 119, the Proponent explains that changes in fish habitat resulting from increased flows will be moderated by the low gradient of the channel (<1%), and the buffering effect of surrounding wetland and beaver dams. The Notice of Alteration does not provide sufficient information to determine whether the proposed mitigation measures, site moderation conditions, and follow-up requirements will adequately address the effects of this change in increased flowrate on fish and fish habitat and aquatic species. **Request for Additional Information:** Provide additional information on whether and how the proposed mitigation measures, site moderation conditions, and follow-up requirements will adequately address the effects of this change in increased flowrate on fish and fish habitat and aquatic species. In particular, assess the risk of erosion and propose appropriate erosion control methods suitable for Tributary KEE3-B1 in the post-closure phase.

ID:	**NOC IR-5**
Response:	The reviewer is correct to note that the larger flows predicted to occur in tributary KEE3-B1 are likely to increase erosion of the channel banks and channel bottom and, therefore, increase sediment loading from tributary KEE3-B1 to the Keewatin River during post-closure. The reviewer is also correct to note that the mitigation measures identified in sub-conditions 3.11.1 and 3.11.2 of the Final Decision Statement (i.e., pointing intake pipes upwards away from sediments and equipping discharge pipes with diffusers, respectively) will not reduce erosion and sedimentation in tributary KEE3-B1 during post-closure. Alamos is not proposing additional mitigation measures to reduce potential erosion of bank and bottom sediments in tributary KEE3-B1 for the reasons explained in the response to IAAC NOC IR-4 and because habitat in tributary KEE3-B1 will be harmfully altered, disrupted, or destroyed (HADD) due to dewatering caused by capture of surface run-off in the Project's water management infrastructure and the hydraulic gradient created by development of the open pit during operation. This HADD of fish habitat is unavoidable but will be offset by the fish habitat offset plan submitted as part of Alamos' Fisheries Act Authorization application. Fish are expected to recolonize tributary KEE3-B1 after the open pit has filled with water and the pit lake is overflowing into tributary KEE3-B1, but Alamos intends to leave this recolonization to natural processes.
Attachment	No.

Response to IAAC NOC IR-6

ID:	**NOC IR-6**
Topic	Groundwater Drawdown
Expert Department or Group:	NRCan
NOA/NOC reference:	Section 3.3.1 Appendix E, Section 5.6 Appendix E, Map 24 Appendix E, Table 5.8 Lynn Lake Gold Project Groundwater Management and Mitigation Plan (GMMP) - Section 7.0 & Map 4
Information Request:	**Context/Rationale:** The proponent has updated their groundwater numerical model to reflect planned alterations. In doing so, the model was recalibrated, and surface water boundary implementation was updated. The updated model is parameterized using increased hydraulic conductivity for the Sand Diamicton, Upper Bedrock, Intermediate Bedrock, and Deep Bedrock hydrostratigraphic units, and decreased recharge (dropping to 72 mm/yr from 120 mm/yr). These updates resulted in an extension of the 1m drawdown contour by 1 km to the east, and 2 km to the west of the open pit. This extent increases the magnitude of the residual effects of the project. It also changes the impact of the project on groundwater surface water interactions within this drawdown cone. For example, the NOA cites a 15% reduction in groundwater recharge to Dot Lake, where there was no change in the EIS. There are also reductions in groundwater discharge to Minton and Payne Lakes in Comparison to the EIS related to waste storage parameterization. Additionally, the NOA lists shorter travel time for seepage from mine facilities to their surface water discharge points. For example, seepage from the MRSA reaches the Keewatin River in <1 year, Minton Lake in 1 year, and the tributary to the Keewatin River in 28 years. In the EIS these travel times were 1 year, 4 years, and 141 years respectively. Shorter travel times require close monitoring to ensure timely mitigation of effects. The Groundwater Management and Mitigation Plan (GMMP) states that the groundwater model will be reviewed every four years. Given the short travel times for seepage, and the magnitude of change resulting from a model recalibration, 4-year intervals may be too long. Additionally the monitoring locations for groundwater quantity do not appear to

ID:	NOC IR-6
	reflect the potential for drawdown to occur between Dot Lake and the Keewatin River, nor south of the open Pit and South of the Keewatin River. In Section 5.6 of Appendix E of the Notice of Alteration, the proponent has stated that this assessment is more conservative than the EIS. This would imply that assumptions have been made to model a more "worst case scenario" relative to the EIS. This does not appear to be the case, as this is a model calibrated to site data, there is no evidence of a greater degree of conservatism applied in this model. Larger magnitudes of impact alone do not constitute more conservative modelling. **Request for Additional Information:** a) Describe the ways in which the updated groundwater model is more conservative than the EIS model, given the similarity in calibration approach and model assumptions between the two models. b) Confirm whether there are any feasibility issues with: - updating the GMMP to be concurrent with model results - increasing the frequency of groundwater level modelling updates to be more often than every 4 years - installing monitoring wells within the forecasted extent of drawdown related to operation of the open pit
Response:	a) The groundwater flow model was updated, subsequent to the EIS, to account for the revised mine plan as well as to address Agency comments on the previous model iteration with regards to hydraulic conductivity, representation of the surface water features, and recharge. The additional conservatism built into the model update are summarized as follows. The calibrated hydraulic conductivities of model units were increased relative to the EIS model, which contributes to greater extent of drawdown compared with the EIS model. A comparison of hydraulic conductivity of model layers between the EIS and NOA/NOC model with measured data ranges is summarized in the table below. The hydraulic conductivity of the diamicton, glaciolacustrine, intermediate bedrock and deep bedrock have increased by one order of magnitude relative to the EIS model. The result is that water is transmitted through the overburden and deep bedrock at a higher rate relative to the EIS model contributing to a greater extent of drawdown and also higher velocity and therefore shorter travel times. In addition, as noted in previous information requests by IAAC, the travel times in the EIS were reported as years when they should have been reported as days, which further contributes to shorter travel times. This is conservative as the NOA/NOC groundwater flow model calibrated hydraulic conductivity for the diamicton, glaciolacustrine, upper bedrock, intermediate bedrock, and deep bedrock is the upper range of measured values.

ID:	NOC IR-6

Model Unit	Hydraulic Conductivity (m/s)		
	Expected Range	**Calibrated EIS Model**	**Calibrated NOA/NOC Model**
Historical Mine Rock	$1x10^{-3}$ to $1x10^{-2}$	$1x10^{-3}$	$1x10^{-3}$
Organics	$1x10^{-8}$ to $1x10^{-5}$	$1.2x10^{-5}$	$1x10^{-5}$
Diamicton	$4x10^{-7}$ to $6x10^{-5}$	$4.2x10^{-6}$	$6.4x10^{-5}$
Glaciolacustrine	$1x10^{-7}$ to $6x10^{-5}$	$8.3x10^{-6}$	$5.8x10^{-5}$
Shallow Bedrock	$5x10^{-8}$ to $5x10^{-4}$	$8.1x10^{-6}$	$2.2x10^{-6}$
Upper Bedrock	$1x10^{-8}$ to $2x10^{-7}$ *$6x10^{-9}$ to $3x10^{-5}$	$2.0x10^{-7}$	$3.7x10^{-7}$
Intermediate Bedrock	$3x10^{-9}$ to $1x10^{-7}$ *$3x10^{-9}$ to $2x10^{-7}$	$3.4x10^{-8}$	$2x10^{-7}$
Deep Bedrock	$9x10^{-9}$ to $6x10^{-8}$ *$7x10^{-9}$ to $1x10^{-7}$	$1.3x10^{-8}$	$1x10^{-7}$

Notes:

*Additional data collected since the EIS/EA.

The EIS groundwater flow model was built in FEFLOW, and the NOA/NOC model was built in MODFLOW. The model codes are fundamentally different. The EIS groundwater flow model used transfer boundaries in FEFLOW. This is equivalent to using river (RIV) boundaries in MODFLOW. The NOA/NOC groundwater flow model uses the stream flow routing package (SFR). The main difference between the RIV and SFR is the ability of the SFR to track surface water within the stream. In other words, if discharge from groundwater to surface water along a stream segment exceeds evaporation or diversions from the segment, the calculated stage and stream flow rate would increase, assuming the stream channel does not change significantly. In contrast, if recharge from surface water to groundwater exceeds the stream flow rate in a cell, the stream would be simulated as dry. Flow in the stream can increase or decrease. The SFR estimates groundwater to surface water "leakage" partly based on the simulated flow in the stream. Therefore, the SFR package is a more rigorous boundary condition compared to the RIV package.

In the event drawdown from the pit caused excessive leakage from surface water to groundwater, the stream would be simulated as dry. That would not occur with RIV. In addition, the NOA/NOC model used the lake (LAK) package to simulate recovery of water in the pit lake. This better represents increasing water levels in the pit during

ID:	**NOC IR-6**
	closure. These alterations of the use of packages in MODFLOW compared to options in FEFLOW are part of the reason the model was transferred to MODFLOW. In both the EIS and NOA/NOC groundwater flow models a unified recharge was used across the model domain. The calibrated recharge rate in the EIS groundwater flow model was 120 mm/year which was reduced to 72.3 mm/year in the NOA/NOC groundwater flow model. Both recharge rates are within the expected range of recharge values for the area of 4 to 146 mm/year. The recharge rate in the NOA/NOC groundwater flow model is in the lower half of the expected range of recharge and is therefore conservative with respect to groundwater drawdown as a lower recharge rate contributes to a larger groundwater drawdown cone and slower recovery. The combination of the adjustments to these parameters to address Agency concerns contributes to a larger drawdown cone and represents the more conservative end of the range of measured values at the site. Further, as any model advances and more data are available to support the calibration, differences are to be expected in the predicted results. The NOA/NOC model better represents the model area not only because it represents additional data collected since completion of the EIS, but also higher hydraulic conductivity and lower recharge was simulated, and more rigorous packages in MODFLOW were employed compared to boundary conditions employed in FEFLOW. Predictions made by groundwater flow models contain a degree of uncertainty, largely related to the heterogeneity of natural systems. Confidence in model predictions is provided through review of the closeness of fit of the model calibration parameters, as well as through uncertainty analysis performed on key hydraulic and hydrogeologic model values. Application of conservatively protective inputs is also used to develop predictions that encompass a reasonable and foreseeable range of potential outcomes. b) The GMMP will be updated to reflect the NOA/NOC groundwater model results as follows: • Groundwater quantity trigger thresholds for groundwater level and pumped volume will be updated to reflect the updated predicted groundwater level and pumped volume (i.e., update groundwater trigger thresholds in Table 5-2 and 5-3 of the GMMP). • A groundwater level trigger threshold monitoring well, MWM-08, is already proposed east of the Keewatin River and adjacent to Dot Lake and should be sufficient for monitoring groundwater level changes adjacent to Dot Lake relative to predictions in the EIS. An additional groundwater level trigger threshold monitoring well will be added to the GMMP, to be installed west of the Keewatin River and south of the Existing Access Road to monitor potential groundwater drawdown east of the Keewatin River and southeast of the open pit.

ID:	**NOC IR-6**
	The frequency of groundwater model reviews every 4 years is sufficient. The groundwater drawdown cone presented in the NOA/NOC is for the end of operation and will take 14 years to develop. The changes in groundwater level from one year to the next will be within the error and sensitivity of the model predictions due to the variations in the natural system. In addition, the GMMP includes adaptive management with trigger thresholds and response plan for groundwater quantity. The trigger thresholds are designed to alert to changing conditions prior to a significant effect. If a trigger threshold is exceeded then an associated response plan is implemented which includes an investigation to the cause of the exceedance and mitigation, if deemed necessary. The model predictions, assumptions, and criteria would be reviewed relative to the measured data as part of the investigation and the need to update the groundwater flow model as part of the investigation would be considered. Therefore, the frequency of groundwater model reviews of every 4 years is sufficient.
Attachment	No.

Response to IAAC NOC IR-7

ID:	**NOC IR-7**
Topic	Groundwater Drawdown
Expert Department or Group:	IAAC
NOA/NOC reference:	Map 5, Appendix A
Information Request:	**Context/Rationale:** Map 5 in Appendix A of the submission shows the groundwater drawdown extent as originally modeled in the EIS as compared to the extent of groundwater drawdown with the proposed updated project calculated with an updated model. It is therefore unclear as to how much of this change in extent is due to the project changes and how much is due to the updated water model. The Minister's decision on an amendment must be based on the potential impacts of the project change. Therefore, it must be clear which potential impacts are due to the project change, as opposed to changes in methodology in the assessment. **Request for Additional Information:** Provide a comparison of the change in groundwater drawdown extent due to the project changes as compared to what the extent would have been with this model in the EIS, including a map showing the extent of >1m drawdown in each of the following cases: 1. the original extent in the EIS 2. the extent predicted by the new model for the project as currently authorized 3. the extent predicted by the new model for the modified project as proposed in the notice of change
Response:	As discussed in the response to IR-6, the NOA/NOC groundwater model is more conservative, more representative, and more rigorous compared with the EIS model. This is to be expected as a project progresses, and additional data is collected and conceptualization of the site refined. The use of the NOA/NOC model to simulate the Project as currently authorized is anticipated to result in a larger drawdown cone compared with the EIS model because the modelled groundwater/surface water interactions are different (the Keewatin River is not a constant head and can better simulate losses of baseflow to the river), and the recharge is lower. In addition, the calibration of the NOA/NOC model was completed based on additional data collection since the EIS. Differences in predictions between models are expected as models are revised and improved. Both models were developed and calibrated according to

ID:	**NOC IR-7**
	accepted industry standards. While the results are somewhat different, both models provide relevant information at each stage of the Project. The NOA/NOC groundwater model improved the representation of the hydrogeologic system compared with the EIS model, addressed previous IAAC information requests related to hydraulic conductivity, Keewatin River, and recharge, and should be used for the NOA/NOC.
Attachment	No.

Response to IAAC NOC IR-8

ID:	**NOC IR-8**
Topic	Groundwater drawdown, Fish and Fish Habitat
Expert Department or Group:	DFO
NOA/NOC reference:	Appendix E Groundwater Model Report -Appendix A, Map 5
Information Request:	**Context/Rationale:** Despite large changes to the area of groundwater drawdown and associated pumping of water from the pit, minimal changes to the Surface Water Management and Monitoring Plan (SWMMP) have been proposed. For example, no additional wetland water level monitoring sites have been proposed. Based on the sites currently proposed (Map 5-2), it does not appear possible to determine the validity of the groundwater drawdown area's effect on wetland features. **Request for Additional Information:** Confirm whether there are any feasibility issues with adding wetland monitoring sites in order to ensure the conclusions relating to effects to fish and fish habitat remain valid. If feasible, propose additional monitoring sites.
Response:	New wetland water level monitoring sites will be added to the Groundwater Management and Monitoring Plan (GWMMP), if required, following completion of multi-season ground-truthing of the treed and shrubby swamps identified by remote sensing interpretation within the predicted zone of groundwater table drawdown. Alamos began ground-truthing of these swamps in spring 2025 but could not visit potential swamps north of Dot Lake due to wildfires. Alamos will continue ground-truthing these swamps, and revisit all in summer 2025, wildfire conditions permitting. Once ground-truthing is complete, the location of fish-bearing swamps within the drawdown zone will be compared to the geographic locations of existing groundwater monitoring wells and drive-point piezometers at the MacLellan site. If additional fish-bearing waters are identified, they will be included as part of Alamos' Fisheries Act Authorization application. Wetland water level monitoring will be moved from the Surface Water Management and Monitoring Plan (SWMMP) to the GWMMP in the next versions of the management and monitoring plans that Alamos intends to resubmit now that it has received comments from federal and provincial regulators and potentially affected Indigenous Nations from the Impact Assessment Agency of Canada. This will be done to keep all aspects of groundwater monitoring in one monitoring program. However, the updated SWMMP will refer to the GWMMP for the wetland monitoring component.
Attachment	No.

Response to IAAC NOC IR-9

ID:	NOC IR-9
Topic	Groundwater Drawdown, Fish and Fish Habitat and possibly Aquatic Species
Expert Department or Group:	ECCC DFO
NOA/NOC reference:	Section 3.3.5 Appendix A - Map 5
Information Request:	**Context/Rationale:** The Proponent states that: ''Compared with the results of the EIS (Stantec 2020e), the effects of the Project on groundwater remained similar, except for the extent of the drawdown cone which was larger in this model iteration.'' ''A final dewatering head of approximately -60 m amsl will result in the drawdown of the water table by up to 1 m over an area extending approximately 1 km north, 1 km east, 2 km south, and 2 km west of the pits. The maximum drawdown in the deepest portion of the pit is nearly 400 m. Drawdown from the MRSA extends approximately 500 m east of the MRSA. Mounding due to the TMF extends approximately 1 km west and reaches a maximum greater than 26 m.'' As groundwater generally feeds wetlands, the increased drawdown could cause the drainage of wetlands and effects on fish and fish habitat. See Map no. 5 from the Notice of Alteration for wetlands affected by drawdown greater than 1m, which encompasses wetlands within the drawdown zone. The Proponent has not provided information to characterize the wetlands that are now anticipated to be impacted by groundwater drawdown, including whether they are groundwater or surface water dominated, and whether they are fish bearing (see ECCC comment #3). Without this information, it is difficult to understand the updated extent of effects on fish and fish habitat. **Request for Additional Information:** a) Clarify whether the wetlands are fed by groundwater or surface water, and to what extent. Provide supporting technical information to substantiate the expected level of wetland drainage. b) Provide additional information on the consequences of lowering the water table by 1m on wetlands and the effects to fish and fish habitat. The Proponent should detail the extent to which wetlands will be reduced or disappear.

ID:	**NOC IR-9**
	c) Provide an update on your ongoing assessment of fish-bearing status of wetlands. Flag from DFO: DFO advises that fish sampling to determine fish presence or absence typically requires that efforts are repeated in multiple years and multiple seasons.
Response:	a) For the purposes of its assessment of potential effects of predicted groundwater drawdown on fish-bearing wetlands, Alamos has assumed that wetlands at the MacLellan site are groundwater-fed. This is a conservative assumption because groundwater table depth is variable near the MacLellan site and in many areas, groundwater table depth may be too deep to interact with surface water levels. Groundwater and surface water level monitoring as part of the GWMMP and SWMMP, respectively, will be used to refine the characterization of the groundwater-surface water interaction in wetlands as the Project progresses. However, new future information about groundwater-surface water interactions will not alter how Alamos will quantify the potential harmful alteration, disruption, or destruction (HADD) of fish-bearing wetlands at the MacLellan site for inclusion in the *Fisheries Act* authorization. b) Like the EIS, Alamos assumes that confirmed fish-bearing swamps within the updated zone of predicted groundwater table drawdown at the MacLellan site will be dewatered during mining operations and, therefore, will result in a HADD of fish habitat. This is a conservative assumption because of the uncertainty about the groundwater contribution to fish-bearing swamps at the Gordon and MacLellan sites. Alamos started to confirm the presence of fish-bearing swamps within the updated zone of predicted groundwater drawdown at the MacLellan site in spring 2025 and will continue this effort in August 2025, wildfire conditions permitting. Positively confirmed fish-bearing swamps within this updated zone will be added to the total HADD of fish habitat reported in the *Fisheries Act* Authorization application. Gain-to-loss ratios will be updated using the relative habitat value system described in the *Fisheries Act* Authorization application and the need for additional offsetting will be discussed with DFO, if required. c) Map 5 in Appendix A of the NOA/NOC application identifies the remotely sensed treed and shrubby swamps within the updated zone of predicted groundwater table drawdown at the MacLellan site. Alamos began ground-truthing these remotely sensed swamps in spring 2025 and was able to visit the identified swamps except those north of Dot Lake before wildfires caused the evacuation of Lynn Lake. At each location, field crews recorded the presence or absence of water and evidence of downstream connectivity to known fish-bearing watercourse or waterbody. Photographs of each site were also taken. Of the 69 remotely sensed swamps that were visited in spring, only three were positively identified as having water and surface connectivity to a fish-bearing watercourse or waterbody (SW8, SW27, and SW15; see Attachment 9-1 [map] in Appendix A). Alamos plans to revisit these three swamps and to visit the remotely sensed swamps north of Dot Lake this August 2025 (wildfire conditions permitting).

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	Note that none of the remotely sensed swamps north of Minton Lake were visited in spring 2025. This is because the geographic extent of fish-bearing habitat in the headwaters of Minton Lake, including potential fish-bearing swamps, were determined during multi-season sampling in 2019 (fall) and 2020 (spring and summer). The footprint of the Mine Rock Storage Area was adjusted after these surveys specifically to avoid impacting fish-bearing habitat with the deposit of deleterious mine rock that would have triggered amendment of Schedule 2 of the Metal and Diamond Mine Effluent Regulation.
Attachment	Yes – see Appendix A.

Response to IAAC NOC IR-10

ID:	**NOC IR-10**
Topic	NO2 monitoring, Indigenous health
Expert Department or Group:	ECCC
NOA/NOC reference:	Section 3.3.1 Section 3.3.13 Appendix C
Information Request:	**Context/Rationale:** The Project change includes the intention to increase the mined tonnage by 86% and the production timeline from 11 to 17 years. The proposed change in production is associated with increased air emissions of about 20% per year. The updated air quality assessment presented in the Notice of Alteration indicates notable increases in predicted 1-hour NO_2 concentrations under the revised 2023 design. Maximum predicted 1-hour NO_2 concentrations are increased by 27%, with exceedances of the 1-hour CAAQS at six receptors. These increases are important given the proximity of several sensitive receptors, including inhabitants of the Black Sturgeon Reserve and the town of Lynn Lake. Condition 6.3.5 specifies targeted continuous NO2 monitoring for at least two consecutive months during year two of operations when emissions were previously expected to peak. The Project change is expected to change the timing of peak air emissions. Condition 6.3.5 requires targeted monitoring of nitrogen dioxide (NO_2) and is mentioned in Section 3.3.13 (Human Health). The condition may require revision in the timing and duration of NO2 monitoring based on an expected increase in emissions caused by the Project change. **Request for Additional Information:** To inform updated timing of NO2 monitoring, provide a conservative estimate of: a) How early in the project NO2 concentrations are predicted to first exceed thresholds b) In what year peak NO2 emissions are predicted to occur
Response:	A campaign of two months of continuous ambient air monitoring of NO_2 will be conducted during the winter (within the period November to January) – as discussed during the EIS technical review phase - to coincide with the highest concentrations predicted by the air dispersion model and to capture the effects of wintertime temperature inversions. The air dispersion modelling for the MacLellan site was conducted to coincide with the worst-case/highest air emissions for the mine life. However, to allow for earlier validation of the

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	model results, the ambient NO_2 monitoring will be conducted during Year 4 of mine operation, which coincides with the highest truck traffic volume for ore haulage from the Gordon site to the ore milling and processing plant at the MacLellan site. If the NO_2 monitoring results are greater than the predictions of the atmospheric dispersion model, and/or if the monitoring detects exceedances of the CAAQS for NO_2, NO_2 monitoring will be continued during mine operation to determine if additional mitigation measures are required to reduce NO_2 emissions in accordance with the Air Quality Management and Monitoring Plan. a) The atmospheric dispersion model simulated a conservative scenario that combined the maximum emissions for a "worst case" year of operation at the Gordon site (Year 3), at the MacLellan site (Year 5) and the ore haulage between the Gordon site and the MacLellan site (Year 4) in one model to provide an indication of the spatial distribution of the potential areas with high predicted concentrations due to the Project. Given that 1-hour NO_2 concentrations exceedances of the ambient air quality criteria are predicted by the dispersion model near the open pit at the Gordon site and near the open pit at the MacLellan site, the NO_2 concentrations could exceed the ambient thresholds at the Gordon site in Year 3 and at the MacLellan site in Year 5. However, other years of operation with lower emission rates were not modelled; therefore, the probability for NO_2 exceedances during other years of operation is unknown. b) The maximum NO_2 emissions will occur in the "worst case" year of operation at the Gordon and MacLellan sites. The worst-case years coincide with the highest production rates (kilotonnes per year [kt/y]) for total material mined and the highest number of operating mining equipment fleet units. Based on the 2023 Feasibility Study Update, the maximum NO_2 emissions at the Gordon site will occur in Year 3 and the maximum NO_2 emissions at the MacLellan site will occur in Year 5 of operation. The maximum NO_2 emissions along the haulage route from the Gordon site to the ore milling and processing plant at the MacLellan site will occur in Year 4 of operation.
Attachment	No.

Response to IAAC NOC IR-11

ID:	**NOC IR-11**
Topic	Potentially Acid-Generating Material
Expert Department or Group:	NRCan
NOA/NOC reference:	p. 61 Surface Water Quality - Assessment methods Appendix F, p.28 Water Quality Model Updates
Information Request:	**Context/Rationale:** The updated submission reports an increase in PAG material from 21 to 41%. The proponent did not submit an updated source term report to verify this increase in PAG material. It is therefore not possible to verify how PAG material would be assessed for the new satellite pit. However, the satellite pit is adjacent to the main open pit and the excavated rock should be similar based on the regional geology presented in the updated groundwater model report. IAAC note: it was 28%, not 21% in the EIS (volume 4, p.i). **Request for Additional Information:** Provide an updated source term report for the satellite pit to verify the increase in PAG material, if readily available. Otherwise, validate the assumption that the satellite pit will contain similar rock types and ML/ARD potential of the main pit. Flag from NRCan: The mine rock management plan should be updated to ensure there is sufficient capacity to handle the larger volume of PAG rock from the satellite pit that will require management.
Response:	Based on the 2024 ARD block model, the proportion of PAG material in the starter pit is estimated to be 24%, when using the PAG criteria of NPR<2. For construction planning purposes, the ARD block model was used to estimate the proportion of materials with an NPR<4 which resulted in an estimated PAG proportion of 41%, and this proportion was incorrectly reported in the model report as the proportion of PAG.
Attachment	No.

Response to IAAC NOC IR-12

ID:	**NOC IR-12**
Topic	Water Quality - Arsenic Expected and Upper-Case Scenario Model Results, Fish and Fish Habitat and Aquatic Species
Expert Department or Group:	ECCC
NOA/NOC reference:	Table 3.18
Information Request:	**Context/Rationale:** Table 3.18 provides a summary of the predicted magnitude of exceedances of arsenic screening criteria, as well as the percentage of months in exceedance of the guideline for both the expected case and the upper-case. The upper-case scenario is based on average climate conditions paired with 95th percentile baseline water quality in the receiving environment and 95th percentile geochemical source terms. The expected case is based on averages. Given the higher inputs into the upper-case scenario, it would be expected that the upper-case model scenario would result in greater exceedances of baseline and guidelines and potentially a greater percentage of months exceeding the guideline (as compared to the expected case). However, ECCC notes that Table 3.18 includes instances where the expected case model results predict a greater degree of change than the upper-case model scenario, which is an unexpected result. For example, the expected case at KEE3-B1 indicates a max fold change (project versus baseline) of 6.3 and a max fold exceedance of the guideline of 1.4 during operations (exceeding guidelines in 9% of months). The upper-case results are lower with a 4.4 max fold change from baseline and a 1.2-fold exceedance of guidelines during operations (exceeding guidelines in 6% of months). In addition, arsenic is identified as a POPC in Minton Lake during operations in the expected case but not in the upper case. The text associated with Table 3.18 does not discuss these unexpected results, whether they are accurate or the result of an error, or whether specific model inputs have contributed to the differences. **Request for Additional Information:** Provide a discussion of the differences in the predictions for arsenic between the expected and upper case, including an explanation for the model providing higher predicted concentrations in the expected case than the upper-case.

ID:	**NOC IR-12**
Response:	The discrepancy in the predicted arsenic concentrations at KEE3-B1 and Minton Lake between the expected-case and the upper-case scenarios is due to the model inputs for the arsenic leaching rates from mine rock. Elemental leaching rates for the average expected case scenario were derived from field leach bin kinetic tests “ML WR AVG” which was intended to represent average mine rock chemistry. By comparison, elemental leaching rates for the upper-case scenario were developed using the field leach bin kinetic test results of the “ML WR S>1%” mine rock sample, which was a mine rock sample with high sulfur content. Because the source terms are derived from field-based tests, at times, the base case had higher leaching rates than the upper-case test. For example, the upper-case source terms were derived from an upper-case field leach bin test, however, the results for some parameters were lower than in the base case results. This may be attributed to the similarities in the geochemistry of the samples and resultant test results. For example, the geochemistry of the deposit is mostly low sulfur as compared to other metal mines that have a much larger spread of sulphur and metals concentrations. Elemental leaching rates from this sample were equal or greater than those used for the expected-case scenario for all parameters with the exceptions of arsenic, boron, molybdenum, nickel, sodium, uranium, and vanadium. For consistency with the EIS, the source terms for the EIS were used in the updated model. Lower leaching rates of these parameters for the upper-case scenario resulted in lower mass loads to the receiving environments via surficial discharge. Some model nodes receive additional mass loads from mine component seepage (e.g., TMF, MRSA) which were based on separate source terms. Depending on the relative contribution of mass loads to a model node, the effects of using the lower leaching rates of these elements for the upper-case scenario are more prominent or muted (e.g., the model node that only receives mine seepage during a project phase).
Attachment	No.

Response to IAAC NOC IR-13

ID:	**NOC IR-13**
Topic	Water Quality - Change to Total Suspended Solids Assumptions, Fish and Fish Habitat and Aquatic Species
Expert Department or Group:	ECCC
NOA/NOC reference:	Section 3.3.4.2 Appendix F Section 3.1.2.6
Information Request:	**Context/Rationale:** One of the changes incorporated into the updated model was the assumption that discharges from the Pit Lake to the Keewatin River tributary KEE3-B1 and discharges from the collection pond to the Keewatin River carry a suspended sediment load of 10 mg/L, whereas in the EIS model a mass load equivalent of 15 mg/L of Total Suspended Solids (TSS) was applied. The report states that this approach was considered more representative than the approach used in the EIS. However, no justification or rationale has been provided for why this change is considered more representative. As described in Appendix F, it is stated that reducing the concentration to 10 mg/L from the 15 mg/L of the EIS model is a more conservative approach to evaluate the impacts of particulate in the discharges to the receiving environment. ECCC disagrees with this statement since higher particulate load is generally associated with higher risk of impacts to fish and the aquatic environment and therefore the use of 15 mg/L would be the more conservative value to apply to the analysis. It is unclear how this change to reduce the particulate contribution may have influenced the overall model results and predictions of surface water quality. **Request for Additional Information:** Provide further justification for the change from 15 mg/L to 10 mg/L TSS, including a discussion on how this is a more conservative approach and how this value is more representative. The Proponent should also discuss how this change in particulate contribution influenced the overall model results.

ID:	**NOC IR-13**
Response:	In the EIS model, a suspended sediment load equivalent to 15 mg/L was based on the Metal and Diamond Mining Effluent Regulations (MDMER) discharge limit. In practice, erosion prevention and sediment control measures are anticipated to be implemented to maintain TSS concentrations below the MDMER discharge limit at “end-of-pipe” and to comply with the Manitoba Surface Water Quality Guidelines for the Protection of Freshwater Aquatic Life in the downstream receiving environment. Therefore, in the updated model, the suspended sediment load was reduced from 15 mg/L to 10 mg/L to maintain TSS concentrations below, but not at, the MDMER discharge limit. Thus, it was considered more representative to assume a TSS concentration of 10 mg/L instead of 15 mg/L in the effluent discharge. Use of the word “conservative” when referencing the change in TSS concentration used in the model from 15 mg/L to 10 mg/L in Section 3.1.2.6 of Appendix F should have been “representative”, as used in the main NOA/NOC document.
Attachment	No.

Response to IAAC NOC IR-14

ID:	**NOC IR-14**
Topic	Water quality Mitigation Measures, Fish and Fish Habitat
Expert Department or Group:	ECCC IAAC
NOA/NOC reference:	Section 4.0 – Conclusions Appendix G – Surface Water Quality Figures Surface Water Management and Monitoring Plan (Version 0 – January 2025)
Information Request:	**Context/Rationale:** The Notice of Alteration identifies changes to the surface water quality conclusions compared to the EIS due to differences in magnitude, timing, duration, and location of predicted water quality concentrations that exceed water quality guidelines for the protection of aquatic life. With the inclusion of the notice of change, the predictions of water quality guideline exceedances occur for additional parameters, through more project phases (EIS - post-closure only, Notice of Alteration – operations, closure, and post closure) and in more water bodies. The Proponent has accordingly increased the magnitude of the residual effect on surface water quality from moderate to high. Similarly, the impacts to fish health, growth, and survival have changed from negligible to high. However, the Notice of Alteration states that risk to fish and other aquatic resources will be reduced by implementing the Surface Water Monitoring and Management Plan (SWMMP) and its adaptive management framework. The Proponent has not proposed any additional mitigations as a result of the changes outlined in the Notice of Alteration. ECCC notes that the timing of the predicted exceedances is a key difference between the EIS and the Notice of Alteration. With the previous predictions indicating that no water quality guideline exceedances would occur until the post-closure phase, there would be numerous years to collect construction and operational monitoring data to refine post-closure water quality predictions, adaptively manage, and implement mitigation to prevent any predicted water quality guideline exceedances in the receiving environment. However, the updated predictions indicate the potential for guideline exceedances during operations. This was not predicted as part of the EIS. **It is unclear whether existing mitigation measures (which did not anticipate guideline exceedances during operations) would be sufficient to be protective of aquatic life.** While monitoring and adaptive management is one component of managing impacts, it is a reactive rather than proactive approach to managing contaminant levels through source control and treatment.

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	IAAC further notes that the residual effects on fish health, growth, and survival provided in s. 3.3.5.4.1 Change in Fish Habitat, subheading "Comparison with the EIS" on p.124 are characterized "without mitigation" and not after mitigation. **Request for Additional Information:** a) Clarify whether the increase in magnitude of effects on surface water quality and effects to fish health, growth and survival was assessed prior to the application of mitigation measures or whether that characterization takes mitigation measures into account. Further, clarify how much of the change in characterization is attributable to a change in modelling methodology and how much is attributable to the project change itself. b) Outline which specific mitigation measures described in the SWMMP would mitigate the specific changes in predictions of effects to surface water quality and subsequent effects to fish health, growth and survival in the Notice of Alteration compared to the EIS predictions. This should include discussions of mitigations related to changes in Parameters Of Potential Concern (POPCs) as well as how elevated water quality concentrations earlier in mine life may impact implementation of mitigation measures. c) Clarify the expected residual effects on surface water quality and fish health, growth and survival after implementation of these mitigation measures in comparison to the EIS, including how much of the change in characterization is attributable to a change in modelling methodology and how much is attributable to the project change itself.
Response:	a) Like the EIS, the characterization of residual effects to surface water quality and to fish health, growth, and survival in the NoA/NoC were based on surface water quality model predictions that included the mitigation measures identified in the Project Description. The mitigation measures included in the NoA/NoC surface water quality model were identical to the mitigation measures included in the EIS surface water quality model and are those described in the Surface Water Management and Monitoring Plan (SWMMP; Version 0, January 2025). However, the characterization of residual effects on surface water quality and effects to fish health, growth and survival did not include any *additional* mitigation measures or *additional* adaptive management strategies discussed in Sections 3.3.4.4 and 3.3.5.3 of the NOA/NOC to address high-magnitude residual effects to surface water quality and fish health, growth and survival. In Section 3.3.5.3, the wording of “without mitigation” should have said “without additional mitigation” to be clearer. The residual effects for surface water quality and effects to fish health, growth and survival in the NOA/NOC were characterized using the updated model results that incorporated the changes in modeling methodology and the changes to the project itself. The residual effects characterization did not differentiate how much change in characterization between the EIS and the NOA/NOC was attributable to a change in modeling methodology and how much was attributable to the project change itself. A description of the modifications to the surface water quality model is presented in Appendix F and provided as a list in the Surface Water Quality Assessment Methods

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	section on Page 61 of the NOA/NOC. A list comparing the parameters of potential concern (POPCs) in the EIS to the NOA/NOC is provided on Page 64 of the NOA/NOC, which outlines the reasoning for exclusion or inclusion of POPCs in the updated model. At a high level, most of the changes in surface water quality model results were attributable to the change in discharge location and the change in predicted zone of groundwater influence. b) No new mitigation measures to reduce effects on surface water quality and fish health, growth, and survival were introduced in the NOA/NOC that were not already included in the EIS. In Appendix E of the SWMMP, Table E-1 in Appendix E of the SWMMP identifies the mitigation measures that will be implemented to reduce potential effects on surface water quality for each Project component or activity at the MacLellan site. c) Like the EIS, characterization of residual effects on surface water quality and fish health, growth, and survival in the NOA/NOC was based on the surface water quality model results that incorporated the mitigation measures included in the Project Description. However, characterization of residual effects on surface water quality and fish health, growth, and survival did not consider any of the potential mitigation measures that could be implemented as part of the adaptive management plan (e.g., pit fertilization). No differentiation was made during the characterization of residual effects on surface water quality and fish health, growth, and survival in the NOA/NOC between changes attributable to change in modelling methods and changes attributable to change in the Project; characterization of residual effects on surface water quality and fish health, growth, and survival was conducted entirely on results of the updated surface water quality model.
Attachment	No.

Response to IAAC NOC IR-15

ID:	**NOC IR-15**
Topic	Water Quality, Toxicity Modifying Factors used in Guidelines, Fish and Fish Habitat and Aquatic Species
Expert Department or Group:	ECCC
NOA/NOC reference:	Section 3.3.4.2 Tables 3.19 and 3.21 EA Report – Page 102 (Fish Health, Growth, and Survival)
Information Request:	**Context/Rationale:** The report provides analysis of predicted water quality concentrations as compared to relevant water quality guidelines including the Manitoba Water Quality Guidelines, Canadian Water Quality Guidelines for the Protection of Aquatic Life, and the Federal Environmental Quality Guidelines (FEQG). Many of these guidelines, including the FEQG, incorporate site-specific Toxicity Modifying Factors (TMF) (e.g., hardness) to arrive at a guideline that is tailored to the specific conditions of that aquatic receiving environment. While the FEQG are included in the analysis (resulting in both inclusions and exclusion of Parameters Of Potential Concern (POPC) as compared to the EIS), the source and/or assumptions of concentrations of TMFs that were used to calculate the guidelines have not been provided. For example, in the Notice of Alteration, aluminum was excluded as a POPC based on using the hardness-dependent FEQG for aluminum, and cobalt was included as POPC based on the hardness-dependent FEQG for cobalt. Since these guidelines are reliant on site-specific TMFs, the values of the TMFs used in the calculation must be explicitly stated so that all assumptions are clear. In addition, TMFs used in calculation of guidelines are usually only valid within a specific concentration range. Caution should be exercised if the TMF concentrations are outside of these ranges. Screening of POPCs is an essential component of assessing the potential for impacts to fish and aquatic life. The use of appropriately calculated guidelines is critical to accurately assessing the potential for impacts. ECCC notes that there was uncertainty related to hardness identified during the EIS Review. ECCC also notes concerns related to assumptions of water hardness and recommended verification of water hardness in the EIS review. This was reflected in the Environmental Assessment Report. **Request for Additional Information:** Provide information on the sources and/or assumptions of TMF concentrations used to derive guidelines. This should include specific values used in calculating guidelines and a discussion of the data sources for this information.

ID:	**NOC IR-15**
Response:	Values for toxicity modifying factors (i.e., pH, water hardness, and dissolved organic carbon) used to calculate variable guidelines were obtained from monthly baseline surface water quality monitoring completed between spring 2015 and fall 2018 at the sites (and corresponding model nodes) listed in Table NOC IR-15.1. The site-specific data collected during this timeframe represents the baseline dataset for the original EIS as well as the NOA assessment. The technical data reports (TDRs) summarizing baseline monitoring results were submitted as part of the original EIS.

Table NOC IR-15.1 Baseline Monitoring Locations Used to Obtain Values for Toxicity Modifying Factors

Water Quality Monitoring Site	**Corresponding Assessment Node Name**	**Assessment Node Description**
AQM4	QM02	Keewatin River upstream of PDA (no anticipated effects here)
AQM31	KEE3-PAY1	Tributary to Keewatin River; downstream of Payne Lake; adjacent to TMF
AQM7	QM03	Keewatin River; First node downstream of collection pond discharge
AQM18	KEE3-B1	Small tributary to Keewatin River; Within PDA; Southeast of Open Pit
AQM8	QM06	Keewatin River; downstream of QM03, Kee3-B1, and PDA
AQM29	QM05	Keewatin River; downstream of QM06 and confluence with Lynn River
AQM16	Minton Lake	Southeast of MRSA and TMF
AQM10	QM10	South Cockeram River; downstream of Minton Lake
AQM11	QM08	South Cockeram Lake; downstream of QM10

Monthly predictions at each node were screened against the corresponding guidelines calculated for each month. The variable guidelines were calculated based on the mean monthly baseline values for each TMF (Attachment 15-1 in Appendix A). If baseline monitoring data were not available for a specific month, the mean of the neighbouring months (e.g., the mean of March and May if April was missing) was used to calculate the guideline. In cases where a TMF value was outside a guideline's applicable range, the TMF value was replaced with the guideline's lower bound TMF value (if below the guideline's TMF range), or the guideline's upper bound TMF value (if above the guideline's TMF range). This adjustment was performed manually for all guidelines

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	except the biotic ligand model (BLM) for dissolved copper because the BLM software automatically adjusts the TMF values to fit within their applicable ranges. For example, the Federal Environmental Quality Guideline (FEQG) for total aluminum is dependent on pH, water hardness, and DOC and has the following applicable TMF ranges: pH (6 – 8.7), water hardness (10 mg/L – 430 mg/L as $CaCO_3$), and DOC (0.08 mg/L to 12.3 mg/L). If the TMF values for a given site and month were, for example, pH (5.5), hardness (6 mg/L as $CaCO_3$), and DOC (14 mg/L), these values would be adjusted to a pH of 6, a hardness of 10 mg/L as $CaCO_3$, and a DOC value of 12.3 mg/L. This approach was followed for each variable guideline with upper and lower limits for TMF values.
Attachment	Yes – see Appendix A.

Response to IAAC NOC IR-16

ID:	**NOC IR-16**
Topic	Water Quantity, Fish and Fish Habitat
Expert Department or Group:	DFO
NOA/NOC reference:	Section 3.3.5.4.1 Change in Fish Habitat
Information Request:	**Context/Rationale:** Decreased flow is expected to occur in the Minton and Dot Lake outlets compared to the original EIS due to loss of watershed area and loss of groundwater input, respectively. The Proponent concludes that there will be no negative effect on fish and fish habitat due to the low gradient and beaver impounded nature of these systems. **Request for Additional Information:** Outline new or existing water monitoring measures to validate the prediction that no negative effect on fish and fish habitat will occur as a result of decreased flow in the Minton and Dot Lake outlets as compared to the original EIS.
Response:	Monitoring of water levels in Minton Lake and stream flows in the Minton Lake outlet are already included in the Surface Water Management and Monitoring Plan (SWMMP) as required by Condition 3.13.1 of the Federal Decision Statement. Minton Lake and the Minton Lake outlet are sites where trigger thresholds for adaptive management have been developed (see Section 8.1.1 and Section 8.1.2 of the SWMMP). However, Alamos intends to update the SWMMP to replace Minton Lake and the Minton Lake outlet with the station at the outlet of the next lake downstream from Minton Lake as the trigger response station for monitoring potential changes in water levels and stream flows caused by the Project. The reason for this switch is because water levels in Minton Lake and flows in the Minton Lake outlet are controlled by beaver dams in the Minton Lake outlet and the variability in number and height of the dams makes it impossible to develop a consistent water level record or an accurate stage-discharge relationship. By comparison, the station at the outlet of the unnamed lake downstream is located in a cobble riffle unaffected by beavers. Alamos intends to include Dot Lake and the Dot Lake outlet as monitoring stations in the next version of the SWMMP because of the predicted effects of the open pit on water levels and stream flows in Dot Lake and the Dot Lake outlet. To do this, Alamos will restart water level data collection in Dot Lake and will begin to develop a stage-discharge relationship in the Dot Lake outlet before the start of mining in the open pit. However, Alamos does not intend to develop trigger response thresholds for adaptive management at either location for the following reasons. First, the largest changes in

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	stream flow are predicted to occur in winter. This is an artifact of the water balance model which predicted winter flow changes in smaller tributaries (such as the Dot Lake outlet) based on the ratio of their watershed areas compared to the Keewatin River; the Keewatin River does flow in winter and, therefore, the model predicted flow in the Dot Lake outlet in winter. In reality, water in the Dot Lake outlet freezes to the bottom in winter. Second, the predicted change in stream flows in the Dot Lake outlet during the open water season are <5% from baseline which is are within the range of uncertainty in hydrological data measurement and analysis.
Attachment	No.

Response to IAAC NOC IR-17

ID:	**NOC IR-17**
Topic	Water Quantity, Fish and Fish Habitat and Aquatic Species
Expert Department or Group:	ECCC
NOA/NOC reference:	Section 3.3.4 Appendix F
Information Request:	**Context/Rationale:** Regarding water quantity, the Notice of Alteration does not provide sufficient information to comment on the adequacy of the Proponent's analysis and conclusions of the effects related to the proposed Project changes. Initial observations made from the information presented in the Notice of Alteration include the following: •The Proponent notes that the freshwater intake and effluent discharge locations have been moved upstream from node QM03 to QM02 (Appendix F; Section 2.1.2). However, no further discussion on how this change affects water management has been provided. •The Proponent states that the water balance method used for estimating receiving environment streamflow was improved (Appendix F; Section 2.2). However, the changes in methodology and the validation parameters were not compared to those included in the original EIS. The updated receiving environment methodology was only validated against one hydrometric station with the largest drainage area (QM08; Appendix F, Figure 2.7), without assessing the accuracy at other smaller nodes within the receiving environment. •There is insufficient information on the methodology and accuracy of water level predictions for key lakes, including Minton Lake and Cockerham Lake. Additionally, potential impacts on upstream and downstream water levels were not directly evaluated at all nodes nearest to key lakes, such as Dot Lake and Payne Lake. **Request for Additional Information:** Provide additional technical documentation and a detailed discussion to substantiate the potential effects on water quantity resulting from the proposed Project changes. This may include (non-inclusive): a description of water management structures including an evaluation of potential changes to water quantity at the intake and discharge points; detailed discussion of any updated methodologies including a description of how potential changes to water levels in lakes are evaluated; a comparison of revised model performance metrics comparing the statistical parameters with those presented in the EIS; an evaluation of the water balance model performance at hydrometric stations to

ID:	**NOC IR-17**
	better demonstrate adequate hydrological characterization throughout the receiving environment; and an assessment of changes in lake water levels resulting from the proposed Project changes for Dot Lake and Payne Lake.
Response:	The description of water management structures (e.g., the freshwater intake and effluent discharge) is provided in Sections 18.3.4, 18.3.6, 18.3.8, 18.3.9, 18.3.10, 18.3.11, and 18.3.14 of the 2023 Feasibility Study Update NI 43-101 Technical Report (Abols et. al, 2023). As shown on the conceptual flow diagram (Figure 2.2 in Appendix F of the 2025 MacLellan Mine Plan Amendment MacLellan NOA/NOC; Stantec 2025), flow predictions for the freshwater intake and effluent discharge have been included in the water balance model. Predicted flow rates at QM02 (Table 2.6 in Appendix F of the 2025 MacLellan Mine Plan Amendment MacLellan NOA/NOC; Stantec 2025) represent the potential effects of freshwater intake and effluent discharge on water quantity at the intake and discharge point (i.e., at QM02). Figure NOC IR-17 (below) shows that the calibration/validation of the 2020 model (Stantec 2020) was based on less than 10 months of measured data during 2015-2016. Measured data during that period missed the high flows in late-summer and fall of 2015 that were driven by prolonged rainfall events (the signature of which is apparent in measured streamflows in the nearby Water Survey of Canada station (WSC05TF002). Although the 2020 modelled flows missed these high flows, numerical validation parameters (e.g., Nash-Sutcliffe Efficiency) were artificially very high because these numerical validation parameters only consider the months with measured data and may lead to misleading conclusions regarding the reliability of model results (Naghibi and Luzi 2022). Reliance on numerical validation parameters would be even less relevant if different models simulate different periods (e.g., the 2020 model simulating one year vs. the 2025 model simulating seven years). Instead, a visual comparison of unit area flow model results shows that the 2025 model outperforms the 2020 model (Figure NOC IR-17). Similarly, although the other hydrometric stations have a shorter period of measured monthly streamflows (compared to QM08), the visual comparison of measured and modelled unit area streamflows shows an acceptable match for the stations (Figure NOC IR-17).

ID:	NOC IR-17

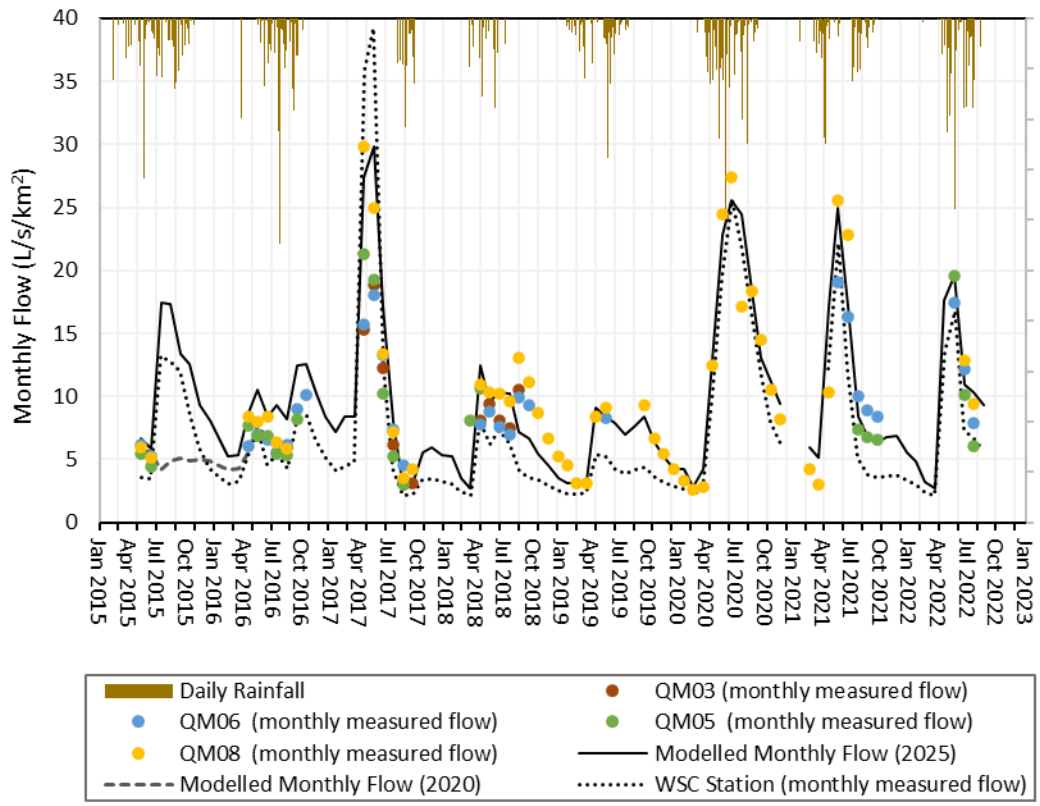


Figure NOC IR-17 Measured and Modelled Site Unit Streamflows during Concurrent Period of Record with Regional Hydrometric Station (WSC05TF002)

The outflow rating curves used in the 2025 model to predict water levels for key lakes as applied and reported in the 2020 model (i.e., the outflow rating curves for Minton Lake and Cockeram Lake; Stantec 2020) were unchanged in the 2025 model (Stantec 2025).

Changes in the outflow of Payne Lake and Dot Lake are predicted to be less than 10%; therefore, the effects of the Project on the water level of these lakes are expected to be not significant (i.e., within the range of natural variability).

References:

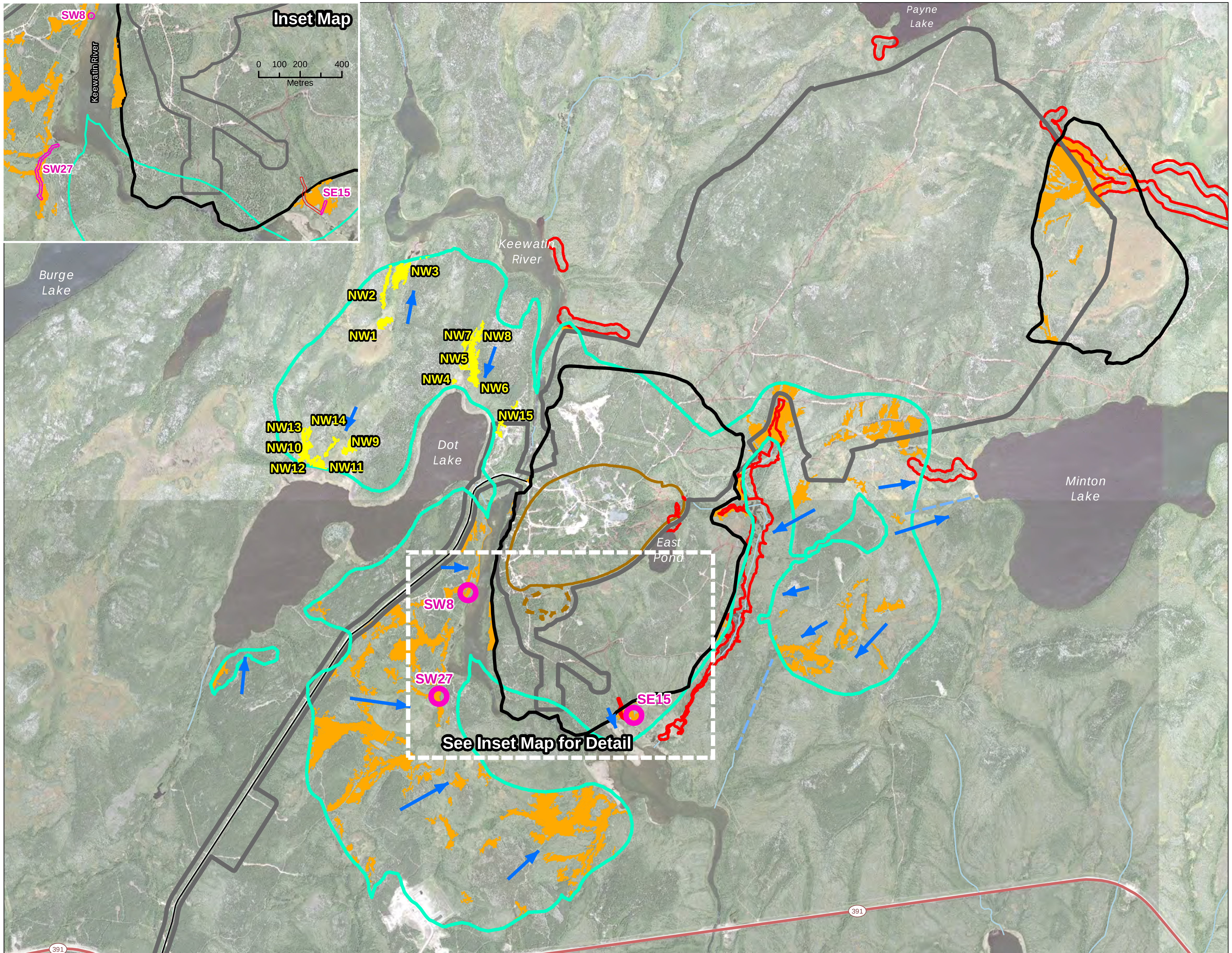
Abols, J., C. Bostwick, M. Cote, J. Volk, and C. Webster. 2023. Feasibility Study Update, NI 43-101 Technical Report for the Lynn Lake Project. Prepared for Alamos Gold Inc.

Naghibi and Luzi. 2022. Predictive Mine Water Balance Modelling – Does Accurate Mean Reliable. Proceedings of Mine Water Solutions, pp. 37-49.

ID:	**NOC IR-17**
	Stantec. 2020. Lynn Lake Gold Project – Hydrology Water Balance and Water Quality Impact Assessment: MacLellan Site – Technical Modelling Report. Prepared for Alamos Gold Inc. Stantec 2025. Lynn Lake Gold Project: MacLellan Water Balance and Water Quality Model Update for Notice of Alteration / Notice of Change. Prepared for Alamos Gold Inc.
Attachment	No.

Appendix A Attachments

Attachment 9-1 (Map)



Stantec

Project Infrastructure

- Open Pit
- Satellite Pit
- Project Development Area

Survey Locations

- Potential Fish-Bearing Swamp Identified in May 2025
- Potential fish-bearing Swamp not visited in May 2025 due to wildfires
- Surface Water Flow Direction

Study Area

- Extent of Groundwater Table Draw-down Greater than 1 m (NOA/NOC)
- Extent of Groundwater Table Draw-down Greater than 1 m (EIS)

Ground-truthed Landuse/Landcover

- Fish-bearing swamp

Remotely Sensed Landuse/Landcover

- Swamp

Landbase

- Existing Access Road
- Highway

N

0 500 1,000 Metres

(At original document size of 11x17)
1:27,500

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Base Data Sources: Government of Manitoba and Government of Canada.

Project Location
Lynn Lake, Manitoba

Prepared by ACampigotto on 2025-06-24
Technical Review by BHorne on 2025-06-24

Client/Project
111473084
ALAMOS GOLD INC.
Lynn Lake Gold Project

Map No.
1

Title
Ground-truthed Fish-bearing Swamps and Remotely Sensed, Potential Fish-bearing Swamps within the Zones of Groundwater Table Draw-down

G:_GIS_Project_Folder\111473008_LLGP_EA\IRs\IAAC-R2_80_wetlands_surveys\NOA\111473084_001_FieldResults_RemotelySensed_and_GroundTruthed_Swamps_MacLellan_NOA_20250624.mxd Revised: 2025-06-24 By: ACampigotto

Attachment 15-1 (Table)

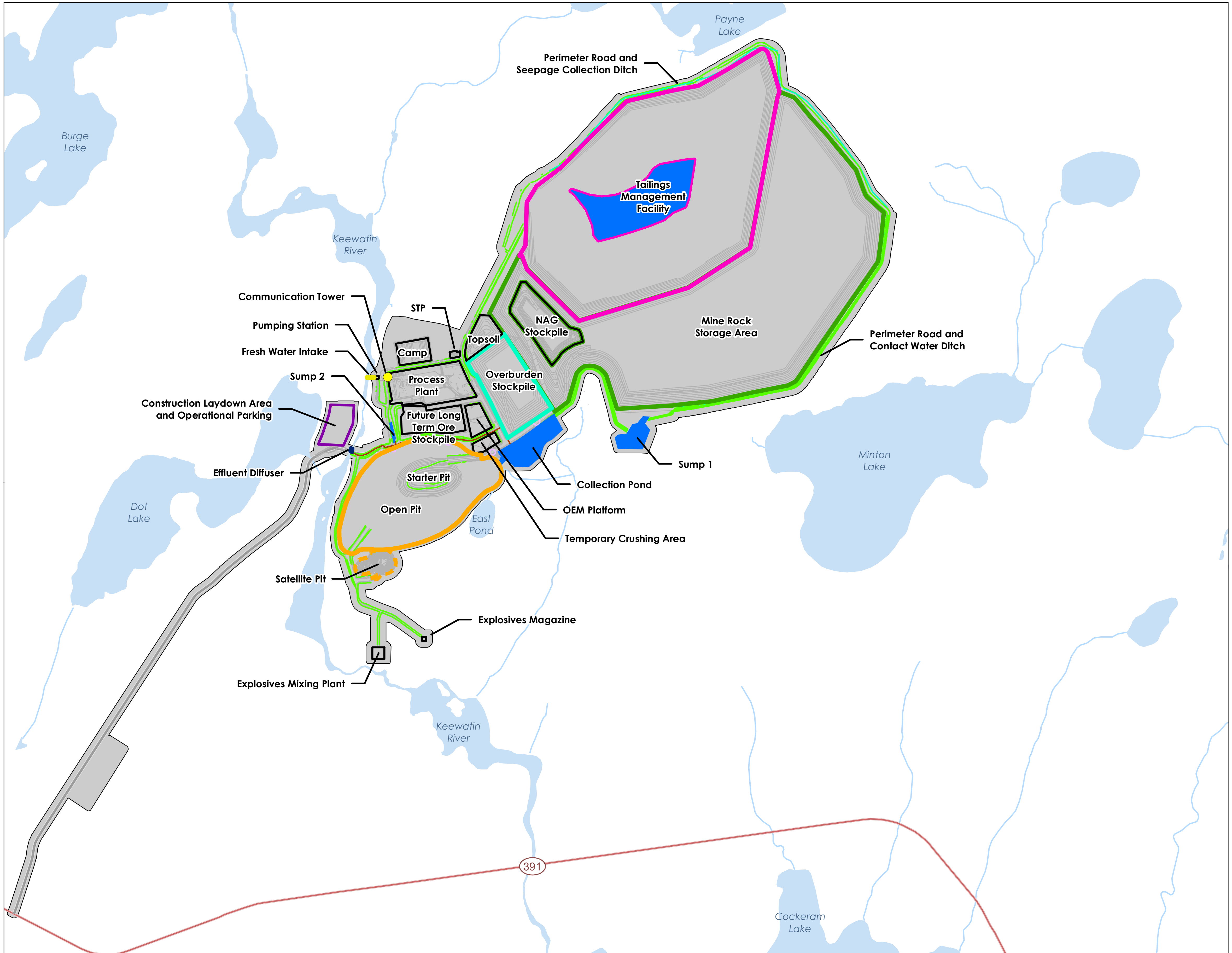
Toxicity Modifying Factors (TMFs) Used to Calculate Variable Water Quality Guidelines for MacLellan Assessment Nodes

TMF	Month	AQM4	AQM7	AQM8	AQM29	AQM16	AQM10	AQM11	AQM18	AQM31
Hardness (mg/L as CaCO3)	Jan	10.3	22.5	10.7	13.3	31.4	27.4	14.6	364	20.5
Hardness (mg/L as CaCO3)	Feb	10.3	20.1	11.2	11.9	29	29.5	14.3	367.7	22.2
Hardness (mg/L as CaCO3)	Mar	10.3	24.4	10.2	11.1	29.7	34.9	13.5	273.5	20.6
Hardness (mg/L as CaCO3)	Apr	9.1	21.4	9.4	10.3	22.5	25.2	13.2	250.6	13.8
Hardness (mg/L as CaCO3)	May	8	18.4	8.6	9.6	15.3	15.6	12.8	227.6	7
Hardness (mg/L as CaCO3)	Jun	10.1	19.6	10.1	10.8	16.1	22.3	17.1	283	8.7
Hardness (mg/L as CaCO3)	Jul	8.7	19.1	8.8	9.6	16.5	21.4	13.8	254.5	8.4
Hardness (mg/L as CaCO3)	Aug	8.5	19.2	10	9.8	19.2	23.3	17.3	259	9.1
Hardness (mg/L as CaCO3)	Sep	9.1	18.1	8.7	9.1	17.6	20.3	14	268.7	9.3
Hardness (mg/L as CaCO3)	Oct	8.2	18.3	9	10.4	15.6	16.8	18.1	245.5	10
Hardness (mg/L as CaCO3)	Nov	9.3	20.4	9.9	11.9	23.5	22.1	16.3	304.8	15.2
Hardness (mg/L as CaCO3)	Dec	9.3	20.4	9.9	11.9	23.5	22.1	16.3	304.8	15.2
pH (field measured)	Jan	6.7	6.6	6.4	6.8	6.3	6.7	6.6	6.9	5.3
pH (field measured)	Feb	6.3	7.1	6.6	6.8	6.4	6.5	6.7	6.8	6.1
pH (field measured)	Mar	6	7	6.6	6.8	6.3	6.3	6	6.5	5.9
pH (field measured)	Apr	6.3	6.8	6.7	6.8	6.5	6.5	6.4	6.8	6.3
pH (field measured)	May	6.6	6.6	6.8	6.8	6.7	6.6	6.7	7.2	6.6
pH (field measured)	Jun	6.9	7.6	6.9	6.9	6.6	6.8	6.8	7.8	6.5
pH (field measured)	Jul	6.8	7.5	7	6.8	7	6.7	7.3	6.9	6.6
pH (field measured)	Aug	6.3	6.8	7.7	7.7	6.2	6.6	6.7	8	6.1
pH (field measured)	Sep	7.1	7.4	7	7	7	6.6	6.8	7.2	6.5
pH (field measured)	Oct	7.2	7.6	6.8	6.9	6	6.8	7	6.9	6.3
pH (field measured)	Nov	7	7.1	6.6	6.9	6.1	6.8	6.8	6.9	5.8
pH (field measured)	Dec	7	7.1	6.6	6.9	6.1	6.8	6.8	6.9	5.8
DOC (mg/L)	Jan	7.3	7.9	7.7	9	9.4	18.4	8.8	24.4	21.9
DOC (mg/L)	Feb	7	7.4	7.7	8.3	9.2	19.9	8.5	22.9	22.8
DOC (mg/L)	Mar	6.8	7.5	7.3	9.1	10	27	8.8	25.2	30.9
DOC (mg/L)	Apr	6.8	7.2	7.9	8.9	10.6	20.3	9	20.6	21.3
DOC (mg/L)	May	6.8	6.9	8.4	8.8	11.1	13.7	9.2	16	11.6
DOC (mg/L)	Jun	7.6	6.7	7.2	8	9	18.6	11	23.2	12.2
DOC (mg/L)	Jul	8	7.8	8.2	9	10.4	18.7	9.1	18.2	14.6
DOC (mg/L)	Aug	8.2	8	8	8.7	8.5	17.6	9.6	19.7	15.9
DOC (mg/L)	Sep	6.8	7.7	7.7	9	9.5	15	9	18.2	14.8
DOC (mg/L)	Oct	7.1	7	7.4	7.8	7.9	15.9	8	16.3	15.2
DOC (mg/L)	Nov	7.2	7.4	7.6	8.4	8.7	17.2	8.4	20.4	18.5
DOC (mg/L)	Dec	7.2	7.4	7.6	8.4	8.7	17.2	8.4	20.4	18.5

DOC = dissolved Organic Carbon

Green value = mean of neighbouring months when baseline data were not available for the month

Appendix B Replacement Maps



Stantec

Project Infrastructure (NOA)

- Communication Tower
- Culvert
- Ditching
- Corridor / Access Road
- Collection Pond Discharge
- Fresh Water Intake
- Effluent Diffuser
- Mine Rock Storage Area
- Overburden Stockpile
- Tailings Management Facility
- Open Pit
- Satellite Pit
- Collection Pond/Sumps
- Other Infrastructure
- Construction Laydown Area
- NOA Project Development Area (PDA)

Landbase

- Highway
- Existing Access Road
- Watercourse
- Waterbody

N

0 0.5 1 Kilometres

(At original document size of 11x17)
1:30,000

Notes
1. Coordinate System: NAD 1983 UTM Zone 14N
2. Base Data Sources: Government of Manitoba and Government of Canada.
3. Project Infrastructure features provided by QPit and Ausenco.

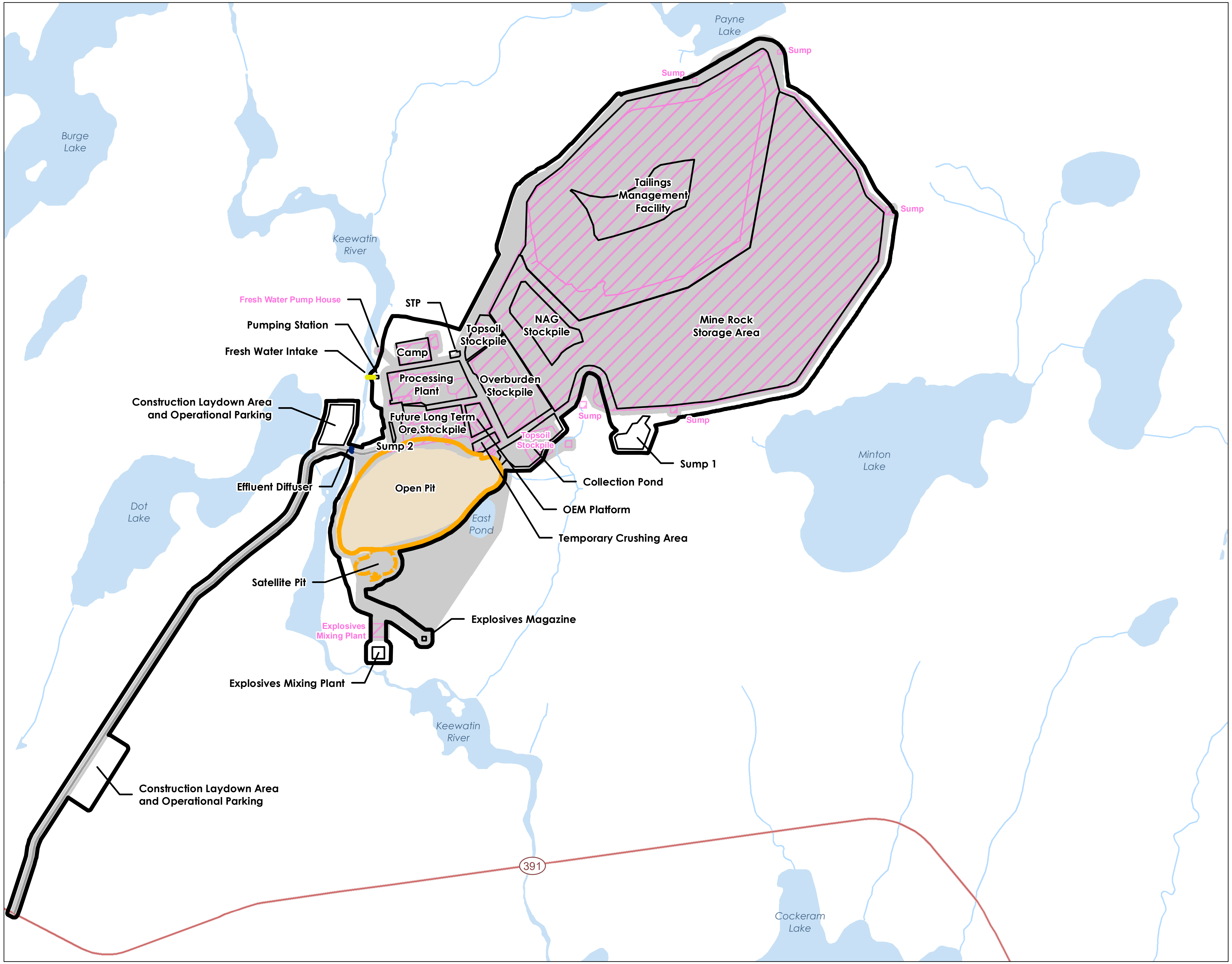
Project Location
Lynn Lake,
Manitoba

Prepared by ACampigotto on 2025-07-09
Technical Review by KMathers on 2025-07-09

Client/Project 111473084
ALAMOS GOLD INC.
Lynn Lake Gold Project

Map No.
2

Title
NOA/NOC Footprint (PDA) - MacLellan site



Stantec

Project Infrastructure (NOA)

- Fresh Water Intake
- Effluent Diffuser
- Open Pit
- Satellite Pit
- Other Infrastructure
- Project Development Area (PDA)

Project Infrastructure (EIS)

- Open Pit
- Other Infrastructure
- Project Development Area (PDA)

Landbase

- Highway
- Existing Access Road
- Watercourse
- Waterbody

N

0 0.5 1 Kilometres

(At original document size of 11x17)
1:30,000

Notes
1. Coordinate System: NAD 1983 UTM Zone 14N
2. Base Data Sources: Government of Manitoba and Government of Canada.
3. Project Infrastructure features provided by QPit and Ausenco.

Project Location
Lynn Lake,
Manitoba

Prepared by ACampigotto on 2025-07-10
Technical Review by KMathers on 2025-07-10

Client/Project 111473084
ALAMOS GOLD INC.
Lynn Lake Gold Project

Map No.
1

Title
Project Infrastructure - MacLellan site

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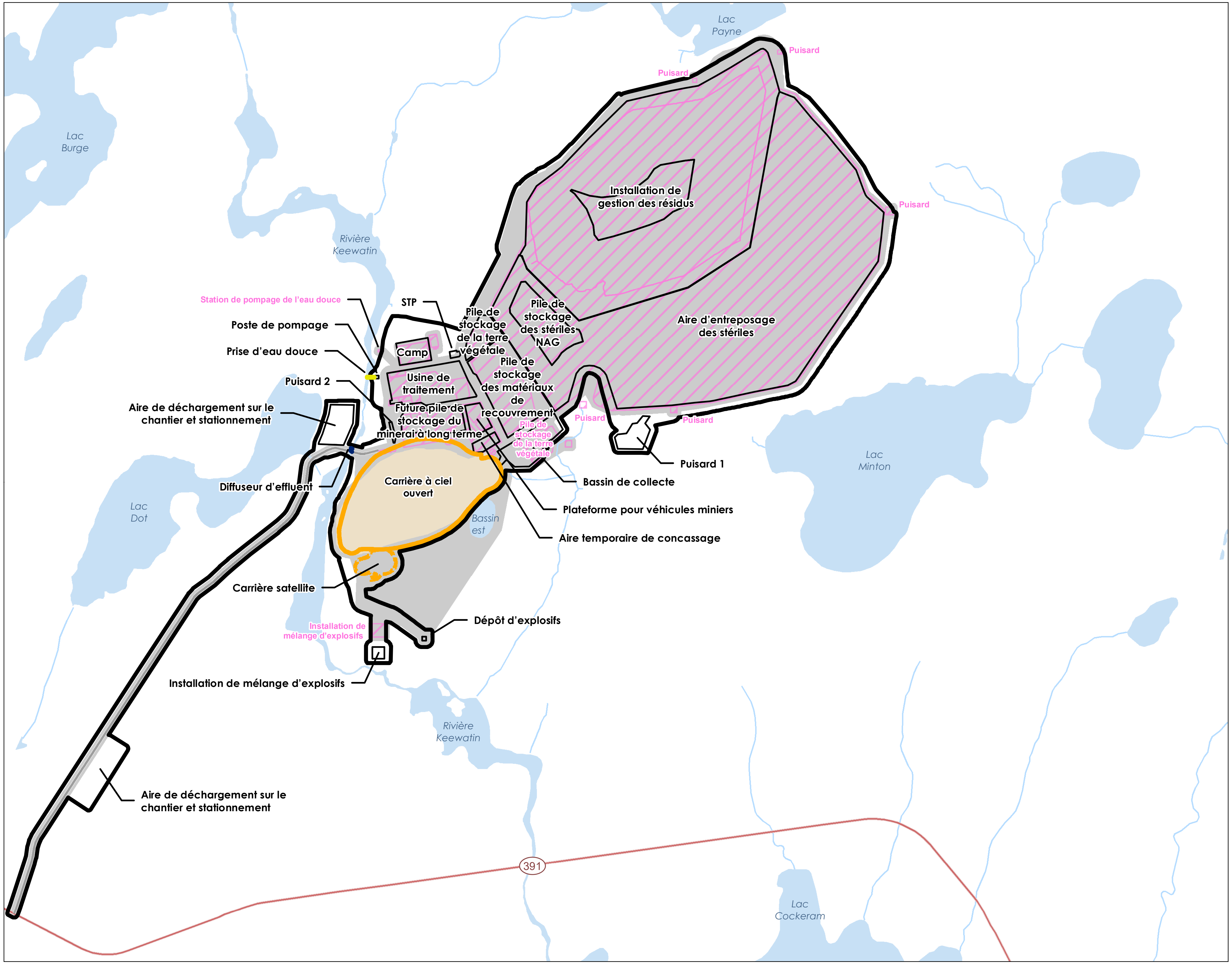

Stantec

Infrastructure du projet (AA)

- Prise d'eau douce
- Diffuseur d'effluent
- Carrière à ciel ouvert
- Carrière satellite
- Autre infrastructure
- Zone de développement du projet (ZDP)

Infrastructure du projet (EIE)

- Carrière à ciel ouvert
- Autre infrastructure
- Zone de développement du projet (ZDP)

Territoire

- Route
- Chemin d'accès existant
- Cours d'eau
- Plan d'eau

N

0 0.5 1 Kilomètres

(Au format original du document de 11x17)
1:30,000

Notes

1. Système de coordonnées : NAD 1983 UTM Zone 14N.
2. Sources des données de référence : gouvernement du Manitoba et gouvernement du Canada.
3. Les caractéristiques du projet d'infrastructure ont été fournies par QPit et Ausenco.

Emplacement du projet
Lynn Lake,
Manitoba

Préparé par ACampigotto le 10-07-2025
Examen technique par KMathers le 10-07-2025

Client/Projet 111473084
ALAMOS GOLD INC.
Projet aurifère Lynn Lake

Carte N°
1

Titre
Infrastructure du projet – site MacLellan

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