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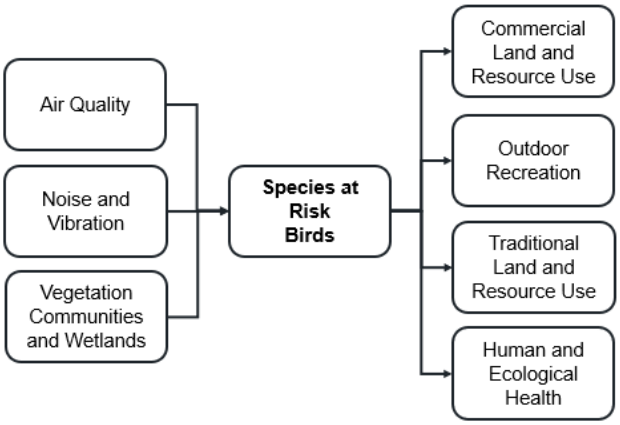
6.16 Species at Risk Birds

Species at risk (SAR) birds are selected as a valued component (VC) due to the potential interactions of the Project with species listed as Threatened and Endangered under the provincial *Endangered Species Act*, 2007 (ESA) and Threatened and Endangered species listed under the federal *Species at Risk Act*, 2002 (SARA).

The following species are considered herein: Eastern Whip-poor-will, Lesser Yellowlegs, and Short-eared Owl, all listed as Threatened species. It should be noted that Barn Swallow, while listed as Special Concern under the ESA, is also listed as Threatened under the federal SARA and has a residence description. Barn Swallow is also offered protection under the federal *Migratory Birds Convention Act, 1994* (MBCA; S.C. 1994, c. 22). Birds that are listed under the MBCA and SARA and have a residence description have residences protected on private and public lands. Therefore, Barn Swallow nests are also considered in this section. Species listed as Special Concern under the ESA and SARA are considered in Section 6.12.

In the absence of mitigation, the potential changes in SAR birds are directly linked to other VCs as informed by the following sections:

- **Air Quality (Section 6.2):** the assessment of the potential effects on air quality includes changes in dust deposition during construction and operation of the Project that may affect SAR bird habitat.
- **Noise (Section 6.3):** the assessment of potential effects from noise includes changes in sensory disturbances during operation which may affect SAR birds.
- **Vegetation Communities and Wetlands (Section 6.11):** the assessment of potential effects on vegetation communities includes change in vegetation communities during construction that may affect habitat for SAR birds.



In addition, the assessment of potential changes to SAR birds are also directly linked to other VCs, and informs the analysis of the following sections:

- **Commercial Land and Resource Use (Section 6.17):** the assessment of potential effects on commercial land and resource use is informed by changes in the abundance of SAR bird habitat, during construction and operation which could result in changes in the use of wildlife resources by local users.
- **Outdoor Recreation (Section 6.18):** the assessment potential effects on outdoor recreation is informed by changes in changes in the abundance of SAR bird habitat during construction and operation that may affect outdoor recreational activities reliant on wildlife species.
- **Traditional Land and Resource Use (Section 6.21):** the assessment of potential effects on traditional land and resource use is informed by changes in the abundance of SAR bird habitat during construction which may result in a change in the use of wildlife species valued by Indigenous people, including Bald Eagle.

- **Human and Ecological Health (Section 6.24):** the assessment of potential effects on human and ecological health is informed by changes in the abundance of SAR bird habitat during construction and operation that may affect changes in potential contaminants in SAR birds.

The assessment of potential changes in SAR birds from the Project is compared against relevant provincial and federal criteria (Section 6.16.1.1) and existing conditions (Section 6.16.2). The terrestrial resources technical support documentation, which includes baseline data on SAR birds and their habitat, is provided in Appendix P.

6.16.1 Assessment Approach

The approach to the assessment of potential effects on SAR birds includes a summary of the relevant regulatory and policy setting, an overview of the input obtained through consultation specific to this VC, the identification of criteria and indicators along with the associated rationale, a description of the spatial and temporal boundaries used for this VC along with a description of the attributes used to determine the significance of any residual, adverse effects. An outline of the analytical methodology conducted for the assessment and the key assumptions and/or conservative approach is found in Section 6.16.5.

6.16.1.1 Regulatory and Policy Setting

The effects assessment for SAR birds has been prepared in accordance with the requirements of the federal Environmental Impact Statement (EIS) Guidelines (Appendix B-1) and the provincially approved Amended Terms of Reference (ToR; Appendix B-3). Concordance tables indicating where EIS Guidelines and ToR requirements have been addressed are provided in Appendix B-2 and B-5, respectively. Government policies, objectives, standards, or guidelines most relevant to the VC are summarized below.

Federal *Species at Risk Act*

The *Species at Risk Act* (SARA; S.C. 2002, c. 29) was passed into law in 2002 and was last amended on June 17, 2024. The SARA aims to prevent wildlife species in Canada from disappearing, to provide for the recovery of wildlife species and to manage species to prevent further risk to their status. SARA provides legal protection to SAR listed in Schedule 1 if they have a designation of Extirpated, Endangered, or Threatened with respect to harming the species or its residence. The SARA applies to federal lands (e.g., First Nations reserve lands) and outside of federal lands to migratory birds (i.e., those species listed under Article I of the Migratory Birds Convention Act, 1994 [S.C. 1994, c. 22]) that also fall under Schedule 1 of the SARA; this does not include the species' critical habitat but it does include residences of migratory birds that have residence descriptions; and aquatic species that fall under Schedule 1 of the SARA.

Regarding birds, the application of SARA has been considered for the portion of the transmission line that crosses Slate Falls Nation. SAR with Extirpated, Endangered, or Threatened federal designations require recovery strategies or conservation action plans that identify their critical habitat for mandatory prohibition from damage or destruction. Species listed as Special Concern in Schedule 1 are not legally protected under SARA but require a management plan. Species listed in Schedule 2 or 3 of SARA are not legally protected under SARA. Still, they require status assessment through the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) to determine conservation status and priority for recovery and action planning. Notably, SARA prohibitions can be applied if provincial legislation or voluntary measures do not adequately protect federally listed species and their residence. Generally, compliance with provincial legislation in Ontario satisfies the SARA requirements.

Under Section 79 of SARA, environmental assessments (EAs) conducted under federal legislation must notify the competent minister in writing if the project will likely affect a listed species or its critical habitat. The proponent must identify the project's adverse effects on the listed wildlife species and its critical habitat and, if the project is carried out, must ensure that measures are taken to avoid or lessen those effects and monitor them. The measures must be taken in a way that is consistent with any applicable recovery strategy and action plans. Environment and Climate Change Canada (ECCC), formerly Environment Canada, must be notified of impacts to listed bird species.

The SARA applies to the SAR birds VC as Barn Swallow is a migratory bird under Schedule 1 and has a residence description. Only Eastern Whip-poor-will's recovery strategy is considered in this evaluation of effects.

Federal *Migratory Birds Convention Act*

The *Migratory Birds Convention Act* (MBCA; S.C. *1994*, c. 22) was passed in 1917, and the last amendment was on December 12, 2017, and is enforced by ECCC. The MBCA prohibits harming and/or killing most species of birds and/or destroying or collecting their eggs or nests. Protected species, listed under Article I of the MBCA, are native or naturally occurring in Canada and are known to occur regularly in Canada. Most birds found in the baseline investigation area receive protection under the MBCA, and nearly all the remaining species receive similar protection under the provincial *Fish and Wildlife Conservation Act, 1997* (FWCA; S.O. 1997, c.41; see Section 6.12).

Under the MBCA, together with the *Migratory Birds Regulations* (C.R.C., c. 1035) which were last amended on July 30, 2022, provide protection to migratory bird nests during the period considered to have a high conservation value (i.e., generally during the nesting period). The "incidental take" of migratory birds and the disturbance, destruction, or taking of the nest of a migratory bird is prohibited. ECCC and the Canadian Wildlife Service have compiled nesting calendars that show the variation in nesting intensity by habitat type and nesting zone within broad geographical areas distributed across Canada (ECCC 2021), which can greatly reduce the risk of encountering a nest. Some species whose nests are reused or subsequently used by other species continue to have year-round nest protection unless they are abandoned.

The MBCA and Migratory Birds Regulations bind all members of the public and all levels of government.

Barn Swallow, Eastern Whip-poor-will, and Lesser Yellowlegs are presented in Article 1. Short-eared Owl is not listed on Article 1 of the MBCA. Some species are not protected under the MBCA but are listed under the ESA (e.g., Rusty Blackbird and Short-eared Owl). If Barn Swallow, Eastern Whip-poor-will, or Lesser Yellowlegs individuals or nests are encountered during Project activities, the Project must comply with the prohibitions of the MBCA and Migratory Birds Regulations, including avoiding the destruction of the nest (i.e., stop work) and following appropriate timing windows for best management practices for vegetation removals. The Project site occurs in nesting zone C5, which has a regional nesting period of late April to late August.

Provincial *Endangered Species Act*

Ontario's ESA was passed into law in 2007 and came into effect on June 30, 2008, and was last amended on July 21, 2024. The ESA is enforced by the Ministry of the Environment, Conservation and Parks (MECP); however, SAR are determined by the Committee on the Status of Species at Risk in Ontario. If a species is listed under the ESA as Extirpated, Endangered, or Threatened, Section 9 of the ESA prohibits killing, harming, harassing, capturing, taking, possessing, collecting, buying, selling, leasing, trading, or offering to buy, sell, lease or trade a member of the species. Similarly, Section 10 of the ESA prohibits the damage or

destruction of the habitat of all Endangered and Threatened species. Protection under the ESA extends to both public and private lands. Species listed as Special Concern are not afforded protection under Sections 9 and 10 of the ESA.

Under the ESA, habitat is defined as the area prescribed by regulation ("Regulated Habitat") or generally ("General Habitat") as an area on which the species depends, directly or indirectly, to carry on its life processes (e.g., reproduction, rearing, hibernation, migration, feeding). General Habitat is further defined for some species through the development of technical General Habitat Descriptions which provide greater clarity on the area of habitat protected for a species.

Impacts on individual SAR and/or their habitats are considered a contravention of the ESA. Under certain circumstances, tools authorized under the ESA (e.g., permit, agreement, instrument) can be applied to allow activities that would otherwise be prohibited by the ESA. Requirements for achieving compliance with the ESA through permit, agreement, or instrument often include confirmation that the activity will not jeopardize the survival or recovery of the species in Ontario, that reasonable steps are taken to minimize the adverse effects, that reasonable alternatives have been considered, and that beneficial actions achieved would outweigh adverse effects.

Any SAR ranked as Endangered or Threatened that may be impacted by any Project work requires consideration. Eastern Whip-poor-will, Lesser Yellowlegs, and Short-eared Owl are listed as Threatened under the ESA and occur in the Study Area.

Provincial *Fish and Wildlife Conservation Act*

The *Fish and Wildlife Conservation Act* (FWCA; S.O. 1997, c.41) was passed into law in 1997 and was last amended on June 8, 2024, and is administered by the Ministry of Natural Resources (MNR). The FWCA applies to "fish and wildlife," whereby fish are defined as having the same meaning as in the *Fisheries Act*, and wildlife is defined as "an animal that belongs to a species that is wild by nature and includes game wildlife and specially protected wildlife."

Schedules 6 to 11 under the FWCA O. Reg. 669/98: Wildlife Schedules identify "specially protected wildlife" and are protected from being killed, trapped, or hunted. If wildlife requires collection or relocation at any point in the Project (i.e., through trapping / collection and relocation), a permit or approval under the FWCA may be required. Additionally, under the FWCA Part II, Section 7(1), Nests and eggs, "A person shall not destroy, take or possess the nest or eggs of a bird that belongs to a species that is wild by nature." If a provision of the FWCA and a provision of the MBCA or ESA conflict the provision that gives the most protection prevails.

Species specific to the Project that are not protected under the MBCA but protected under the FWCA include the Short-eared Owl, which occurs on Schedule 7 Specially Protected Raptors. If the nest or eggs of a Short-eared Owl are found, authorization for removal is required (as well as authorization under the ESA). Permits under the FWCA are contractor-specific, whereby the individual undertaking the work to rescue and relocate or collect wildlife will be the responsible party required to obtain the necessary permits and approvals.

6.16.1.2 Influence of Consultation with Indigenous Communities, Government, and the Public

Consultation has been ongoing for several years, prior to and throughout the environmental assessment process, and will continue with Indigenous communities, government agencies, and the public through the life of the Project. Section 2 provides more detail on the consultation process. The Record of Consultation

(Appendix D) includes detailed comments received and responses provided during the development of the final EIS/EA.

Consultation feedback has been addressed through direct responses (in writing and follow-up meetings) and incorporated into the final EIS/EA, as appropriate. An overview of the key comments that influenced the assessment for SAR birds between the draft and final EIS/EA is provided below.

Baseline Information

The Impact Assessment Agency of Canada (IAAC) requested further information on bird species abundance and distribution that accounts for observer bias or provides a rationale for excluding observer bias from the analysis. Further, it was requested to demonstrate that the data gathered from point count surveys are valid for estimating abundance or distribution estimates for migratory birds, including SAR birds, for the Project Development Area (PDA), the Local Study Area (LSA), and the Regional Study Area (RSA). The final EIS/EA has included the analyses in Appendix P (Baseline Terrestrial Report) and summarized the information in Section 6.12. It notes that the data gathered from point count surveys are valid for estimating the abundance or distribution of migratory birds and include abundance estimates and confidence intervals. Appendix P includes the estimates which have quantified and accounted for sources of error and bias, including species probability of detection, detection distance, time of day, observer, and habitat, and observer bias has been incorporated into the analysis of avian data. Further, Appendix P-3 includes a concordance table against the ECCC Annex on Baseline Guidance (dated August 13, 2021). IAAC requested further justification that sufficient baseline sampling for birds has been undertaken to support the conclusions for the effects assessment. Baseline surveys for migratory birds continued in 2022 and included breeding bird point counts, owl surveys, autonomous recording unit (ARU) surveys, and stick nest surveys adapted from ECCC's Annex on Baseline Guidance (dated August 13, 2021). Multi-year migratory bird point count surveys per provincial and federal avian protocols were undertaken across the LSA and RSA and included multiple seasons to obtain density estimates of individual breeding bird species. Additional details of the study design and results have been added to Appendix P (Baseline Terrestrial Report) of the final EIS/EA.

Cat Lake First Nation, Lac Seul First Nation, and Slate Falls Nation inquired whether Eastern Whip-poor-will surveys were completed at locations where Common Nighthawk were found. ARUs were used in the survey and would have detected both species if they were at the ARU station. This information was added to Appendix P (Baseline Terrestrial Report), which also includes the results of the baseline surveys completed.

MECP requested collection of baseline data for Eastern Whip-poor will using approved standards and guidelines. The *Draft Survey Protocol for Eastern Whip-poor-will (*Caprimulgus vociferus*) in Ontario* (MNRF 2014b) was developed for southern and central Ontario, where road and walking access is prevalent. The area around the Project has very limited all season road access providing limited access to the broader distribution of suitable habitat for Eastern Whip-poor will. In addition, the logging road is not safe to survey from at night as it is narrow and logging trucks are frequently using it to transport large loads. Despite this, surveys for the Project were conducted in 2021 and 2022 following the protocol, including timing surveys by moon phase, three survey periods, and targeting defined habitats, along with the concurrent use of autonomous recording units (ARU). Recent research and technology advancements highlight the efficacy of ARUs for crepuscular surveys. Additionally, ARUs are now recommended by ECCC (ECCC Annex, dated August 2021) for safer, more effective surveys in remote areas. Studies by Knight et al. (2022) and Hannah et al. (2022) show that ARUs improve the detection of nightjars by capturing data across various conditions. Findings from these studies follows:

Knight et al. (2022) state:

- "If using passive acoustic monitoring, we suggest Eastern Whip-poor-will surveys should move beyond the previous reliance on moon phase and use an unconstrained protocol for most applications. We showed that cumulative probability of detection is maximized by conducting many unconstrained visits. In other words, using all survey data and accounting for imperfect detection with the appropriate covariates results in higher overall detectability than only surveying when conditions are optimal."
- "Using passive acoustic monitoring and an unconstrained approach to survey Eastern Whip-poor-wills and other nocturnal species should be feasible for most applications if equipment is available. ARUs are a valuable tool for surveying nocturnal species like nightjars (Frommolt and Tauchert 2014, Shonfield et al. 2018, Duchac et al. 2020) because nocturnal human surveys for nightjars are often restricted to roadsides for safety considerations (Takats et al. 2001, Knight et al. 2019), which can result in a biased understanding of habitat relationships, occupancy and population size (Pankratz et al. 2017, Yip et al. 2017b)"

Hannah et al. (2022) state:

- "Established species-specific survey protocols are often inconsistent between jurisdictions, with limited spatial and temporal data to inform survey timing. The recent proliferation of programmable autonomous recording units (ARUs) and automated detection software enables the processing of huge volumes of acoustic data, which can improve our understanding of the acoustic phenology of many bird species."
- "In particular, detection probability can be maximized by using ARUs to record at times of peak acoustic activity and collecting multiple recordings, as done in Shonfield and Bayne (2017) and Gibb et al. (2018). Autonomous recorders can also be deployed safely in remote locations during the day and programmed to ensure timing coincides with the crepuscular periods of peak activity found here. The resultant ARU recordings can be processed into Common Nighthawk detections quickly and reliably; signal recognition technology works well for this species because the call is simple, consistent, and frequent (Knight et al. 2017)."

Assessment Methodology

IAAC requested clarification on how the spatial boundary addresses both potential direct and indirect effects to each valued component. Section 6.1 of the EIS/EA describes the LSA which includes the geographic extent of the potential direct and indirect Project effects. Further, it notes that the RSA is based on the maximum geographic extent or zone of influence in which the potential effects are assessed and used to provide regional context to the valued component. The study areas are further refined in the relevant effects assessment for each valued component. The rationale for the LSA and RSA for SAR birds has been revised in Section 6.16.1.3 of the final EIS/EA and includes consideration for watersheds, eco-districts, Bird Conservation Regions (BCR), traditional knowledge, and any other guidance made available by ECCC regarding the development of ecologically defined study areas.

The Ministry of Natural Resources (MNR) requested further clarification on the suitability of the study area for the assessment of effects at the regional scale to evaluate cumulative effects on the populations of SAR birds. The LSA for SAR birds is described in Section 6.16.1.3 and is defined as a two kilometre (km) buffer from the PDA, which includes consideration of direct overprinting of habitat, as well as indirect effects associated with sensory disturbance. Based on recommendations from ECCC to consider watersheds and

patterns in land cover, the RSA has been redefined and includes consideration for the use of ecologically defined boundaries.

Effects Assessment

IAAC requested a further assessment of potential effects from spills and other accidents and malfunctions on SAR birds that may be harmed by accidental events impacting aquatic systems, the identification of appropriate mitigation measures, the identification of residual effects, and the significance of the residual effects. The assessment of potential malfunctions and accidents has been included in Section 9, and includes a description of relevant safeguards, potential environmental concerns, and response measures. Specifically, Section 9.12 considers vehicular accidents that could release materials, Section 9.13 considers the potential spill of cyanide, and Section 9.14 considers the potential release of products from containment and dispensing facilities. Key measures to mitigate the potential effects of a spill on the environment, including SAR birds, are outlined in Section 9.

Northwestern Ontario Métis Community (NWOMC) requested further information on how the potential Project effects on birds may result in impacts on NWOMC values and interests. Potential effects on birds, including migratory birds, are assessed in Section 6.12. In addition, the potential effects on SAR birds are assessed in Section 6.16. In both sections, proven mitigation measures are proposed to eliminate and/or reduce potential effects on birds. As a result of the effectiveness of these measures, the effect on the use by Indigenous people is expected to be minimized as described in Section 6.21.

MNR requested clarification on the assessment of SAR bird mortality associated with the decommissioning phase as it could result in the loss of nesting habitat by some species. Habitat supporting SAR birds is conservatively assumed to be removed from within the PDA during the construction phase. As a result, the likelihood that these species would continue to use these areas during operation and closure is reduced, and therefore the risk of mortality during closure would be lower. The risk of mortality for SAR birds is assessed in Section 6.16.6 and it has been determined that with the implementation of mitigation measures such as buffers, speed limits, timing windows for vegetation clearing, and pre-construction nest surveys, the potential effects would be mitigated and there would be no residual effects.

Analytical Methods

MNR requested further information on the rationale for the zone of influence. Section 6.16.1.3 describes the LSA as the area intended to capture potential direct effects from the Project (such as habitat loss) and indirect effects (such as sensory disturbance) which could extend beyond the PDA. The zone of influence is the area between the spatial footprint of an activity and the extent of the activity's effects on the surrounding habitat and includes consideration for changes in air quality, noise, and groundwater as described in Section 6.16.5.

Mishkeegogamang Ojibway Nation (MON) requested further information on the assumptions used to support a conservative assessment of the effects on SAR birds. It has been assumed that all the habitat within the PDA will be removed during the construction phase of the Project. However, some areas may not be fully removed and will remain, and therefore this assumption will overestimate the actual effects. Further, it has been assumed that rehabilitation measures and any associated offsetting of habitat loss or disturbance would not occur until the closure phase. In reality, progressive rehabilitation is expected to occur during the operation phase such that some of the rehabilitated areas would provide habitat to SAR birds prior to closure, and as a result, the effects would be overestimated. Overall, the assumptions used in Section 6.16.5 provide a conservative approach and result in an overestimation of effects.

Mitigation Measures

The MNR requested further information on the mitigation measures for wildlife habitat loss and mortality. The direct and indirect loss of SAR bird habitat, as well as the potential changes in the risk of mortality, is assessed in Section 6.16. The assessment takes into consideration the mitigation measures identified in these sections and has determined that the residual effects are not significant and, therefore, no further mitigation is required. Monitoring programs will be implemented to verify the accuracy of the predicted effects, assess the effectiveness of the implemented mitigation measures, and may be further optimized in response to monitoring data.

IAAC requested clarification on the timing windows that will be used for vegetation removal to mitigate impacts on migratory birds. Recommended timing windows have been provided in accordance with the MBCA and *Migratory Birds Regulations*. Recommended timing windows have also been presented in line with those sensitive periods for bats. This has been updated in Section 6.16.4.

MON requested clarification on how pre-construction surveys will mitigate the loss of "nesting habitat" for Barn Swallow. Barn Swallow are closely tied to locations where they have nested before; fidelity to nesting locations appears to be greater than fidelity to specific nests (Shields 1984), as referenced in the residence description (ECCC 2019). Pre-construction surveys, as described in Section 6.16.4, will identify actively used nesting habitat so that Project activities can be sequenced to avoid these areas during construction and operation.

Characterization of Residual Effects

MNR requested further analysis of the impacts on SAR birds, mitigation, and residual effects from controlled dewatering and water management activities within the open pit basin associated with the Project. The changes in the surface water catchments as a result of these activities, including applicable mitigation measures, have been included in the assessment of potential changes in vegetation communities and wetlands, as described in Section 6.11.6, and the results of these changes have been carried forward into the assessment of potential effects on SAR birds.

MON requested further information to support the conclusions for potential effects on Eastern Whip-poor-will. Baseline surveys for the Project have been undertaken and have substantially expanded the baseline knowledge for Eastern Whip-poor-will in both distribution and abundance of this SAR in this region of Ontario, as described in Appendix P (Baseline Terrestrial Report) and Section 6.16.2.1. This extensive baseline information for Eastern Whip-poor-will was used to support the assessment of potential effects.

IAAC requested further information on nesting bird habitat to provide evidence that there is enough equivalent habitat for birds to be displaced to and that the vegetation being removed is not unique to the Project footprint. The change in cover type has been presented in the draft EIS/EA, which showed less than a 1% change in vegetation communities in the RSA. This analysis of habitat available within the revised RSA relative to each habitat type within the PDA has been updated and is included in Table 6.16-5.

6.16.1.3 Spatial and Temporal Boundaries

The Project Development Area (PDA) is defined as the footprint of the Project, including the mine site, mine site access road, and the transmission line corridor, as well as a buffer to allow for flexibility for design optimizations during Project permitting. The buffer includes approximately 250 m around the mine site area. The buffer for the transmission line is included within the 40 m wide corridor and the 30 m wide corridor for the mine access road. Where the mine access road and transmission line are aligned together, the buffer is included within a 60 m wide corridor.

The spatial boundaries used for the assessment of SAR birds are shown in Figure 6.16-1 and defined as follows:

- **Local Study Area (LSA):** The LSA consists of a 2 km buffer around the mine site area of the PDA, a 2 km buffer from the centreline of the mine site area of the PDA, and a 1 km buffer from the centreline of the transmission line. The LSA includes the outer extent to which potential direct and indirect effects are anticipated to occur. The direct effects include anticipated areas of SAR bird habitat that may be overprinted. Areas adjacent to the PDA may experience indirect effects as result of a change in function, connectivity and quality. The predicted indirect effects are measured within a zone of influence, which is the area between the spatial footprint of an activity and the extent of the activity's effects on the surrounding habitat (Wilson 2016). The indirect effects are based on the zone of influence associated with the changes due to the following:
    - The groundwater drawdown (Figure 6.16-10).
    - The extent of the modelled air emissions (Figure 6.16-11); and
    - The extent of the modelled noise emissions (Figure 6.16-12).
- **Regional Study Area (RSA):** The RSA includes the combination of quaternary watershed boundaries that may be influenced by the Project and is based on guidance outlined by ECCC to define an ecologically relevant study area. The extent of the RSA considers patterns in land cover where assemblages of vegetation and wetlands occur with distinct environmental conditions, relevant eco-districts and BCRs, and traditional knowledge from local Indigenous communities.

The temporal boundaries for the assessment are defined as:

- **Construction Phase:** Years -3 to -1, representing the construction period for the Project.
- **Operation Phase:** Years 1 to 10, with the first year potentially representing a partial year as the Project transitions from construction into operation. Mining of the ore from the open pit will end in Year 10, at which time the pit will begin refilling with water.
- **Decommissioning and Closure Phase:**
    - Active Closure: Years 11 to 15, when final decommissioning and the majority of active reclamation activities are carried out; and,
    - Post-Closure: Years 16+, corresponding to the post-closure monitoring period when the filled open pit basin will be reconnected to Springpole Lake.

Effects on each VC are assessed for each Project phase (i.e., construction, operation and closure).

6.16.1.4 Criteria and Indicators

In undertaking the assessment of effects on SAR birds, the following criteria were used:

- Change in relative abundance of habitat;
- Change in the function, connectivity, and quality of habitat; and,
- Change in the risk of mortality.

The specific criteria, measurable indicators and the rationale for the selection of criteria are described in Table 6.16-1. To support the effects assessment, indicators are assessed using professional judgement and experience.

6.16.1.5 Description of Residual Effect Attributes

The residual effects for SAR birds are characterized in terms of the following attributes:

- Magnitude;
- Geographic extent;
- Duration;
- Frequency;
- Reversibility; and,
- Timing.

These attributes along with the rankings are further described in Table 6.16-2.

In addition, the residual effects for SAR birds are characterized according to the ecological and/or social context within which the VC is found. This is a qualitative measure of the sensitivity and/or resilience of the VC to potential change. The following ranking is applicable:

- **Level I:** The VC may or may not be sensitive but is capable of supporting the predicted change with typical mitigation measures.
- **Level II:** The VC is sensitive and requires special measures to support the predicted change.
- **Level III:** The VC is sensitive and unable to support the predicted change even with special measures.

As noted in Section 6.1, a residual effect is defined as significant if both of the following criteria are satisfied:

- A Level II or III rating is attained for all of the attributes involving magnitude, extent, duration, frequency, reversibility and timing ; and
- A Level II or III rating is attained for ecological and/or social context.

Conversely, if a Level I rating is achieved for any of the attributes involving magnitude, extent, duration, frequency, reversibility or timing , or if a Level I rating is achieved for the ecological and/or social context, then the residual effect is considered to be not significant.

In the event there is a significant adverse effect, the likelihood of occurrence is further described.

6.16.2 Existing Conditions

A description of the baseline conditions is presented below to characterize the existing conditions for SAR birds and is based on several years of study that has resulted in a comprehensive dataset for this stage of project planning. The existing conditions are used to support the assessment of potential effects from the Project on SAR birds and will support long-term monitoring for the Project. Further baseline information on SAR birds can be found in the technical support documentation (Appendix P) includes baseline data from field investigation conducted on SAR birds.

Field studies conducted in 2021 and 2022 documented Eastern Whip-poor-will, Lesser Yellowlegs, and Barn Swallow. The Project also occurs within the breeding range for the Short-eared Owl, a highly nomadic species whose nesting and wintering areas align with local outbreaks of voles and small rodents (Cadman and Page 1994); the MECP requested the inclusion of the Short-eared Owl. Species distribution, abundance,

and estimates of breeding status, where possible, for each SAR bird are summarized below. Habitat mapping is also completed to inform the effects assessment (Appendix P-3.15 to 3.17).

Road networks associated with forestry and the Slate Falls Nation community are present in the southwestern and southeastern parts of the RSA. The E1C and Wataynikaneyap Power transmission line corridors run east to west across the RSA. The Project falls within Bird Conservation Region #8, an ecologically distinct region in North America with similar bird communities, habitats, and resource management issues. The 2021 objective for BCR #8 is recovery. The *Wabauskang Traditional Knowledge Use in the Area of the Springpole Gold Access Corridor Project* (ArrowBlade 2014) and the *Cat Lake – Slate Falls Community Based Land Use Plan* (NDMNRF 2019) documents Eastern Whip-poor-will in the RSA.

6.16.2.1 Eastern Whip-poor-will

Eastern Whip-poor-will in Ontario is listed as Threatened under ESA in 2009. COSEWIC assessed this species as Threatened in 2009, and in 2011 it was listed as Threatened under Schedule 1 of the SARA. Eastern Whip-poor-will is listed under Article I of the MBCA.

From the provincial Recovery Strategy (MECP 2019), the nesting and foraging habitats of the Eastern Whip-poor-will typically feature well-drained soils, moderate tree cover, and sparse shrub and herb cover. These include early-succession forests, forest edges, rock or sand barrens, savannahs, old burns, and sparse conifer plantations. Foraging occurs in prairies, shrub wetlands, regenerating clear-cuts, and agricultural fields, where low tree cover and perches help locate prey, such as moths and beetles. Eastern Whip-poor-will occupancy is linked to open wetlands, which provide key foraging areas.

Baseline surveys for Eastern Whip-poor-will for the Project have expanded the baseline knowledge in both the distribution and abundance of this SAR in this region of Ontario. Prior to these baseline survey efforts, there were no confirmed records of Eastern Whip-poor-will in this region. The Project is located in an area well north of the currently published range boundary for Eastern Whip-poor-will in the federal Recovery Strategy (MECP 2019). Previously, this species has largely been associated with mixed deciduous ecosystems associated with the Great Lakes in south and central Ontario (MECP 2019). During earlier baseline survey efforts, there were no confirmed records of EWPW in this region. Surveys for Eastern Whip-poor-will were conducted from 2012 to 2019 in the accessible areas around the exploration camp.

In 2021, Eastern Whip-poor-will surveys were expanded in both spatial extent and sampling effort. ARUs were utilized in an attempt to detect this species in areas with no road access and in a wider variety of habitats away from the exploration camp. After successful detection in 2021, survey efforts in 2022 were further expanded with more than double the ARU deployments across suitable habitat types and included vegetation surveys and habitat mapping (Figure 6.16-2). In 2021, ARUs were in place and recording for Eastern Whip-poor-will from June 1 to July 1. In 2022, ARUs were in place and recording from May 7 to August 7, capturing the window of May 18 to June 30 recommended in the 2014 *Draft Survey Protocol for Eastern Whip-poor-will (Caprimulgus vociferus) in Ontario* (MNRF 2014b). In both years, ARUs were set to record 30 minutes before sunset until 90 minutes after sunset and 60 minutes before sunrise to 60 minutes after sunrise, as required by the Protocol window. The window includes 30 minutes after sunset and continuing while the moon is still visible, as well as "If conditions are favourable, surveys may extend until as late as 15 minutes before sunrise." Figure 6.16-3 and Figure 6.16-4 show the 2021 and 2022 ARU results for Eastern Whip-poor-will recorders.

Eastern Whip-poor-will were recorded on nights with and without the full moon in both 2021 and 2022. In 2022, from May 7 to August 7, they were detected from early June to the end of July. During 2022 ARUs did not detect much activity in May, possibly due to the more northern location of the Project. This is analogous

to the provincial breeding bird protocols, which have slightly different target survey windows for provincial breeding bird protocols in northern verses southern regions of Ontario and results seen in Common Nighthawk at increasingly northern latitudes (Hannah et al. 2022). However, the results demonstrate that the surveys conducted in June were sampling within the window of core activity for this species in this northern area of their range. This timeframe is further supported by the Birds Canada Nesting Calendar Query Tool, that suggests Eastern Whip-poor-will in BCR #8, Lake St. Joseph Eco district, and Nesting Zone C5 has be a greater than 80 percent of nesting between May 23 and July 26. The Ontario Breeding Bird Atlas Safe Dates/Breeding Dates for the Boreal Shield are between 24 May 24 and 31 July 31 (Birds Canada 2023).

Surveys were conducted following the *Draft Survey Protocol for Eastern Whip-poor-will (*Caprimulgus vociferus*) in Ontario* (MNRF 2014b), including timing surveys by moon phase, three survey periods, and targeting defined habitats, with the use of ARUs.

In addition, Eastern Whip-poor-will habitat was mapped using the results of the vegetation and habitat surveys in 2022 with a Habitat Suitability Index (HSI) model that was developed by WSP Canada Inc. (WSP) in conjunction with MNR (prior to MECP administering the ESA) for linear corridor environmental assessments in northwest Ontario (Figure 6.16-2; Appendix P-3.15). Based on the HSI modelling, it was found that 103 hectares (ha) of habitat exists in the PDA, 3,032 ha in the LSA, and 78,318 ha in the RSA. In addition to HSI modelling, the General Habitat Description was considered. The General Habitat Description (MECP 2017) is a technical document that clarifies the area of habitat protected for a species. Habitat is classified as follows:

- **Category 1:** Nest and the area within 20 m of the nest;
- **Category 2:** The area between 20 and 170 m from the nest or centre of approximated defended territory; and
- **Category 3:** The area of suitable habitat between 170 and 500 m of the nest or centre of approximated defended territory.

The HSI model assumes potential breeding habitat (Category 1), so Category 2 and 3 habitats were applied based on this assumption. This is illustrated in Figure 6.16-5, and provides mapping quantification and buffered distance, as requested by the MECP.

6.16.2.2 Eastern Whip-poor-will Recovery Strategy

The WSP habitat mapping considers breeding habitat and the application of Category 2 and 3 buffers considers foraging habitats. The recovery strategy for Eastern Whip-poor-will (MECP 2019) notes that habitat loss or degradation by mineral extraction is a medium level of concern for the species' recovery. Mineral extraction is a localized extent of continuous frequency with a moderate population-level effect.

Mineral extraction can cause a loss or degradation of suitable habitats for nesting and/or foraging, remove environmental conditions that allow sufficient prey populations, and fragment habitat (MECP 2019). These effects are especially applicable where forest cover is already low on the landscape (e.g., less than 25% or 2,500 ha in a 10 by 10 km square) and if the effect is permanent. Moreover, these effects are always applicable if the activity would result in landscape forest cover falling below 25% and if the effect is permanent. Lastly, these effects are applicable at all times if biophysical attributes become unavailable or available in insufficient amounts at the time they are needed by the species (MECP 2019).

The RSA occurs in an area of the boreal forest known as the Northern Coniferous Region, characterized by closed forests where Black Spruce is the predominant tree, with Jack Pine and Tamarack (Section 6.11). Forest cover on the landscape is high, the RSA is 87% treed (coniferous treed, deciduous treed, coniferous swamp and deciduous swamp; Section 6.11, Table 6.11-2). Based on the above understanding, the assessment criteria are reviewed as follows:

- Change in relative abundance of habitat will assess if forest cover will be reduced to less than 25% in the RSA. Additionally, this criterion will assess the change in relative abundance of habitat in the RSA via habitat mapping.
- Change in the function, connectivity and quality of habitat will assess if the area indirectly altered by air, noise, and groundwater drawdown impacts reduces forest to less than 25% in the RSA (i.e., the biophysical attributes become unavailable or available in insufficient amounts). Additionally, the change in the function, connectivity and quality of habitat will assess the percent of habitat indirectly altered by air, noise, and groundwater drawdown impacts (land-use change).
- The change in risk of mortality will consider if vegetation removal occurs during sensitive times.

It should be noted that some activities that would destroy habitat could also generate the open habitats necessary for foraging and nesting in the following years (MECP 2019). This is a potential positive effect that may be documented in follow-up monitoring.

6.16.2.3 Barn Swallow

Barn Swallow was downlisted to Special Concern under Ontario Regulation 230/08: Species at Risk in Ontario after COSEWIC and COSSARO reassessed this species in 2021. However, Barn Swallow is listed as Threatened under the federal SARA and has a Residence Description. Birds with a Residence Description under SARA have their residences (the nest) protected on both private and public lands, and therefore Barn Swallow nests are included in Section 6.16. However, other Barn Swallow habitats (e.g., foraging) are assessed in Section 6.12. Barn Swallow is protected under the MBCA.

Under SARA, the nest, occupied or not, is considered a residence from May 1st (or the date when adults are first seen building or occupying the nest, whichever is earlier), until August 31st (or the date when a bird is last seen at the nest, whichever is later; Government of Canada 2019). During the period of occupancy of the residence, any activity that damages or destroys the functions of the nest would constitute damage or destruction of the residence. These activities include, but are not limited to, moving, damaging, or destroying the nest; blocking access to the nest; disturbing the nest; or any other activity that would damage or destroy the functions of the nest (Government of Canada 2019).

One pair of Barn Swallows was observed nesting on a building at the existing exploration camp in 2021 (main shop / garage), and nesting is likely to continue at this location as breeding is thought to be successful. Two individuals were also observed in 2018 (Northwinds 2021). Barn Swallow is not widely distributed and may only occur in other anthropogenic places, such as structures in Slate Falls Nation.

6.16.2.4 Lesser Yellowlegs

Lesser Yellowlegs was listed as Threatened under the ESA in January 2023. COSEWIC assessed this species as Threatened in 2020, but the addition to Schedule 1 of the SARA is pending. Lesser Yellowlegs is listed under Article I of the MBCA.

Although Lesser Yellowlegs breed primarily within the Taiga Shield and Hudson Plains BCR (BCR #7), there is evidence that Lesser Yellowlegs breed in the northern Boreal Softwood Shield (BCR#8) as well

(COSSARO 2021). Lesser Yellowlegs nest on dry ground near peatlands, marshes, ponds, and other wetlands. Adults may travel many kilometres from the nest to the wetlands where they forage so their home range may be as large as several dozen square kilometres (Government of Canada 2023). As shorebirds, Lesser Yellowlegs eat primarily invertebrates gleaned from water or land, especially snails and flies, beetles, and dragonflies of all life stages (Cornell Lab 2024). Lesser Yellowlegs habitat was mapped for the Project using updated Forest Resource Inventory (FRI) data, provided by MNR in 2023.

Individuals documented on ARUs in the baseline investigation area may be migrating to breeding grounds or breeding and nesting in the investigation area. The Recovery Strategy (Catling et al. 2024) currently considers breeding habitat for Lesser Yellowlegs to include the nesting and foraging areas utilized during the nesting season (late April to July). Based on the Birds Canada Nesting Calendar Query Tool, Lesser Yellowlegs in BCR #8, Lake St. Joseph Eco district, and Nesting Zone C5 are likely to nest between May 13 and July 13. The Ontario Breeding Bird Atlas Safe Dates / Breeding Dates for the Boreal Shield are between May 23 and July 14 (Birds Canada 2023).

Additionally, until key migratory stopover and staging area can be identified nationally, any location where Lesser Yellowlegs have been observed for a consecutive period of 15 days or more during the migratory period (mid-June to mid-September for southbound migration and mid-March to early May for northbound migration) should be considered a candidate key migratory stopover / staging area (Catling et al. 2024).

In 2021, ARU detections were low, largely due to the issues associated with fires and the COVID-19 pandemic. However, in 2022 Lesser Yellowlegs were recorded on numerous ARUs in the RSA, with most detections occurred during the nesting window (Figure 6.16-7). No ARUs had Lesser Yellow activity with a consecutive period of at least 15 days during the southbound migratory period; note that due to logistics and safety, ARUs were not deployed prior to early May. ARUs deployed to specifically target marsh habitat (breeding habitat for Lesser Yellowlegs) recorded from early May to mid-August. There is an overlap between the breeding window and the southbound migration window. Lesser Yellowlegs are considered breeding in the RSA. Lesser Yellowlegs habitat was mapped for the Project (Figure 6.16-6; Appendix P-3.16). Based on the HSI modelling, it was found that 936 ha of habitat exists in the PDA, 11,469 ha in the LSA, and 250,491 ha in the RSA.

6.16.2.5 Lesser Yellowlegs Recovery Strategy

Breeding habitat can include a mosaic of ecological communities but must occur near a wetland community and are primarily in boreal wetlands (Catling et al. 2024). The WSP habitat mapping considers breeding habitats. The Recovery Strategy for Lesser Yellowlegs (Catling et al. 2024) lists various direct impacts from mining, including changes and contamination of watercourses and wetlands, dust and emissions, and an increase in noise levels. However, Lesser Yellowlegs appear to be tolerant to some breeding habitat disturbances and therefore, the scope of the threat is small, and the severity is slight. The Recovery Strategy does note that large-scale mines may be a greater threat.

Lesser Yellowlegs are considered breeding in the RSA. Based on the above understanding, the assessment criteria are reviewed as follows:

- Change in relative abundance of habitat will assess the change in breeding habitat.
- Change in the function, connectivity and quality of habitat will assess the percent of habitat indirectly altered by air, noise, and groundwater drawdown impacts (land-use change).
- The change in risk of mortality will consider if vegetation removal occurs during sensitive times.

6.16.2.6 Short-eared Owl

Short-eared Owl in Ontario was uplisted to Threatened on the ESA in January 2023. COSEWIC assessed this species as Threatened in 2021, but it is currently listed as Special Concern on Schedule 1. While the MBCA protects a wide range of bird species in Canada, it does not include the Strigidae family (owls). However, the FWCA lists Short-eared Owl on Schedule 7 Specially Protected Raptors.

Within Ontario, the Short-eared Owl breeds primarily within northern Ontario in the Hudson Bay Lowlands and James Bay Ecoregions (COSSARO 2021b) and is considered uncommon in most of the remaining breeding range where the availability of nesting habitat is relatively limited, especially in the boreal forest (COSEWIC 2021). The lack of records from interior northern lowland areas is likely due to limited survey efforts rather than an absence of owls (Cadman and Page 1994). Short-eared Owl prefers large unfragmented open habitats (more than 50 continuous hectares; COSEWIC 2021), prey abundance is the primary factor influencing nesting habitat choice. They eat primarily small mammals, including voles, mice, ground squirrels, shrews, rats, bats, muskrats, and moles. They will also predate smaller birds and insects. Short-eared Owl nest scrapes are placed on the ground in dry open habitats beside vegetation sufficiently large to conceal the adult female while incubating and the nestlings after hatching (Cadman and Page 1994; COSEWIC 2021). Adults may travel many kilometres from the nest to the areas where they forage (Cadman and Page 1994).

Based on the Birds Canada Nesting Calendar Query Tool, Short-eared Owl in Lake St. Joseph Eco district, BCR #8, and Nesting Zone C5, have a greater than 80% likelihood of nesting between June 27 and July 17. The Ontario Breeding Bird Atlas Safe Dates / Breeding Dates for the Boreal Shield are April 30 to August 14 (Birds Canada 2023). Short-eared Owl habitat was mapped for the Project (Figure 6.16-8; Appendix P-3.17). Based on the HSI modelling, it was found that the PDA has approximately 23 ha of continuous habitat. The LSA has approximately 849 ha, and the RSA has approximately 25,000 ha.

Field surveys and analysis of SAR birds in ARU data revealed no short-eared owls. However, this species is cryptic and that a lack of detection does not necessarily indicate the absence of a breeding population in the area; therefore, MECP has requested the inclusion of this species.

6.16.2.7 Short-eared Owl Assessment Criteria

Short-eared Owl is an irregular breeder in the boreal forest nesting zone C5 (COSEWIC 2021), and potentially suitable habitat tends to be occupied only when there is a reliable source of small mammal prey (Cadman and Page 1994; COSEWIC 2021). Short-eared Owl is vulnerable to the cumulative effects of various threats in breeding and wintering areas, and likely also along migration routes. Natural system modifications (i.e., the change in land cover type) are considered the largest threat to the Short-eared Owl. The impact of mining is not known, but generally, direct displacement or avoidance due to exploration or production may occur (COSEWIC 2021).

Based on the above understanding, the assessment criteria are reviewed as follows:

- Habitat mapping in the RSA shows suitable breeding habitat is present. The change in relative abundance of habitat will assess the change in habitat mapping.
- Change in the function, connectivity and quality of habitat will assess the percent of habitat indirectly altered by air, noise, groundwater drawdown impacts (land-use change) and fragmentation.
- The change in risk of mortality will consider if vegetation removal occurs during sensitive times.

6.16.2.8 Traditional Knowledge

As part of the Project, all eight Indigenous communities were contacted to participate in the EA process, and to provide Traditional Knowledge and Traditional Land Use (TK/TLU) information. To date, six Indigenous communities, Cat Lake First Nation, Lac Seul First Nation, Mishkeegogamang Ojibway Nation, Slate Falls Nation, Wabauskang First Nation and the Northwestern Ontario Métis Community, have provided Traditional Knowledge and Traditional Land Use information. Specific TK/TLU information relevant to SAR birds was not identified.

6.16.3 Identification of Potential Effect Pathways

The initial step in the assessment process is to identify interactions between the Project and SAR birds that can result in pathways to potential effects. These potential effects may be direct, indirect, and/or positive, where applicable. Table 6.16-3 includes the potential interactions of the Project with SAR birds, prior to the application of the mitigation measures. The professional judgement of technical experts with experience in mine projects in Ontario and Canada, as well as input from Indigenous communities, government agencies and the public, informed the identification of those interactions that are likely to result in a pathway to a potential effect due to a measurable change on SAR birds. These pathways to potential effects are further described below for each phase of the Project, along with the rationale for those interactions excluded from further assessment. Section 6.16.4 and Table 6.16-4 provide a description of the mitigation measures applied to these pathways to potential effects during all phases of the Project. The residual effects, after the application of the mitigation measures, are then described and further evaluated in Section 6.16.6, using the criteria and indicators identified in Section 6.16.1.4.

Construction Phase

The construction phase of the Project is expected to occur over a three-year period and will include the preparation of the site and the construction of mine infrastructure. The following interactions with the Project result in pathways to potential effects on SAR birds are described below. After mitigation is applied to each pathway, as described in Table 6.16-3, the residual effects are assessed using the criteria identified:

- Site preparation activities for the mine site area, including clearing, grubbing, and bulk earthworks, interact with SAR birds.
    - These activities result in pathways to potential effects on SAR birds due to the following:
        - The removal of vegetation which may directly affect habitat for SAR birds;
        - The regrading and alterations in catchment areas may change the contribution of surface water and indirectly affect habitat for SAR birds;
        - The use of equipment may cause sensory disturbances and air emissions (including dust) which may indirectly affect habitat for SAR birds; and
        - The use of equipment may increase potential collisions with SAR birds and may change the risk of mortality.
    - The assessment of potential effects on SAR birds includes the change in habitat; the changes in the function, connectivity and quality of habitat; and the change in the risk of mortality from these pathways.

- The construction of the mine access road and airstrip, including the development and operation of potential aggregate resource areas, interacts with SAR birds. These activities result in pathways to potential effects on SAR birds due to the removal of vegetation, which may directly affect habitat for SAR birds, and the use of equipment may change sensory disturbances and air emissions, which may indirectly affect habitat for SAR birds, and may also increase potential collisions with SAR birds leading to changes in the risk of mortality. The assessment of potential effects on SAR birds includes the change in habitat; the changes in the function, connectivity and quality of habitat; and the change in the risk of mortality from these pathways.
- The construction of the transmission line interacts with SAR birds. This activity results in pathways to potential effects on SAR birds due to the removal of woody vegetation, which may directly affect habitat for SAR birds; the use of equipment may change sensory disturbances and air emissions which may indirectly affect habitat for SAR birds; and the use of equipment may increase potential collisions with SAR birds and may change the risk of mortality. The assessment of potential effects on SAR birds includes the change in habitat; the changes in the function, connectivity and quality of habitat; and the change in the risk of mortality from these pathways.
- The development of temporary construction camp and staging areas, the fish habitat development area, the onsite haul and access roads, the buildings and onsite infrastructure, the construction of the dikes, the construction of the starter embankments for the co-disposal facility (CDF), the development of the surficial soil stockpile and ore stockpiles interacts with SAR birds. These activities result in pathways to potential effects on SAR birds due to the use of equipment may change sensory disturbances and air emissions which may indirectly affect habitat for SAR birds; and the use of equipment may increase potential collisions with SAR birds and may change the risk of mortality. The assessment of potential effects on SAR birds includes the changes in the function, connectivity and quality of habitat as well as the change in the risk of mortality from these pathways.
- The development of the central water storage pond and other water management and treatment facilities interacts with SAR birds. These activities result in pathways to potential effects on SAR birds due to the change in catchment areas and surface water regime levels which may indirectly affect habitat for SAR birds; the use of equipment may change sensory disturbances and air emissions which may indirectly affect habitat for SAR birds; and may increase potential collisions with SAR birds leading to a change in the risk of mortality. The assessment of potential effects on SAR birds includes the changes in the function, connectivity and quality of habitat as well as the change in the risk of mortality from these pathways.
- The commissioning of the process plant, the stripping of lake bed sediments and overburden in the open pit and the initiation of pit development interact with SAR birds. These activities result in pathways to potential effects on SAR birds due to the change in sensory disturbances from the process plant and equipment, which may indirectly affect the habitat for SAR birds and may increase potential collisions with SAR birds, leading to a change in the risk of mortality. The assessment of potential effects on SAR birds includes the changes in the function, connectivity and quality of habitat, as well as the change in the risk of mortality from these pathways.

There is no plausible interaction between employment and expenditure activities and SAR birds during any Project phase.

Operation Phase

The operation phase is anticipated over a 10-year period, but the removal of habitat will occur during the construction phase. The following interactions with the Project result in pathways to potential effects on SAR birds as described below. After mitigation is applied to each pathway, as described in Table 6.16-3, the residual effects are assessed using the criteria identified:

- The operation of the open pit interacts with SAR birds. This activity results in a pathway to a potential effect on SAR birds due to a change in groundwater levels that could indirectly affect the habitat for SAR birds. The assessment of potential effects includes changes in the function, connectivity and quality of SAR bird habitat from this pathway.
- The operation of the process plant, open pit, CDF, and ore stockpiles interacts with SAR birds and results in a pathway to potential effects due to the indirect alteration from sensory disturbances. The assessment of potential effects on SAR birds includes the change in the function, connectivity, and quality of SAR bird habitat from this pathway.
- The operation and maintenance of the transmission line interacts with SAR birds, and results in a pathway to a potential effect due to vegetation management within the corridor to maintain operation. The assessment of potential effects on SAR birds includes the change in the habitat function, connectivity, and quality from this pathway.
- The operation of the mine, onsite haul roads and mine access road interacts with SAR birds and results in a pathway to a potential effect due to the indirect alteration from sensory disturbances and interactions with Project-related traffic. The assessment of potential effects on SAR birds includes the change in the function, connectivity and quality of SAR bird habitat and the change in the risk of mortality from this pathway.
- The operation of the accommodations complex interacts with SAR birds and results in a pathway to potential effects due to the potential for nuisance wildlife to be attracted to domestic waste. The assessment of potential effects on SAR birds includes the change in the risk of mortality from this pathway.
- The operation of the process plant, management and treatment facilities interacts with SAR birds and results in a pathway of potential effects due to the changes in hydrology that could indirectly affect the habitat for SAR birds. The assessment of potential effects on SAR birds included changes to the function, connectivity and quality of SAR bird habitat from this pathway; and
- The interaction between SAR birds and the operation of the overburden and ore stockpiles, overburden stockpile, and mine site infrastructure within the mine site area results in a pathway of potential effects due to the indirect alteration from sensory disturbances. The assessment of potential effects on SAR birds included changes in the function, connectivity, and quality of SAR bird habitat from this pathway.

Progressive reclamation activities during operation are unlikely to interact with SAR birds as these will be limited during this phase.

The interaction between SAR birds and potential spills are not a planned activity that would occur within the normal operating conditions. However, the risk of an unplanned spill is fully assessed in Section 9 and includes consideration of the design and operational safeguards to avoid a spill, an assessment of the

potential risks to the environment as a result of an unplanned spill, and the contingency and emergency measures that would be put into place in the event that a spill occurs.

Decommissioning and Closure Phase

Activities occurring during the active closure phase, which is expected to occur over a five-year period, are similar to those that occur during the construction phase and use similar mining equipment, but generally on a smaller scale. The following interactions with the Project result in pathways to potential effects on SAR birds, as described below. After mitigation is applied to each pathway, as described in Table 6.16-3, the residual effects are assessed using the criteria identified:

Final reclamation activities will include revegetating disturbed areas to provide stable slopes and reduce the potential for erosion and would support the re-establishment of vegetation communities in the PDA. The interaction between SAR birds and these activities results in a pathway to potential effects due to the sensory disturbance to SAR birds. The assessment of potential effects on SAR birds includes the changes in the function, connectivity and quality of SAR bird habitat from this pathway.

Dewatering of the open pit will have ceased during Year 10 of operation, and groundwater levels in the PDA will return to near baseline conditions once mining and ore processing activities cease and the open pit basin is filled. During decommissioning and closure, the removal of assets, demolition of remaining materials, disposal of demolition-related wastes off-site, and filling of the open pit basin are not anticipated to interact with SAR birds beyond the operation and sensory disturbance noted above. Beyond closure, the activities will be primarily monitoring, and there will be no discernible interaction with and are not expected to affect SAR birds. birds.

6.16.4 Mitigation Measures

Measures to be implemented to avoid or minimize the effects of the Project on SAR birds include the following:

- Develop of a compact mine site to limit the areal extent of disturbance.
- Co-locate the transmission line, airstrip and mine access road within a shared infrastructure corridor, where feasible.
- Follow appropriate timing windows for vegetation removals; in combination with timing windows for wildlife and wildlife habitat (6.12), Boreal Caribou (6.13), Wolverine (6.14), and bats (6.15), vegetation removals should only occur between September 15 to January 14.
- Avoid the removal of Category 1, 2 and 3 habitat for Eastern Whip-poor-will, unless authorized under an ESA or other appropriate approval.
- Avoid the removal of nests for Barn Swallow, Eastern Whip-poor-will or Lesser Yellowlegs, unless authorized under an ESA approval and/or a permit issued under the Migratory Bird Regulations.
- Comply with the requirements of the MBCA and Migratory Birds Regulations, if Barn Swallow, Eastern Whip-poor-will or Lesser Yellowlegs individuals are encountered during Project activities.
- Implementation of mitigation measures for potential effects on air quality relevant to SAR birds (Section 6.2.4) including:
    - During construction, operations and active closure, a dust management plan will be implemented to identify potential sources of fugitive dusts, outline mitigation measures that

will be employed to control dust generation and detail the inspection and record keeping required to demonstrate that fugitive dusts are being effectively managed;

- Dust emissions from roads and mineral stockpiles will be controlled through the application of water spray and supplemented by dust suppressants, if required;
- Site roads will be maintained in good condition, with regular inspections and timely maintenance completed to minimize the silt loading on the roads; and,
- Vehicle speeds will be limited.

- Implement the mitigation measures for potential effects on noise relevant to SAR birds (Section 6.3.4), including:
  - Building dimensions, layout and orientation will be designed to shield noise sources, where possible;
  - Acoustical enclosures will be used in the process plant to limit overall noise emissions from key noise sources, such as the ball mills;
  - Generator intakes and exhausts in the process plant will use silencers;
  - Motorized equipment will be selected or designed with mufflers / silencers to limit noise emissions during all phases of the Project;
  - Reversing alarms should be dimmable with white noise and/or strobe lights, but in accordance with the applicable health and safety regulations, during all phases of the Project;
  - The use of engine brakes will be prohibited;
  - Vehicles and equipment will be operated in such a way that impulsive noise is minimized, where possible, during all phases of the Project;
  - Regular inspections will take place to confirm that equipment and machinery used on site is operated in good working condition through regular maintenance; and,
  - For helicopter use during transmission line construction, minimum flight altitudes will be maintained unless the helicopters are engaged in construction tasks, landing or departure.
- During construction, operation and closure phases, implement mitigation measures for lighting to minimize sensory disturbance (Appendix J), including:
  - To prevent a direct line-of-sight from light, maintain light sources below natural barriers such as tree lines or artificial barriers such as berms; and,
  - Minimize light spill and glare using shielding on stationary light sources and direct lighting downwards where practicable.
- Implement the mitigation measures for potential effects on surface water relevant to SAR birds (Section 6.6.4, Section 6.7.4 and 6.8.4), including.
  - During construction, operation and active closure, an erosion and sediment control (ESC) plan will be implemented to manage runoff water in disturbed area;
  - During construction, operation and active closure, an integrated water management system will be designed to collect and control contact water;

- Water collection ditches will be constructed and operated around the perimeter of infrastructure, including the CDF and stockpiles to collect overland flow and seepage and direct it to the integrated water management system;
- Non-contact water will be diverted away from Project components using ditches, diversion berms and other suitable measures;
- Collected contact water that is not recycled in ore processing will be treated at the effluent treatment plant and discharged to the southeast arm of Springpole Lake in accordance with permitting requirements; and,
- Implement measures outlined in a spill prevention and contingency plan to be developed prior to construction.

- Implementation of mitigation measures for potential effects on vegetation communities and wetlands relevant to SAR birds (Section 6.11.4) including:
  - During construction and operation, minimize the clearing of vegetation within the mine access road and transmission line corridor to that needed for the construction and safe operation;
  - During construction and operation, minimize the removal of woody vegetation within the transmission line corridor to maintain natural cover to adjacent areas. The removal of woody vegetation will be limited to hazard trees and clearing to provide safe construction access and infrastructure needs;
  - During construction, operation and active closure phases, implement mitigation measures for wetlands; and,
  - During operations and closure phases, undertake progressive and final rehabilitation of mine development in accordance with the filed Closure Plan, and implement a revegetation plan that preferentially uses local vegetation sources, incorporates plant species of interest to Indigenous communities, and wildlife habitat features.
- Implementation of mitigation measures for potential effects on wildlife and wildlife habitat relevant to SAR birds (Section 6.12.4) including:
  - During construction, operation and closure phases of the Project, domestic solid waste products and similar materials will be properly secured, stored and disposed of at an offsite licensed facility, particularly anything that is an attractant for scavenging wildlife. Domestic solid waste products will be transported to a landfill off site, mitigating the habitat sink effect of increased predator densities that can be created due to access to landfill sites;
  - Discouraging wildlife from inhabiting contact water ponds (including the CDF and CWSP ponds);
  - During construction of the Project, minimize the disturbance by using existing trails and roads for travel, where practical;
  - Maintain existing hydroperiod conditions, outside the zone of influence for dewatering, by directing water from dewatering activities away from terrestrial habitats, where possible;

- During the operation phase of the mine access road, enforce reduced speed limits along Project-controlled roads within high-quality wildlife habitats, particularly along segments with known or recurrent wildlife crossings;
- During the operation phase of the mine access road, Project-related vehicles travelling on the mine access road must come to a stop if wildlife is encountered and provide them with the right-of-way to cross the road;
- During the operation phase of the transmission line, minimize vegetation management to that necessary for safe operation;
- During construction, operation and closure phases, wildlife (including SAR) awareness training will be provided to Project employees; and,
- During construction, operation and closure phases, log (and report as needed) observed wildlife, sign / tracks and wildlife–vehicle collisions and alter mitigation measures as appropriate.

The application of mitigation measures to specific pathways and phases is illustrated in Table 6.16-4. Mitigation measures described in this section are expected to be effective for their intended purposes, given their effective implementation at similar projects.

Monitoring programs will be implemented to verify the accuracy of the predicted effects, assess the effectiveness of the implemented mitigation measures and may be further optimized in response to monitoring data. Monitoring programs are in place for the Project with several years of data collection completed. An overview of monitoring for the Project going forward is further described in Section 12 and will be refined during the permitting phase to incorporate conditions of approvals and permits. Consultation on the monitoring programs is expected to continue through all phases of the Project.

6.16.5 Analytical Methodology

To quantify the direct effects of removing habitat from the PDA, it was conservatively assumed that all habitat (terrestrial and wetland vegetation communities) would be removed. Habitat suitability mapping was overlaid with the PDA in GIS tools, and the removal areas were calculated.

Areas adjacent to the PDA within the LSA may experience indirect effects, such as edge effects, changes in light and changes in environmental conditions due to dust, noise, and groundwater from water management activities. Artificial lighting will be required during the construction, operation, and closure phases of the Project, and an assessment of the effect of light from the Project was conducted (Appendix J). Changes in air quality parameters such as dust were modelled for the Project as described in Section 6.2 and uses the scenario with a silt content of 5.8% and control efficiency of 85%, as a conservative approach. Potential changes in air quality above background levels around the mine site area are considered in the quantification of indirect effects, but not along the mine access road or transmission line, as there are short term, localized effects (Figure 6.16-11). Changes in the acoustic environment during the operation of the mine site areas (Year 4) were modelled, as described in Section 6.3, and the indirect effects on habitat were quantified for noise levels above 40 A-weighted decibels (dBA; Figure 6.16-12). The rationale for this threshold is described in Section 6.12.5. The controlled dewatering and water management within the open pit basin will result in a change in groundwater levels (drawdown cone) that emanates radially from the open pit toward the nearest boundary conditions (i.e., Springpole Lake and Birch Lake), as shown in Figure 6.16-10. The 2 m groundwater drawdown contour indicates an inferred zone of influence for the open pit and is quantified as an indirect effect on habitat during operation. The indirect effects (including

dust, noise and groundwater) are quantified by overlaying the predicted changes in the environmental conditions on ecosite and HSI mapping within the LSA and the removal areas were calculated. To understand potential indirect effects (e.g., sensory disturbance, groundwater drawdown), the overlays do not factor in the removal of the PDA (i.e., the area directly impacted by the PDA is not subtracted from the indirect impact calculations).

The potential change in the risk of mortality to species was undertaken in a qualitative manner, considering experience with other mine operations, literature, and Project-specific.

6.16.5.1 Assumptions and the Use of the Conservative Approach

For the purposes of this effects assessment, the following assumptions have been made:

- The PDA contains buffers to allow for flexibility for design optimizations during Project permitting. The buffer includes approximately 250 m around the mine site area, a 40 m wide corridor for the transmission line, and the 30 m wide corridor for the mine access road. Where the mine access road and transmission line are aligned together, the buffer is included within a 60 m wide corridor.
- The 2021 Forest Resource Inventory (FRI) ecosite mapping was used for the purposes of this effects assessment to support the analyses presented in this assessment. It has been conservatively assumed that all vegetation communities supporting SAR bird habitats within the PDA will be removed, and therefore overestimates the amount of habitat removed and fragmented as a result of the PDA. However, in reality, vegetation communities will be maintained in specific areas to provide a buffer along waterbodies and mine site infrastructure, where necessary.
- As noted, it is conservatively assumed that all vegetation communities / habitats in the PDA will be removed. However, to understand potential indirect effects (e.g., sensory disturbance, groundwater drawdown), the overlays do not factor in the removal of the PDA (i.e., the area directly impacted by the PDA is not subtracted from the indirect impact calculations). This assumption further applies a conservative approach.
- Progressive rehabilitation will occur at select locations during construction and operation when disturbance activities have been completed. Nevertheless, to be conservative, the assessment of the effects assumes that final rehabilitation activities will be completed during the active closure phase.
- The noise threshold to evaluate the effects of sensory disturbance is assumed to be greatest within the 40 dBA contour around the mine site area, as modelling in the noise modelling report (Appendix H-3). Literature indicates that wildlife responses begin at noise levels of approximately 40 dBA, with documented impacts occurring below 50 dBA (Shannon et al. 2016). As a result, a 40 dBA continuous noise threshold, which corresponds to the noise of a suburban area at night, is used as a disturbance benchmark.
- The assessment of mortality risk focuses on the construction and operation phases, as a conservative scenario. The risk of mortality would be expected to be less during the decommissioning and closure phase once the footprint has been restored. It is assumed that the implementation of sensitive timing windows would effectively reduce the risk of mortality during the removal of vegetation.

As a result, these assumptions provide a conservative approach to the effects assessment, and the predicted effects on SAR bird habitat are likely to be overestimated.

Lastly, in the absence of habitat thresholds, a conservative approach was used to evaluate the residual effects' size or degree relative to baseline conditions (i.e., magnitude). It was considered that Project-related changes (i.e., the residual effect) have a moderate potential to adversely affect bat habitat if a change of greater than 1% was found in the RSA. This approach is supported by ECCC's Annex on Baseline Guidance (dated August 13, 2021), which states, "If displacement of nesting birds will occur, baseline data should provide evidence that there is enough equivalent habitat for birds to be displaced to, and that the vegetation being removed is not unique to the project footprint." If a change greater than 5% was found in the RSA, it was considered to have a high potential to adversely affect SAR bird habitat.

6.16.6 Characterization of Potential Residual Effects

The assessment and characterization of potential residual effects on SAR birds focused on direct habitat losses, indirect habitat alterations, and the risk of mortality during the Project. The residual effects of the Project on SAR birds and their habitats after the application of mitigation were assessed as discussed in the subsections below.

6.16.6.1 Change in Relative Abundance of Habitat

This criterion aims to analyze the direct effects of the Project on SAR bird habitat and determine whether there is enough equivalent habitat for individuals to be displaced to and whether the habitat being removed is unique to the Project footprint. The loss of habitat (a change to the relative abundance of habitat) will be greatest in the PDA during construction. The PDA has an area of 2,026.3 ha—mine site area, 1,527.9 ha; mine access road, 183.7 ha; transmission line, 314.7 ha. The conservative approach assumes that all terrestrial and wetland vegetation communities, and therefore habitats, in the PDA will be removed during construction.

Table 6.16-5 summarizes the change in the relative abundance of habitat for Eastern Whip-poor-will, Lesser Yellowlegs, and Short-eared Owl with respect to the baseline state habitat mapping (Figure 6.16-2, Figure 6.16-6, Figure 6.16-8) and the change due to the removal of the PDA (as direct disturbance) for the LSA and RSA scales.

Eastern Whip-poor-will: Following the Recovery Strategy, an assessment of the forest cover was completed using the results from change in vegetation communities in Section 6.11. It was found that removing all forest cover in the PDA (coniferous treed, deciduous treed, coniferous swamp and deciduous swamp) resulted in an 11.04% loss in the RSA. Forest cover in the RSA was determined to be 87% (Section 6.11). After the removal of 11.04%, it equals 75.96%, indicating that the forest cover will not be reduced to less than 25% in the RSA. Therefore, according to the Recovery Strategy, the effects of habitat disturbance are less likely to impact Eastern Whip-poor-will (MECP 2019).

Potentially suitable breeding habitat was mapped (Section 6.16.2.1; Figure 6.16-2; Appendix P-3.15), and the PDA has 103 ha (less than 6% of the PDA is suitable habitat), the LSA has 3,031 ha (approximately 13% of the LSA is suitable habitat), and RSA has 78,318 ha (approximately 15% of the RSA is suitable habitat). To assess the change in the relative abundance of habitat, the removal of mapped habitat in the PDA represents a loss of 103 ha. This is a 3.40% loss from the LSA, and from the RSA, it is a 0.13% loss (Table 6.16-5). If Category 1, 2, or 3 habitat is confirmed during the construction of the PDA, timing windows would be implemented during vegetation clearing to minimize effects on nesting and foraging habitats for this species.

The transmission line will also pass through a tract of land potentially used by Eastern Whip-poor-will. During operations, displaced Eastern Whip-poor-will may forage in areas farther away from the mine site portion of the PDA, including the new transmission line corridors. Progressive rehabilitation measures carried out during operations and final reclamation will promote the re-establishment of vegetation for habitat.

The assessment criteria for Eastern Whip-poor-will habitat considers the needs described in the recovery strategy (MECP 2019) and estimates the habitat availability for this species before and after the construction impacts. The removal of vegetation is conservatively overestimated, direct and localized to the PDA, and occurs in a landscape with high forest cover. Although there will be a loss of 103 ha of habitat during construction, this makes up less than a 1% of the breeding habitat in the RSA, meaning that enough suitable habitat to support Eastern Whip-poor-will exists elsewhere.

Barn Swallow is excluded from the specific analysis in Table 6.16-5 and Table 6.16-6 as only Barn Swallow nests are considered in Section 6.16. During construction, the removal of the main shop / garage will remove the Barn Swallow nest. Barn Swallow nests are commonly situated on buildings, and it is likely that Barn Swallow will be able to create new nests, resulting in no residual effect on a change in the relative abundance of habitat for Barn Swallow.

Lesser Yellowlegs: During construction, vegetation clearing will remove terrestrial communities within the PDA, representing an 8.16% loss of potentially suitable nesting and foraging habitat for Lesser Yellowlegs in the LSA and a 0.37% loss in the RSA (Table 6.16-5).

During construction of the PDA, vegetation clearing may remove nesting and foraging habitats for this species. The direct effects of habitat loss on Lesser Yellowlegs' habitat are direct and localized to the PDA, with suitable habitats common throughout the LSA and RSA. The assessment criteria for Lesser Yellowlegs habitat considers the needs described in the recovery strategy (Catling et al. 2024) and estimates the habitat availability for this species before and after the construction impacts. While the conservative approach likely overestimates the loss of 936 ha of habitat for Lesser Yellowlegs during construction, site conditions within the PDA will be permanently altered. Vegetation communities are not likely to return to the existing conditions, but this is not expected to limit the ability of this species to move through the landscape. Lesser Yellowlegs appear to tolerate some breeding habitat disturbances (Catling et al. 2024).

Short-eared Owls: Potentially suitable breeding habitat was mapped (Section 6.16.2.4; Appendix P-3.17), and the PDA has 22.81 ha (1.32% of the PDA is habitat), the LSA has 848.90 ha (3.65% of the LSA is habitat), and RSA has 24,477.21 ha (4.71% of the RSA is habitat). To assess the change in the relative abundance of habitat, the removal of mapped habitat in the PDA represents a loss of 22.81 ha. This is a 2.69% loss from the LSA, and from the RSA, it is a 0.09% loss (Table 6.16-5). Given that the PDA contains continuous habitat tracts equal to or exceeding 50 ha, the removal of vegetation during the construction phase will result in the loss of 23 ha of habitat for this species' nesting and foraging habitats.

6.16.6.2 Change in the Function, Connectivity and Quality of Habitat

Indirect changes in the function, connectivity, and quality of habitat will occur during the construction, operation and closure phases; however, the most pronounced effects will occur during the operations phase. These indirect changes in habitat at the LSA scale will result from activity within the PDA due to light, dust deposition, noise, and alteration in the water regime. Groundwater drawdown was assessed using quantitative predictive modelling during operations, and changes in groundwater flow are expected to return to near-baseline conditions in the closure phase. With the implementation of mitigation measures for groundwater (Section 6.5.4), no residual effects on SAR birds or their habitats are expected to occur in

construction or closure. Further, there will be negligible flow reductions predicted due to changes in groundwater within and outside the PDA during operations and no effects on SAR birds and their habitats are expected from this pathway.

The majority of the affected habitat will already be directly lost due to vegetation removal from the development of the mine site area, but keeping with the conservative assumption, the indirect effects are assessed irrespective of the direct changes.

Lesser Yellowlegs depend on wetland habitats for much of their breeding and foraging activities. Due to alterations in the groundwater and surface water regime during operation, the suitability and availability of habitats for Lesser Yellowlegs may be reduced within the groundwater ZOI. These changes could lead to a transformation of the habitat, making it less conducive for the species, and potentially prompting Lesser Yellowlegs to seek alternative locations. The groundwater drawdown (Figure 6.16-10) is primarily restricted to the PDA, and wholly contained within the LSA. The groundwater drawdown is estimated to effect approximately 1% of wetlands in the LSA (Section 6.11). The groundwater drawdown is included in the calculation of indirect habitat changes (Table 6.16-6).

Operations have the potential to deposit dust, which may negatively impact nesting habitat; however, the implementation of a dust management plan will mitigate this effect, as described in Section 6.16.4. The air quality isopleth for a particulate matter less than 10 microns (PM_{10}) was used to calculate the zone of influence (ZOI) for indirect air effects on SAR bird habitat. The air quality isopleth for the modelling of dust used a highly conservatively scenario that assumed a higher than expected silt content (5.8%) and lower than expected control efficiency (85%). The ZOI encompasses the PDA, where the direct loss of habitat has already occurred. Surrounding the mine site area, it extends out to the LSA, which has limited high-value terrestrial habitat suitable for SAR birds (the majority of the area is open water). As a result, there will be minor temporary exceedances outside the PDA in the LSA (Figure 6.16-11; Table 6.16-6).

Mine construction and operations are anticipated to occur during night and day, and additional artificial lighting will be required. Eastern Whip-poor-will hunt by use of eyesight, bright lighting may cause them to avoid habitat adjacent to the mine site. An assessment of the effect of light from the Project was conducted (Appendix J) and measures to mitigate potential effects are identified in Table 6.16-4. However, with the implementation of mitigation for lighting through all phases, the potential effect will be mitigated and not extend beyond the PDA (Appendix J). During closure, light disturbances that indirectly change habitat will be discontinued. Therefore, the potential effect of lighting on SAR birds, including Eastern Whip-poor-will will be minimized within the PDA in all Project phases.

Eastern Whip-poor-will depend on auditory cues for much of their interactions at night. During construction and operations, Eastern Whip-poor-will may avoid the mine site and surrounding lands to seek quieter habitats. Owls, in general, have acute hearing which they use to hunt small mammals and birds (Kauffman 1996). Short-eared Owls reportedly find prey mostly by sound but also by sight (Kauffman 1996). Therefore, it can be inferred that excessive noise could potentially interfere with their hunting and communication. Sensory disturbance may impair habitat function, by impacting behaviour and reproductive success. Prey species have evolved anti-predator responses to threatening stimuli, such as loud noises and rapidly approaching objects, and therefore perceive human-caused noise and movement as a form of predation risk (Frid and Dill 2002); intermittent and unpredictable noise is often perceived as a threat (Francis and Barber 2013). In contrast, chronic and frequent noise interferes with animals' abilities to detect important sounds. Acoustical masking from increased noise can interfere with bird communication, particularly at lower frequencies and during the breeding period, which can reduce habitat function and result in locally

reduced species richness, diversity and/or abundance (Rheindt 2003; Wood and Yezerinac 2006). As a result, bird species richness is expected to decrease when ambient noise increases above baseline (Stone 2000). Bird assemblages would be most sensitive during the breeding and nesting period, although they can increase the amplitude of vocalizations in response to increased ambient noise levels. Regardless, sensory disturbances can result in the disturbance of nesting birds and reduce the ecological function of the nesting habitat, thereby affecting breeding success.

The sound threshold for interference with sensitive bird species is 50 to 60 dBA as one-hour averages (Dooling and Popper 2007). Baseline noise levels were assessed to be between 30 and 48 dBA during the leaves-on period (June 2021) and between 20 and 36 dBA during the leaves-off period (April 2021). The federal acoustical guideline limits for ambient noise generated by mining operations with respect to the effects of noise on wildlife is less than 45 dBA during nighttime and 55 dBA during daytime. Changes in sound levels during the Year 4 operation phase of the Project were modelled using the 40 dBA threshold to determine the extent of potential effects on SAR birds.

Beyond species responses from the direct and indirect changes (function and quality of habitat), landscape fragmentation (function of connectivity) can reduce the probability that some wildlife species can persist on a landscape. With the development of non-vegetated areas adjacent to some habitat, it is predicted that fragmentation will occur along the edges of the PDA, including the mine site, the access road and the transmission line where it does not follow an existing route. This will result in changes in the microclimate that create conditions for the regrowth of early successional species and other species adapted to disturbance conditions (including invasive and non-native species).

The above indirect changes in habitat may result in avoidance / displacement behaviours, altered movement / barrier effects, altered predation risk, altered habitat suitability, and/or altered community dynamics.

Eastern Whip-poor-will: Modelled air quality effects during operations impacted 16.75 ha of Eastern Whip-poor-will habitat, a 0.55% decrease of habitat in the LSA and a 0.02% change in the RSA (Table 6.16-6). Similarly, modelled groundwater drawdown effects during operations impacted 5.61 ha of Eastern Whip-poor-will habitat, a 0.19% decrease in the LSA and a 0.01% decrease in the RSA (Table 6.16-6). The indirect effects of air quality and pit dewatering are located in the central part of the mine site and are not expected to impact Eastern Whip-poor-will. Modelled noise levels are centralized on the location of the mine site area and mine access road. Noise indirectly affects 29.02 ha of Eastern Whip-poor-will habitat, a 0.96% decrease in the LSA, and a 0.04% decrease in the RSA (Table 6.16-6). As the area indirectly altered by air, groundwater drawdown, and noise levels do not reduce forest cover to less than 25% in the RSA, the biophysical attributes are still available in sufficient amounts.

While there may be some temporary changes in bird behaviour in the PDA or LSA, these effects are not expected to have long-term impacts on the populations of Eastern Whip-poor-will. The area directly altered and indirectly altered by air, groundwater drawdown, and noise levels overlaps. The indirect changes are a low-magnitude effect.

Barn Swallow is an urban-adapted species and has been found nesting at other active mine sites in Ontario. No residual effect on a change in the function, connectivity and quality of habitat is anticipated for Barn Swallow.

Lesser Yellowlegs: Modelled air quality effects during operations impacted 952.45 ha of Lesser Yellowlegs habitat, an 8.30% change in the LSA and a 0.38% decrease in the RSA (Table 6.16-6). Modelled groundwater dewatering effects during operations impacted 340.68 ha of Lesser Yellowlegs habitat, a 2.97% change in

the LSA and a 0.14% decrease in the RSA (Table 6.16-6). Noise indirectly effects 1,297.97 ha of Lesser Yellowlegs habitat, an 11.32% change in the LSA and a 0.52% decrease in the RSA (Table 6.16-6). While there may be some temporary changes in bird behaviour in the PDA or LSA, these effects are not expected to have long-term impacts on the populations of Lesser Yellowlegs. The area directly altered and indirectly altered by air, groundwater drawdown, and noise levels overlaps. The indirect changes are a low-magnitude effect.

Short-eared Owls: Modelled air quality and groundwater drawdown effects during operations had no impact on Short-eared Owl habitat. The indirect effects of air quality and pit dewatering are localized to the mine site area, and no Short-eared Owl habitat occurs in the mine site area. Modelled noise levels are centralized on the location of the mine site and mine access road, where habitat is limited for the species. Overall, noise indirectly effects 55.62 ha of habitat, reducing habitat in the LSA by 6.55% and by 0.23% of the RSA (Table 6.16-6). The area directly altered and indirectly altered by air, groundwater drawdown, and noise levels overlaps. One note, given that this species is sensitive to fragmentation, and the PDA contains continuous habitat tracts equal to or exceeding 50 ha, the transmission line may fragment potential habitat. The indirect changes are a low-magnitude effect.

6.16.6.3 Change in the Risk of Mortality

Ground disturbance and vegetation clearing can result in physical disturbance of key habitat features (e.g., nests) and vehicle and equipment movement can result in accidental mortality (i.e., wildlife-vehicle collisions), which is elevated during sensitive timing windows. There are legislative requirements to warrant following appropriate timing windows and best management practices for vegetation clearing within the to reduce incidental removals to avoid the destruction of nests and individuals. If construction of the PDA cannot occur outside sensitive windows, mortality is possible. Mortality outside of the PDA is not expected to occur (i.e., vegetation removals are direct and localized to the PDA). As the construction activities, which include vegetation clearing, may occur during a sensitive period, a residual effect is carried forward. There is no risk of mortality and, therefore no residual effect regarding Barn Swallow nests, if in compliance with SARA.

During construction and operations and, to a lesser extent, closure, collisions of birds with vehicles and anthropogenic structures represent a risk of human-caused mortality for birds. Eastern Whip-poor-will are known to roost on gravel roads within their preferred habitat. Foraging individuals or displaying males may also collide with vehicles. Aerial foraging and road-roosting behaviour make this species susceptible to collision risk. However, with the implementation and enforcement of speed limits on Project-related roads and wildlife awareness training for Project employees, the risk of mortality for SAR birds can be minimized.

6.16.7 Significance of Residual Effects

The ecological and/or social context of SAR birds is considered moderate (Level I) as the VC is capable of supporting the predicted change with typical mitigation measures.

6.16.7.1 Change in Relative Abundance of Habitat

With the implementation of mitigation measure for direct changes to habitat, including maintaining a compact site, and rehabilitation of the PDA at closure, there will be less than a 1% direct loss of breeding habitat for Eastern Whip-poor-will, Lesser Yellowlegs and Short-eared Owl in the RSA. As a result, the magnitude of the residual effect will be low (Level I), as there is low potential to adversely affect SAR birds and there is sufficient habitat maintained elsewhere in the RSA. Further, Eastern Whip-poor-will habitat and forest cover in the RSA is not predicted to fall below 25% due to the Project (as required by the Recovery

Strategy [MECP 2019]). The geographic extent of the residual effect is confined to the PDA (Level I), however, the duration is high (Level III) because occurs from construction until the implemented rehabilitation measures have stabilized during the post-closure phase. The frequency of the residual effect is low (Level I) as it occurs once during the construction phase, and is predicted to be partially reversible (Level II) at the end of closure when some areas of the PDA will not be fully revegetated. The timing of the residual effect will be mitigated avoiding vegetation clearing during sensitive timing windows and is therefore low (Level I). As a result, the adverse residual effect on SAR birds due to a direct change in SAR bird habitat is predicted to be not significant.

6.16.7.2 Change in the Function, Connectivity, and Quality of Habitat

With the implementation of mitigation measure for air, noise, and groundwater, the residual effect is predicted to be a less than 1% change in habitat. As a result, the magnitude of the residual is low (Level I) as there is a low potential to adversely affect SAR birds and the habitat functions are likely maintained elsewhere in the RSA. Further, the indirect effects will not result in Eastern Whip-poor-will habitat and forest cover in the RSA falling below 25% (as required by the Recovery Strategy [MECP 2019]). The geographic extent of the residual effect is low (Level I) as it is constrained within the LSA, and is expected to be fully reversible (Level I) as Project activities cease after closure. The duration of the residual effect is considered moderate (Level II), as the effects will occur during the Project's construction and operation phases which is less than 20 years. However, the residual effects are predicted to occur intermittently throughout construction and operations (Level II) and will occur occasionally during sensitive timing windows (Level II). As a result, the adverse residual effect on SAR birds due to a change in the function, connectivity and quality of SAR bird habitat is predicted to be not significant.

6.16.7.3 Change in the Risk of Mortality

With the implementation of mitigation measure for SAR birds, including the avoidance of clearing activities during sensitive periods, and enforcing speed limits, the magnitude of the residual effect on SAR birds due to a change in mortality is low (Level I). The geographic extent of the residual effects will be confined to the PDA (Level I). The duration of the residual effects on SAR birds is moderate (Level II), as the effects will occur during the construction and operations phases of the Project, which is less than 20 years. The residual effects are predicted to occur infrequently during construction and operations (Level I). The effects will be fully reversible as Project activities cease after closure (Level I). The timing of the residual effect is considered to be moderate (Level II), as the highest risk for mortality (vegetation removal) will occur outside sensitive timing windows, but activities during the operations phase of the Project will coincide with sensitive periods for SAR birds. As a result, the adverse residual effect on SAR birds due to a change in the risk of mortality is predicted to be not significant.

6.16.8 Confidence Prediction

The confidence level in the prediction is considered moderate-high based on the quality and quantity of baseline information, updated FRI data, and industry-standard assessment techniques. The updated FRI data were used to undertake habitat mapping and GIS analysis. The assessment of changes in the function, connectivity, and quality of SAR bird habitat relied on the results of predictive modelling undertaken for groundwater, noise, air, and lighting. The predicted effects are based on recovery strategies and conservative assumptions. Potential environmental effects and associated mitigation measures are industry standards and are informed by species-specific information where available.

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Table 6.16-1: SAR bird Species at Risk Birds Criteria, Indicators, and Rationale

Criteria	Indicators	Rationale
Change in relative abundance of habitat	Area and relative abundance of breeding habitat, in ha For Eastern Whip-poor-will, Iif forest cover will be reduced to less than 25% in the RSA	The direct loss of habitat due to the Project is based on the change in the area and relative abundance of habitat, which provides a measure of the availability of resources (e.g., food, shelter).
Change in the function, connectivity, and quality of habitat	Area indirectly altered, in ha For Eastern Whip-poor-will, Iif forest cover will be reduced to less than 25% in the RSA	The indirect effect of a Project on habitat due to edge effects and sensory disturbance is based on changes in the function, connectivity, and quality of habitat that can affect species movement and dispersal, access to resources, and survival. Landscape fragmentation (function of connectivity) can reduce the probability that some wildlife species can persist on a landscape.
Change in the risk of mortality	Qualitative risk of mortality Vegetation removal outside of sensitive timing windows	The change in the risk of increased mortality could occur due to vegetation clearing that results in physical disturbance of key habitat features (e.g., nests), and vehicle and equipment movement that results in accidental mortality (i.e., wildlife-vehicle collisions), and the implementation of Project components that result in increased predation.

Table 6.16-2: Significance Determination Attributes and Rankings for SAR bird

Attribute	Description	Category
Magnitude	A qualitative or quantitative measure to describe the size or degree of the residual effects relative to baseline conditions	**Level I:** The Project-related residual effect has a low potential to adversely affect SAR birds and/or the habitat required for SAR birds to carry out the life processes necessary to survive and reproduce. Habitat functions are likely maintained elsewhere in the RSA. Project-related changes in habitat are less than 1% of the RSA. **Level II:** The Project-related residual effect has a moderate potential to adversely affect SAR birds and/or the habitat required for SAR birds to carry out the life processes necessary to survive and reproduce (e.g., some temporary changes in behaviour but not expected to have long-term impacts on the population or change the status of local populations or the availability of unique habitats). SAR birds habitat functions are likely maintained elsewhere in the RSA. Project-related changes in habitat are between 1% and 5% of the RSA. **Level III:** The Project-related residual effect has a high potential to adversely affect SAR birds and/or the habitat required for SAR birds to carry out the life processes necessary to survive and reproduce. Habitat functions are not maintained elsewhere in the RSA. Project-related changes in habitat are greater than 5% of the RSA.
Geographic extent	The spatial extent over which the residual effect will take place	**Level I:** Effect is restricted to the LSA. **Level II:** Effect extends beyond the LSA. **Level III:** Effect extends beyond the RSA.
Duration	The time period over which the residual effect will or is expected to occur	**Level I:** Effect occurs over the short term: less than or equal to 3 years. **Level II:** Effect occurs over the medium term: more than 3 years but less than 20 years. **Level III:** Effect occurs over the long term: greater than 20 years.
Frequency	The rate of occurrence of the residual effect	**Level I:** Effect occurs once, infrequently or not at all. **Level II:** Effect occurs intermittently or with a certain degree of regularity. **Level III:** Effect occurs frequently or continuously.
Reversibility	The extent to which the residual effect can be reversed	**Level I:** Effect is fully reversible. **Level II:** Effect is partially reversible or potentially reversible with difficulty. **Level III:** Effect is not reversible.
Timing	A measure of whether the residual effect occurs during a sensitive period of the year	**Level I:** Effects do not occur during a sensitive period, or related effects are fully mitigated. **Level II:** Effects occur during a sensitive period, and related effects are partially mitigated. **Level III:** Effects occur during a sensitive period, or related effects cannot be fully mitigated.

Table 6.16-3: Potential Interactions of Project Components on SAR Birds

Project Component / Activity	SAR Birds
Construction Phase	
Site preparation activities in the mine site area, including clearing, grubbing and bulk earthworks	Yes
Construction of the mine site access road and airstrip, including the development and operation of aggregate resource areas	Yes
Development of temporary construction camp and staging areas (primarily on site, but potentially off site)	Yes
Construction of the fish habitat development area	Yes
Construction of the transmission line to the Project site	Yes
Construction of the onsite haul and access roads	Yes
Construction of dikes in north basin of Springpole Lake	Yes
Construction of buildings and onsite infrastructure	Yes
Construction of the central water storage pond	Yes
Controlled dewatering of the open pit basin	Yes
Construction of the starter embankments for the CDF	Yes
Stripping of lake bed sediment and overburden at the open pit	Yes
Development of the surficial soil stockpile	Yes
Initiation of pit development in rock	Yes
Initiation of stockpiling of ore	Yes
Establishment and operation of water management and treatment facilities	-
Commissioning of the process plant	Yes
Employment and Expenditures	-
Operations Phase	
Operation of the process plant	Yes
Operation of open pit mine	Yes
Management of overburden, mine rock, tailings and ore in designated facilities	Yes
Operation of water management and treatment facilities	Yes
Accommodations complex operations	Yes
Operation and maintenance of mine site infrastructure, including the fuel farm	Yes
Progressive reclamation activities	Yes
Employment and Expenditures	-
Decommissioning and Closure Phase	
Removal of assets that can be salvaged	-
Demolition and recycling and/or disposal of remaining materials	-
Removal and disposal of demolition-related wastes in approved facilities	-
Reclamation of impacted areas, such as by regrading, placement of cover, and revegetation	Yes
Filling the open pit with water	-
Monitoring and maintenance	-
Employment and expenditures	-

Note:
- = The interaction is not expected, and no further assessment is warranted.

Table 6.16-4: Proposed Mitigation Measures for Potential SAR Bird Effects

Pathways to potential effect	Phase			Proposed Mitigation Measure
	Con.	Op.	Cl.	
Change in habitat	•	•	–	Develop of a compact mine site to limit the areal extent of disturbance.
	•	–	–	Co-locate the transmission line, airstrip and mine access road within a shared infrastructure corridor, where feasible.
	•	•	–	Follow appropriate timing windows for vegetation removals; in combination with timing windows for wildlife and wildlife habitat (6.12), Boreal Caribou (6.13), Wolverine (6.14), and bats (6.15), vegetation removals should only occur between September 15 to January 14.
	•	•	–	Avoid the removal of Category 1, 2 and 3 habitat for Eastern Whip-poor-will, unless authorized under an ESA or other appropriate approval.
	•	•	–	Avoid the removal of nests for Barn Swallow, Eastern Whip-poor-will or Lesser Yellowlegs, unless authorized under an ESA approval and/or a permit issued under the Migratory Bird Regulations.
	•	•	•	Implementation of mitigation measures for potential effects on vegetation communities and wetlands relevant to SAR birds (Section 6.2.4) including: • During construction and operation, minimize the clearing of vegetation within the mine access road and transmission line corridor to that needed for the construction and safe operation; • During construction and operation, minimize the removal of woody vegetation within the transmission line corridor to maintain natural cover to adjacent areas. The removal of woody vegetation will be limited to hazard trees and clearing to provide safe construction access and infrastructure needs; and, • During operations and closure phases, undertake progressive and final rehabilitation of mine development in accordance with the filed Closure Plan, and implement a revegetation plan that preferentially uses local vegetation sources, incorporates plant species of interest to Indigenous communities, and wildlife habitat features.
	•	•	–	Implementation of mitigation measures for potential effects on wildlife and wildlife habitat relevant to SAR birds (Section 6.12.4) including: • During construction of the Project, minimize the disturbance by using existing trails and roads for travel, where practical; and, • During the operation phase of the transmission line, minimize vegetation management to that necessary for safe operation.
Change in function, connectivity and quality of habitat	•	•		Develop of a compact mine site to limit the areal extent of disturbance.
	•			Co-locate the transmission line, airstrip and mine access road within a shared infrastructure corridor, where feasible.

Table 6.16-4: Proposed Mitigation Measures for Potential SAR Bird Effects

Pathways to potential effect	Phase			Proposed Mitigation Measure
	Con.	Op.	Cl.	
	•	•		Follow appropriate timing windows for vegetation removals; in combination with timing windows for wildlife and wildlife habitat (6.12), Boreal Caribou (6.13), Wolverine (6.14), and bats (6.15), vegetation removals should only occur between September 15 to January 14.
	•	•		Avoid the removal of Category 1, 2 and 3 habitat for Eastern Whip-poor-will, unless authorized under an ESA or other appropriate approval.
	•	•		Avoid the removal of nests for Barn Swallow, Eastern Whip-poor-will or Lesser Yellowlegs, unless authorized under an ESA approval and/or a permit issued under the Migratory Bird Regulations.
	•	•	•	Implementation of mitigation measures for potential effects on air quality relevant to SAR birds (Section 6.2.4) including: • During construction, operations and active closure, a dust management plan will be implemented to identify potential sources of fugitive dusts, outline mitigation measures that will be employed to control dust generation and detail the inspection and record keeping required to demonstrate that fugitive dusts are being effectively managed; • Dust emissions from roads and mineral stockpiles will be controlled through the application of water spray and supplemented by dust suppressants, if required; • Site roads will be maintained in good condition, with regular inspections and timely maintenance completed to minimize the silt loading on the roads; and, • Vehicle speeds will be limited.
	•	•	•	Implement the mitigation measures for potential effects on noise relevant to SAR birds (Section 6.3.4), including: • Building dimensions, layout and orientation will be designed to shield noise sources, where possible; • Acoustical enclosures will be used in the process plant to limit overall noise emissions from key noise sources, such as the ball mills; • Generator intakes and exhausts in the process plant will use silencers; • Motorized equipment will be selected or designed with mufflers / silencers to limit noise emissions during all phases of the Project; • Reversing alarms should be dimmable with white noise and/or strobe lights, but in accordance with the applicable health and safety regulations, during all phases of the Project; • The use of engine brakes will be prohibited; • Vehicles and equipment will be operated in such a way that impulsive noise is minimized, where possible, during all phases of the Project;

Table 6.16-4: Proposed Mitigation Measures for Potential SAR Bird Effects

Pathways to potential effect	Phase			Proposed Mitigation Measure
	Con.	Op.	Cl.	
				• Regular inspections will take place to confirm that equipment and machinery used on site is operated in good working condition through regular maintenance; and, • For helicopter use during transmission line construction, minimum flight altitudes will be maintained unless the helicopters are engaged in construction tasks, landing or departure.
	•	•	•	During construction, operation and closure phases, implement mitigation measures for lighting to minimize sensory disturbance (Appendix J), including: • To prevent a direct line-of-sight from light, maintain light sources below natural barriers such as tree lines or artificial barriers such as berms; and, • Minimize light spill and glare using shielding on stationary light sources and direct lighting downwards where practicable.
	•	•	•	Implement the mitigation measures for potential effects on surface water relevant to SAR birds (Section 6.6.4, Section 6.7.4 and 6.8.4), including. • During construction, operation and active closure, an erosion and sediment control (ESC) plan will be implemented to manage runoff water in disturbed area; • During construction, operation and active closure, an integrated water management system will be designed to collect and control contact water; • Water collection ditches will be constructed and operated around the perimeter of infrastructure, including the CDF and stockpiles to collect overland flow and seepage and direct it to the integrated water management system; • Non-contact water will be diverted away from Project components using ditches, diversion berms and other suitable measures; • Collected contact water that is not recycled in ore processing will be treated at the effluent treatment plant and discharged to the southeast arm of Springpole Lake in accordance with permitting requirements; and, • Implement measures outlined in a spill prevention and contingency plan to be developed prior to construction.
	•	•	•	Implementation of mitigation measures for potential effects on vegetation communities relevant to SAR birds (Section 6.2.4) including: • During construction and operation, minimize the clearing of vegetation within the mine access road and transmission line corridor to that needed for the construction and safe operation; • During construction and operation, minimize the removal of woody vegetation within the transmission line corridor to maintain natural cover to adjacent areas. The removal of woody

Table 6.16-4: Proposed Mitigation Measures for Potential SAR Bird Effects

Pathways to potential effect	Phase			Proposed Mitigation Measure
	Con.	Op.	Cl.	
				vegetation will be limited to hazard trees and clearing to provide safe construction access and infrastructure needs; and, • During operations and closure phases, undertake progressive and final rehabilitation of mine development in accordance with the filed Closure Plan, and implement a revegetation plan that preferentially uses local vegetation sources, incorporates plant species of interest to Indigenous communities, and wildlife habitat features.
	•	•	–	Implementation of mitigation measures for potential effects on wildlife and wildlife habitat relevant to SAR birds (Section 6.12.4) including: • During construction of the Project, minimize the disturbance by using existing trails and roads for travel, where practical; • Maintain existing hydroperiod conditions, outside the zone of influence for dewatering, by directing water from dewatering activities away from terrestrial habitats, where possible; and, • During the operation phase of the transmission line, minimize vegetation management to that necessary for safe operation.
Change in the risk of mortality	•	•	–	Follow appropriate timing windows for vegetation removals; in combination with timing windows for wildlife and wildlife habitat (6.12), Boreal Caribou (6.13), Wolverine (6.14), and bats (6.15), vegetation removals should only occur between September 15 to January 14.
	•	•	–	Avoid the removal of Category 1, 2 and 3 habitat for Eastern Whip-poor-will, unless authorized under an ESA or other appropriate approval.
	•	•	–	Avoid the removal of nests for Barn Swallow, Eastern Whip-poor-will or Lesser Yellowlegs, unless authorized under an ESA approval and/or a permit issued under the Migratory Bird Regulations.
	•	•	–	Comply with the requirements of the MBCA and Migratory Birds Regulations, if Barn Swallow, Eastern Whip-poor-will or Lesser Yellowlegs individuals are encountered during Project activities.
	•	•	•	Implement the mitigation measures for potential effects on surface water relevant to SAR birds (Section 6.6.4, Section 6.7.4 and 6.8.4), including. • Implement measures outlined in a spill prevention and contingency plan to be developed prior to construction.
	•	•	•	Implementation of mitigation measures for potential effects on wildlife and wildlife habitat relevant to SAR birds (Section 6.12.4) including: • During construction, operation and closure phases of the Project, domestic solid waste products and similar materials will be properly secured, stored and disposed of at an offsite licensed facility, particularly anything that is an attractant for scavenging wildlife. Domestic solid waste products will

Table 6.16-4: Proposed Mitigation Measures for Potential SAR Bird Effects

Pathways to potential effect	Phase			Proposed Mitigation Measure
	Con.	Op.	Cl.	
				be transported to a landfill off site, mitigating the habitat sink effect of increased predator densities that can be created due to access to landfill sites; • Discouraging wildlife from inhabiting contact water ponds (including the CDF and CWSP ponds); • During the operation phase of the mine access road, enforce reduced speed limits along Project-controlled roads within high-quality wildlife habitats, particularly along segments with known or recurrent wildlife crossings; • During the operation phase of the mine access road, Project-related vehicles travelling on the mine access road must come to a stop if wildlife is encountered and provide them with the right-of-way to cross the road; • During construction, operation and closure phases, wildlife (including SAR) awareness training will be provided to Project employees; and, • During construction, operation and closure phases, log (and report as needed) observed wildlife, sign / tracks and wildlife–vehicle collisions and alter mitigation measures as appropriate.

Notes:
Con = construction; Op = operation; Cl = closure; ● = mitigation is applicable; – = mitigation is not applicable.

Table 6.16-5: Habitat Assessment for SAR Birds Relative to Baseline Conditions

VC	Proxy Species	Baseline Condition (area, in ha) [1]						Condition during Mine Operations (area, in ha) [2]				Change in Cover Type[3]	
		PDA	%	LSA	%	RSA	%	LSA	%	RSA	%	LSA	RSA
SAR birds	Eastern Whip-poor-will	103.00	5.94%	3,031.84	13.05%	78,318.04	15.08%	2,929	12.61%	78,215.03	15.06%	-3.40%	-0.13%
	Lesser Yellowlegs	935.61	53.97%	11,468.49	49.37%	250,490.78	48.22%	10,533	45.35%	249,555.18	48.04%	-8.16%	-0.37%
	Short-eared Owl	22.81	1.32%	848.90	3.65%	24,477.21	4.71%	826	3.56%	24,454.40	4.71%	-2.69%	-0.09%

Notes:
(1) Refers to the condition prior to mine development.
(2) Refers to the conditions after the mine has been developed for operations (i.e., the removal of the PDA footprint in GIS analysis).
(3) Change in Cover Type is calculated as = ((Condition during Mine Operations – Baseline Condition)/Baseline Condition).
(4) HSI modelling, and GIS analysis used FRI data attributes, as such percentages are calculated based on coverage area. Within the PDA's 2,026.33 ha, 1,733.56 ha are represented in FRI ecosites. The LSA and RSA, spanning 30,773.41 ha and 628,311.38 ha respectively, have 23,228.22 ha and 519,473.30 ha captured in FRI ecosites.

Table 6.16-6: Groundwater, Air Quality, and Noise Levels on Valued Component for SAR Birds

VC	Proxy Species	HSI (Area, in ha) [1]			Operational Impact (Area, in ha) Change in Cover Type[2,3]														
		PDA	LSA	RSA	Pit Dewatering Drawdown Area	LSA after Drawdown	RSA after Drawdown	LSA % Change	RSA % Change	Air Quality Effects	LSA after Air Effects	RSA after Air Effects	LSA % Change	RSA % Change	Noise Effects	LSA after Noise Effects	RSA After Noise Effects	LSA % Change	RSA % Change
SAR Birds	Eastern Whip-poor-will	103.00	3,031.84	78,318.036	5.61	3,026.23	78,312.42	-0.19%	-0.01%	16.75	3,015.09	78,301.29	-0.55%	-0.02%	29.02	3,002.82	78,289.02	-0.96%	-0.04%
	Lesser Yellowlegs	935.61	11,468	250,490.784	340.68	11,127.81	250,150.11	-2.97%	-0.14%	952.45	10,516.04	249,538.34	-8.30%	-0.38%	1,297.97	10,170.52	249,192.81	-11.32%	-0.52%
	Short-eared Owl	22.81	848.90	24,477.21	0.00	848.90	24,477.21	0.00%	0.00%	0.00	848.90	24,477.21	0.00%	0.00%	55.62	793.28	24,421.59	-6.55%	-0.23%
Total Habitat Available[4]		1,733.56	23,228.22	519,473.30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
(1) Refers to the condition prior to mine development.
(2) Refers to the conditions during mine has operations (i.e., the removal of the ZOI footprint in GIS analysis).
(3) Change in Cover Type is calculated as = ((Operational Impact – Baseline Condition)/Baseline Condition).
(4) HSI modelling, and GIS analysis used FRI data attributes, as such percentages are calculated based on coverage area. Within the PDA's 2,026.33 ha, 1,733.56 ha are represented in FRI ecosites. The LSA and RSA, spanning 30,773.41 ha and 628,311.38 ha respectively, have 23,228.22 ha and 519,473.30 ha captured in FRI ecosites.

480000 500000 520000 540000 560000 580000 600000 620000 640000 660000 680000

5700000 5680000 5660000 5640000 5620000

Carillon Lake
Kapikik Lake
Gitche Lake
Dobie Lake
Zionz Lake
Birch Lake
Springpole Lake
Fawcett Lake
Wright Lake
Gull Lake
Shabumeni Lake
Seagrave Lake
Kezik Lake
Fry Lake
Narrow Lake
Woman Lake
Okanse Lake
Trout Lake
SLATE FALLS NATION
Joyce Lake
Perrigo Lake
Bamaji Lake
Jeanette Lake
Blackstone Lake
Confederation Lake
Lake St. Joseph
Little Trout Lake
Doran Lake
Slate Lake
Whitemud Lake
Otatakan Lake
Miniss Lake
Bruce Lake
Bluffy Lake
De Lesseps Lake
St. Raphael Lake

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LEGEND

- Proposed Mine Feature
- Project Development Area
- Local Study Area for SAR Birds
- Regional Study Area for SAR Birds
- First Nation Reserve
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- Watercourse
- Waterbody

0 5 10 20 30 40 50 Kilometres

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

Local and Regional Study Areas for Species at Risk Birds

PROJECT N°: ONS2104 | **FIGURE: 6.16-1**

SCALE: 1:500,000 | DATE: May 2024

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Carillon Lake
Kapikik Lake
Gitche Lake
Dobie Lake
Zionz Lake
Birch Lake
ARU 52
Springpole Lake
Fawcett Lake
Gull Lake
Wright Lake
Shabumeni Lake
Seagrave Lake
Kezik Lake
EWPW-13
EWPW-12
B28
A28
EWPW-7
ARU 39
ARU 38
A3
B3
Fry Lake
Trout Lake
Narrow Lake
Woman Lake
Okanse Lake
B14
SLATE FALLS NATION
Joyce Lake
Perrigo Lake
Bamaji Lake
Jeanette Lake
Blackstone Lake
Confederation Lake
Lake St. Joseph
Little Trout Lake
Doran Lake
Slate Lake
Whitemud Lake
Otatakan Lake
Miniss Lake
Bruce Lake
Bluffy Lake
De Lesseps Lake
St. Raphael Lake

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LEGEND

- Proposed Mine Feature
- Project Development Area
- Local Study Area for SAR Birds
- Regional Study Area for SAR Birds
- Whip-poor-will Survey Locations (2021 ARU) (labelled with ID)
- Whip-poor-will Survey Locations (2022 ARU) (labelled with ID)
- Whip-poor-will - Moderate to High Habitat Suitability Areas
- First Nation Reserve
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- Watercourse
- Waterbody

0 5 10 20 30 40 50 Kilometres

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

WSP

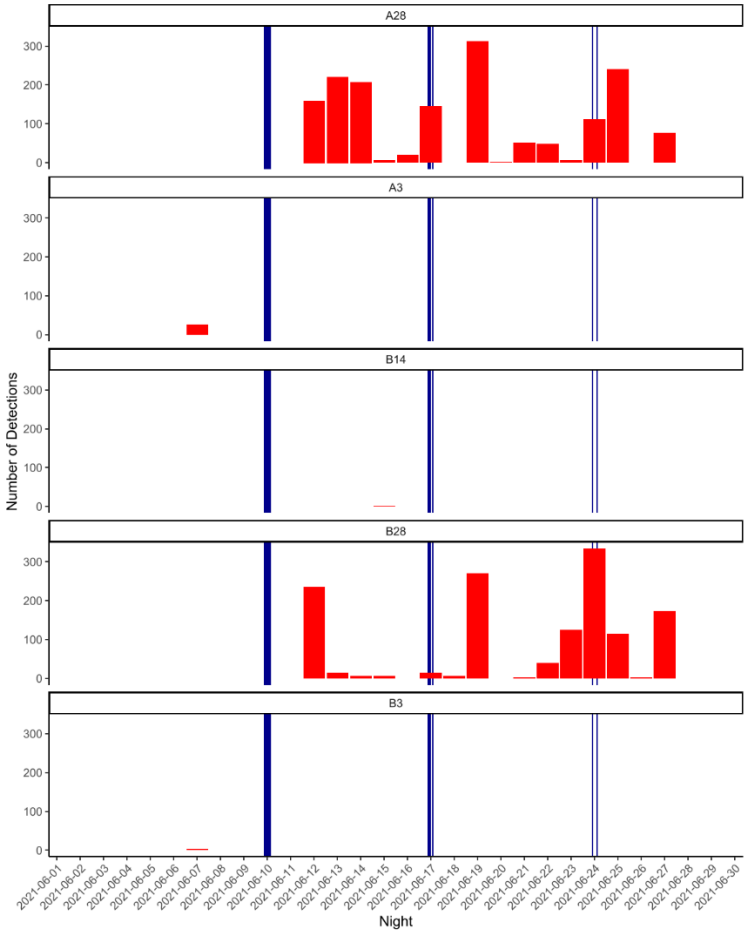
SPRINGPOLE GOLD PROJECT

Eastern Whip-poor-will Habitat Suitability Analysis Results Summary Map

PROJECT N°: ONS2104 | **FIGURE: 6.16-2**

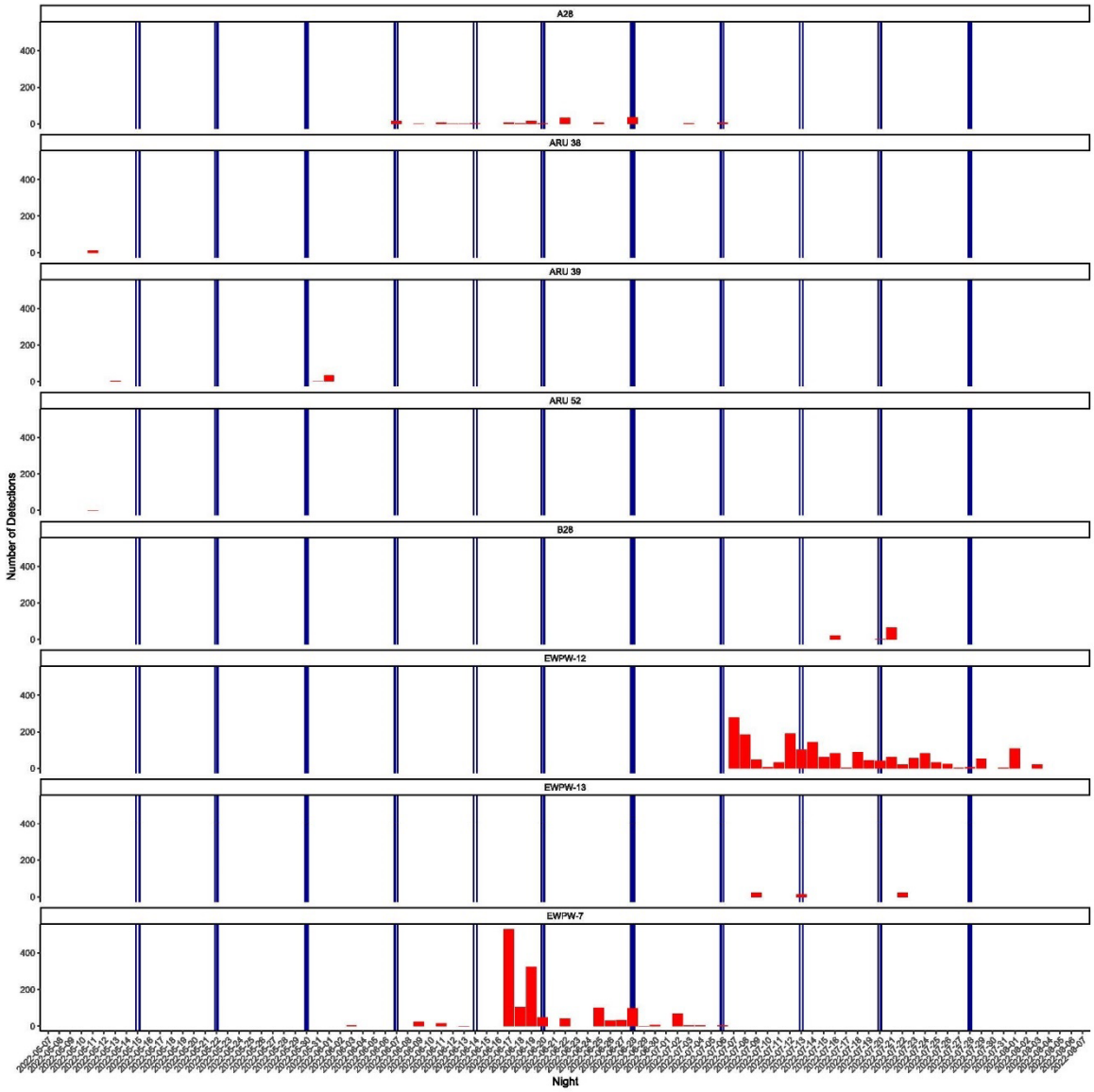
SCALE: 1:500,000 | DATE: May 2024

Figure 6.16-3: Eastern Whip-poor-will Autonomous Recording Unit Results of the 2021 Surveys



Note:
Double blue line is the full moon, and the solid blue line is the new moon.

Figure 6.16-4: Eastern Whip-poor-will Autonomous Recording Unit Results of the 2022 Surveys



Note:
Double blue line is the full moon, and the solid blue line is the new moon.

480000 500000 520000 540000 560000 580000 600000 620000 640000 660000 680000

5700000 5680000 5660000 5640000 5620000

Carillon Lake
Kapikik Lake
Gitche Lake
Dobie Lake
Zionz Lake
Birch Lake
Fawcett Lake
Wright Lake
Springpole Lake
Gull Lake
Shabumeni Lake
Seagrave Lake
Kezik Lake
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EWPW-14
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EWPW-2
EWPW-7
EWPW-1
EWPW-9
EWPW-10
EWPW-11
Fry Lake
Trout Lake
Narrow Lake
Woman Lake
Okanse Lake
SLATE FALLS NATION
Joyce Lake
Perrigo Lake
Bamaji Lake
Jeanette Lake
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Little Trout Lake
Doran Lake
Slate Lake
Whitemud Lake
Otatakan Lake
Miniss Lake
Bruce Lake
Bluffy Lake
De Lesseps Lake
St. Raphael Lake

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LEGEND

- Proposed Mine Feature
- Project Development Area
- Local Study Area for Wildlife and Wildlife Habitat
- Regional Study Area for Wildlife and Wildlife Habitat
- Whip-poor-will - Moderate to High Habitat Suitability Areas
- Category 2 Habitat (150m Buffer)
- Category 3 Habitat (330m Buffer)
- Whip-poor-will Survey Locations (2022 ARU) (labelled with ID)
- First Nation Reserve
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- Watercourse
- Waterbody

0 5 10 20 30 40 50 Kilometres

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

Eastern Whip-poor-will Habitat Suitability Analysis Results Summary Map

PROJECT N°: ONS2104 | **FIGURE: 6.16-5**

SCALE: 1:500,000 | DATE: May 2024

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Carillon Lake
Kapikik Lake
Gitche Lake
Dobie Lake
Zionz Lake
Fawcett Lake
Wright Lake
Kasagin Lak
Shabumeni Lake
Birch Lake
Springpole Lake
Gull Lake
Seagrave Lake
Kezik Lake
Fry Lake
Narrow Lake
Woman Lake
Trout Lake
Okanse Lake
Joyce Lake
Perrigo Lake
Jeanette Lake
Confederation Lake
Little Trout Lake
Slate Lake
Bamaji Lake
Blackstone Lake
Lake St. Joseph
Doran Lake
Whitemud Lake
Bluffy Lake
Bruce Lake
Otatakan Lake
Miniss Lake
De Lesseps Lake
St. Raphael Lake

SLATE FALLS NATION

ARU 38 ARU 39 MB1_ARU 34 ARU 31 ARU 35 ARU 45 ARU 43 ARU 44 ARU 13 EWPW-13 ARU 42 EWPW-11 ARU 48 ARU 29 EWPW-4 EWPW-12 EWPW-1 B28 EWPW-10 ARU 46 A51 ARU 4 ARU 38 B6 B24 A24 A19 EWPW-9 ARU 30 C19-30 ARU 36 ARU 56 ARU 41 ARU 37 ARU 18 ARU 17 B11 ARU 9 B10 ARU 60 MB2_ARU 58 A20 B20 ARU 49 ARU 51 ARU 14 ARU 54 ARU 15 ARU 55 ARU 57 ARU 11-2 ARU 11 ARU 12

LEGEND

- Lesser Yellowlegs Survey Locations (2021 ARU) (labelled with ID)
- Lesser Yellowlegs Survey Locations (2022 ARU) (labelled with ID)
- Lesser Yellowlegs - Moderate to High Habitat Suitability Areas
- Proposed Mine Feature
- Project Development Area
- Local Study Area for SAR Birds
- Regional Study Area for SAR Birds
- First Nation Reserve
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- Watercourse
- Waterbody

0 5 10 20 30 40 50 Kilometres

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

WSP

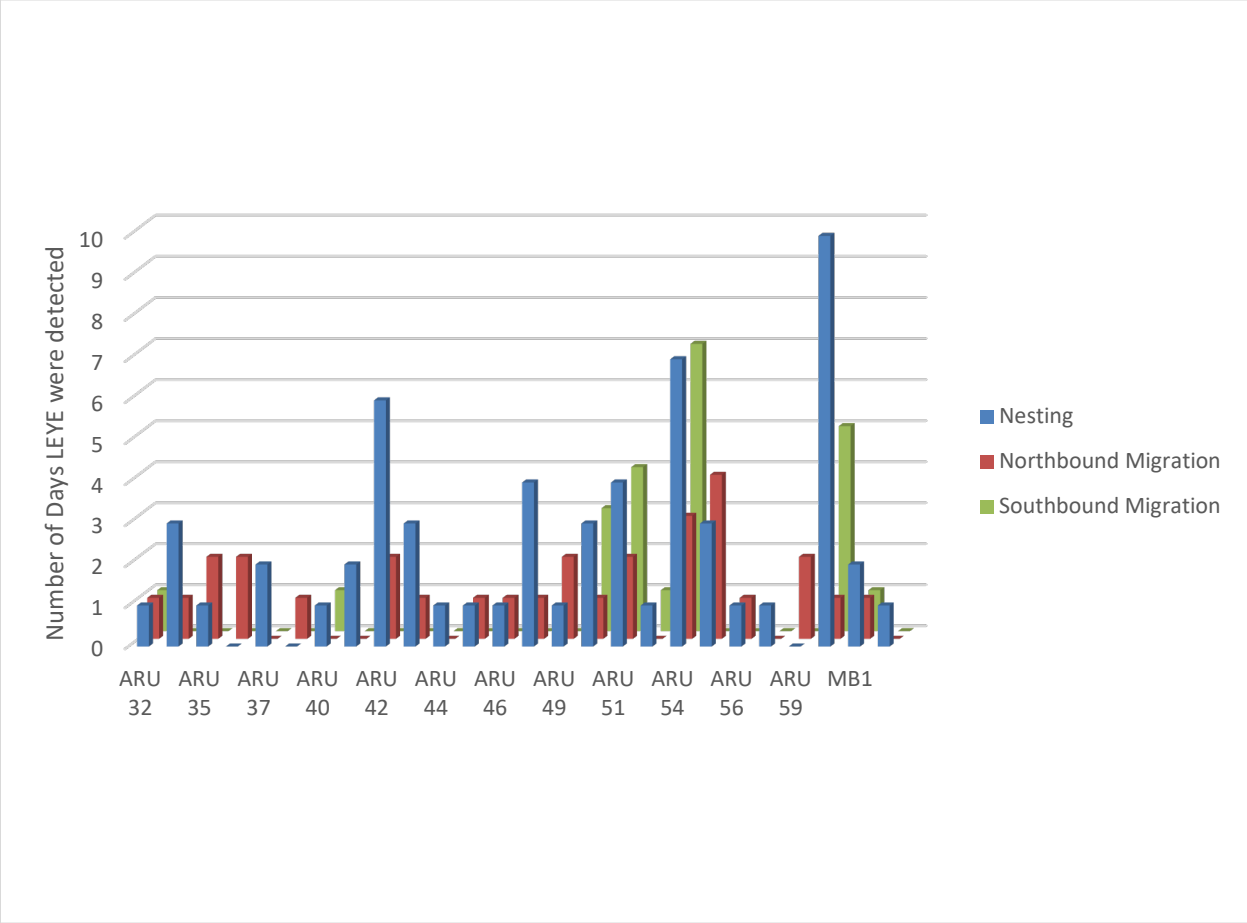
SPRINGPOLE GOLD PROJECT

Lesser Yellowlegs Suitability Analysis Results Summary Map

PROJECT N°: ONS2104 | **FIGURE: 16.6-6**

SCALE: 1:500,000 | DATE: May 2024

Figure 6.16-7: Number of Days Lesser Yellowlegs Were Detected by Autonomous Recording Unit and Period



Notes:
Periods included:

- **Northbound migration:** before May 13;
- **Nesting:** May 13 to July 14; and
- **Southbound migration:** June 15 and after.

Overlap between nesting and southbound migration means some values are double-counted.

480000 500000 520000 540000 560000 580000 600000 620000 640000 660000 680000

5700000 5680000 5660000 5640000 5620000

Carillon Lake
Kapikik Lake
Gitche Lake
Dobie Lake
Zionz Lake
Birch Lake
Springpole Lake
Fawcett Lake
Gull Lake
Wright Lake
Shabumeni Lake
Seagrave Lake
Kezik Lake
Kasagin Lak
Fry Lake
Narrow Lake
Woman Lake
Okanse Lake
Trout Lake
SLATE FALLS NATION
Joyce Lake
Perrigo Lake
Bamaji Lake
Jeanette Lake
Blackstone Lake
Confederation Lake
Lake St. Joseph
Little Trout Lake
Doran Lake
Slate Lake
Otatakan Lake
Whitemud Lake
Miniss Lake
Bruce Lake
Bluffy Lake
De Lesseps Lake
St. Raphael Lake

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LEGEND

- Short-eared Owl - Moderate to High Habitat Suitability Areas
- Project Development Area
- Local Study Area for SAR Birds
- Regional Study Area for SAR Birds
- First Nation Reserve
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- Watercourse
- Waterbody

0 5 10 20 30 40 50 Kilometres

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

WSP

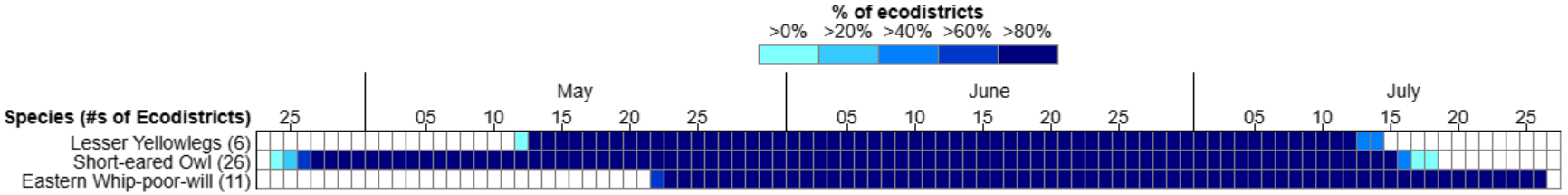
SPRINGPOLE GOLD PROJECT

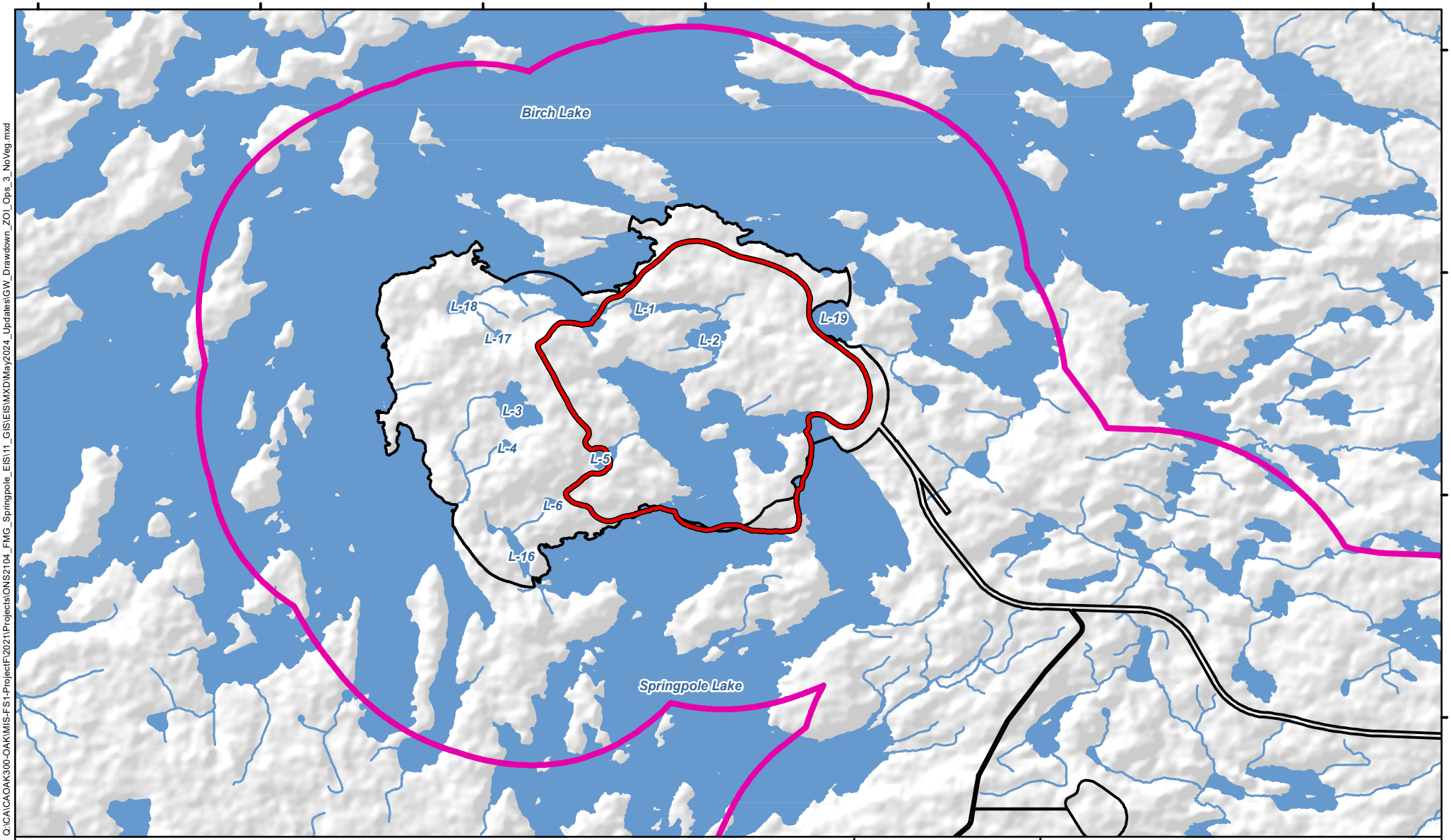
Short-eared Owl Suitability Analysis Results Summary Map

PROJECT N°: ONS2104 | **FIGURE: 16.16-8**

SCALE: 1:500,000 | DATE: June 2024

Figure 6.16-9: Nesting Calendar





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LEGEND

- Proposed Mine Feature
- Groundwater 2 m Drawdown Zone of Influence (Nov. 2023 Model)
- Local Study Area for SAR Birds
- Waterbody
- Watercourse

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan current as of Oct. 30, 2023

0 0.5 1 2 3 4 5 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

N W E S

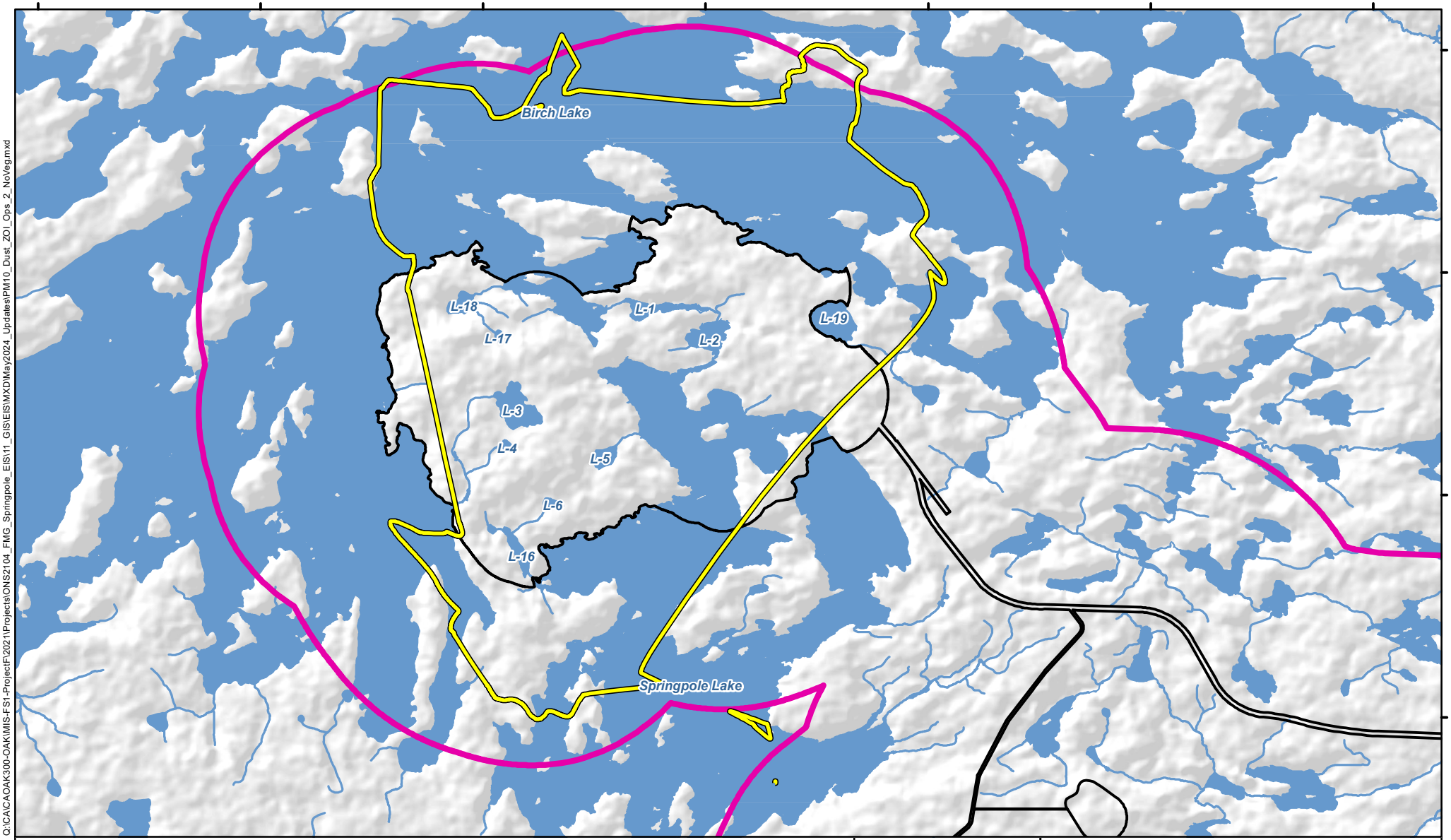
First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

Groundwater Drawdown Zone of Influence during Operations

PROJECT N°: ONS2104	**FIGURE: 6.16-10**
SCALE: 1:60,000	DATE: June 2024



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LEGEND

- Proposed Mine Feature
- PM10 Concentration (µg/m3), 85% Dust Control, 5.8% Silt, Project and Baseline Effects
- Local Study Area for SAR Birds
- Waterbody
- Watercourse

Disclaimer for PM10 Concentration (µg/m3) shown:
- Predicted effects should be considered in the context of the conservative nature of the emission rate estimates (all sources active at the maximum all the time, activity levels for all years at the maximum year of operations) and the conservative modelling (worst-case meteorological conditions over five years of meteorological data.
- For the low dust control and higher silt, only the Fish Harvest sensitive receptor predicts exceedances and only 0.3% of the time (6 days) ion a 5-year period. All exceedances for the fish harvest were predicted in December and January.

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan current as of Oct. 30, 2023

Datum: NAD83
Projection: UTM Zone 15N

N W E S

0 0.5 1 2 3 4 5 Kilometres

First Mining Gold

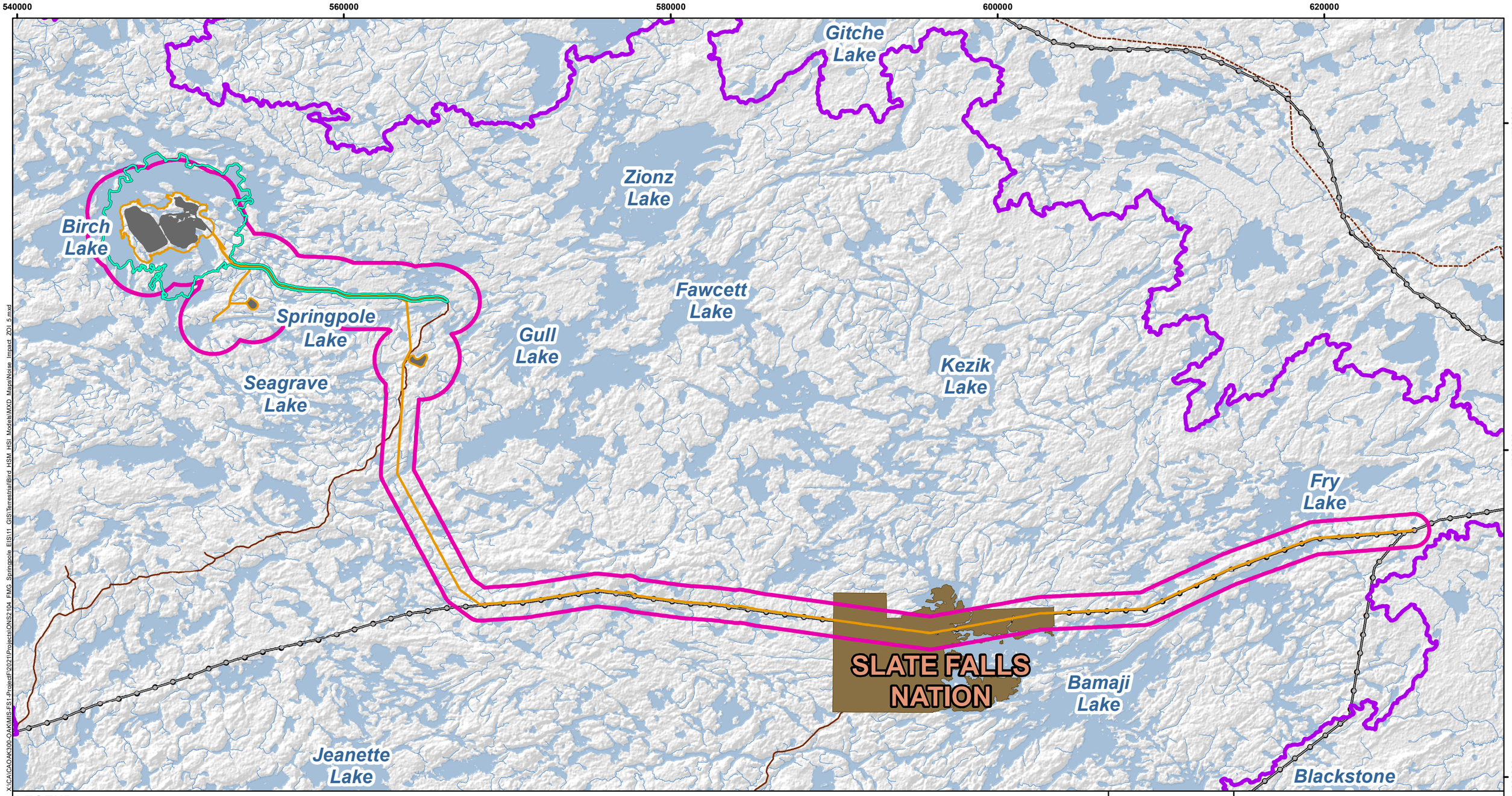
WSP

SPRINGPOLE GOLD PROJECT

PM10 Concentration Isopleth (24-Hour Averaging Time) Zone of Influence during Operations

PROJECT N°: ONS2104 | **FIGURE: 6.16-11**

SCALE: 1:60,000 | DATE: June 2024



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LEGEND

- Proposed Mine Feature
- Project Development Area
- Local Study Area for SAR Birds
- Regional Study Area for SAR Birds
- Noise Impact Zone of Influence (June 2024 model) * Existing Road
- Existing Winter Road
- First Nation Reserve
- Existing Transmission Line
- Watercourse
- Waterbody

0 5 10 20 30 40 50 Kilometres

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.
* Outer boundary of 40 dBA contours within continuous noise areas (mine site and access road)

Datum: NAD83
Projection: UTM Zone 15N

First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

Noise Impact Zone of Influence during Operations

PROJECT N°: ONS2104

FIGURE: 6.16-12

SCALE: 1:220,000

DATE: October 2024