SNAP LAKE MINE

Wildlife Management and Monitoring Plan Tier 2

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19 March 2021

REVISIONS HISTORY

Version	Date	Notes/Revisions
1	19 March 2021	No previous versions.

EXECUTIVE SUMMARY

The Snap Lake Mine (Mine) is a diamond mine owned and operated by De Beers Canada Inc. (De Beers) and is approximately 220 kilometres (km) northeast of Yellowknife, NWT. A Wildlife Management Plan (WMP; De Beers 2008a) and Wildlife Effects Monitoring Program (WEMP; De Beers 2004) were developed and implemented as required under the Snap Lake Land Use Permit and Environmental Agreement.

An update to the WEMP was approved in 2013, following a review of wildlife monitoring results at the Mine, and at other diamond mines in the region. This review was undertaken jointly with the Government of the Northwest Territories, the Snap Lake Environmental Monitoring Agency, other monitoring agencies, and community organizations in 2009, 2010, and 2011.

The 2013 update involved the following changes to the WEMP:

- removal of aerial surveys for caribou during the northern migration, annual raptor nest use and productivity surveys, and wolf den use surveys in the study area;
- modification to the caribou aerial survey design to assess a zone of influence (ZOI);
- replacement of surveys for bear sign with a regional hair snagging program to monitor grizzly and black bears;
- replacement of wolverine surveys for snow tracks with a standardized hair snagging program;
- systematic surveys of wildlife interactions within the site, waste management areas, and the winter access road; and
- action levels to guide adaptive management for habitat loss and direct Mine-related wildlife mortality.

In February of 2019 De Beers submitted to the Government of the Northwest Territories (GNWT), a single Wildlife Effects Monitoring Program to address all wildlife monitoring and management requirements under the Environmental Agreement. The 2019 WEMP was aligned with the Final Closure and Reclamation Plan and water licence renewal package and described all future wildlife monitoring at Snap Lake. Review comments from the GWNT were not provided specifically on this plan, though the GNWT did participate in the public review of the water licence and Final Closure and Reclamation Plan and all associated management plans.

In August 2019 the GNWT issued a new guidance document for wildlife management plans (GNWT-ENR 2019a) to meet requirements of the *NWT Wildlife Act*. The Snap Lake water licence renewal process was completed in the spring of 2020 with the issuance of the new licence in May of 2020. The GNWT then issued a directive letter to De Beers in September of 2020 instructing De Beers that a new Tier 2 Wildlife Management and Monitoring Plan (WMMP) for Snap Lake would be required to meet compliance with the *NWT Wildlife Act*. The WMMP should align with the Final Closure and Reclamation Plan.

The Snap Lake WMMP document was prepared in accordance with the GWNT guidelines and the September 18, 2020 letter to De Beers from the GWNT. The caribou behaviour, grizzly bear hair snagging, and wolverine hair snagging programs were removed from the WMMP, as an outcome of the 2021 Slave Geological Province Wildlife Workshop.

Currently, operations at the Mine have ceased and wildlife mitigation and monitoring will be adjusted and adapted to align with the changes in intensity and frequency of planned site activities associated with closure and post-closure. The WMMP includes the following changes:

- systematic wildlife surveys to occur during periods that staff are on site;
- remote camera monitoring during periods with no staff on site;
- replacement of aerial surveys with collared caribou for ZOI monitoring;
- no contributions to regional monitoring (per Tier 2 WMMP guideline requirements).

TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

ACRONYMS AND ABBREVIATIONS

AQEMMP	Air Quality Emissions Management and Monitoring Plan
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
De Beers	De Beers Canada Inc.
DNA	deoxyribonucleic acid
EAR	Environmental Assessment Report
ELC	ecological landscape classification
EMS	Environmental Management System
ENR	(Department of) Environment and Natural Resources
FCRP	Final Closure and Reclamation Plan
GIS	Geographical Information System
GNWT	Government of Northwest Territories
GPS	global positioning system
Mine	Snap Lake Mine
MVEIRB	Mackenzie Valley Environmental Impact Review Board
NWT	Northwest Territories
QA/QC	quality assurance/quality control
RSA	regional study area
SARA	*Species at Risk Act*
SARC	Species at Risk Committee
SGP	Slave Geographical Province
SLEMA	Snap Lake Environmental Monitoring Agency
VECs	valued ecosystem components
WEMP	Wildlife Effects Monitoring Program
WWHPP	Wildlife and Wildlife Habitat Protection Plan
WMP	Wildlife Management Plan
WMMP	Wildlife Management and Monitoring Plan
ZOI	zone of influence

UNITS OF MEASURE

%	percent
±	plus or minus
ha	hectare
km	kilometre
km/hr	kilometres per hour
km^2	square kilometre
m	metre

1. INTRODUCTION

1.1 Background

De Beers Canada Inc. (De Beers) owns and operates the Snap Lake Mine (Mine). An Environmental Assessment Report (EAR) for the proposed underground Mine (De Beers 2002a) was completed and submitted to the Mackenzie Valley Environmental Impact Review Board (MVEIRB) in February 2002. Following the EAR review process, the MVEIRB recommended that the Mine proceed subject to the implementation of measures to mitigate environmental impacts (MVEIRB 2003). Final regulatory approvals for construction and operation of the Mine were granted in May 2004, and construction began in April 2005. Mining began in 2007 and ceased in December of 2015. Activities at the Mine shifted from operation to care and maintenance in 2015 and the Mine is presently in extended care and maintenance. In December of 2017 notification was provided that De Beers intends to close the Mine. A Final Closure and Reclamation plan (FCRP) and water licence renewal package was submitted to the Mackenzie Valley Land and Water Board (MVLWB) in March 2019. The MVLWB issued their recommendation for approval of the Snap Lake water licence in March 2020 and the licence was issued in May 2020. Several management plans, including the FCRP were resubmitted in March 2021 (De Beers 2021a). The Tier 2 Wildlife Management and Monitoring Plan (WMMP) presented here is aligned with direction from the GNWT and the updated September 2020 FCRP, and is intended to cover wildlife monitoring activities at the Mine during closure and post-closure (i.e., decommissioning/demolition, reclamation, and monitoring).

The WMMP is required under the Environmental Agreement and the *Northwest Territories* (*NWT*) *Wildlife Act*. The WMMP was initially developed in 2004 as the Wildlife Effects Monitoring Program (WEMP) and subsequently in 2008 as the Wildlife Management Plan (WMP) (De Beers 2008a). Since that time a number of changes to wildlife monitoring have occurred following discussions with the Government of the Northwest Territories (GNWT), Snap Lake Environmental Monitoring Agency (SLEMA), Independent Environmental Monitoring Agency, Environmental Monitoring Advisory Board, and community organizations (Marshall 2009; Handley 2010). In 2013, the GNWT issued guidelines (GNWT-ENR 2013) for developing a Wildlife and Wildlife Habitat Protection Plan (WWHPP) and WEMP, with a different focus between the two plans. The WWHPP was meant to focus on site mitigation and monitoring and the WEMP was meant to focus on off-site (or regional) monitoring. The WMMP presented here combines both on-site and off-site requirements reflected in the most recent versions of the WWHPP and WEMP documents (De Beers 2013a,b), meets the terms of the new guidance documents (GNWT-ENR 2019a) and importantly, reflects changes from operation, to care and maintenance, to closure and post-closure.

In 2009 and 2010, the Department of Environment and Natural Resources (ENR), GNWT hosted a workshop with representatives from the Diavik, Ekati, and Snap Lake diamond mines, their monitoring agencies, and community organizations (Marshall 2009; Handley 2010). The workshop included a review of existing wildlife monitoring programs at these mines and recommendations for changes. The consensus of the attendees at the workshop was that an alternate study design was needed for grizzly bear monitoring. Further, attendees concluded that surveys of caribou during the northern migration, raptor nests, and wolf dens added little value because the data from these programs were ineffective at assessing mine-related effects. Instead, it was recommended that the mines contribute in-kind data from wolf den and raptor nest surveys to ENR and the National Peregrine Falcon Recovery Program, respectively. Contributions to those

programs were made during operation of the Snap Lake Mine and discontinued during care and maintenance. Analysis of long-term raptor nest survey data found no evidence for a strong linkage between the Mine and nest occupancy or success during the years when the program was conducted at Snap Lake (De Beers 2008b) or at Ekati and Diavik (Coulton et al. 2013).

An additional workshop on grizzly bear monitoring was hosted by ENR in November 2011, at which a regional hair snagging program supported by De Beers, BHP Billiton Canada Inc. (Ekati), and Rio Tinto Canada Inc. (Diavik) was proposed (Rescan 2012). The purpose of this proposed grizzly bear monitoring program, which integrates the findings and recommendations from the additional workshop, was to provide ENR with regional-scale demographic information and population trends for grizzly bear that would support cumulative effects assessment. This program was implemented in 2013 and 2014 and supported by De Beers. Similarly, a wolverine hair snagging program was implemented at the Mine in 2013 and 2014 to provide demographic and population trend information and support cumulative effects assessment but also to support the assessment of wolverine as a species at risk in the NWT.

More recently, ENR hosted another Slave Geological Province wildlife workshop in April of 2018 in Yellowknife. De Beers attended this workshop along with other industry, Indigenous communities, government agencies, academia, and environmental consultants. The results of the grizzly bear monitoring were presented by Dr. Marco Musiani of the University of Calgary. No effects of mining operations on grizzly bear populations were reported through this program (Jessen 2017). Dr. Musiani also presented vegetation monitoring work conducted by his students and largely funded by De Beers to elucidate the relationships between grizzly bear populations and phenology of tundra plants (Diepstraten et al. 2018). In addition, a presentation on the analysis of wolverine hair snagging data showed no evidence of mine-related effects on wolverine populations during the more than 10-year study period (Efford and Boulanger 2018).

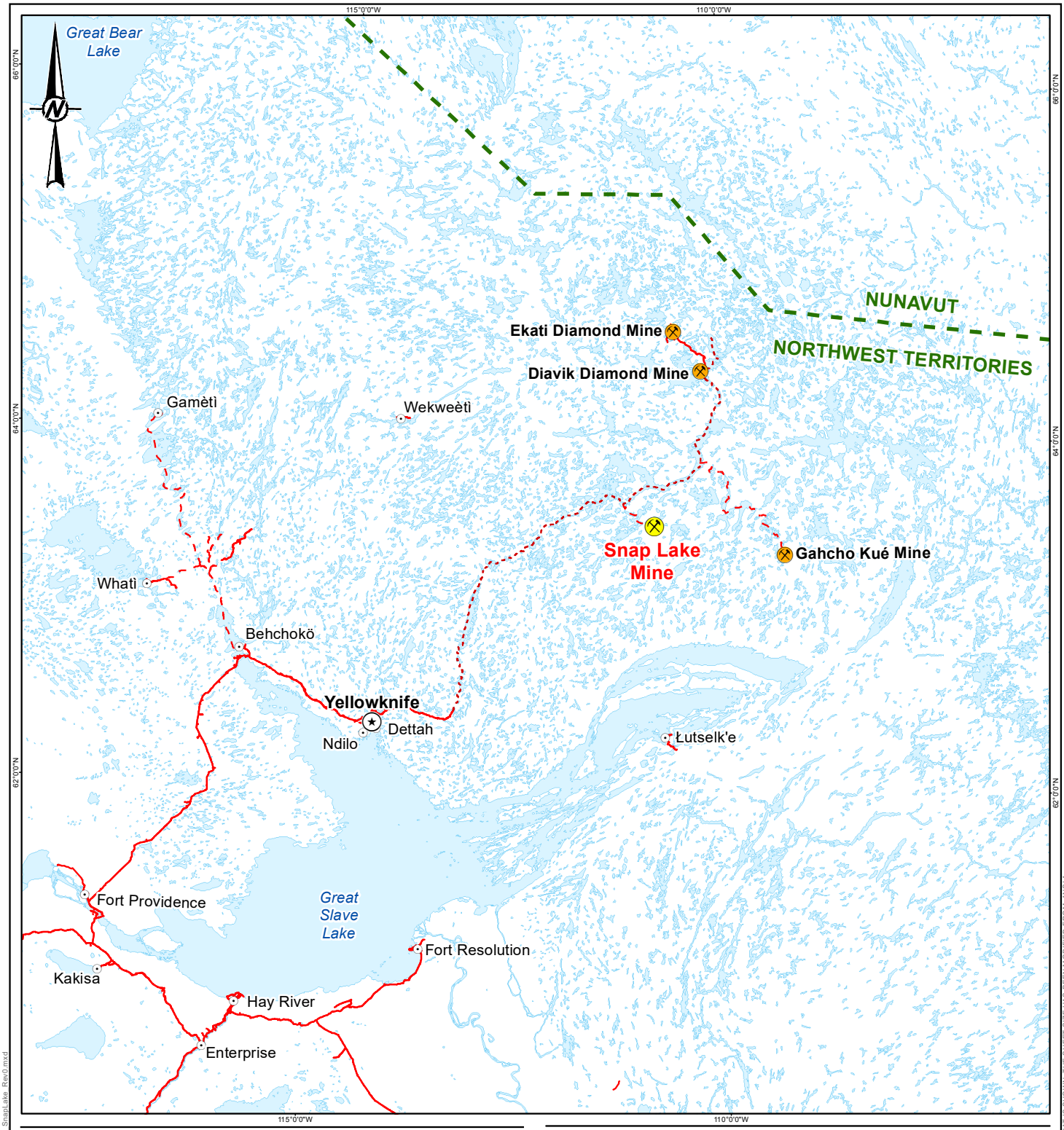
Activity levels at the Mine have declined substantially since operation ended (December 4, 2015) and the site has been under care and maintenance. Populations of grizzly bear (ERM 2018) and wolverine (Efford and Boulanger 2018) are stable, and wolverine was assessed as not at risk in the NWT in 2014 (NWT SARC 2014). Currently, grizzly bear has no listed status in the NWT (NWT CMA 2018). Participation in grizzly bear and wolverine hair snagging programs is no longer applicable to the Mine based on objectives for a Tier 2 WMMP (GWNT-ENR 2019a). Wildlife monitoring for the Mine has been modified to align with planned activities during closure and post-closure to protect grizzly bear, wolverine and other wildlife from adverse effects that might occur due to the increase in the presence of people on site, particularly during the two-year decommissioning/demolition period of closure.

In December 2017, De Beers announced the implementation of preparations for closure of the Mine. Following the successful installation of remote monitoring instrumentation at site, De Beers transitioned to zero occupancy for the winter of 2018/2019. During closure the Mine site will be occupied by staff full-time until completion of closure activities and then unoccupied during post closure, except when periodic post-closure monitoring is required. De Beers will implement the WMMP during closure and post-closure of the Mine with the level of monitoring (e.g., component type, intensity, frequency, and duration) commensurate with the level of activities and number and capacity of staff on site.

1.2 Study Area

The Mine is located approximately 220 kilometres (km) northeast of Yellowknife, Northwest Territories (NWT), 30 km south of MacKay Lake, and 100 km south of Lac de Gras where the Diavik Diamond Mine and the Ekati Diamond Mine are located (Figure 1-1). The WMMP study area is defined by a circle with a radius of 31 km, centred on the Mine site (Figure 1-2), and is identical to the regional study area (RSA) used in the EAR (De Beers 2002a). The size and shape of the study area were chosen so that the area remained within the Taiga-Shield Ecozone. The scale of the study area is also ecologically relevant with respect to determining the distribution of habitat types available to wildlife species during their seasonal and annual movements. The study area encompasses Camsell Lake and the southern portion of MacKay Lake, which are important historical migratory routes for the Bathurst caribou herd (Weledeh Yellowknives Dene 1997; Lutsel K'e Dene First Nation 2001).

The study area primarily consists of heath tundra/boulder habitat interspersed with lakes (Figure 1-2). The habitat in the study area is naturally divided along a line approximately through the centre in a northeast to southwest direction. Heath tundra/bedrock and heath tundra/boulder associations dominate the southeastern half of the study area while the northwestern half largely consists of heath tundra, heath tundra/boulder, and spruce forest stands. Vegetation also includes sedges and grasses, and heath mat with low shrubs such as dwarf birch, willow, Labrador tea, crowberry, bog cranberry, and bearberry. Eskers are found throughout the study area. The Mine site and location of infrastructure are shown in Figure 1-3.



LEGEND

- Snap Lake Mine
- Existing Mine
- Territorial Capital
- Populated Place
- All Weather Road
- Tibbit-to-Contwoyto Winter Road
- Winter Road
- Territorial/Provincial Boundary
- Watercourse
- Waterbody

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REFERENCES

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CLIENT

DE BEERS GROUP

PROJECT

SNAP LAKE MINE

TITLE

LOCATION OF SNAP LAKE MINE

CONSULTANT

GOLDER

YYYY-MM-DD	2020-10-30
DESIGNED	C. GRAY
PREPARED	L. STUART
REVIEWED	D. COULTON
APPROVED	D. COULTON

PROJECT NO.	PHASE	REV.	FIGURE
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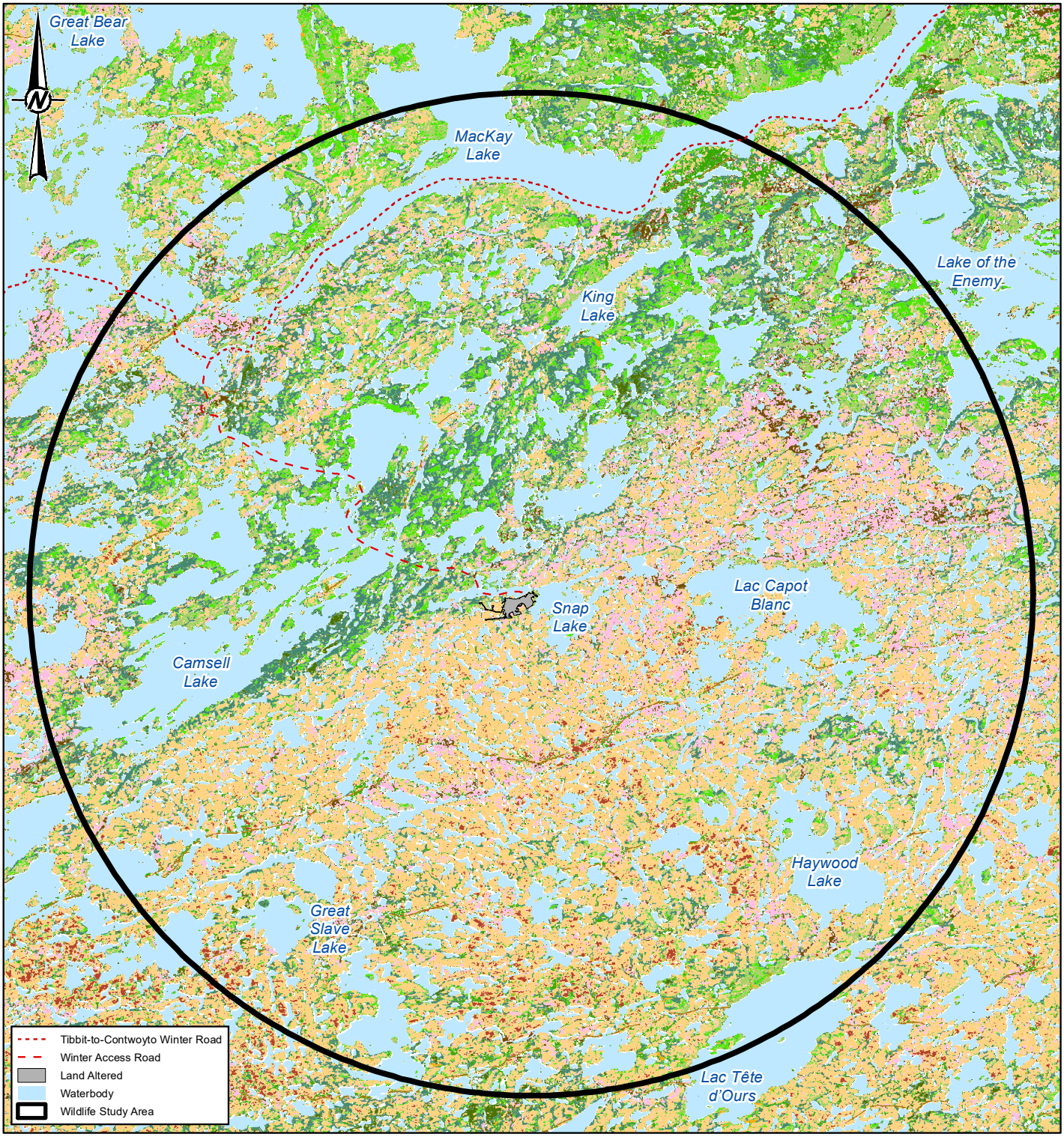
PATH: I:\CLIENTS\DE BEERS\Snap Lake\Mapping\MXD\WMP 2020\Fig 1-1 Location of SnapLake Rev0.mxd



LEGEND

Ecological Landscape Classification

- Bedrock Boulder
- Closed Spruce Forest
- Esker Complex
- Heath Bedrock
- Heath Boulder
- Heath Tundra
- Lichen Veneer
- Mixed Forest
- Open Spruce Forest
- Riparian Tall Shrub
- Sedge Wetland
- Tussock Hummock

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REFERENCES

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CLIENT

DE BEERS GROUP

PROJECT

SNAP LAKE MINE

TITLE

WILDLIFE MANAGEMENT AND MONITORING PLAN STUDY AREA

CONSULTANT

GOLDER

YYYY-MM-DD	2020-10-30
DESIGNED	D. COULTON
PREPARED	L. STUART
REVIEWED	D. COULTON
APPROVED	D. COULTON

PROJECT NO.	PHASE	REV.	FIGURE
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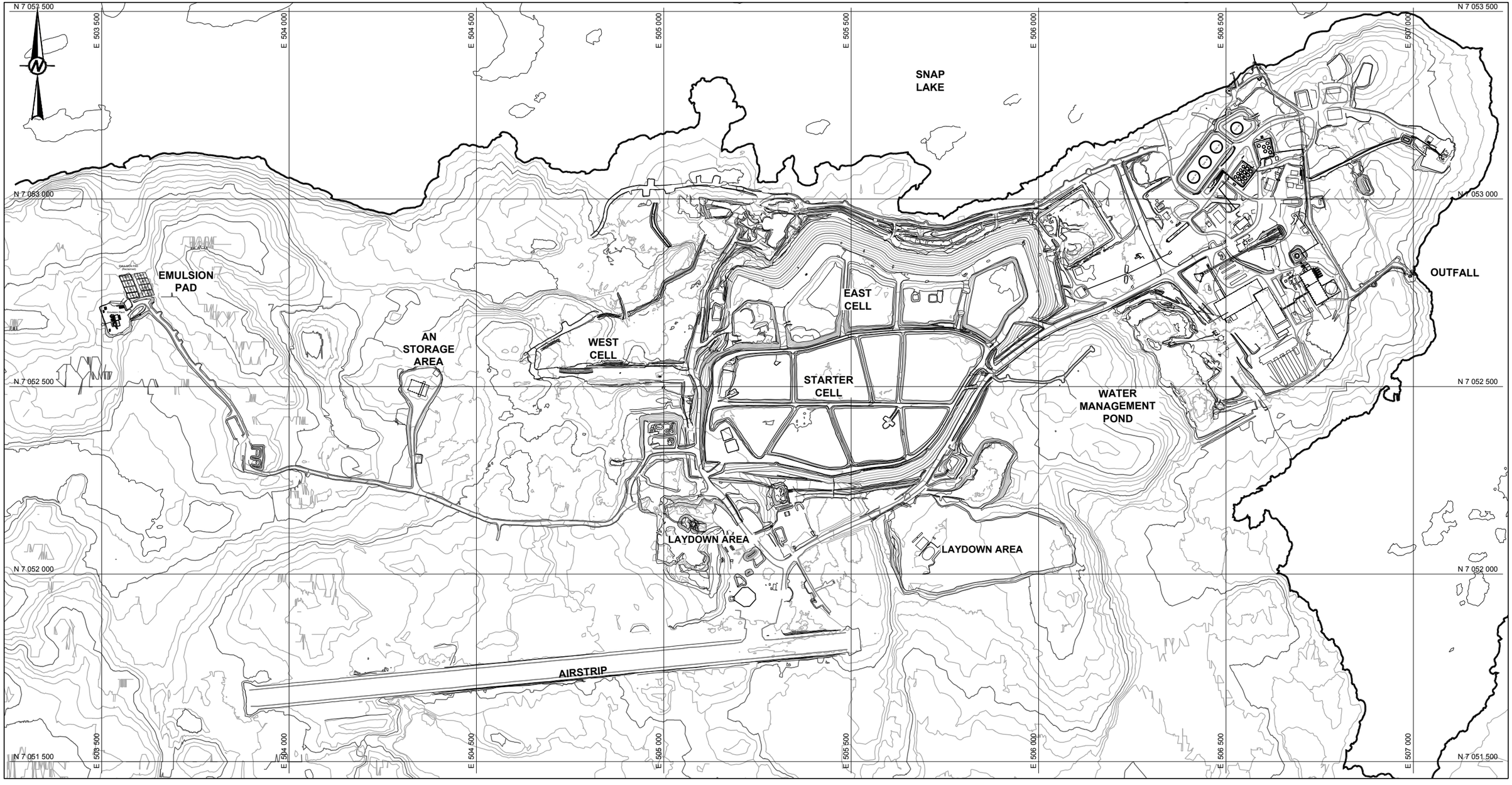

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NOTES

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2. Coordinate system : UTM zone 12.
3. Project site infrastructure is shown for information purposes only.

REFERENCE

August 2019 contours and infrastructure provided by De Beers, file name: "statmap august 14, 2019 incl contours.dwg", received: December 02, 2019.

CLIENT
De Beers Group of Companies

CONSULTANT
GOLDER

YYYY-MM-DD	2021-03-19
PREPARED	J. FARAH
DESIGN	D. COULTON
REVIEW	D. COULTON
APPROVED	C. GRAY

PROJECT
SNAP LAKE MINE

TITLE
SNAP LAKE MINE SITE INFRASTRUCTURE

PROJECT No.	PHASE/TASK	Rev.	FIGURE
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1.3 Purpose

The principal purpose of the updated WMMP is to comply with relevant Articles in the Environmental Agreement (e.g., Articles VII and VIII), related corporate commitments, and legislative and regulatory requirements such as the *NWT Wildlife Act* and *Species at Risk Act* (Appendix A). The intent of this document is to describe the monitoring components, objectives, methods, frequency, analyses, and reporting requirements to meet the associated relevant Articles and regulatory requirements. To comply with the relevant terms and conditions stated in the Land Use Permit and Environmental Agreement, and to provide an updated plan fit for closure and post-closure De Beers has designed the WMMP on the following objectives:

- test impact predictions made in the EAR;
- implement, through the Environmental Management System (EMS) (De Beers 2002b), operational practices that mitigate disturbance to wildlife and wildlife habitat, including migratory and non-migratory birds and their nesting areas, species at risk, and caribou;
- determine the effectiveness of mitigation implemented through the EMS;
- incorporate available Traditional Knowledge;
- establish action levels or triggers for early warning signs to implement adaptive management and mitigation where appropriate;
- provide opportunities for the involvement and active participation by communities in the implementation of the WMMP;
- develop and review the WMMP in collaboration with the GNWT and the SLEMA; and
- contribute to monitoring the progress of closure objectives of the FCRP (Appendix C; De Beers 2021a).

1.4 Valued Ecosystem Components

Several indicators or valued ecosystem components (VECs) will be measured to test predicted effects, evaluate the performance of the EMS, and determine unanticipated effects on wildlife and wildlife habitat. These VECs were selected because of their ecological, cultural, and economic importance, and potential sensitivity to Mine-related stressors. The following VECs are monitored by De Beers under the existing WEMP:

- vegetation and associated wildlife habitat;
- caribou;
- grizzly bear; and
- wolverine.

During closure and post-closure, De Beers will continue to monitor these VECs and other wildlife through the on-site programs. Additional off-site monitoring is planned for caribou.

1.5 Species of Concern

The intent of the federal *Species at Risk Act* (*SARA*) and the *Species at Risk (NWT) Act* is to prevent wildlife species from becoming extirpated or extinct, to provide for the recovery of extirpated, endangered or threatened species, and to manage species of special concern to prevent them from becoming at further risk. This legislation may be used to prohibit the killing, harming, or harassing of listed species, the damage and destruction of their residences, and the destruction of critical habitat. The *Species at Risk (NWT) Act* applies only to birds not already covered by the *Migratory Birds Convention Act*. In the NWT, the Species at Risk Committee will assess species, and the Conference of Management Authorities will prepare the List of Species at Risk, providing legal protection.

For the purposes of the WMMP, species may be considered of concern as a result of their national or territorial status, or their status under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (GNWT-ENR 2019a). As the *Species at Risk (NWT) Act* is implemented, the NWT Species at Risk Committee will make further assessments, and the Conference of Management Authorities will prepare the List of Species at Risk, providing legal protection for these species, and possibly leading to changes in the species at risk considered for the Mine and the WMMP. There are currently six species of concern that may interact with the Mine (Table 1-1).

Table 1-1: Species of Concern for the Snap Lake Mine, Potential Effects, and Related Monitoring Components in the Wildlife Management and Monitoring Program

Species	*Species at Risk (NWT) Act*	COSEWIC Assessment	*Federal Species at Risk Act*	Potential Mine Effects	Components of the WMMP
Barren-ground caribou	Threatened	Threatened	Under consideration	• may be affected by habitat loss • may be sensitive to disturbance and human activity • risk of harm or mortality	Habitat loss Site monitoring Sensory disturbance monitoring
Grizzly bear (western population)	No Status	Special Concern	Special Concern	• may be attracted to developments if food is available resulting in injury/mortality risk • sensitive to disturbance particularly when accompanied by young or during denning • long generation time means one individual may be affected by disturbance seasonally over multiple years, resulting in potential regional population effects	Habitat loss Site monitoring

Table 1-1: Species of Concern for the Snap Lake Mine, Potential Effects, and Related Monitoring Components in the Wildlife Management and Monitoring Program

Species	*Species at Risk (NWT) Act*	COSEWIC Assessment	*Federal Species at Risk Act*	Potential Mine Effects	Components of the WMMP
Wolverine (western population)	Not at Risk	Special Concern	Special Concern	• may be attracted to developments if food or shelter are available resulting in injury/mortality risk	Habitat loss Site monitoring
Peregrine falcon (*anatum-tundrius complex*)	No Status	Not at Risk	Special Concern	• falcons have been known to nest on Mine infrastructure where they may be at risk of harm or may cause delays in Mine activities	Habitat loss Site monitoring (particularly for nesting activity)
Rusty blackbird	No Status	Special Concern	Special Concern	• may nest on Mine infrastructure (risk of mortality)	Habitat loss Site monitoring (particularly for nesting activity)
Short-eared Owl	No Status	Special Concern	Special Concern	• may be affected by habitat loss • sensitive to noise and disturbance and human activity during nesting	Habitat loss Site monitoring (particularly for nesting activity)

1.6 Measures from Environmental Review

In the report from the MVEIRB on the environmental assessment for the Mine, five wildlife-related measures were recommended to De Beers for the proposed Mine to proceed (MVEIRB 2003) (Table 1-2).

Table 1-2: Wildlife-related Measures from the Mackenzie Valley Environmental Impact Review Board's Report on the Environmental Assessment for the Snap Lake Project

Measure	Snap Lake Mine Outcome
(S21) De Beers should design a project-specific monitoring protocol to test for behaviourally induced habitat avoidance effects as a result of the project, and include this in an Adaptive Management Plan. There is a need to develop scientifically sound research projects to address this issue and to examine the relationship between project activities and a reduction in habitat effectiveness. This protocol should apply to grizzly bear, wolverine and caribou and should be developed in consultation with the GNWT and Traditional Knowledge holders.	A Wildlife Effects Monitoring Program (WEMP) was developed in 2004 (De Beers 2004). The WEMP included monitoring for grizzly bear, wolverine, and caribou related to measuring changes in habitat and habitat effectiveness (suitability). Both the WEMP and Wildlife Management Plan (WMP; De Beers 2008a) reflect consultation with the GNWT and the Snap Lake Environmental Monitoring Agency (SLEMA), which included individuals from Indigenous communities.

Table 1-2: Wildlife-related Measures from the Mackenzie Valley Environmental Impact Review Board's Report on the Environmental Assessment for the Snap Lake Project

Measure	Snap Lake Mine Outcome
(R13) De Beers shall, in consultation with the GNWT, develop a Caribou Protection Plan that imposes increasingly stringent mitigation measures as the number of animals potentially exposed to disturbance from the site increases. This plan could be modeled on the caribou protection measures included as terms and conditions of land use permits by Indigenous and Northern Affairs Canada in the past.	Mitigation and monitoring to protect caribou was incorporated into the WMP (De Beers 2008a). Examples include the reporting requirement by site staff when caribou are seen and deterring caribou from site hazards (e.g., airstrip).
(R14) De Beers shall, in consultation with the GNWT, develop a monitoring program to test the predictions of the EAR for grizzly bears, wolverines, and caribou and to further the scientific understanding of behavioural responses of these species to Mine-related disturbance.	Grizzly bear, wolverine, and caribou behaviour monitoring was included in the WEMP (De Beers 2004). Grizzly bear and wolverine behaviour were monitored indirectly through habitat use and snow track surveys, respectively. Caribou behaviour was monitored through aerial surveys and ground-based scanning observations. The WEMP became part of the WMP (De Beers 2008a), which was developed in consultation with the GNWT and SLEMA.
(R17) De Beers shall, in consultation with the GNWT, develop a comprehensive waste and odour management strategy to minimize the attraction of carnivores to the site. The strategy must identify and describe details of design features, operational measures, employee/contractor staff awareness and training, for handling of food, food waste and other wastes throughout the mine site and specifically for the incinerator, landfill site, kitchens, camps and personnel quarters.	A Domestic Waste Management Plan (De Beers 2006) was developed for the Snap Lake Mine. This plan included strategies, design features, and policies and procedures to manage odours such as training on waste segregation and limiting access to food waste by wildlife. The WMP (De Beers 2008a) includes mitigation of waste and odours, design features, and operational measures such as staff environmental awareness training and waste segregation.
(R18) De Beers shall, in consultation with the GNWT, develop a comprehensive on-site Wildlife Management Plan that limits the attractiveness of the mine site to carnivores and includes protocols for dealing with on-site wildlife encounters. The requirement for the on-site wildlife management plan shall be incorporated into the proposed Environmental Agreement.	The WMP (De Beers 2008a) includes mitigation for limiting attractiveness to the Mine site by carnivores (and gulls/ravens), primarily implemented through the Waste Management Plan (De Beers 2006). The WMP (De Beers 2008a) also included protocols for dealing with wildlife encounters at site.

In addition to measures from the environmental assessment review process, the Mine developed this WMMP to comply with legislation, regulations, and De Beers' Environmental Agreement with the Government of Canada for the Snap Lake Mine. A table demonstrating concordance of the WMMP with legislation, regulations, and the Environmental Agreement is provided in Appendix A.

1.7 Engagement

De Beers has been, and continues to be, committed to engaging with Indigenous groups, communities, and regulators throughout the life of the Mine. This includes communications and outreach activities in relation to planning, construction, operation, and care and maintenance activities conducted to date, and closure of the Mine. Engagement on the WMMP will follow the approach outlined in the Snap Lake Mine Engagement Plan (De Beers 2019a). The Engagement Plan is based on the guidance identified in the MVLWB Engagement Guidelines for Applicants and Holders of Water Licences and Land Use Permits. It also conforms to De Beers' Sustainable Development Policy and Guidelines for working with Aboriginal Communities. As noted in the MVLWB Engagement Guidelines, the Snap Lake Mine Engagement Plan describes how De Beers will continue to work with affected parties and parties of interest throughout the life of the Mine.

De Beers' approach to engagement is guided by the following values:

- Respect for each party's unique history, knowledge, perspective, and culture is the foundation of a positive relationship. Careful listening, understanding of communication protocols, and following through on commitments made are important ways of practicing respect.
- Timeliness in providing adequate time for communities to evaluate and respond.
- Trust between parties is recognized as vital to the success of engagement activities. Building trust requires a long-term commitment to the relationship and to following through on commitments. Engaging parties before, during, and after each stage or aspect of Mine development helps to build and maintain trust.
- Transparency, including complete disclosure of information in a plain-language and understandable manner in multiple accessible formats, demonstrating a willingness to address issues as they arise, and adjust perspectives and practices as additional information is provided. Openness, sincerity, and honesty are core values necessary to genuine engagement.
- An ongoing process that allows for feedback and fosters lasting and meaningful relationships.
- Responsiveness such that communication leads to meaningful changes and/or feedback regarding perspectives or practices.

The Mine is now entering the closure and post-closure phase and De Beers will continue to work closely with stakeholders and affected parties during this time. As activities at the Mine change over the years, De Beers will continue to regularly update stakeholders and affected parties and seek their input at key decision points. Engagement will take place during forums including:

- SLEMA;
- Snap Lake Working Group;
- Community Meetings;
- Workshops; and
- Site Visits.

Engagement on the WMMP will also take place as part of the annual reporting process, which has occurred throughout operation.

1.8 Mitigation

The environmental design features and mitigation policies, practices, and procedures that the Mine has implemented to avoid and minimize or limit effects to wildlife and wildlife habitat are collectively referred to as mitigation. The WMMP includes a large number of mitigation actions implemented on a hierarchy of intensity (action) levels and spatial and temporal scales to protect wildlife and wildlife habitat. Standard mitigation hierarchy includes the following (IFC 2012; BBOP 2015):

- Avoid: actions taken to completely avoid creating effects from the outset, such as careful spatial or temporal placement of elements of infrastructure and engineered designs of facilities (e.g., infrastructure placement can avoid disturbing areas with rare plants or uncommon and sensitive wildlife habitat).
- Minimize: actions taken to reduce the duration, intensity and/or spatial extent of effects that cannot be avoided.
- Reclaim: actions taken to rehabilitate degraded ecosystems or restore ecological function following exposure to effects that cannot be completely avoided and/or minimized (e.g., revegetated areas).
- Offset: measures taken to compensate for any residual significant, adverse effects that cannot be avoided, minimized and/or rehabilitated or restored. Offsets are achieved once compensation is sufficient that the outcome is no net loss or a net gain for the feature (e.g., VEC) for which compensation was developed. Offsets can take the form of positive management interventions, such as off-site restoration of degraded habitat, arrested degradation or averted risk, and protecting areas where there is imminent or projected loss.

Adverse effects from a project should be mitigated as much as possible using avoidance, followed by minimization, and reclamation. This is because effects that are avoided entirely or minimized mean that the effects from a development prior to implementing reclamation are reduced.

The Snap Lake Mine uses mitigation that avoids, minimizes, and reclaims adverse effects associated with environmental risks or effects pathways. The results of the EAR (De Beers 2002a) and Review Panel (MVEIRB 2003) for the Mine concluded that there were no significant residual effects to wildlife and wildlife habitat, so offsetting is not required. The Bathurst Caribou Range Plan (GNWT-ENR 2019b) suggests that financial and in-kind contributions to science and Traditional Knowledge research and monitoring (guardianship programs) are a form of offsetting even though this form of compensation cannot be demonstrated to result in no net loss or a net gain. The Mine has a history of contributions that can be considered compensatory actions. The Mine has made financial contributions to the GNWT's caribou collaring program that has supported increases in the number of collars deployed and deployment of high resolution geo-fenced collars, which will better inform management and the ecology of caribou. The Mine has contributed to DNA hair snagging studies for grizzly bear and wolverine that provide demographic information and have informed species at risk assessments by the NWT Species at Risk Committee (NWT SARC 2014, 2017), and cumulative effects assessments and management by the GNWT. The Mine has completed zone of influence (ZOI) monitoring and analysis, which does not inform on Mine mitigation but

contributes to understanding cumulative effects to caribou (De Beers 2008b; Boulanger et al. 2012). Monitoring results during closure and post-closure of the Mine will also fill an information gap about effects to wildlife during decommissioning/demolition, reclamation, and post-closure activities.

A primary direct effect from Mine development is the small observed loss of vegetation communities and associated wildlife habitat. Mitigation for loss of wildlife habitat consists of reclamation activities in accordance with the Final Revegetation Plan (De Beers 2020a) and the FCRP (De Beers 2021a). Reclamation is expected reduce/replace the amount of disturbed vegetation and wildlife habitat over the long term during and beyond post-closure.

Incidents are considered direct effects and include any wildlife interaction at the Mine site that requires a response by Mine personnel, which may range from simple deterrent actions to the injury or death of an animal. Mitigation actions implemented at the Snap Lake Mine previously during construction and operation (i.e., WMP and WWHPP), and into closure and post-closure to reduce the potential for Mine-related wildlife incidents include:

- provide training to on-site personnel about wildlife awareness and safety including the dangers of improper food waste disposal and feeding wildlife (De Beers 2021b);
- education and enforcement of proper waste management practices to all workers and visitors to the site (De Beers 2021b);
- implement waste management awareness programs (De Beers 2021b);
- continual improvement of the waste management program through adaptive management (De Beers 2021b);
- implementation of the Spill Contingency Plan (De Beers 2020b);
- prohibit hunting, trapping, harvesting and fishing by site staff and contractors;
- prohibit the personal use of recreational vehicles;
- establish and enforce speed limits (30 km/hr) on roads;
- recording the presence of wildlife at site (OP-014);
- wildlife will have the right-of-way on roads;
- wildlife and raptor nest surveys of areas prior to reclamation or decommission activities (OP-014);
- isolate and remove any chemical hazards to wildlife (i.e., spill management);
- deter wildlife from hazardous areas (OP-194);
- avoid destruction of active bird nests;
- 20 m buffer zones are used around active nests found at site;
- staff are alerted to the presence of wildlife to protect work and wildlife safety; and,
- zero tolerance toward harassment of wildlife.

Sensory disturbances such as the presence of people, smells, lights, noise and dust may alter the suitability of wildlife habitat indirectly even when wildlife habitat has not been physically disturbed. Mitigations implemented at the Mine previously and during closure to reduce the potential for Mine-related sensory disturbance include:

- manage fugitive dust (e.g., surface watering as required) in accordance with the Air Quality Emissions Management and Monitoring Plan (AQEMMP) (De Beers 2019b);
- enforce speed limits (maximum of 30 km/hr) to assist in reducing the production of dust and noise;
- prohibit recreational vehicle use by personnel; and
- provide environmental sensitivity training for personnel.

1.9 Monitoring of Mine-related Effects

Monitoring of Mine-related effects will include the following components:

- direct loss of vegetation communities associated with the Mine footprint; and
- site observations of wildlife and Mine-related incidents.

Monitoring of sensory disturbance to wildlife in the recent versions of the monitoring program (i.e., WEMP and WMP) was focused on caribou and included two components:

- whether the caribou ZOI changes in relation to Mine activity; and
- whether caribou behaviour changes with distance from the Mine.

The sensory disturbance programs for caribou were seldom implemented due to insufficient numbers of caribou in proximity to Mine. Caribou populations have dramatically declined in the region over the past two decades. De Beers will use collared caribou data instead of aerial surveys for ZOI monitoring.

De Beers continues to support the gathering of Traditional Knowledge and application of Traditional Knowledge to the monitoring and mitigation of the Mine. The primary mechanism for this is continued support of the SLEMA and its Traditional Knowledge Panel. De Beers also adheres to the Engagement Plan for informing and receiving input from the Aboriginal Parties.

Closure of the Mine represents a change in the activity at the Mine site where the focus is on decommissioning infrastructure, rehabilitating areas disturbed, and implementing engineering plans for Mine Components that are to remain permanently in accordance with the FCRP (De Beers 2021a). The overarching goal of the FCRP is to return the site, and affected areas around the Mine, to technically viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and with human activities. Activities associated with closure will involve the use of heavy machinery and equipment and human presence similar to the Mine construction phase. However, the intensity, frequency and duration of these activities and number of people on site will vary over closure and post-closure. De Beers will implement the WMMP during the closure and post-closure phase of the Mine with the level of monitoring (e.g., component type, intensity, frequency, and duration) commensurate with the level of activities and number and capacity of staff on site.

The WMMP has been organized to generally follow the guidelines for compliance with the *NWT Wildlife Act* (GNWT-ENR 2019a). The Snap Lake WMMP contains the criteria for a Tier 2 WMMP in accordance with GNWT guidelines (GNWT-ENR 2019a) and the Mine entering the closure phase. Each component of the WMMP includes the following sections:

- an introduction that links Mine activities as described in the EAR and potential effects on wildlife;
- a description of the objective(s);
- a description of the biological indicators (measured parameters) that will be used to assess the accuracy of effects predictions, identify unexpected effects, and evaluate the effectiveness of mitigation measures for the Mine;
- a description of the sampling program, field protocols, analytical techniques, and quality assurance/quality control (QA/QC) procedures;
- a description of the format for the WMMP Annual Report, and how the report should be used to periodically evaluate and adjust the components included in the WMMP; and
- an update to the program for closure and post-closure.

1.10 Related Mine Plans and Documents

The WMMP is part of a series of monitoring plans and programs that have been created in compliance with various licenses and agreements, to verify the accuracy of potential effects, and to determine the effectiveness of mitigation. Other monitoring plans, programs, licenses, and agreements that are related to the WMMP include:

- Environmental Agreement;
- Land Use Permit;
- AQEMMP (De Beers 2019b);
- Engagement Plan (De Beers 2019a);
- FCRP (De Beers 2021a);
- Final Revegetation Plan (De Beers 2020a);
- Spill Contingency Plan (De Beers 2020b);
- Vegetation Monitoring Program (De Beers 2019c); and

Waste Management Plan (De Beers 2021b). Although the WMMP is a stand-alone plan, in areas of disagreement between the management plans, deferral will be made to the regulated plans under the MVLWB requirements.

2. DIRECT EFFECTS

This section of the WMMP considers direct, physical effects to wildlife habitat from the Mine, such as removal, alteration, and reclamation of vegetation communities, which can alter wildlife movement, abundance, and distribution. Other direct effects include Mine-related injury or mortality to animals. Direct effects are used to evaluate mitigation of the Mine site and activities and apply to all wildlife, not just VECs. Monitoring components of direct effects include:

- vegetation loss;
- site wildlife monitoring and incidents; and
- wildlife effects associated with the winter access road.

2.1 Vegetation Loss

Each wildlife species has specific habitat requirements that are necessary for finding food, shelter (from predators and weather), and a suitable place for raising young. For example, barren-ground grizzly bears select home ranges that include more esker, tussock/hummock, birch seep, and riparian tall shrub areas relative to other habitat types (McLoughlin et al. 2002). Alternately, caribou prefer heath tundra relative to other habitats during the northern migration but exhibit greater use of sedge wetlands and tussock/hummock habitats during the post-calving migration (BHP Billiton 2004; Johnson et al. 2005).

The summary of cumulative annual predicted habitat loss for each Ecological Landscape Classification (ELC) unit is provided in the EAR (De Beers 2002a). At full development, the Mine was predicted to disturb 219 hectares (ha) of soil and vegetation based on 2.4 metres (m) resolution land cover data (De Beers 2018). Most of this loss occurred during the first year of construction. During operation, the extent of terrestrial disturbance was 192.4 ha, which is 23.9 ha less than predicted. Additional adverse effects to vegetation associated with closure and post-closure are expected to be minimal. Decommissioning/demolition of Mine facilities and infrastructure and reclamation/revegetation are anticipated to result in positive changes to vegetation communities and create functional wildlife habitat. Mitigation measures to limit vegetation loss during life of Mine include the following:

- confirm the Mine footprint is kept within the area authorized by the Land Use Permit;
- promote natural revegetation and practice progressive reclamation;
- implement the FCRP for the Mine (De Beers 2021a); and
- implement the Final Revegetation Plan for the Mine (De Beers 2020a).

2.1.1 Objective

Disturbance to vegetation and associated wildlife habitat was expected to occur directly from the construction of Mine infrastructure. In the EAR, the total direct loss or alteration to wildlife habitat within the study area was predicted to be 219 ha at full development using 2002 land cover classification (De Beers 2018). This area includes the core Mine area, airstrip, and the North Pile, as well as the esker quarry, the esker access road (a temporary winter road), and the winter access road from the Tibbitt-to-

Contwoyto winter road to the Mine site. Natural areas used for Mine facilities were assumed to be effectively lost to wildlife for the duration of the Mine life and for several decades after closure, until natural vegetation becomes re-established. The area used in the EAR predictions was a conservative estimate; physically altered areas will be reclaimed progressively throughout closure to reduce and restore the extent of disturbed habitat.

Reclamation is designed to encourage a natural succession of indigenous plant species on priority areas within the Mine site (i.e., physical footprint). Where appropriate, grading and contouring will be done to promote soil stability and revegetation. Where rock slopes or other site features preclude revegetation, materials such as capping rock may be used to provide long-term stability.

This component of the WMMP has the following objective:

- To determine if the amount of direct habitat loss is greater than 219 ha as predicted in the EAR (De Beers 2002a).

Monitoring for habitat change with respect to reclamation and revegetation is primarily completed through the Vegetation Monitoring Program (De Beers 2019c). Wildlife use of reclaimed and revegetated areas will be monitored through systematic site visits to record signs of wildlife activity (e.g., nests, tracks, and scat). Records of incidental wildlife observations during times of site occupancy will also be used to monitor wildlife use of reclaimed and revegetated areas.

2.1.2 Study Area

The study area for this component of the WMMP includes the Mine site.

2.1.3 Field Methods

Monitoring the direct effects of the development on wildlife habitat will focus on the cumulative area of ELC units (vegetation types) altered. Included in this cumulative total will be both the area of ELC units altered due to previous Mine development, and the area of successfully reclaimed and revegetated ELC units (Vegetation Monitoring Program (De Beers 2019c) and FCRP (De Beers 2021a)). Changes to ELC units will be estimated using ground surveys, satellite imagery, and Geographical Information System (GIS) analysis.

2.1.3.1 Frequency

The cumulative loss of ELC units (wildlife habitat) will be measured immediately before closure activities. In accordance with the Final Revegetation Plan (De Beers 2020a), once revegetation and reclamation are complete, the reclamation sample plots will be monitored annually for the first five years. If after five years the closure criteria are not achieved, the reclamation plots will be monitored on a five-year interval until the closure criteria are achieved. The frequency of reclamation monitoring is subject to change depending on the results, trends, and regulatory requirements. Information on the change in the ELC unit area required for the analysis of cumulative changes in wildlife habitat will be obtained from the Vegetation Monitoring Program (De Beers 2019c).

2.1.3.2 Parameters

Parameters are the area of the Mine footprint, ELC units, and reclaimed habitats as defined by the Vegetation Monitoring Program (De Beers 2019c). Indicators of wildlife use of reclaimed and revegetated areas are animal observations, animal signs (tracks, scat, feeding areas), upland breeding bird nests, raptor nests and mammal dens and burrows.

2.1.4 Data Analyses

Analyses will be completed in a GIS platform to compare the predicted and observed cumulative area of ELC units altered due to Mine activities, including revegetated areas and reclaimed ELC units. Qualitative and quantitative (depending on the amount of data obtained) analyses will also be performed to identify long-term trends in wildlife use of revegetated and reclaimed areas.

2.2 Site Wildlife Monitoring and Incidents

Mine-related activities can result in wildlife incidents such as wildlife interactions with the Mine site or staff that require action such as the use of deterrents, or result in property damage, injury or death of wildlife. Food garbage, oil products, and shelter opportunities can attract wildlife and increase the risk of adverse animal-human interactions, and vehicle or aircraft collisions with wildlife. Injury or mortality from vehicles, aircraft or the consumption of toxic material from spills can also occur for animals passing through the Mine site. However, effective waste management, wildlife safety, the Spill Contingency Plan (De Beers 2020b), and employee education mitigate the risk of wildlife injury and mortality.

Raptors (falcons, hawks, and owls) and other bird species are known to nest on buildings and other site infrastructure within mining areas (BHP Billiton 2003, 2011; DDMI 2010), which can be dangerous to the birds if not mitigated. The tundra peregrine falcon (*Falco peregrinus anatum-tundrius complex*) is designated as a species of special concern by COSEWIC, but has no status federally or territorially (GNWT-ENR 2012a). This species has been observed to nest adjacent to mine sites and in open pits. Unoccupied nests detected prior to closure activities will be reported to ENR or ECCC to determine the appropriate course of action.

Mitigations implemented at the Mine to reduce the potential for Mine-related wildlife incidents include:

- provide training to on-site personnel about wildlife awareness and safety including the dangers of improper food waste disposal and feeding wildlife (De Beers 2021b);
- education and enforcement of proper waste management practices to all workers and visitors to the site (De Beers 2021b);
- implement waste management awareness programs (De Beers 2021b);
- continual improvement of the waste management program through adaptive management (De Beers 2021b);
- prohibit hunting, trapping, harvesting and fishing by employees and contractors;
- establish and enforce speed limits (maximum of 30 km/hr) on roads;

- wildlife will have the right-of-way on roads;
- wildlife and raptor nest surveys of areas prior to decommissioning/demolition and reclamation activities (OP-014);
- isolate and remove any chemical hazards to wildlife (i.e., Spill Contingency Plan; De Beers 2020b);
- avoid destruction of active bird nests; and
- zero tolerance toward harassment of wildlife.

De Beers monitors the number of wildlife incidents, which are reported in an annual wildlife report. Site monitoring of wildlife incidents and mortalities will also inform on the progress of closure objectives in the FCRP (De Beers 2021a), such as SW3, SW4, SW6, NP2 and I2 associated with wildlife safety (Appendix C). However, the success indicators in the FCRP (De Beers 2021a) are not measured and determined from wildlife monitoring. For example, closure objective SW1 is that dust levels are safe for people, vegetation, aquatic life, and wildlife and achievement of this objective will be measured and determined from dust and vegetation monitoring for metals concentrations. Other closure objectives associated with stability of Mine Components (e.g., Mine Rock Piles) and wildlife safety will be determined from engineering designs and inspections (Appendix C; De Beers 2021a).

2.2.1 Objectives

De Beers will monitor Mine-related interactions, injuries, or mortality (i.e., incidents) to wildlife during closure and post-closure. Observations of wildlife on and adjacent to the Mine site will also be recorded. The program is designed to provide regular reporting and to contribute to an understanding of the best practices that can be used to limit Mine-related incidents with wildlife. All wildlife species will be considered, not just VECs.

This component of the WMMP has the following objectives:

- monitor the number of Mine-related incidents with wildlife on site and the winter access road (OP-014; OP-001);
- record the presence of wildlife on and adjacent to the Mine site and winter access road (OP-014; OP-001);
- protect wildlife from site hazards and closure activities;
- implement mitigation for bird nests that are located within the lease boundary where required;
- inform on waste management practices;
- describe the annual frequency of public use of the winter access road (OP-001);
- include community participation in closure monitoring programs; and
- contribute monitoring on the progress of closure objectives of the FCRP (Appendix C; De Beers 2021a).

2.2.2 Study Area

The study area for this component of the WMMP includes the Mine site and the winter access road.

2.2.3 Field Methods

2.2.3.1 Wildlife Incidents

An incident is defined as any wildlife interaction that requires a response by Mine personnel. This may include simple deterrent actions (e.g., deterring caribou or muskox off the airstrip) up to mortality. Records will be kept of all wildlife incidents that occur or are discovered within the Mine site area (Appendix B). Incidents will be reported annually in the WMMP and as part of the EMS reporting.

Observations of nesting activity on Mine infrastructure by bird species will be recorded, and decommissioning/demolition and reclamation activities in the area around the nest will be suspended until the nest is no longer active. De Beers will report the presence of active nests to the regulating authority of the species (i.e., ENR or Canadian Wildlife Service).

2.2.3.2 Monitoring of Wildlife Presence within the Mine Site

De Beers will record incidental observations of common, uncommon, rare or new species (i.e., species that have expanded their range to include the study area). As well, the *Species at Risk (NWT) Act*, which was implemented in February 2010, provides a list of wildlife and plant species targeted for conservation (GNWT-ENR 2012a). The WMMP may be expanded to include rare or new species depending on the frequency of observations and information from other resource users of the study area. The final decision to include rare or new species in the WMMP will be based on discussions with communities, SLEMA, and relevant government agencies.

The surface Mine Components described in the FCRP (De Beers 2021a) will be the focus of monitoring activities to protect wildlife from decommissioning/demolition and reclamation activities. These include the North Pile and related Water Management System and Surface Infrastructure (e.g., airstrip, buildings, waste management areas), which will be surveyed once prior to decommissioning activities commencing. Observers will record the location, survey time and duration, species observed, the number of animals, sex and age (if possible), approximate distance from site infrastructure, and global positioning system (GPS) coordinates. Observers will also record any other details that could be considered important (e.g., injured wildlife, wildlife consuming food waste). Systematic surveys will allow the number of incidents to be standardized and assessed for temporal trends. In addition to recording evidence of wildlife use, inspections of waste management areas will also record the presence of wildlife attractants (e.g., food, food packaging) to determine the effectiveness of the waste management system (De Beers 2021b).

During post-closure when the site is unoccupied by staff and contractors, wildlife cameras will be used at Mine Components to monitor and contribute to the progress of achieving closure objectives related to safe passage and use by wildlife. For example, cameras may record species presence in or moving through revegetated and reclaimed areas. Thus, information from wildlife monitoring is anticipated to provide a secondary line of evidence on reclamation success (Appendix C; De Beers 2021a).

Winter Access Road

Security staff will record evidence of traffic-wildlife collisions, private traffic use, and wildlife occurrence along the winter access road during years when the road is active, as part of regular monitoring for road maintenance, spills, and break-downs. The GNWT-ENR maintains responsibility for monitoring and management of wildlife harvest.

2.2.4 Frequency

Incidental observations of wildlife will be collected by site personnel while on site during closure and post-closure. Systematic surveys of the Mine site and winter access road will occur once a week during winter road operations, and approximately once every two weeks for site wide observations when the site is occupied and/or the winter road is operational during closure.

2.2.5 Parameters

Parameters include the number and location of recorded wildlife incidents, and observations from Mine site surveys and remote cameras. Parameters associated with waste management inspections will be the proportion of inspections where wildlife attractants, misdirected waste, and observations of wildlife sign are observed. For wildlife cameras, the number, type of species and frequency observed recorded in photos will be reported (OP-201). Recorded injuries and mortalities will also be reported. For the winter access road monitoring, the number of traffic-wildlife collisions, frequency of private traffic use and wildlife observed will be recorded.

2.2.6 Data Analyses

Data analyses will be generally be limited to summary statistics. If there are sufficient data, then temporal trends may also be assessed. Analyses will also attempt to determine the cause of incidents and identify any further mitigation that would improve the effectiveness of mitigation measures.

3. SENSORY DISTURBANCE TO WILDLIFE

Mining activity not only causes direct changes to habitat but can also disturb wildlife indirectly by influencing the quality of habitats adjacent to the physical footprint. The indirect effects of the Mine on wildlife habitat are typically associated with a decrease in habitat effectiveness or suitability. Fugitive dust, which could theoretically alter the palatability of forage or the growth of plants, and potentially the feeding behaviour of animals is addressed as part of the AQEMMP (De Beers 2019b) and the Vegetation Monitoring Program (De Beers 2019c).

The level of sensory disturbance during periods of closure are predicted to be higher than operation and care and maintenance and similar to construction due to an increased presence of people and machinery required for decommissioning/demolition and reclamation of Mine facilities and infrastructure. The following mitigations are implemented to limit sensory disturbance on wildlife at the Mine:

- use dust suppression strategies such as regular road watering, when required based on visual observations;
- enforce speed limits (30 km/hr) to reduce the production of dust and noise;
- prohibit recreational vehicle use by personnel; and
- provide environmental sensitivity training for personnel.

Monitoring for sensory disturbance is focused on caribou and at areas beyond the Mine site. This type of monitoring will inform on the effects related to closure and post-closure (when staff are on site) activities.

3.1 Caribou

The Bathurst caribou herd is one of six barren-ground caribou herds in the NWT and was previously considered the only herd with an annual range that included the Mine study area. Information from satellite collared cows collected by ENR confirms that the Bathurst herd annual range overlaps with the Mine study area. Collar data also suggest that caribou from the Beverley and Ahiak herds may occasionally occur in the study area, based on their presence in the adjacent Lac de Gras region. The most recent population estimate for the Bathurst herd determined by ENR in June 2018 was 8,200 animals (GNWT-ENR 2020). Both Traditional and scientific knowledge indicate that caribou herd size cycles relatively regularly with climate patterns (GNWT-ENR 2005, 2006; Bongelli et al. 2020). Caribou herds also exhibit periodic changes in seasonal migration routes and calving and winter ranges (Gunn et al. 1997; Gunn and D'Hont 2002; Boulanger et al. 2004; Bathurst Caribou Management Planning Committee 2004). A more recent analysis demonstrated changes in seasonal range attributes (e.g., area, location) with declining population size in the Bathurst herd (Virgl et al. 2017). Barren-ground caribou (*Rangifer tarandus groenlandicus*) were listed as threatened by the NWT Species at Risk Committee on 11 July 2018 (NWT SAR 2018). The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessed barren-ground caribou in November 2016 as threatened (COSEWIC 2016). A Recovery Strategy for Barren-ground Caribou in the Northwest Territories was issued by the Conference of Management Authorities in 2020 (NWT CMA 2020).

In 2019, ENR developed a Bathurst Caribou Range Plan (GNWT-ENR 2019b), which proposes development limitations and hierarchical management actions for different areas in the Bathurst annual range. The Mine is located in Area 2 of the Bathurst Caribou Range Plan, which has a designated moderate development

level and status of cautionary. The Mine is in compliance with recommended Management Tools described in the Bathurst Caribou Range Plan such as having a small site footprint (i.e., Habitat Conservation), contributing to the Barren-ground Caribou Management Strategy, and previously contributing to grizzly bear and wolverine hair snagging programs (i.e., Offsetting/Compensatory Mechanisms).

Monitoring studies for caribou during closure and post-closure has the following objective:

- Determine whether caribou behaviour changes in relation to Mining activities (Handley 2010);

Monitoring completed for this objective by the Mine addressed caribou behaviour based on changes in distribution (i.e., a zone of influence).

3.1.1 Zone of Influence Monitoring

Past methods of monitoring changes in caribou distribution in relation to Mine activities included the use of aerial surveys, beginning in 1999 during baseline studies. As the Bathurst caribou herd declined, the effectiveness of aerial surveys to provide an adequate number of caribou observations during the post-calving period for analysis also decreased (De Beers 2013c). Aerial surveys have not been triggered since 2012. Instead of collecting aerial survey data during closure and post-closure, De Beers will use collared caribou data to complete ZOI monitoring.

3.1.1.1 Objective

The objective of this component of the WMMP is to:

- Determine whether a caribou zone of influence changes in relation to mining activity.

3.1.1.2 Field Methods

Satellite and GPS collared caribou location data provided by the GNWT will be used for monitoring caribou distribution.

3.1.1.3 Frequency

The GNWT monitors caribou locations with satellite and GPS collars annually.

3.1.1.4 Parameters

Parameters include measuring changes in caribou habitat use relative to availability.

3.1.1.5 Data Analyses

Regression or other similar statistical models will be used to evaluate changes in a ZOI in relation to mining activity and natural factors. Mechanism(s) causing such changes are uncertain and likely related to sources of sensory disturbance operating simultaneously. Therefore, this monitoring does not directly inform on mitigation but is used to fill an information gap. Activity at the Mine site during the decommissioning/demolition period of closure is anticipated to be similar to construction and less than during operation and care and maintenance. De Beers will complete analysis of collar data at the end of the closure (1996 to end of closure), and once during post-closure (1996 to post-closure), depending on availability of collar data in the Mine study area.

4. ACTION LEVELS FOR ADAPTIVE MANAGEMENT

The study of direct effects associated with the Mine site and activities will provide feedback for decisions regarding the effectiveness of current mitigation designs, policies, and practices. Wildlife have remained in the area surrounding the Snap Lake Mine. Although some wildlife species may avoid the Mine site, occasionally there are wildlife within the Mine perimeter.

Action levels for vegetation loss will not be considered given that the Snap Lake Mine footprint and layout are ultimately governed by the required land use permits and leases for the Mine. Although the final Mine footprint may have some variance from that presented in the EAR (De Beers 2002a), these changes should be minor, and reclamation is expected to result in positive changes to vegetation communities and associated wildlife habitat in the long-term (during and beyond post-closure).

The direct Mine-related effects from injury or mortality of wildlife will be evaluated against the following action levels for adaptive management:

- Level I Change (no action required, continued monitoring): No wildlife present at site.
- Level II Change (implement mitigation, continued monitoring): Wildlife present at site.
- Level III Change (incident investigation, internal review of applicable mitigation, develop action plan): Any incident resulting in direct Mine-related injury or mortality of wildlife.

Action levels for dustfall were set out in the Vegetation Monitoring Program to act as a trigger for additional Triggered Monitoring Programs (De Beers 2019c), and include:

- if dustfall monitoring data exceed the Alberta Ambient Air Quality Guidelines (AEP 2017) for dustfall over a three-month period; or
- visual dust observations reported during daily operations when personnel are present show a high-dust condition extending over a long enough period that visible dusting of vegetation occurs, then a dustfall effects monitoring program is triggered.

A dustfall “trigger” may produce a response that would include enhanced dust suppression such as surface watering. In the event of a trigger, a Dustfall Effects Triggered Monitoring Program may also be initiated to identify if dust from the Mine has caused a significant difference in the plant species cover or composition of ELC types (units), in the vigour of plant species, or in the depth of the active layer. The Dustfall Effects Triggered Monitoring Program is described within the Vegetation Monitoring Program (De Beers 2019c). If studies show evidence that dustfall is the cause of significant changes in vegetation community or active layer characteristics, then the appropriate changes during closure and/or post-closure would be applied.

As described in Section 3.1, sensory disturbance mechanism(s) causing changes to caribou behaviour outside of the Mine footprint are uncertain and likely related to many sources (e.g., lights, smells, noise, dust) operating simultaneously. Therefore, ZOI monitoring does not directly inform on mitigation but is used to fill an information gap on associated ZOI magnitude, extent and duration during closure and post-closure. Therefore, action levels will not be considered in monitoring for sensory disturbance.

5. QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

For all components of the WMMP, the study designs, field methods, and data collection techniques will be reviewed on an ongoing basis by De Beers, their environmental consultants, SLEMA, government biologists, and regulators. In addition, raw data will be available for review by the SLEMA, community organizations, and government through the EMS data management system. These QA/QC control procedures will provide consistency and integrity of study designs, field protocols, and data collection techniques. Furthermore, continuous evaluation of study methods and results will be used to identify elements for modification or implementation of new techniques. This approach is intended to provide a WMMP that generates feedback for the EMS and adaptive environmental management strategies, and which concurrently complies with the terms and conditions in the Land Use Permit and Environmental Agreement for the Mine.

6. REPORTING

A report on the WMMP during the calendar year will be available for regulatory review in March of the following year and will follow Article 7.4 of the Environmental Agreement. Each year, the report will summarize the cumulative data and analyses from baseline through present. The main body of the report will be technical, providing details on the study design, sampling protocols, statistical analyses (where applicable), and results. A plain English summary will also be included. In addition to the WMMP components, additional information on environmental variables will be provided including weather, freshet timing, and winter access road season length. This additional information will be appended to the report. Records of wildlife incidents during the reporting year will also be appended.

Experience has shown that significant patterns associated with effects from mining operations and natural factors are typically not apparent with data collected during one- or two-year periods. However, if significant results are obtained within the short-term, then a discussion of these results will be provided annually. All results will be discussed in the context of predictions made in the EAR (De Beers 2002a) and relative to potential environmental significance.

The reports will provide a mechanism for determining the certainty of effects predictions, unanticipated ecological effects, and effectiveness of mitigation policies, procedures, and actions. The reports will also be used to help assess the effectiveness and utility of various components of the WMMP. Using the principles of adaptive management, the assessment will be used to make recommendations regarding the intensity, frequency, and duration of recording of wildlife observations, and possible changes to the components included in the monitoring program.

7. ROLES AND RESPONSIBILITIES

The Snap Lake Mine employs Environment Supervisors to manage and guide the Environment Technicians who implement the WMMP. The Environment Department is led by a superintendent who oversees regulatory concordance, reporting and engagement associated with the WMMP and provides the resources necessary to implement the WMMP, which is also intended to engage interested parties and solicit feedback.

8. REFERENCES

AEP (Alberta Environment and Parks, Government of Alberta). 2017. *Alberta Ambient Air Quality Objectives and Guideline Summary*. Government of Alberta.

Bathurst Caribou Management Planning Committee. 2004. *A Management Plan for the Bathurst Caribou Herd*. Bathurst Caribou Management Planning Committee. Yellowknife, NT, Canada.

BBOP (Business and Biodiversity Offset Programme). 2015. *Mitigation Hierarchy*. Available at: http://bbop.forest-trends.org/pages/mitigation_hierarchy. Accessed: February 4, 2015.

BHP Billiton. 2003. *Ekati Diamond Mine. 2002 Wildlife Effects Monitoring Program*. Prepared by Golder Associates Ltd. Yellowknife, NT, Canada.

BHP Billiton. 2004. *Ekati Diamond Mine. 2003 Wildlife Effects Monitoring Program*. Prepared by Golder Associates Ltd. Yellowknife, NT, Canada.

BHP Billiton. 2011. *Ekati Diamond Mine. 2010 Wildlife Effects Monitoring Program*. Prepared by Rescan Environmental Services Ltd. Yellowknife, NT, Canada.

Bongelli E, Dowsley M, Velasco-Herrera VM, Taylor M. 2020. *Do North American Migratory Barren-Ground Caribou Subpopulations Cycle?* Arctic 73: 326-346.

Boulanger J, Poole K, Fournier B, Wierzchowski J, Gaines T, Gunn A. 2004. *Assessment of Bathurst Caribou Movements and Distribution in the Slave Geological Province*. Department of Resources, Wildlife, and Economic Development, Government of the Northwest Territories. Yellowknife, NT. Manuscript Report No. 158.

Boulanger J, Poole KG, Gunn A, Wierzchowski J. 2012. *Estimating the Zone of Influence of Industrial Developments on Wildlife: A Migratory Caribou and Diamond Mine Case Study*. *Wildlife Biol* 18: 164-179.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2016. COSEWIC Assessment and Status Report on the Caribou *Rangifer tarandus*, Barren-ground population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 123 pp. (http://www.registrelep-sararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1).

Coulton DW, Virgl JA, English C. 2013. *Falcon Nest Occupancy and Hatch Success Near Two Diamond Mines in the Southern Arctic, Northwest Territories*. Avian Conservation and Ecology 8:14, http://dx.doi.org/10.5751/ACE-00621-080214.

DDMI (Diavik Diamond Mines Inc.). 2010. *Analysis of Environmental Effects from the Diavik Diamond Mine on Wildlife in the Lac De Gras Region*. Prepared by Golder Associates Ltd. Yellowknife, NWT, Canada.

De Beers (De Beers Canada Inc.). 2002a. *Snap Lake Diamond Project: Environmental Assessment Report*. Submitted to the Mackenzie Valley Environmental Impact Review Board. Yellowknife, NT, Canada.

De Beers. 2002b. *Snap Lake Diamond Project Environmental Management System*. Yellowknife, NT, Canada.

De Beers. 2004. *Snap Lake Diamond Project Wildlife Effects Monitoring Program*. Yellowknife, NT, Canada.

De Beers. 2006. *Snap Lake Domestic Waste Management Plan*. Submitted to the Mackenzie Valley Land and Water Board. Snap Lake Diamond Project. May 2006.

De Beers. 2008a. *Snap Lake Mine: Wildlife Management Plan*. Prepared by Golder Associates Ltd., Yellowknife, NT, Canada.

De Beers. 2008b. Snap Lake Mine: Analysis of Environmental Effects to Wildlife, 1999 to 2007. Prepared for De Beers Canada Inc. by Golder Associates Ltd., Calgary, AB.

De Beers. 2013a. *Snap Lake Mine Wildlife and Wildlife Habitat Protection Plan.* Prepared for De Beers Canada Inc., by Golder Associates Ltd., Yellowknife NT.

De Beers. 2013b. *Snap Lake Mine Wildlife Effects Monitoring Program.* Prepared for De Beers Canada Inc., by Golder Associates Ltd., Yellowknife NT.

De Beers. 2013c. *Snap Lake Mine Wildlife and Wildlife Habitat Protection Plan: 2013 Annual Report*. Prepared for De Beers Canada Inc. by Golder Associates Ltd. Yellowknife, NT.

De Beers. 2018. *Snap Lake Mine 2017 Wildlife and Wildlife Habitat Protection Monitoring Report*.

De Beers. 2019a. *Snap Lake Mine Engagement Plan*, Version 2.0. March, 2019.

De Beers. 2019b. *Snap Lake Mine Air Quality and Emissions Monitoring and Management Plan, Version 3*. Submitted to the Mackenzie Valley Land and Water Board, March 2019.

De Beers. 2019c. *Snap Lake Mine Vegetation Monitoring Program*. March 2019.

De Beers. 2020a. *Snap Lake Mine Revegetation Plan*. Appendix J of the Snap Lake Mine Final Closure and Reclamation Plan. August, 2020. Prepared for De Beers Canada Inc. by Arktis Solutions Inc.

De Beers. 2020b. *Snap Lake Spill Contingency Plan, Version 5.* August 2020.

De Beers. 2021a. *Snap Lake Mine Final Closure and Reclamation Plan*, Version 1.1. Submitted to the Mackenzie Valley Land and Water Board, March 2021.

De Beers. 2021b. *Snap Lake Mine Waste Management Plan, Version 5.1*. Submitted to the Mackenzie Valley Land and Water Board. January 2021.

Diepstraten RAE, JessenTD, Fauvelle CMD, Musiani MM. 2018. Does climate change and plant phenology research neglect the Arctic tundra? *Ecosphere*. Volume 9(9).

Efford, M. and J. Boulanger J. 2018. *Analyses of Wolverine DNA Mark-Recapture Sampling in the Northwest Territories 2004–2015*. Prepared for the Department of Environment and Natural Resources, Government of the Northwest Territories.

ERM. 2018. Ekati Diamond Mine and Diavik Diamond Mine: Grizzly Bear Population Assessment in the Lac de Gras Region, Northwest Territories – Final Report. Prepared for Dominion Diamond Ekati ULC and Diavik Diamond Mine (2012) Inc. by ERM Consultants Canada Ltd., Vancouver, BC.

GNWT-ENR (Government of the Northwest Territories, Department of Environment and Natural Resources). 2005. *NWT Species 2000: General status ranks of wild species in the Northwest Territories. 5. Status Ranks – What did we find?* Yellowknife, NT, Canada.

GNWT-ENR. 2006. Caribou Forever - *Our Heritage, Our Responsibility: A Barren-ground Caribou Management Strategy for the Northwest Territories 2006-2010*. Environment and Natural Resources, Yellowknife, NT, Canada.

GNWT-ENR. 2012a. *Species at Risk in the Northwest Territories*. A Guide to Species in the NWT Currently Listed, or Considered for Listing, under Federal and Territorial Species at Risk Legislation. Government of the Northwest Territories, Yellowknife, NT, Canada.

GWNT-ENR. 2012b. *Proposed new Wildlife Act for the Northwest Territories; Plain Language Draft for Consultation*. Government of the Northwest Territories, Yellowknife, NT, Canada.

GNWT-ENR. 2013. *Wildlife & Wildlife Habitat Protection Plan and Wildlife Effects Monitoring Program Guidelines*. Yellowknife, NT.

GNWT-ENR. 2019a. *Wildlife Management and Monitoring Plan (WMMP) Process and Content Guidelines*. Yellowknife, NT, Canada.

GNWT-ENR. 2019b. *Bathurst Caribou Range Plan*. Available at: https://www.enr.gov.nt.ca/en/services/caribou-de-la-toundra/bathurst-caribou-range-plan.

GNWT-ENR. 2020a. *Bathurst Caribou Herd*. Government of the Northwest Territories, Department of Environment and Natural Resources. [accessed March 2018]. https://www.enr.gov.nt.ca/en/services/barren-groundcaribou/bathurst-herd.

Golder (Golder Associates Ltd.). 2015. *Sample Size Requirements for Caribou Behaviour Monitoring*. Prepared for De Beers Canada Inc., by Golder Associates Ltd. Yellowknife, NT.

Gunn A, Dragon J, Nishi J. 1997. *Bathurst Calving Ground Survey, 1996*. Department of Renewable Resources. File Report No. 119. Yellowknife, NT, Canada.

Gunn A, D'Hont A. 2002. *Extent of Calving for the Bathurst and Ahiak Caribou Herds June 2002*. Department of Resources, Wildlife and Economic Development, Yellowknife, NT, Canada. Manuscript Report No. 149.

Handley J. 2010. *Diamond Mine Wildlife Monitoring Workshop Report*. Prepared for Environment and Natural Resources. Yellowknife, NT, Canada.

IFC (International Finance Corporation). 2012. *Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources*. January 12, 2012.

Jessen, T.D. 2017. *Spatiotemporal Factors Influencing the Distribution and Abundance of Grizzly Bears (Ursus Arctos) inhabiting the barren grounds of the Central Canadian Arctic*. MSC. Thesis. University of Calgary.

Johnson CJ, Boyce MS, Case RL, Cluff DH, Gau RJ, Gunn A, Mulders R. 2005. *Cumulative Effects of Human Developments on Arctic Wildlife*. Wildlife Monograph No. 160. The Wildlife Society.

Lutsel K'e Dene First Nation. 2001. *Traditional Knowledge of the Na Yaghe Kue Region: An Assessment of the Snap Lake Project. Final Assessment Report*. Submitted to De Beers Canada Mining Inc. Yellowknife, NT, Canada.

Marshall R. 2009. *Diamond Mine Wildlife Monitoring Workshop Report*. Prepared for Environment and Natural Resources. Yellowknife, NT, Canada.

McLoughlin PD, Case RL, Gau RJ, Cluff HD, Mulders R, Messier F. 2002. *Hierarchical Habitat Selection by Barren-ground Grizzly Bears in the Central Canadian Arctic*. *Oceologia* 132:102-108.

MVEIRB (Mackenzie Valley Environmental Impact Review Board). 2003. *Report of Environmental Assessment and Reasons for Decision on the De Beers Canada Mining Inc. Snap Lake Diamond Project*. Yellowknife, NT, Canada.

NWT CMA (Northwest Territories Conference of Management Authorities). 2018. *Consensus Agreement on Not Listing Grizzly Bears in the NWT*. March 19, 2018.

NWT CMA. 2020. Recovery Strategy for Barren-ground Caribou (*Rangifer tarandus groenlandicus*) in the Northwest Territories. Conference of Management Authorities, Yellowknife, NWT.

NWT SARC ((Northwest Territories Species at Risk Committee). 2014. *Species Status Report for Wolverine (Gulo gulo) in the Northwest Territories*. Species at Risk Committee, Yellowknife, NT.

NWT SARC. 2017. *Species Status Report for Grizzly Bear (Ursus arctos) in the Northwest Territories*. Species at Risk Committee, Yellowknife, NT.

NWT SARC. 2018. *Species Status Report for Barren-ground Caribou (Rangifer tarandus groenlandicus) in the Northwest Territories*. Species at Risk Committee, Yellowknife, NT.

Rescan. 2012. *Joint Regional Grizzly Bear DNA Proposal, 2012*. Prepared for BHP Billiton Canada Inc., De Beers Canada Inc., and Rio Tinto Canada. Vancouver, BC, Canada.

Spence CE, Gratton P. 2005. *Defining a National Park Boundary – Lessons Learned from Stakeholder Involvement*. Available at: http://www.miningnorth.com/ministersConference/2003/MAC.pdf. Accessed: July 27, 2015.

Virgl JA, Rettie JW, Coulton D. 2017. *Spatial and Temporal Changes in Seasonal Range Attributes in a Declining Barren-Ground Caribou Herd.* Rangifer 37: 31-46.

Weledeh Yellowknives Dene. 1997. *Weledeh Yellowknives Dene, A History*. Yellowknives Dene First Nations Elders Advisory Council. Yellowknife, NT, Canada.

Wolfe SA, Griffith B, Wolfe CAG. 2000. *Response of Reindeer and Caribou to Human Activities*. Polar Research 19: 63-73.

9. GLOSSARY

Adaptive Management	Management method that incorporates change from monitoring results and is an iterative and ongoing process.
Aerial Surveys	The collection of data in a fixed-wing aircraft or helicopter.
Barren-Ground	Describes the Arctic tundra landscape north of the treeline.
Barriers	Impediment to wildlife movement or behaviour, e.g., roads, airstrips, facilities.
Baseline	Describes the assessed pre-development environmental setting (1999 to 2004), against which changes in the environment from the Snap Lake Diamond Project will be assessed.
Disturbance	A natural or human-induced process that influences the patterns of species, populations, and/or individuals.
Ecological Land Classification (ELC)	A means of classifying landscapes by integrating landforms, soils and vegetation components in a hierarchical manner.
Esker	Linear structures of loose sand and gravel, formed by glacial rivers. They provide critical habitat for carnivores and ungulates in the Arctic.
Footprint	The proposed development area that directly affects the soil and vegetation components of the landscape.
Freshet	A spring thaw event resulting from melting snow and ice on rivers.
Fugitive Dust	Dust that is difficult to control or retain.
Ground Survey	The collection of data from the ground (e.g., by foot or snowmobile).
Habitat	The place or environment where a plant or animal naturally or normally lives or occurs.
Heath	Any of a family (Ericaceae, the heath family) of shrubby dicotyledonous and often evergreen plants that thrive on open barren usually acid and ill-drained soil.
Home Range	The area to which an animal usually confines its annual or seasonal activities.
Indigenous Species	Originating and living or occurring naturally in an area or environment.
Land Classification Unit	Units of land categorized based on specific properties or suitability for specific purposes.
Lichen	Complex thallophytic plants made up of an alga and a fungus growing in symbiotic association on a solid surface (e.g., on a rock).
Mine Footprint	The disturbed area covered by the Mine site.

Natural Variation	Disparity in an environmental condition that occurs naturally, without human-induced disturbance.
Non-Nursery	Group of animals composed of adult females, adult males, or adult females and males, but no calves.
Nursery	Group of animals composed of adult females with calves, adults with calves.
Relative Abundance	An estimate of the number of individuals within an area relative to the number of individuals within a larger area.
Riparian	A band of terrestrial habitat that is adjacent to and directly influenced by streams, rivers or lakes.
Sample Plot	A sampling unit used to estimate variables within a patch.
Sedge	Any of a family (*Cyperaceae*, the sedge family) of usually tufted marsh plants similar to but taxonomically different from grasses.
Tundra	A level or rolling treeless plain that is characteristic of Arctic and subarctic regions, consists of black mucky soil with a permanently frozen subsoil, and has a dominant vegetation of mosses, lichens, herbs, and dwarf shrubs. Analogous to barren-ground.
Upland	Elevated land (e.g., hilly or mountainous).
Valued Ecosystem Component (VEC)	A component of the environment that is representative of traditional, public, and scientific values (e.g., caribou or areas of rare plant potential and traditional plant potential).
Wildlife	Under the proposed new *Species at Risk Act*, wildlife includes all wild vertebrates and invertebrates except fish and marine mammals. This definition includes mammals, birds, reptiles, amphibians, and insects (GNWT-ENR 2012b).
Zone of Influence (ZOI)	The geographic area where animal behaviour and activities may be influenced by mining activities.

APPENDIX A CONCORDANCE TABLE

Table A1 Concordance of Legislation/Regulation Requirements and Wildlife Management and Monitoring Plan Guidelines

Legislation/ Regulation/ Agreement	Requirement	Corresponding Section in WMMP	Responsible Regulatory Agency
Environmental Agreement	• Measure compliance with regulatory requirements • Determine the environmental effects of the Mine • Implement A Wildlife Management Plan • Test impact predictions • Measure the performance of operations and effectiveness of impact mitigation	Entire Document	Government of Canada, GNWT
Migratory Birds Convention Act, Migratory Bird Regulations	The taking of nests or eggs of migratory game or insectivorous or nongame birds shall be prohibited, except for scientific or propagating purposes under such laws or regulations as the High Contracting Powers may severally deem appropriate.	Section 2.2	CWS (ECCC)
NWT Wildlife Act	A Wildlife Management and Monitoring Plan must include: (a) a description of potential disturbance to big game and other prescribed wildlife, potential harm to wildlife and potential impacts on habitat; (b) a description of measures to be implemented for the mitigation of potential impacts; (c) the process for monitoring impacts and assessing whether mitigative measures are effective; and, (d) other prescribed requirements.	Entire Document	GNWT-ENR
Species at Risk Act and *Species at Risk (NWT) Act*	De Beers Group of Companies will adhere to requirements of all applicable Regulations or Recovery Plans that may be developed over the duration of the Mine.	Section 1.5	CWS (ECCC) GNWT-ENR
NWT Wildlife Act	Guidelines for the preparation of a Tier 2 Wildlife Management and Monitoring Plan (WMMP), dated June 2019.	Section 1.0	GNWT-ENR
	Purpose of and Objectives of the WMMP		
	Measures, conditions and developer commitments concordance table	Section 1.6	
	Engagement	Section 1.7	
	Mention of associated operational or management plans	Section 1.10	
	Project description	Section 1.0	
	Project map	Section 1.0	
	Affected species or habitat features	Section 1.4	
	Potential impacts to wildlife and wildlife habitat	Section 1.4	
	Employee wildlife awareness education and training	Section 1.8	
	Infrastructure design and camp layout for bear safety and/or to prevent denning, nesting, and roosting	Section 1.8	
	Management of camp waste and other wildlife attractants	Section 1.8	
	Timing restrictions and/or set back distances to protect wildlife and wildlife habitat features	Section 1.8	
	Direct habitat loss – minimizing the project's physical footprint	Section 2.1	

Table A1 Concordance of Legislation/Regulation Requirements and Wildlife Management and Monitoring Plan Guidelines

Legislation/ Regulation/ Agreement	Requirement	Corresponding Section in WMMP	Responsible Regulatory Agency
NWT Wildlife Act (cont'd)	Habitat alteration – minimizing physical manipulation of habitat that would decrease its value to wildlife	Section 2.1	
	Indirect habitat loss – minimizing functional habitat loss due to sensory disturbance, dust, etc.	Section 3.0	
	Management of hazards to wildlife (e.g., open pits, tailings ponds, roads, airstrips, spills)	Section 1.8	
	Wildlife deterrence procedures	Appendix B	
	Habitat restoration	Section 2.1	
	Description of the role of community wildlife monitors in implementing aspects of the plan	Section 1.7	
	Offsetting or compensatory measures	Section 1.9	
	Mitigation monitoring	Section 2.2	
	Wildlife effects monitoring	Sections 2.2, 3.1	
	Project footprint size reporting	Section 2.0	
	Description of approach to adaptive management	Section 4.0	
	Formal response frameworks with action levels	Section 4.0	
	Reporting protocols	Section 6.0	
	Roles and responsibilities	Section 7.0	
	Literature cited	Section 8.0	
	Glossary	Glossary	
	SOPs	Appendix B	
	Monitoring forms and data sheets	Appendix B	
	Reporting form templates	Appendix B	
	WMMP revisions tracking table	Page i	

CWS = Canadian Wildlife Service, Environment and Climate Change Canada.
ECCC = Environment and Climate Change Canada.
GNWT = Government of the Northwest Territories.
GNWT-ENR = Department of Environment and Natural Resources, Government of the Northwest Territories.

APPENDIX B STANDARD OPERATING PROCEDURES, DATA SHEETS AND REPORT FORMS

DE BEERS GROUP	SNAP LAKE MINE		
Department:	Environment & Permitting	**Document No.:**	*OP 194*
Section:		**Effective Date:**	March 19, 2021
OPERATING PROCEDURE –*Bear Deterrents*			
Revision:	1	**Replaces:**	
APPROVED:			

1.0 PURPOSE

To establish a procedure for deterring caribou and other wildlife from hazardous areas at the Snap Lake Mine (SLM).

2.0 SCOPE

This procedure applies to all employees and contractors at the SLM who have been trained in wildlife deterrents. This Operating Procedure (OP) outlines the step by step procedure for managing caribou and other wildlife observed at the mine site and away from areas that may be considered hazardous. Hazardous areas include the airstrip, high traffic areas, where heavy equipment is in use, and where blasting or demolition activities are taking place. The objective is to prevent wildlife injuries and mortalities by moving animals away from these areas and off the SLM site.

3.0 RESPONSIBILITIES

3.1. Mine General Manager or Designate:

3.1.1. Overall management of the SLM site and workforce.

3.2. Head of Departments, Superintendents or their Designates:

3.2.1. Ensure this procedure is communicated to their employees and contractors as applicable;

3.2.2. Ensure their employees and contractors have received the appropriate training as applicable; and

3.2.3. Ensure this procedure is implemented as applicable.

3.3. Supervisors:

3.3.1. Implement this procedure as applicable; and

3.3.2. Ensure this procedure is followed as applicable.

3.4. Environmental Superintendent, or Designates:

3.4.1. Monitor the implementation of this procedure; and

3.4.2. Ensure this procedure is maintained.

All printed copies are considered uncontrolled documents.

3.5. All Employees that use bear deterrents:

3.5.1. Understand and practice this procedure as required;

3.5.2. Be aware of applicable Safe Work Plans related to bears and other aggressive animals and bear deterrents;

3.5.3. Read and understand information contained in the approved Bear Awareness Program(s) before going into the field;

3.5.4. Ensure bear deterrents in use are within the specified expiry dates;

3.5.5. Record use of wildlife deterrents on the SLM Near Hit Reporting Card: CL 003; and

3.5.6. Ask their supervisor for clarification if they are unsure of any aspect of this procedure.

Responsibilities of Employers, Contractors, Supervisors and Employees are also described in the NWT Mine Health and Safety Act (Sections 15 – 18) and throughout the NWT Mine Health and Safety Regulations.

4.0 CRITICAL CONTROLS

A completed Job Risk Analysis can be found in Section 10.0, and lists hazards, unwanted events and controls in place for the tasks/activities related to bear deterrents (Refer to OP-193 Bear Deterrents):

5.0 PROCEDURE

5.1. Introduction

Caribou and other wildlife observations at site are called in by radio, or otherwise communicated as soon as possible to Environment Technicians by site employees, pilots or observed by Environment personnel conducting inspections in various areas around the mine site. Upon receiving the report of wildlife presence, ensure all pertinent information is collected from the caller- who is calling the report in, where is the animal spotted, what direction is the animal moving, are there people working in that general area. This information should be documented in the Wildlife log. Only personnel trained in deterrence actions should respond and attempt to move animals away from hazardous areas. Environment staff will communicate to contractors and staff about the location of animals to promote vigilance about the location where wildlife were observed. If there is no risk to the animal or to people, then the animals should be left undisturbed.

5.2. Herding Action

5.2.1. Animal herding in open or confined corridors will use a combination of a small truck and/or foot patrol as most appropriate to the local situation and terrain. The direction of herding will depend on their location or confined corridor

relative to the escape routes. The shortest escape route may not always be the most appropriate route.

5.2.2. Herding by vehicle and on foot will entail approaching animals at a slow speed (i.e., <5 km/hr for vehicles) and stopping when animals show an alarmed response. When animals stall, the patrol will slowly move forward to initiate a further response. Observation of wildlife behaviour will provide cues on when to proceed. Herding should never stimulate a Very Alarmed-Panic Escape Response. Herding should never cause animals to run, only to slowly move away from the hazardous area.

5.3. Bear Bangers

5.3.1. Bear bangers are used as a deterrent when wildlife comes too close to site personnel **but are never used on caribou**. Refer to OP-0193 on Bear Deterrents.

5.4. Air Horn

5.4.1. Using air horns and making noise while in the bush will deter animals from approaching. **Air hons are never used on caribou.** Making noise while walking is the best advice for protection against bear encounters. Whistles are not recommended because you can sound like an animal. NOTE: Air horns are ineffective at temperatures below 0° Celsius.

5.4.2. When wildlife deterrents are used it must be reported on a SLM Near - Hit Reporting Card (CL 003) which must be given to the SHR Coordinator or Environmental Coordinator.

5.5. Travelling with Bear Deterrents

5.5.1. Bear deterrents are restricted from commercial flights (refer to OP-0193 on Bear Deterrents).

5.5.2. See OP 178: Helicopter Safety – Transport of Hazardous and Bulky Material.

5.6. Bear Awareness

5.6.1. All personnel working outside of the camp area are required to receive the appropriate Bear Safety Awareness and orientation before going out in the field; this is available from the SHR/E and Training Departments (OP-193 Bear Deterrents).

5.6.2. All personnel working outside of the camp area are to have training on the use and care of bear bangers and bear spray before going out in the field. Training will be conducted by the SHR/E and Training Department or designate, who will maintain a record of the training (see OP-193 Bear Deterrents).

5.7. Sign-In Sheet

5.7.1. In an effort to mitigate the loss, and misplacement of bear deterrents, employees and contractors at the SLM site must sign-out and bring back bear deterrents on a daily basis to the Environmental Coordinator with the exception of air horns. On a daily basis the bear deterrents will be locked in a designated cabinet in the Environmental Coordinator's office with the information recorded on CL 175: Bear Deterrents Sign-Out Checklist.

5.8. Safe Work Plan

5.8.1. All field crews will add bear (or wildlife) encounters on their Safe Work Plans and Job Risk Assessments. See OP 208: Safe Work Plan Development Procedure.

6.0 APPROVAL

Name	Title	Date	Signature
	SHRT / Environmental Superintendent	March 19, 2021	

7.0 REVISION HISTORY

Noted below is the revision history of this document.

Revision	Date	Comments
1	March 19, 2021	Initial Issue of SLM Management System Documents

8.0 DEFINITIONS

None

DE BEERS GROUP	SNAP LAKE MINE		
Department:	Environment	**Document No.:**	**OP 014**
Section:		**Effective Date:**	March 19, 2021
OPERATING PROCEDURE – *Environmental Inspections*			
Revision:	2	**Replaces:**	1
APPROVED:	*Original Signature: Refer to Item 6. APPROVAL*		

1.0 PURPOSE

This document summarizes the environmental inspections that are required by the Snap Lake Safety, Health and Environmental Management System and all applicable environmental operating permits and environmental management plans during the Closure and Post-closure Phase of Snap Lake Mine (SLM).

2.0 SCOPE

This procedure applies to all employees and contractors at the SLM and associated facilities.

3.0 RESPONSIBILITIES

3.1. Mine General Manager or Designate:

3.1.1. Overall management of the SLM sites and workforce.

3.2. Heads of Departments, Superintendents or their Designates:

3.2.1. General inspections of their work sites for signs of environmental effects resulting from their activities, including waste storage and handling, spills, fuel and hazardous material storage and handling, and wildlife activity;

3.2.2. Accurate completion of inspection forms and other records; and

3.2.3. Reporting any environmental issues identified to the Environmental Manager or designate.

3.3. Environmental Superintendent or Designate:

3.3.1. Monitor the implementation of this procedure; and

3.3.2. Ensure this procedure is maintained.

3.4. Environmental Coordinator or Designate:

3.4.1. Monitor the implementation of this procedure;

3.4.2. Follow up on issues and corrective actions identified, and communicate these to the relevant Department or Contractor representative;

3.4.3. Ensure this procedure is maintained, and revised as required.

3.5. Environmental Technician or Designate:

3.5.1. Regular inspections of storage areas for waste, explosives, fuel and chemicals;

3.5.2. Regular inspections of Mine Components and surface infrastructure and facilities;

3.5.3. Compiling records and summaries of inspections carried out;

3.5.4. Accurate completion of inspection forms and other records within their control; and

3.5.5. Reporting the completion of inspection forms and other records.

3.6. All Employees:

3.6.1. Promptly reporting any environmental spills or other environmental problems, including problems with drinking water or sewage to the Environmental Coordinator or designate; and

3.6.2. Understanding and implementing this procedure as required.

Responsibilities of Employers, Contractors, Supervisors and Employees are also described in the NWT Mine Health and Safety Act (Sections 15 – 18) and throughout the NWT Mine Health and Safety Regulations.

4.0 CRITICAL CONTROLS

If not currently available, these will be identified during the next document review when the Job Risk Assessment is completed.

5.0 PROCEDURE

5.1. The Environmental Technician will inspect SLM facilities for wildlife presence immediately prior to closure activities involving decommissioning/demolition of infrastructure or areas where mobile equipment will used for reclamation or rehabilitation. Inspections will include searching entire areas where activities will occur for wildlife and nests (if applicable). Activities will not commence until the survey inspections are complete and the facilities or areas are deemed not to contain wildlife, nests, eggs or young. Unoccupied nests will be reported to the Department of Environment and Natural Resources, Government of the Northwest Territories or Environment and Climate Change Canada to determine the appropriate course of action.

5.2. The Environmental Technician will inspect SLM facilities and work areas, as described below, at a frequency of every two weeks or as outlined in specific OPS and

management plans. Results of these inspections will be recorded in checklists and forms as outlined in this procedure. The regular completion of Environmental Inspections will be tracked by the Environmental Coordinator or their designate using *CL 130: Environmental Inspection Tracking Table*. Any noted deficiencies will be recorded on *CL 035 Work Site Environmental Inspection* (unless otherwise specified), and reported to the Environmental Coordinator so corrective actions can be determined, tracked, and implemented in a timely manner.

5.3. The Environmental Technician will inspect waste storage areas every two weeks using *CL 071: Waste Inspection*. This includes inspecting maintenance areas and shops for appropriate handling of hazardous wastes in the workplace to ensure that secondary containment and spill response equipment is in place, containers are appropriately labelled, and that any full containers have been taken to the central hazardous waste management area. Environment personnel will also inspect the non-hazardous landfill site at least weekly for excessive dust, windblown litter, nuisance animals, odour, gate controls and other issues. Personnel will also survey water management ponds every two weeks for use by birds using the *Wildlife Sightings Log (CL 031)*.

5.4. The worker assigned as the "Responsible Person" in control of the open fire burn pit will check that it contains only clean wood and cardboard before starting the fire. This will include checking the area around the pile to be sure that the fire cannot spread to other nearby material and completing the Open burning Record Form.

5.5. When the SLM airstrip for fixed-wing aircraft is in use, a check of the airstrip is required to look for people, mobile equipment or wildlife such as bears or caribou within 100 m of the strip. This will be done on any day which an aircraft arrival is expected and again at reasonable intervals before expected aircraft arrival times. The radio operator must be immediately notified of any such risks so that they can notify inbound aircraft of the possible presence of animals or other activity on or near the runway. These observations are to be communicated to the Environmental Coordinator/Technician or designate and recorded *the Wildlife Sighting Log (CL 031)*.

5.6. Equipment Operators must conduct pre-use inspections on any equipment that is about to be operated to ensure that there is no leaking oil or fuel. Any such leakage must be fully contained by absorbent pads or other devices, locked-out to prevent use, and repaired prior to operation. Operators must also investigate any unusually noisy vehicle, generator or stationary engine to ensure that it is equipped with an exhaust muffler system that is in good working order. If not, repairs must be completed before the equipment is used (See *OP 004: Equipment Operations - Environmental Factors, OP 126: Zero Energy and Lockout*).

5.7. The Environmental Technician will inspect soil stockpiles, excavations, water bodies and protection measures every two weeks looking for signs of soil erosion, contamination or other problems (e.g., dead vegetation, discoloured runoff, etc.). Observations of any problems will be reported to the Environmental Manager and as appropriate through the *CL 035 Work Site Environmental Inspection* (See *OP 007: Vegetation Management*). Note that erosion inspections are not required during frozen ground conditions.

5.8. The Environmental Technician will inspect fuel storage areas and tanks and associated secondary containment and fuel handling infrastructure on a weekly basis for evidence of leaks, spills or other environmental problems, and record their observations on *CL 019 Fuel System Inspection Sheet*. See *OP 201: Petroleum Products* for additional details.

5.9. The Environmental Technician will inspect a representative sample of mining equipment, light vehicles and other mobile equipment for evidence of leakage, missing or damaged spill kits and fire extinguishers or other environmentally significant deficiencies on a weekly basis. Any problems noted will be reported to the Environmental Coordinator or designate and, as appropriate, through *CL 035 Work Site Environmental Inspection*.

5.10. Site Services workers will determine, on a weekly frequency, the inventory of gasoline, diesel and Jet-B fuels on site. They will do this by counting the number of fuel drums and measuring the depth of fuel in each bulk tank. The tank level readings will be converted to volume measurements, corrected for temperature expansion to a standard 15^{o} C temperature and recorded in fuel inventory tracking records (written or digital) stored within the Site Services Department. On a monthly basis, the Site Services Supervisor or their designate will reconcile fuel inventory measurements against consumption and deliveries to determine if unexplained losses or leaks are apparent. See *OP 201: Petroleum Products for details*.

5.11. The Environmental Technician will inspect operating pipeline(s) carrying water, wastewater, processed kimberlite or petroleum products on at least a monthly frequency, or as otherwise specified in other operating procedures, permits, or management plans. These inspections will be recorded on inspection form *CL 035 Work Site Environmental Inspection*.

5.12. The Environmental Technician will inspect spill response kits throughout the site, including contractor work areas and the on-site Spill Response Trailers on at least a monthly basis. Basic supplies will be replaced and any problems observed will be reported to the Environmental Coordinator. These inspections will be documented in *CL 035: Work Site Environmental Inspection* and *CL 088: Spill Kit Inspection Form*.

5.13. The Environmental Technician will inspect the on-site explosives blending plant and related storage areas on at least a bi-weekly basis accompanied by the explosives contractor. This inspection will focus on environmental issues such as waste management, water penetration of the storage area, materials storage, spills and spill prevention measures. The inspection will be documented using *CL035: Work Site Environmental Inspection* and any deficiencies raised will be tracked and resolved by the Environmental Coordinator or designate, and the Mining Manager.

6.0 APPROVAL

Name	Title	Date	Signature
Name	Environmental Superintendent	March 19, 2021	

7.0 REVISION HISTORY

Noted below is the revision history of this document.

Revision	Date	Comments
0	Month/Day/Year	Approved for Use

SIGHTING LOG LOCATION: _____

MONTH / YEAR: _____

DATE (DD-MMM-YYYY)	TIME (24hr)	SPECIES	COUNT	LOCATION	ACTIVITY / BEHAVIOUR (WALKING, FEEDING, FLYING, NESTING, ETC.)	OBSERVER	COMPANY

DE BEERS GROUP	CHECKLIST **Waste Inspection**	ID No.: CL 071 Revision Date: **November 19, 2020**

Date (DD-MMM-YYYY): _____ Time: _____ Inspected By: _____

Weather: _____

Landfill Burn Pit

Infrastructure Status

Non-Compliance Issues: Yes No

If Yes, Type (i.e., food waste, hydrocarbons, recyclables) and Number:

_____

_____

_____

_____

_____

_____

Wildlife Observation

Wildlife Present: Yes (Number seen) No

Type of Observation: Tracks Scat Fur Live Dead

Species: _____

Denning Activity: Yes No

Comments:

_____

_____

_____

_____

DE BEERS GROUP	SLM FORM **BIRD NESTING DATA SHEET**	ID No.: CL 117 Revision Date:November 19, 2020

Site: Snap Lake		**Weather:**	
Date (DD-MMM-YYYY):		**Start Time:**	**End Time:**
Observers/Company:		**Location Inspecting:**	

Nest #	Location of Nest	UTM Coordinates		Photo #	Time	Wildlife Observer
		Easting	Northing			

Approved by: Environmental Superintendent

Unauthorized Changes Prohibited

DE BEERS GROUP	SNAP LAKE MINE		
Department:	Environment	**Document No.:**	**OP 201**
Section:	Monitoring	**Effective Date:**	March 19, 2021
OPERATING PROCEDURE – *Remote Camera Monitoring*			
Revision:	1	**Replaces:**	
APPROVED:			

1.0 PURPOSE

The purpose of this Operating Procedure (OP) is to outline the procedures for monitoring wildlife at the Snap Lake Mine during closure and post-closure phases using remote cameras.

2.0 PROCEDURES

2.1. CAMERA PLACEMENT (Post-Closure)

Camera plots will be located in and around the following areas:

- Capped Surface North Pile
- East and West Influent Storage Ponds
- Reclaimed Area: Surface Facilities and Equipment (Fuel tank farm)
- Reclaimed area: Airstrip and Apron
- Reclaimed area: Main Camp (Kitchen, Dorms) and Process Plant Area

2.2. CAMERA DEPLOYMENT AND RETREIVAL

All incidental sightings of wildlife, including tracks, nests, roosting sites, feeding sites must be recorded the first time a species is observed. Some species or their sign (e.g., tracks, scat, habitation) must be recorded upon each observation and their GPS location marked. Consult the specific work instructions for details. For every observation, record the species, number of individuals, date and time, sex and age (if possible), location, and vegetation or disturbance types. Incidental data will be recorded using the wildlife sightings log.

2.4. PHOTO REVIEW AND DATA

All images will be reviewed for presence of wildlife and the total number of images counted in a spreadsheet. When wildlife are observed, the image ID, date, time, camera ID, memory card ID, the species and number of animals will be recorded. Also recorded will be the behaviour(s) shown by wildlife. Any other details that may be informative will be recorded as notes.

DE BEERS GROUP	SLM Form **Remote Camera Monitoring Datasheet - Deployment**	ID No.: Revision Date: March 19, 2021

QA/QC:		Season:		Sheet _____ of _____

Plot Name:		Plot Phot		diagram	↑N
Description (circle one):		Snow Depth (cm)			
crossing structi trail		Habitat:			
seismic line ROW		Camera Facing (Deg			
other:		Camera Sensitivi			
Date (dd/mon/yyyy):		Memory Card Nar			
Time:		Height of Camera (c			
Observer		Camera Inventory			
NAD: #	UTM Easting:	UTM Northing:			

Notes:

Plot Name:		Plot Phot		diagram	↑N
Description (circle one):		Snow Depth (cm)			
crossing structi trail		Habitat:			
seismic line ROW		Camera Facing (Deg			
other: AGP		Camera Sensitivi			
Date (dd/mon/yyyy):		Memory Card Nar			
Time:		Height of Camera (c			
Observer		Camera Inventory			
NAD: #	UTM Easting:	UTM Northing:			

Notes:

Plot Name:		Plot Phot		diagram	↑N
Description (circle one):		Snow Depth (cm)			
crossing structi trail		Habitat:			
seismic line ROW		Camera Facing (Deg			
other: AGP		Camera Sensitivi			
Date (dd/mon/yyyy):		Memory Card Nar			
Time:		Height of Camera (c			
Observer		Camera Inventory			
NAD: #	UTM Easting:	UTM Northing:			

Notes:

DE BEERS GROUP	**SLM Form** **Remote Camera Monitoring Datasheet Retrieval**	ID No.: Revision Date: March 19, 2021

Season:	
Observers:	

Sheet:	_____of_____
QA/QC:	

Plot Name	Card Name		Date *(dd/mm/yyyy)*	Time (hh:mm)	Battery (%)	Memory (%Full)	Number of Pictures	Notes
	Out:							
	In:							
	Out:							
	In:							
	Out:							
	In:							
	Out:							
	In:							
	Out:							
	In:							
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	In:							

All printed copies are considered uncontrolled documents.

DE BEERS GROUP	SNAP LAKE MINE		
Department:	Environment & Permitting / SHRT	**Document No.:**	**OP 078**
Section:		**Effective Date:**	March 19, 2021
OPERATING PROCEDURE – *Responding to Bears or Aggressive Animals At or Near SLM (Emergency Situation)*			
Revision:	1	**Replaces:**	
APPROVED:			

1.0 PURPOSE

This procedure applies to the Snap Lake Mine (SLM) site for the purpose of dealing with aggressive animal sightings, encounters, or in-camp situations.

2.0 SCOPE

This procedure applies to environmental superintendent and support personnel (i.e., ERT) responding to all aggressive animal sightings, encounters, and in-camp situations at the SLM. It covers such issues as consideration for the safety of personnel in relation to wildlife presence, requesting support should there be a need, reporting the incident, and dealing with deterrent actions and/or removal of the animal.

Aggressive animals include wolverines, bears, and wolves. Foxes and large birds are not normally aggressive but shall be managed in a similar manner if the animal's actions are aggressive in nature.

3.0 RESPONSIBILITIES

3.1. Mine General Manager or Designate:

3.1.1. Ensure that this procedure is implemented and maintained.

3.2. Heads of Departments/Contractor Managers, Superintendents or their Designates:

3.2.1. Ensure this procedure is communicated to their employees and contractors;

3.2.2. Ensure their employees and contractors have received the appropriate training; and

3.2.3. Ensure this procedure is implemented.

3.3. Environmental Superintendent or Designate:

3.3.1. Record the sighting on the Wildlife Monitoring Log;

3.3.2. Report and record encounters and actions on a Wildlife Deterrent Report and forwarding to appropriate *ENR Wildlife Officer;*

3.3.3. Ensure carcasses are handled properly, and the skin, including claws, head, and any requested specimen(s), are delivered to the appropriate *ENR Wildlife Officers* in a timely manner; and

3.3.4. Ensure any incident regarding wildlife is reported for the purpose of the Annual Wildlife Management and Monitoring Report.

3.4. Safety, Health, Risk and Environmental (SHR/E) Superintendent or Designate:

3.4.1. Monitor the implementation of this procedure; and

3.4.2. Ensure this procedure is maintained.

3.5. SHRT/E Coordinator is responsible for:

3.5.1. Monitoring the adherence of this procedure.

3.6. Supervisors:

3.6.1. Implement this procedure and ensure it is properly followed.

3.6.2. Record use of wildlife deterrents on the SLM Isometrix incident reporting database.

3.7. All Employees that use bear deterrents:

3.7.1. Understand and practice this procedure as required;

3.7.2. Be aware of applicable Safe Work Plans related to bears and other aggressive animals and bear deterrents;

3.7.3. Read and understand information contained in the approved Bear Awareness Program(s) before going into the field;

3.7.4. Ensure bear deterrents in use are within the specified expiry dates;

3.7.5. Report the use of wildlife deterrents on a SLM Near Hit reporting card

3.7.6. Ask their supervisor for clarification if they are unsure of any aspect of this procedure.

3.8. All Environmental Personnel or other Designated Individuals Who Handle or Fire the Shotgun:

3.8.1. Are required to hold a valid Canadian, Firearms Possession and Acquisition Licence (PAL).

3.9. All Employees:

3.9.1. Understand and practice this procedure as required; and

3.9.2. Ask their supervisor for clarification if they are unsure of any aspect of this procedure.

Responsibilities of Employers, Contractors, Supervisors and Employees are also described in the NWT Mine Health and Safety Act (Sections 15 – 18) and throughout the NWT Mine Health and Safety Regulations.

4.0 CRITICAL CONTROLS

- Site radio communication;
- Bear Awareness Training;
- Bear deterrent sign-out kits;
- Bear stands containing bear spray, air horns, and informational posters,
- All persons handling firearms at SLM must have a valid Canadian PAL;
- Proper firearms usage techniques, positioning of second person always in line and never in front or behind the first person;
- Use of firearms 'safety' switch.

5.0 PROCEDURE

5.1. The intent of this procedure is to:

5.1.1. Prevent risk of injury to humans;

5.1.2. Prevent aggressive animals from becoming habituated to the site and its infrastructure;

5.1.3. Prevent aggressive animals from seeking refuge in or around buildings, equipment storage or laydown areas;

5.1.4. Prevent aggressive animals from gaining access to areas or substances that could be harmful to the animal, such as fuel and chemical storage;

5.1.5. Prevent injury or death to aggressive animals;

5.1.6. The landfill operator shall be the sole judge as to what types of wastes are acceptable for disposal at the landfill. On-site personnel are responsible for enforcing any regulatory requirements for waste acceptance at the site level.

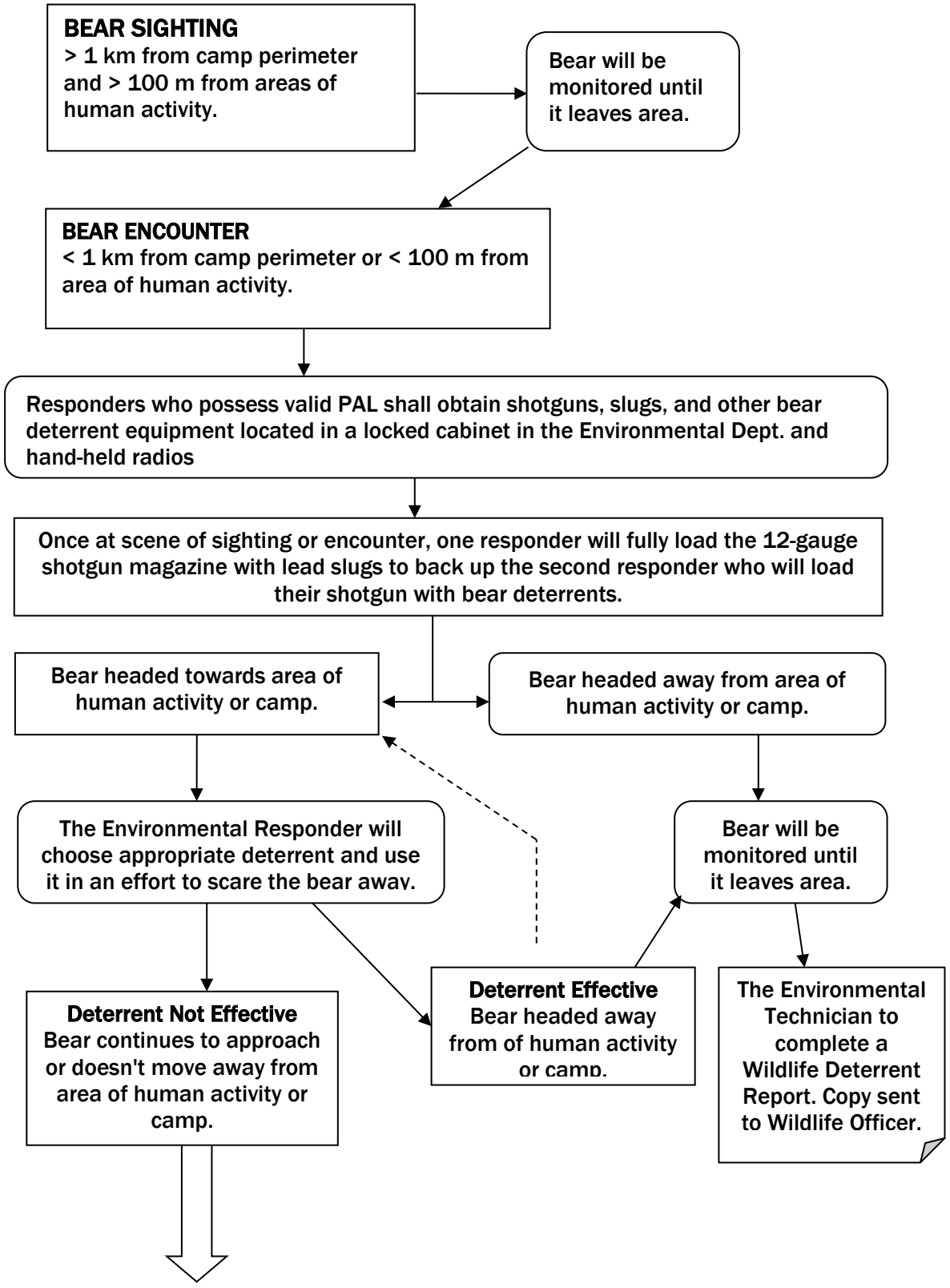
5.2. WARNING

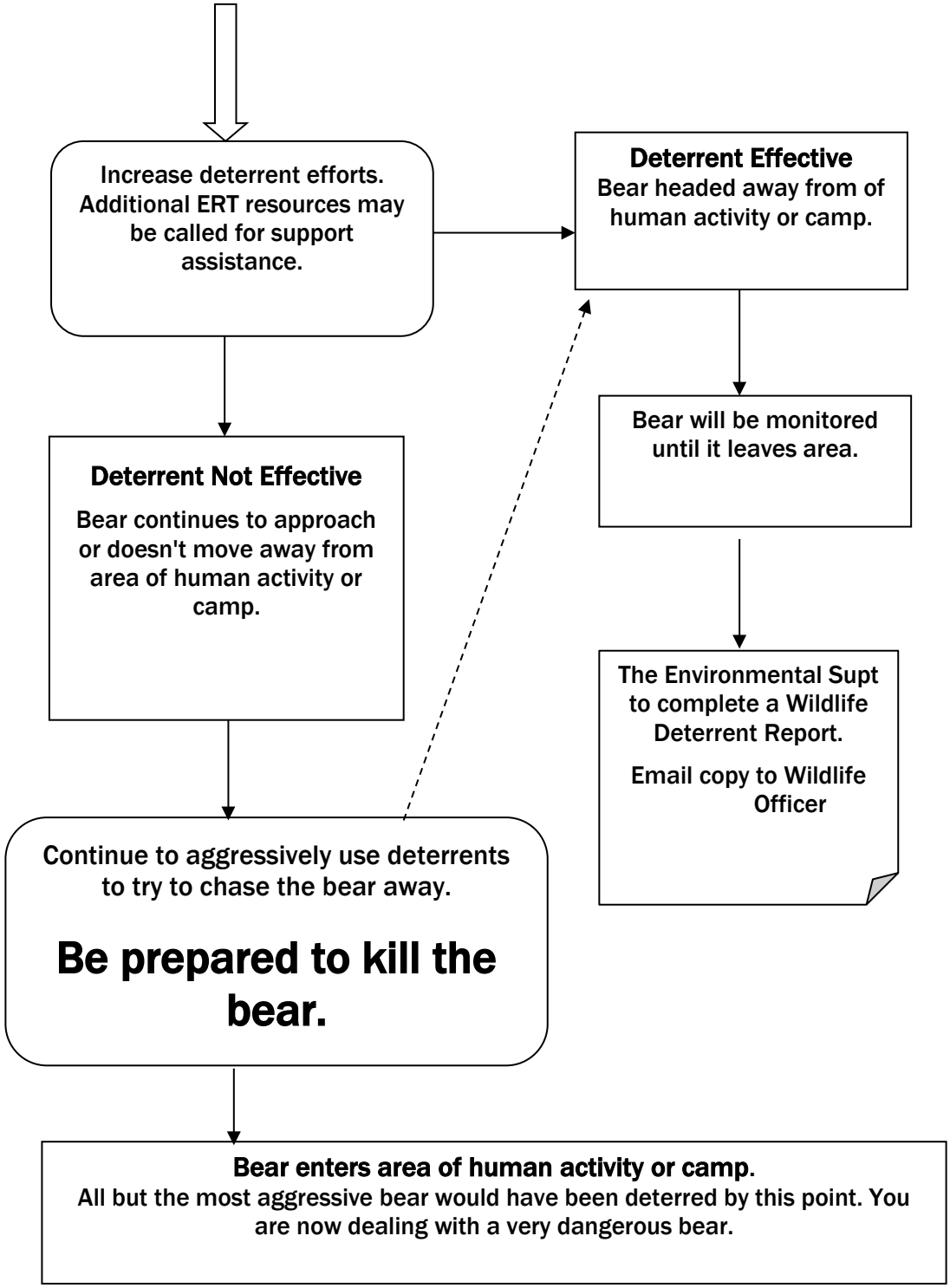
5.2.1. When responding to a wildlife encounter or an animal in camp, there must be a minimum of two responders;

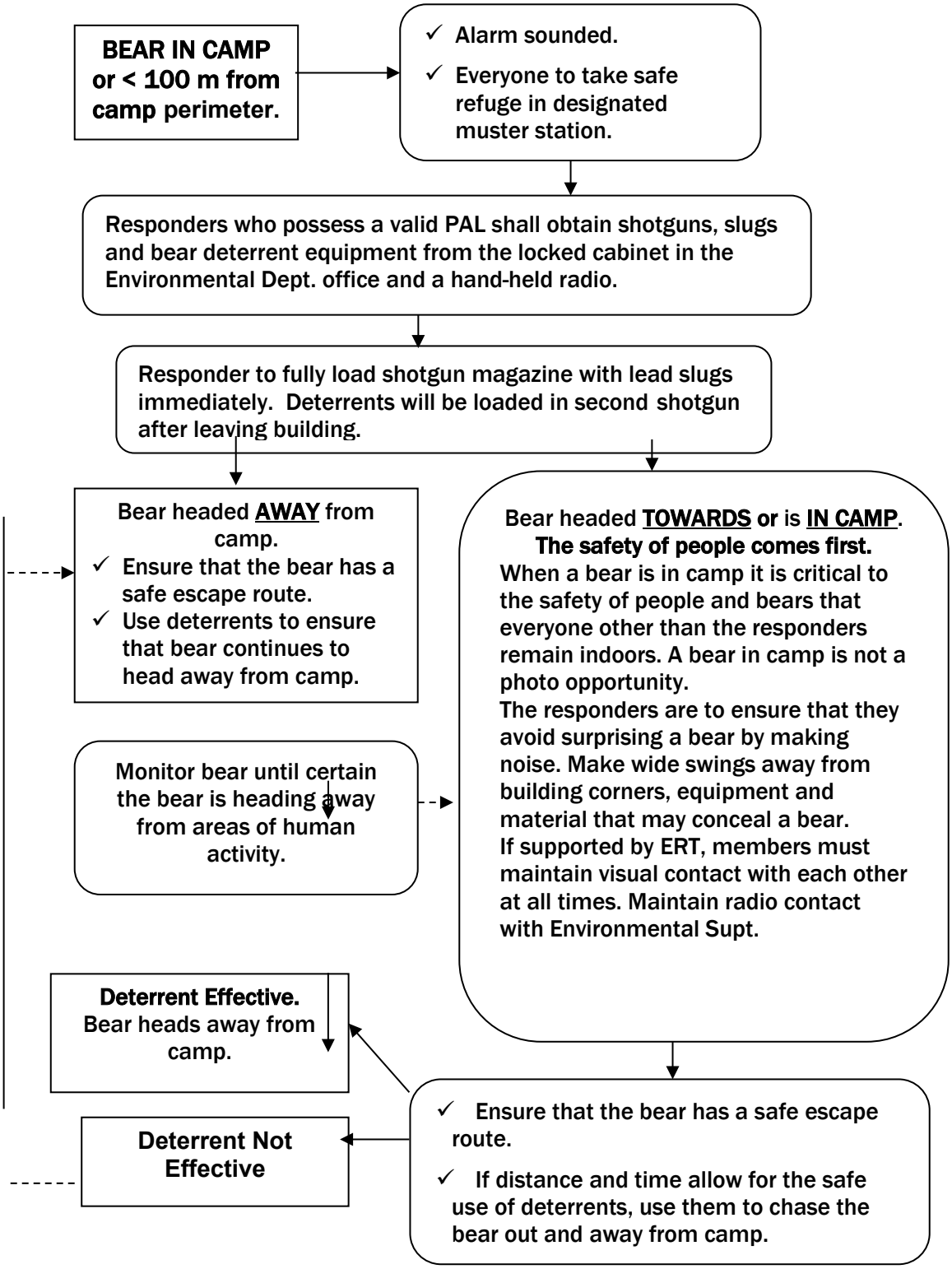
5.2.2. One responder will load their shotgun magazine fully with slugs to provide backup for the second responder who will load their shotgun with bear deterrents (rubber slugs);

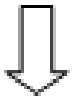
5.2.3. When preparing to fire both responders must be side by side, at least 3 metres apart (neither responder is allowed to be in front of the other responder);

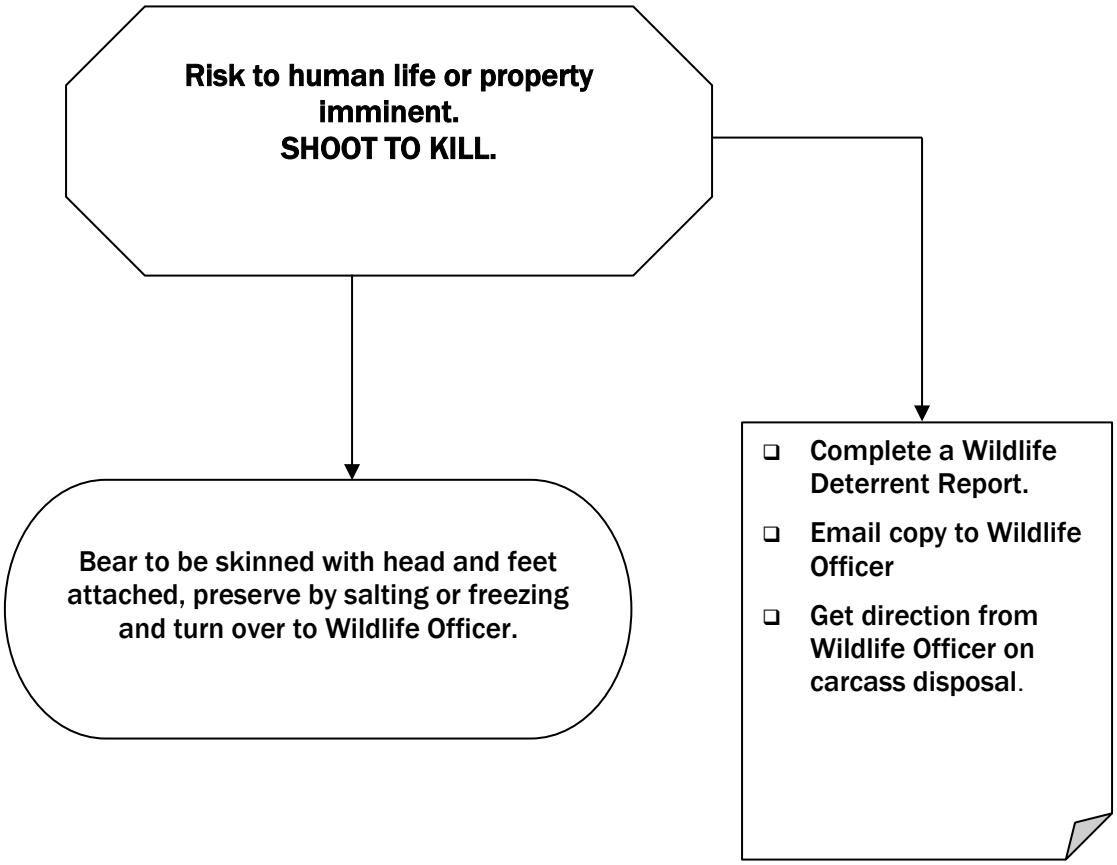
5.2.4. Deterring animals at closer range may also include the use of the 15 mm bangers and screamers with a second responder having a fully loaded (with slugs) shotgun as backup.


BEAR SIGHTING
> 1 km from camp perimeter and > 100 m from areas of human activity.
Bear will be monitored until it leaves area.
BEAR ENCOUNTER
< 1 km from camp perimeter or < 100 m from area of human activity.
Responders who possess valid PAL shall obtain shotguns, slugs, and other bear deterrent equipment located in a locked cabinet in the Environmental Dept. and hand-held radios
Once at scene of sighting or encounter, one responder will fully load the 12-gauge shotgun magazine with lead slugs to back up the second responder who will load their shotgun with bear deterrents.
Bear headed towards area of human activity or camp.
Bear headed away from area of human activity or camp.
The Environmental Responder will choose appropriate deterrent and use it in an effort to scare the bear away.
Bear will be monitored until it leaves area.
Deterrent Not Effective
Bear continues to approach or doesn't move away from area of human activity or camp.
Deterrent Effective
Bear headed away from of human activity or camp.
The Environmental Technician to complete a Wildlife Deterrent Report. Copy sent to Wildlife Officer.


Increase deterrent efforts. Additional ERT resources may be called for support assistance.
Deterrent Effective
Bear headed away from of human activity or camp.
Bear will be monitored until it leaves area.
The Environmental Supt to complete a Wildlife Deterrent Report.
Email copy to Wildlife Officer
Deterrent Not Effective
Bear continues to approach or doesn't move away from area of human activity or camp.
Continue to aggressively use deterrents to try to chase the bear away.
Be prepared to kill the bear.
Bear enters area of human activity or camp.
All but the most aggressive bear would have been deterred by this point. You are now dealing with a very dangerous bear.


BEAR IN CAMP or < 100 m from camp perimeter.
✓ Alarm sounded.
✓ Everyone to take safe refuge in designated muster station.
Responders who possess a valid PAL shall obtain shotguns, slugs and bear deterrent equipment from the locked cabinet in the Environmental Dept. office and a hand-held radio.
Responder to fully load shotgun magazine with lead slugs immediately. Deterrents will be loaded in second shotgun after leaving building.
Bear headed AWAY from camp.
✓ Ensure that the bear has a safe escape route.
✓ Use deterrents to ensure that bear continues to head away from camp.
Monitor bear until certain the bear is heading away from areas of human activity.
Bear headed TOWARDS or is IN CAMP.
The safety of people comes first.
When a bear is in camp it is critical to the safety of people and bears that everyone other than the responders remain indoors. A bear in camp is not a photo opportunity.
The responders are to ensure that they avoid surprising a bear by making noise. Make wide swings away from building corners, equipment and material that may conceal a bear.
If supported by ERT, members must maintain visual contact with each other at all times. Maintain radio contact with Environmental Supt.
Deterrent Effective.
Bear heads away from camp.
Deterrent Not Effective
✓ Ensure that the bear has a safe escape route.
✓ If distance and time allow for the safe use of deterrents, use them to chase the bear out and away from camp.





Any time a bear approaches or enters areas of human activity, conduct a site investigation to determine why the bear was attracted to the site. Record findings on Wildlife Deterrent Report.

If an attractant is found, deal with it immediately. Failure to deal with the attractant will only lead to more problems.

5.3. Bear Bangers

5.3.1. Bear bangers are used as a deterrent when wildlife comes too close to site personnel. Bear bangers can be compared to blanks. When used correctly, the loud noise from the banger (along with the flash, like a firework or flare) should deter the animal from approaching any further. Revolver (starting pistol style) or Flare-Gun style launchers are allowed. If unsure whether or not a particular style of bear banger launcher is allowed check with the Environmental Coordinator.

5.3.2. To use a bear banger, please follow the instructions available. Always discharge the banger between you and the animal. Pay particular attention not to overshoot, as the animal may now run towards you (away from the loud noise).

5.3.3. If the animal does not leave, walk backwards slowly, never looking the animal directly in the eyes. Make loud noises as you retreat. DO NOT TURN YOUR BACK AND RUN. THE ANIMAL MAY CHASE YOU. Ask your supervisor for other available information.

5.4. Bear Spray

5.4.1. Bear spray can also be used as a deterrent. The spray works on the principle that the burning sensation the animal feels (in the eyes, nose and lungs) will "scare" it off.

5.4.2. The concern with using bear spray is that you must be in close proximity to the animal and up-wind (30 feet Spray Distance). If you are down-wind, you may be affected by the spray thus rendering you helpless. If you are too far away, the spray will dissipate and not be effective.

5.4.3. A qualified individual will be designated to demonstrate proper loading and firing techniques to all personnel who require bear spray use.

5.5. Air Horn

5.5.1. Using air horns and making noise while in the bush will deter animals from approaching. Making noise while walking is the best advice for protection against bear encounters. Whistles are not recommended because you can sound like an animal. NOTE: Air horns are ineffective at temperatures below 0º Celsius.

5.5.2. When wildlife deterrents are used it must be reported on a SLM Near - Hit Reporting Card (CL 003), which must be given to the Environmental Coordinator.

5.6. Travelling with Bear Deterrents

5.6.1. Bear deterrents are restricted from commercial flights. Do not take bear bangers, bear spray, or air horns with you on a commercial plane or in your luggage. For charter fixed wing and helicopter flights, employees are to identify the presence of bear spray or bear bangers to the pilot and follow his/her directions. Travelling with bear deterrents in chartered helicopters or fixed wing aircraft is at the discretion of the Aircraft Company and pilot. Bear deterrents must be kept out of the passenger section of the helicopter or fixed wing aircraft at all times. The safe method to transport bear deterrents in a helicopter or fixed wing aircraft is to store them in the cargo hold in a hard plastic lockable container (such as a clam shell or similar). Each field crew is to be assigned a lockable container so that easy removal is achieved from the aircraft. See OP 178: Helicopter Safety – Transport of Hazardous and Bulky Material.

5.7. Bear Awareness

5.7.1. All personnel working outside of the camp area are required to receive the appropriate Bear Safety Awareness and orientation before going out in the field;

5.7.2. All personnel working outside of the camp area are to have training on the use and care of bear bangers and bear spray before going out in the field.

5.8. Sign-In Sheet

5.8.1. In an effort to mitigate the loss, and misplacement of bear deterrents, employees and contractors at the SLM site must sign-out and bring back bear deterrents on a daily basis to the Environmental Coordinator with the exception of air horns. On a daily basis the bear deterrents will be locked in a designated cabinet in the Environmental Coordinator's office with the information recorded on CL 175: Bear Deterrents Sign-Out Checklist.

5.9. Safe Work Plan

5.10. All field crews will add bear (or wildlife) encounters on their Safe Work Plans and Job Risk Assessments.

5.11. Using a Helicopter to Deter an Animal

It is illegal to harass wildlife with aircraft, but occasionally, and only for reasons of human safety, it may be necessary to use a helicopter to push wildlife. When using a helicopter to deter an animal from the SLM, the following procedures must be followed:

5.11.1. At least one member of the Environmental Department must be on board. That person will be responsible for the safety of the animal and will provide instructions to the pilot;

5.11.2. The pilot is responsible for the aircraft and the safety of the people on board, and has final say regarding such matters;

5.11.3. The pilot must maintain radio contact with SLM site management;

5.11.4. To stress the animal as little as possible, the pilot must keep the helicopter well back from the animal. The minimum distance between the helicopter and the animal is 100 m (330 ft.) back and 30 m (100 ft.) up. The pilot should only get close enough to get the animal to move. A bear moving at a fast walk can cover a lot of ground quickly and efficiently, so there is no need to have the bear running. A running bear may become overheated and die;

5.11.5. The pilot must keep the animal in visual contact, observing the minimum distances;

5.11.6. The pilot must keep the helicopter between the animal and the site to prevent pushing the animal into camp;

5.11.7. DO NOT push an animal for more than 10 min or 3 km (2.2 miles);

5.11.8. Once the Environmental representative is satisfied that the animal is moving away, the pilot may be directed to stop pursuing the animal and take the helicopter to an altitude where they can continue to monitor the animal to ensure it is not returning;

5.11.9. Once satisfied that the animal poses no further immediate risk, the helicopter will return to camp;

5.11.10. An update of the situation will be provided to the SHR/E Manager.

5.12. Destroying a Problem Bear

5.12.1. Deciding exactly when to shoot a bear is a difficult decision to make and is wholly dependent on the prior experience and training of the shooter. For this reason there is no set distance at which to pull the trigger;

5.12.2. The bear must be shot when personnel are in immediate danger of attack, or when it is not possible to remove the bear without endangering human life;

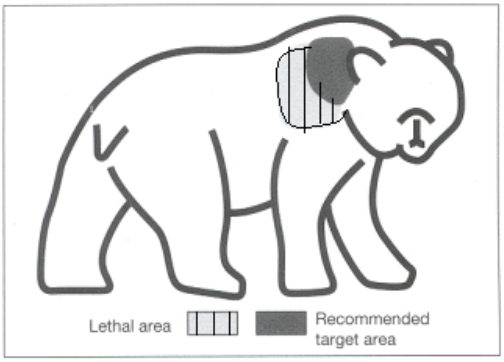


Figure 5. Area of instant kill or disabling shot.

5.12.3. Before shooting, always consider what is beyond the bear as the slug may pass through the bear or miss the target;

5.12.4. It is very difficult to kill a charging bear. The first shot is intended to stop or knock down the bear, not kill it. If the bear is standing sideways, shoot at the large shoulder and into the chest area;

5.12.5. If the bear is facing head on, shoot into the neck and top of the shoulders;

5.12.6. Once the bear is stopped or down, use the remaining lead slugs to kill the bear. A minimum of two shots must be made into the vital areas;

5.12.7. Do not approach the bear until the shotgun is fully reloaded and the bear is dead;

5.12.8. Do not handle or touch the bear until personal protective equipment (PPE) requirements have been determined;

5.12.9. If a bear is shot, return to camp and report to the SHR/E Superintendent or Designate. The Environmental Superintendent will complete the Wildlife Deterrent Report;

5.12.10. The Environmental Superintendent will report the incident to the appropriate Wildlife Officer;

5.12.11. The bear hide must be removed, with the claws and the head attached, and kept from spoiling by salting or freezing. The hide and skull must be turned over to a Wildlife Officer as soon as possible. Before handling the bear or removing the hide, determine the PPE requirements (i.e. disposable latex gloves, raingear, etc.) as per the Wildlife Disease Investigation Manual and any other special precautions in consultation with the Wildlife Officer;

5.12.12. Dispose of the carcass under the direction of the Wildlife Officer.

5.13. Training

5.13.1. This Site Wide Operating Procedures (OPs) requires specific training for all responders;

5.13.2. Advanced Bear Safety training is required. This training will include sessions on bear biology, bear behaviour, bear/human encounters, what to do in the event of an encounter, prevention, detection, proper use of deterrents, bear response planning and reporting procedures;

5.13.3. All Environmental personnel or other designated individuals who handle or fire the shotgun are required to hold a valid Canadian Possession and Acquisition Licence (PAL);

5.13.4. All Environmental or other designated individuals who handle or fire the shotgun must take training in the use of the specific on-site firearm(s).

6.0 APPROVAL

Name	Title	Date	Signature
	SHRT / Environmental Superintendent	March 19, 2021	

7.0 REVISION HISTORY

Noted below is the revision history of this document.

Revision	Date	Comments
1	March 19, 2021	Approved for Use

8.0 DEFINITIONS

8.1. Area of Human Activity: Any area within the SLM footprint where people are active. The size of this area will expand and contract based on the level and location of activity on site. Bears will be deterred from site regardless of how many people are at site to avoid human-bear conflicts.

DE BEERS GROUP	SNAP LAKE MINE		
Department:	Environment & Permitting	**Document No.:**	*EP-DOP 001*
Section:		**Effective Date:**	March 19, 2021
OPERATING PROCEDURE –*Winter Road Wildlife and Public Use Surveillance*			
Revision:	1	**Replaces:**	
APPROVED:			

1.0 PURPOSE

The purpose of this program is to gather information on the use of the Snap Lake Mine winter road by members of the public, contractors, staff, and wildlife. This surveillance program is designed to address concerns that use of the winter road during closure and post-closure will lead to increased wildlife mortalities due to vehicle traffic. De Beers will monitor both wildlife occurrence and public use of the road and where possible will gather information on wildlife mortalities and incidents.

2.0 SCOPE

Security personnel will patrol the length of the road in pick-up trucks once every two weeks during the haul season (February-March) so long as weather permits. Duties related to traffic flow, delay reporting, accident reporting and investigation, obtaining emergency service for transport vehicles and first aid are not addressed in this Operating Procedure. This procedure addresses only the recording and reporting of wildlife observations and the use of the road by members of the public.

3.0 RESPONSIBILITIES

3.1. Environment Department

The Environment Department is responsible for communicating with the Contractor on at least a weekly basis during the contract. This can be done either through face-to-face contact, radio, email, phone or other means. The Environment Department will be responsible for refining the operating procedure as needed including revisions to maps, division of responsibilities, and data sheets. The Environment Department will provide the relevant logs (i.e., data sheets) to the Contractor. The Environment Department will hire and supervise an Aboriginal Community Monitor who may accompany the Security Contractor during their daily surveillance of the Snap Lake Mine winter access road. The Environment Department is responsible for reporting to government, regulators, communities, and the public.

3.2. Security Contractor

The Security Contractor will be responsible for conducting the daily surveillance of the road. The Security Contractor will record their wildlife and public use observations on the relevant data sheets, and will provide those data to the Environment Department on a weekly basis. The contractor will report any key observations, such as the occurrence of caribou, other wildlife, public use, and

vehicle-wildlife collision to the Environment Department. Data sheets shall be submitted to the Environment Department at the end of each survey. The Security Contractor shall allow an Aboriginal Community Monitor to accompany them on the daily surveillance of the road upon request.

4.0 CRITICAL CONTROLS

If not currently available, these will be identified during the next document review when the Job Risk Assessment is completed.

5.0 DEPARTMENT OPERATING PROCEDURE

5.1. Equipment to be provided by DBCI

- Map of the winter road
- Data sheets (attached)

5.2. Equipment to be provided by Security Contractor

- One GPS unit/vehicle set to NAD83, and spare batteries
- Field supplies including pencils and field notebook
- Digital camera

5.3. Procedures

5.3.1. Public Use Surveys

De Beers and its contractors will not restrict public or recreational use of the winter access road. Disclosure of information by recreational users is purely optional and voluntary. De Beers and its Contractors will maintain a friendly and hospitable demeanor when conversing with members of the public who may be using the road. De Beers and its contractors will explain the rules of the road to users as necessary to ensure the safety of workers and members of the public. These include the check-in procedures if arriving at site, road speed limits, and right-of-way for wildlife.

Security Contractors will record occurrences of recreational users of the winter access road on the Winter Road User Form. These observations shall include vehicles that were observed but not stopped as well as those that were stopped. One data form shall be filled in for every recreational vehicle observed on the road. Security Contractors may, at their discretion, stop recreational users of the road to converse and gather information. This interview shall be cordial, and if users do not wish to provide personal information they shall not be pressed. Security personnel shall record the information on the Winter Road User Form. Key pieces of information include

number of people, names, purpose of trip, community of origin, description of vehicle, license plate number, number of snowmobiles, the location (portage number/lake name) and number of animals killed (if hunting).

Information on public use of the road, including names, license plate numbers, locations, and photos will be shared with the Government of Northwest Territories, Environment and Natural Resources upon request.

5.3.2. Wildlife Observations

All wildlife the size of a fox or larger observed from the road must be announced on the radio and recorded on the Winter Road Wildlife Sightings Form. The original observer shall record their observations upon check-in at Snap Lake Mine Dispatch. The Security Contractor shall record their own winter road wildlife sightings and shall provide completed forms to the Environment Department on a weekly basis. The Security Contractor can record the observations relayed by others, but must make note of the original observers name on the form.

The Security Contractor shall make every effort to enforce the rules of the road as they relate to wildlife including giving the right-of-way to wildlife, slowing to 10km/h when wildlife are present, and turning off bright head-lights when stopped at night due to wildlife presence on the road.

5.3.3. Incident Reporting

All incidents concerning wildlife and/or members of the public shall be investigated, recorded, and reported as per the standard incident reporting procedures. The contractor shall use the Accident-Incident Short Report Form to record all relevant observations including but not limited to:

- Location (UTM, lake, portage)
- Time and Date
- Names, companies of people involved
- Photographs
- Potential Causes/contributing factors
- Management response actions taken (e.g., re-routed traffic, reported to Environment/Dispatch)

Incidents involving wildlife or members of the public shall be reported immediately to the Environment Department.

6.0 CONTACT NUMBERS

6.1. Environment Staff

Environment Superintendent:

Environment Coordinator:

Environment Technician:

WINTER ROAD WILDLIFE SIGHTINGS FORM

YEAR:_____ SHEET:_____ De Beers Group of Companies

DATE (Y/M/D)	TIME (24 h)	SPECIES	NUMBER	LOCATION				PROXIMITY TO ROAD[1]			OBSERVER	COMPANY
				Lake Name	Portage Number	UTM						
						Easting	Northing	on	bank	off		

1. A check mark to indicate animal is on the road, on the bank of the road, or off the road is fine. Observer may also estimate distance from center of road to animal in meters.

De Beers Winter Road Access Reporting

Winter Road User Survey

SIDE ONE: USER INFORMATION

Monitoring Station: ☐ Gahcho Kué Winter Road ☐ Snap Lake

Monitor's name: _____

Vehicle Information

Description of vehicle: _____

Vehicle license place origin (Territory/Province): _____ License plate no: _____

Accessory vehicles: (Snowmobiles/ATVs) **NO** ☐ **YES** ☐ How many? _____

Number of people in the vehicle: _____

Northbound Date: _____ Time: _____ am / pm
(Spell out Month)

Southbound: Date: _____ Time: _____ am / pm
(Spell out month)

Community representation **(indicate the community for EACH person in the vehicle)**

Yellowknife	_____	N'Dilo	_____	Ingraham Trail	_____
Dettah	_____	Rae/Edzo	_____	Wha Ti	_____
Gameti	_____	Wekweti	_____	Lutsel K	_____

Other (specify) _____

Purpose for using the winter road (check all that apply):

Sight-seeing: ____ Camping:____ Trapping:___ **(Licence #)**_____
Fishing: ___ **(Licence #)**_____
Hunting: ___ **(Licence #)**_____
Other (specify) _____

Hunter classification: GHL ____ Special GHL ____ Resident ____ Non-Resident ____
(Use one √ per hunter) Non-Resident Alien _____

How many days for hunting? 1 2 3 Other _____

What animal species are you hunting? (check all that apply)

Caribou	_____	Moose	_____	Grouse	_____
Wolf	_____	Wolverine	_____	Ptarmigan	_____

Other (specify) _____

DE BEERS
GROUP OF COMPANIES

Accident - Incident
Short Report Form
Must be submitted within 24 hours
Rating of 6 or more requires 3 page AI Form within 72 hours

YELLOW FIELDS REQUIRE COMPLETION N/A or pen mark required to identify attention		Date of Accident/Incident	Date Reported	Date of Investigation
SITE	DEPARTMENT	Time of Accident/Incident	Time Reported	Date Submitted

TYPE OF MISHAP — Multiple Selections Possible

ACCIDENT				INCIDENT	
INJURY		PROPERTY DAMAGE LOSS TO PROCESS		POTENTIAL FOR LOSS	
FIRST AID		ENVIRONMENT		INJURY	
MEDICAL AID		EQUIPMENT		ENVIRONMENT	
LOST TIME		MATERIAL		EQUIPMENT	
OCCUPATIONAL ILLNESS		LOSS TO PROCESS		LOSS TO PROCESS	
				HAZARD	
				SHE NON-CONFORMANCE	

BRIEF DESCRIPTION OF INJURY, LOSS, POTENTIAL LOSS, OR HAZARD

LOCATION OF OCCURRENCE

EMPLOYEE NAME:		OCCUPATION:		YRS OF EXPERIENCE IN OCCUPATION:	

Describe what happened including the event and IDENTIFY THE ROOT CAUSE

STATE WHAT ACTION WILL PREVENT THIS EVENT FROM RE-OCCURRING Root Cause must be addressed in these actions.	RESPONSIBLE PERSON	DATE TO BE COMPLETE	Action assigned by

WITNESSES:

RISK ASSESSMENT RATING	PROBABILITY	+	HIGHEST CONSEQUENCE	=	RISK ASSESSMENT RATING	=

Rating of 6 or more requires completion of 3 page AI Form within 72 hours

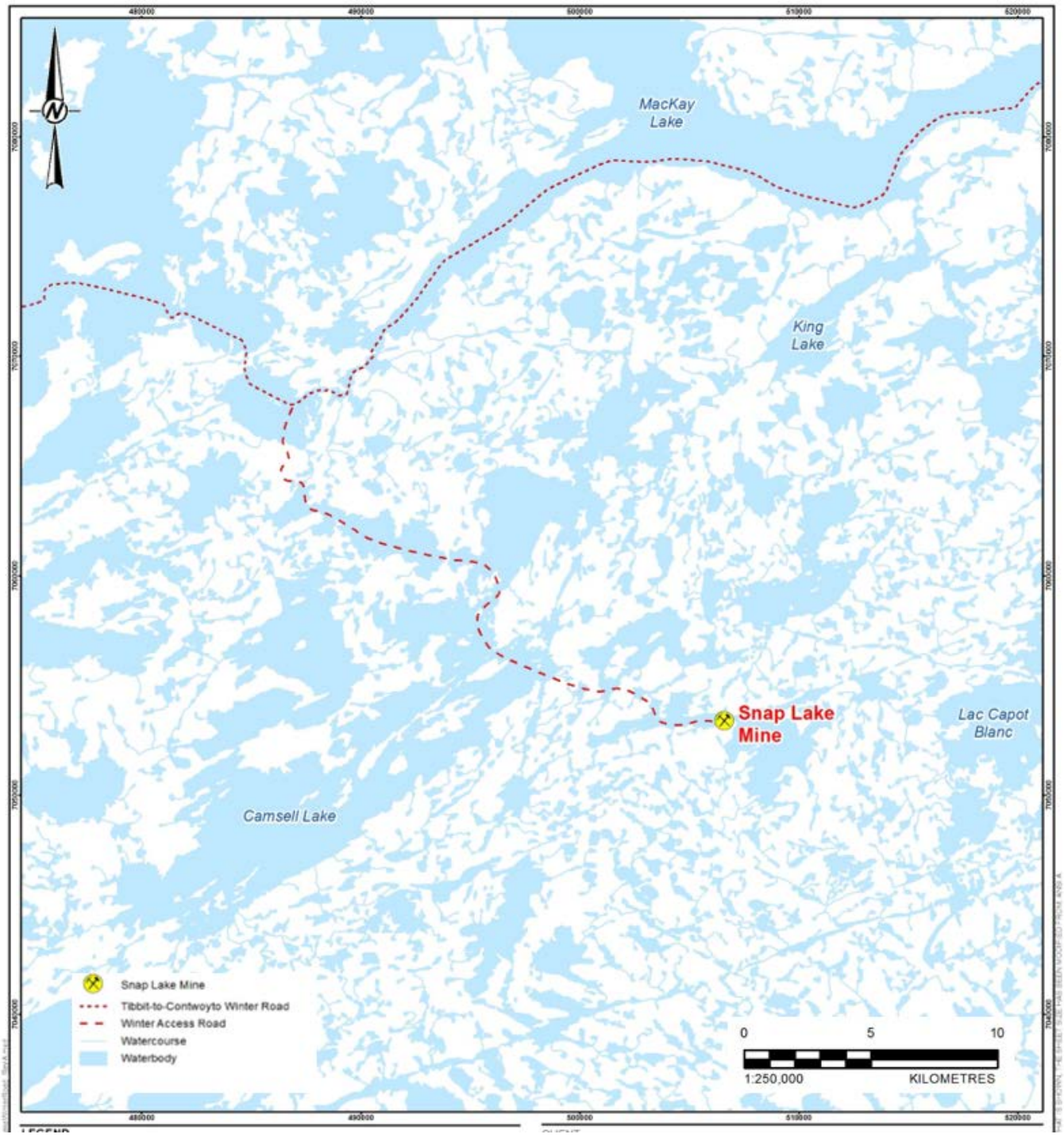
COMMENTS	PRINTED NAME	SIGNATURE	TITLE	DATE
			Employee	
			Immediate supervisor	
			JOSHEC Rep.	
			DBC Dept. Mgr.	
			SHE Coordinator	
			SHE Manager	
			Mine Manager	

Note: Any Supervisor or Manager or their designate may require an investigation be completed on any incident regardless of the risk rating where other potentially more serious outcomes could result.

Effective November 10, 2000.	Approved by: SHE Manager	File: A130 Accident-Incident Short Form

All printed copies are considered uncontrolled documents.

6.1.1. Field Map



7.0 APPROVAL

Name	Title	Date	Signature
	Environmental Superintendent	March 19, 2021	

8.0 REVISION HISTORY

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1	March 19, 2021	Approved for Use

9.0 DEFINITIONS

None

APPENDIX C CLOSURE OBJECTIVES FOR SNAP LAKE MINE

Table C1 Closure Objectives, Criteria, and Method of Measurement to Evaluate Achievement of Criteria (Source: Table 5.2 of De Beers 2021a)

Closure Objective	Revised Closure Criteria[a]	Primary Reclamation Activities	Post-Closure Inspections and/or Monitoring	Associated Monitoring Plans[b]
Site Wide				
SW1 – Dust levels safe for people, vegetation, aquatic life and wildlife.	1. Physical Stability Not applicable as this is a chemical objective. 2. **Chemical Stability** a) Ambient air quality will meet the Northwest Territories Ambient Air Quality Standards (NWTAAQS) as demonstrated by monitoring during Closure. b) Dustfall will meet the Alberta Ambient Air Quality Guidelines (AAAQG) as demonstrated by monitoring during Closure. 3. **Future Use and Aesthetics** The principle of future use has been considered through identification of chemical stability criteria for air quality that are protective of people, vegetation, aquatic life and wildlife.	Engineering design and construction of a cover placed over the North Pile in accordance with the North Pile Closure Design (Appendix H). The North Pile closure will be completed as per design and QA/QC. QA/QC protocol and as-built reports completed and signed off by a professional engineer. The cessation of mining, construction and active closure activities (e.g., diesel combustion, surface vehicle traffic, blasting, material crushing and handling, earthworks, etc.) will result in diminished air emissions.	Air quality monitoring for suspended particulates and dustfall will be conducted during Closure. Vegetation dustfall monitoring event five years Post-Closure. Geotechnical monitoring of the engineered cover will occur to ensure long-term performance as a barrier. See Closure Objective NP1&2 for more detail regarding monitoring activities. Site inspections will be conducted by SLEMA to provide on-going community input into this objective.[6]	Air Quality and Emissions Monitoring and Management Plan Vegetation Monitoring Program
SW2 – Drainage pathways for surface runoff are physically stable.	1. **Physical Stability** Acceptable results for a minimum of three consecutive years of visual monitoring for deformation and degradation Post-Closure as part of site geotechnical inspections completed and signed off by a professional engineer[7]. Acceptable results are defined as a concluding statement in the geotechnical inspection report signed off by a professional engineer that drainage pathways are performing as designed and are physically stable. 2. Chemical Stability Not applicable as this is a physical objective. 3. **Future Use and Aesthetics** Future use and aesthetics are considered through physical stability criteria as described in SW2-1. Where appropriate, aesthetic considerations have been included in designs.	Final grading to promote positive drainage. Drainage pathways (e.g., spillways at the North Pile) will be established as per design (Appendix L.1 and L.2) as presented in the Final Landform Design Plan (Appendix G.3) and the North Pile Closure Design (Appendix H), and QA/QC. QA/QC protocol and as-built reports completed and signed off by a professional engineer.	Geotechnical inspections (visual) of the drainage pathways will occur Post-Closure in concert with the site geotechnical inspection and monitoring program. Surface water monitoring during Post-Closure at applicable drainage pathways to assess expected outcome that drainage pathways do not contribute erosion-induced sediment to site runoff. See Closure Objective SW3 for closure criteria and more detail on this monitoring program.	North Pile Management Plan Closure and Post-Closure Geotechnical Monitoring Plan (Appendix to the North Pile Management Plan) Final Landform Design Plan
SW3 – Surface runoff and seepage water quality that is safe for people, vegetation, aquatic life, and wildlife.	1. Physical Stability Not applicable as this is a chemical objective. Relevant physical stability criteria are provided in NP1 and SW2. 2. **Chemical Stability** a) Meet Effluent Quality Criteria in surface water discharge as described in MVLWB Water Licence MV2019L2-0004 for a period of 5 years from the initiation of the Post-Closure period; b) Water Quality concentrations in Snap Lake are less than Aquatic Effects Monitoring Program (AEMP) benchmarks[8] as defined in the approved AEMP Design Plan and are demonstrated for a period of 5 years from the initiation of the Post-Closure period;	Closure of the North Pile including the application of a cover in accordance with the North Pile Closure Design (Appendix H), and final grading where required site-wide to promote positive drainage. Develop the closure water management system (Appendices L.1 and L.2): 1) Phase 1 – Active Water Management that includes monitoring, storage and active treatment (as required). Runoff and seepage will report to the Influent Storage Ponds (ISPs) and the WMP. When water quality meets EQCs, discharge via pumping to Snap Lake. If EQCs not met, active treatment to meet EQCs prior to discharge.	Geotechnical visual inspection of engineered covers for signs of deformation and/or degradation) to assess expected outcome that erosion-induced sediment will not contribute to water quality concerns and in concert with monitoring program (temperature and piezo water level monitoring within the North Pile area). Water quality monitoring (runoff and seepage at monitoring locations established across the site). Aquatic effects monitoring (water quality, fish heath, and fish tissue metal concentrations in Snap Lake). Monitoring total dissolved solids at Node 22 (in Mackay Lake).	North Pile Management Plan Closure and Post-Closure Geotechnical Monitoring Plan (Appendix to the North Pile Management Plan) Water Management Plan Surveillance Network Program Aquatic Effects Monitoring Program

[6] De Beers committed to site inspections by SLEMA as part of the response to initial comments on FCRP Version 0, 2019.

[7] Where specified, the responsible professional engineer must be the Engineer of Record (EOR) for the North Pile. In all other cases, the professional engineer is to be qualified to perform the indicated scope.

[8] The Aquatic Effects Monitoring Program benchmarks incorporate health-based drinking water guidelines (Health Canada, 2019) if they are lower than water quality guidelines or site-specific water quality objectives for the protection of aquatic life.

Closure Objective	Revised Closure Criteria[a]	Primary Reclamation Activities	Post-Closure Inspections and/or Monitoring	Associated Monitoring Plans[b]
	c) Mean fish health endpoints are within the regional normal range as defined in the approved AEMP Design Plan and demonstrated twice after the initiation of the Post-Closure period (once during the first three years of Post-Closure (Year 1-3) and once during the following three years of Post-Closure (Year 4-6); and d) Fish tissue metal concentrations are below Health Canada benchmarks[9] as defined in the approved AEMP Design Plan and as demonstrated once after the initiation of the Post-Closure period (between Post-Closure Year 4 and 6). **3. Future Use and Aesthetics** The principle of future use has been considered through the identification of chemical stability requirements under SW3-2, whereby conformance with EA 1314-02 Measure 1 parts a through c[10] is demonstrated. Conformance with EA 131402 Measure 1d is demonstrated when the annual calculated total dissolved solids concentration at Node 22 (in Mackay Lake) is less than the Acceptable Limit[11], as defined in the approved AEMP Design Plan, within a minimum of 10 years of monitoring during the closure and post-closure period (until 2030)[12].	2) Phase 2 – No Active Water Management that includes passive gravity water flow once water meets EQCs and breach of water control structures is approved. Phase 1 and Phase 2 water management systems established as per design (Appendix L.1 and L.2) and QA/QC. QA/QC protocol and as-built(s) completed and signed off by a professional engineer.	Site inspections by SLEMA in addition to a community fish-tasting program[13] to provide on-going community input into this objective.	
SW4 – Mine areas are physically stable and safe for use by people and wildlife.	**1. Physical Stability** Acceptable results for a minimum of three consecutive years of visual monitoring for deformation and degradation Post-Closure as part of site geotechnical inspections completed and signed off by a professional engineer. Acceptable results are defined as a concluding statement in the geotechnical inspection report signed off by the professional engineer that landforms are performing as designed and are physically stable. **2. Chemical Stability** Not applicable as this is a physical objective. Chemical stability is addressed through site wide and infrastructure objectives (SW1, I1, and I3). **3. Future Use and Aesthetics** The principle of future use has been considered through identification of physical stability criteria for slope angles and maximum cover fill size to be protective of wildlife. Landform design will be compatible with surrounding areas to provide continuity in wildlife habitat and support site aesthetics in accordance with SW5-3. Additional detail on considerations for wildlife protection in landform design are described under SW6-3.	Closure of the North Pile in accordance with the North Pile Closure Design (Appendix H). Engineered earthen structures remaining at the site (e.g., North Pile) will be physically stable. See North Pile closure objectives NP1 and NP2 below for details specific to stability of the North Pile. Final grading will promote positive drainage. Drainage pathways will be established for long-term stability to avoid issues with erosion. Removal of all surface hazards, including buildings and equipment.	Geotechnical inspections (visual) of the site will occur Post-Closure in concert with the site geotechnical inspection and monitoring program. Additional monitoring will occur at the North Pile area (See NP1 and NP2 closure objectives below). Wildlife monitoring at the Mine area during Closure. Site inspections will be conducted by SLEMA to provide on-going community input into this objective.	North Pile Management Plan Closure and Post-Closure Geotechnical Monitoring Plan (Appendix to the North Pile Management Plan) Wildlife Effects Monitoring Program Final Landform Design Plan

[9] Health Canada. 2015. Health Canada's Maximum Levels for Chemical Contaminants in Foods. Available at: https://www.canada.ca/en/health-canada/services/food-nutrition/food-safety/chemical-contaminants/maximum-levels-chemical-contaminants-foods.html. Accessed January 2021.

[10] Mackenzie Valley Environmental Impact Review Board (MVEIRB), 2014. Report of Environmental Assessment and Reasons for Decision, De Beers Canada Inc. Snap Lake Amendment Project EA1314-02. September 2014.

[11] If Total Dissolved Solids (TDS) concentrations are above the Acceptable Limit due to causes other than the Mine (e.g., regional changes in TDS concentrations due to climate change effects), the Acceptable Limit may be recalculated following the approved methods in Golder (2017a) using more recent reference data.

[12] Ten years (2021 to 2030) are expected to be sufficient to capture peak concentrations at Node 22 based on model predictions (Golder, in prep). If concentrations at Node 22 are increasing based on data up to 2030 results, then monitoring should continue until concentrations at Node 22 are no longer increasing. Methods for identifying increasing trends will be provided in the approved AEMP Design Plan.

[13] As per the approved AEMP Design plan for closure, fish tasting will occur as necessary to verify results of fish health and fish tissue chemistry programs in Snap Lake.

Closure Objective	Revised Closure Criteria[a]	Primary Reclamation Activities	Post-Closure Inspections and/or Monitoring	Associated Monitoring Plans[b]
SW5 – Landscape features (shape and vegetation) match aesthetics of the surrounding natural area.	1. **Physical Stability** There will be no visible buildings, equipment or non-local materials remaining on site. Construction of physically stable drainage pathways is addressed in SW2. 2. **Chemical Stability** Not applicable as this is a physical/future use and aesthetics objective regarding landscape features at closure as described in SW5-1 and SW5-3. Chemical stability is addressed through site wide and infrastructure objectives (SW3, I2, I3). 3. **Future Use and Aesthetics** The principle of future use has been considered through the design of final landforms that includes slope angles and drainage pathways to be protective of people and wildlife. Landform design will be compatible with surrounding areas to provide continuity in wildlife habitat and support site aesthetics. Final grading will reflect surrounding topography (i.e., steep edges in mine-impacted areas including landforms, pits and trenches, flattened or backfilled) with slopes of 3H:1V where practical[14] through engineering design. Final grading will promote positive drainage towards pre-disturbance drainage pathways where practical. Revegetation targets for the key priority areas are addressed under SW7.	Removal of all buildings, equipment, and surface hazards. Final grading will reflect surrounding topography and re-establish natural drainage pathways where practical. Closure of the North Pile in accordance with the North Pile Closure Design (Appendix H); final design of North Pile will not exceed elevation of surrounding terrain. Revegetation efforts as detailed in Closure Objective SW7.	Final landscape inspected by a qualified professional[15] and representatives of SLEMA. Submission of as-built conditions in a summary report completed by a qualified person. Vegetation monitoring detailed in Closure Objective SW7.	Final Landform Design Vegetation Monitoring Program Closure and Post-Closure Geotechnical Monitoring Plan (Appendix to the North Pile Management Plan)
SW6 – Safe passage and use for Caribou and other wildlife.	1. **Physical Stability** Where practical through engineering design, a 3H:1V slope in mine-impacted areas will be achieved to facilitate caribou passage. Acceptable results of visual monitoring for deformation and degradation for a minimum of three years Post-Closure as part of site geotechnical inspections completed and signed off by a professional engineer. Acceptable results are defined as a concluding statement in the geotechnical inspection report that landforms are performing as designed and are physically stable. 2. **Chemical Stability** Chemical stability is addressed under SW1, SW3 and I3. 3. **Future Use and Aesthetics** The principles of future use and aesthetics of the land have been considered through identification of physical stability criteria for slope angles and maximum cover fill size to create a relatively smooth surface and facilitate caribou and other wildlife passage, as well as to match surrounding terrain.	Removal of all buildings, equipment, and surface hazards. Closure of the North Pile in accordance with the North Pile Closure Design (Appendix H). Engineered earthen structures remaining at the site (i.e., North Pile) will be physically stable. See North Pile closure objectives NP-1 and NP-2 below for details specific to stability of mine waste areas. Final grading of landforms to match surrounding terrain with slopes of 3H:1V where practical per SW5-3. Access to the underground mine will be blocked in a physically stable manner per objective UG3. Chemical stability criteria to support safe passage and use of the site by caribou and other wildlife are detailed in Closure Objectives SW1, SW3 and I3.	Final landscape inspected by a qualified professional and representatives of SLEMA. Submission of as-built conditions in a summary report completed by a qualified person. Geotechnical inspections (visual) of the site will occur Post-Closure in concert with the site geotechnical inspection and monitoring program. Water quality monitoring (runoff and seepage at locations of concern across the site). Wildlife monitoring at the Mine area during Closure. Site inspections will be conducted by SLEMA to provide on-going community input into this objective. Post-Closure inspection and monitoring will be a combination of professional engineer and representatives of SLEMA.	North Pile Management Plan Closure and Post-Closure Geotechnical Monitoring Plan (Appendix to the North Pile Management Plan) Wildlife Effects Monitoring Program Aquatic Effects Monitoring Program Final Landform Design Plan
SW7 – Revegetation targeted to priority areas.	1. Physical Stability	Revegetation efforts will include some combination of the following activities at priority areas across the mine-impacted area:	Final landscape inspected by a qualified professional and representatives of SLEMA.	Revegetation Plan Vegetation Monitoring Program

[14] "Where practical", as it applies to implementation of reclamation activities, means the measure is to be implemented in all cases other than where a local circumstance is prohibitive or implementation of the activity would cause more harm than good. For example, the slope will be graded at an angle of 3H:1V unless doing so would lead to an unacceptable environmental effect on an adjacent habitat such as deposition of fill material into a waterbody or leakage of processed kimberlite into the environment. In those instances where a criteria or reclamation activity cannot be implemented, a rationale would be provided for consideration by the MVLWB.

[15] A qualified professional is defined as one who possesses specified knowledge, skills, training, experience and other requirements (e.g., holding an accreditation from a professional association) to perform a task.

Closure Objective	Revised Closure Criteria[a]	Primary Reclamation Activities	Post-Closure Inspections and/or Monitoring	Associated Monitoring Plans[b]
	Not applicable as this is a future use and aesthetics objective as described in SW7-3. Physical stability is addressed through site wide and infrastructure objectives (SW2, SW4, NP2, I2). 2. **Chemical Stability** Not applicable as this is a future use and aesthetics objective as described in SW7-3. Chemical stability is addressed through site wide and infrastructure objectives (SW3, I1, I2, I3). 3. **Future Use and Aesthetics** Discussions with traditional land users and knowledge holders highlighted the general importance of indigenous plant types to animals, fish and birds. This input has been integrated into design of the revegetation program, allowing for natural progression of native vegetation species to develop on the reclaimed landscape over time. Revegetation activities, including scarification, soil preparation, and seeding, will be successfully completed at priority areas to promote natural recovery. Priority areas are defined as the mine building and main laydown area. Successful completion will be measured by 5% mean plant coverage on upland areas as measured by Post -Closure monitoring, resulting in a mean plant coverage of approximately 25% over the LSA. Revegetation activities have been designed to target successful completion within 5 years of seeding.	• Grading surfaces to promote drainage and limit pooling, surface material loosening (scarification); • Soil preparation, including placement of salvaged overburden as a growth amendment to priority locations; • Seed application of native species; and • Optimization of revegetation activities through adaptive management measures identified from on-going monitoring of existing and future revegetated areas, as well as input from representatives of SLEMA.	Submission of as-built conditions in a summary report completed by a qualified person. Vegetation monitoring will be completed to evaluate the establishment of vegetation at reclaimed surfaces across the site and provide a documented case study for future projects.	
North Pile				
NP1 – Prevent PK from entering the surrounding terrestrial and aquatic environment.	1. **Physical Stability** Successful closure of the North Pile to support objective NP1 is to include the following: a) Closure design of engineered structures (including a cover at least 0.3 m thick and water control structures) is prepared by a professional engineer and approved by the Water Board as necessary. b) Engineered closure works are constructed according to the design intent and as-built reports are prepared by the professional engineer. c) Facility (including perimeter embankments, water control structures and instrumentation) is routinely monitored according to design and under the direction of the North Pile Engineer of Record who is also a professional engineer. d) Facility is periodically inspected and cumulative monitoring data reviewed against design by the North Pile Engineer of Record. e) Inspection reports are prepared by the North Pile Engineer of Record including recommended maintenance work and recommended adjustments to the monitoring program. f) Recommended maintenance work is implemented by the owner or otherwise addressed in a timely manner. g) As-built reports, monitoring results, inspection reports and maintenance descriptions are provided to the Water Board. h) Post-Closure monitoring and inspection program proceeds for a minimum of three years and then progressively decreases in scope and frequency based on demonstrated stability, in coordination with the	Deposition of PK within the North Pile Facility, which will include a cover at Closure. Closure of the North Pile in accordance with the North Pile Closure Design (Appendix H) and QA/QC. QA/QC protocol and as-built(s) completed and signed off by a professional engineer. Maintenance work recommended by the professional engineer as part of the annual geotechnical inspection report is implemented by the owner or otherwise addressed in a timely manner.	Geotechnical inspections (visual) of the North Pile will occur Post-Closure in concert with the site geotechnical inspection and monitoring program. Thermal monitoring will be completed using thermistor cables installed in the North Pile. Water table in the North Pile will be monitored through vibrating wire piezometers. Both thermistors and vibrating wire piezometers are currently being monitored and monitoring is expected to continue into Closure and Post Closure as needed. Water quality monitoring of seepage will occur at the North Pile area as outlined in the SNP.	North Pile Management Plan Closure and Post-Closure Geotechnical Monitoring Plan (Appendix to the North Pile Management Plan) Surveillance Network Program

Closure Objective	Revised Closure Criteria[a]	Primary Reclamation Activities	Post-Closure Inspections and/or Monitoring	Associated Monitoring Plans[b]
	North Pile closure monitoring plan in the North Pile Management plan and site-wide Post-Closure monitoring program, and in accordance with recommendations of the engineer. Successful closure will be demonstrated by: a) Inspection reports and as-built reports prepared and signed off by the North Pile Engineer of Record and approved by the Water Board as necessary; and b) Meeting acceptable performance threshold values consistently as presented in the North Pile closure monitoring plan and demonstrates steady state condition as identified in CDA 2014[16] that could include: - pore pressures (ground water levels) have reduced and stabilized - dam erosion prevention measures are effective - deformations are either non-existent or are at a steady state and do not present a concern with respect to the stability of the dam. Once steady state condition achieved, transition to Closure passive care (Post-Closure condition) can be evaluated based on the data and engineering judgement, in accordance with the North Pile Closure Designs and North Pile Management Plan. Acceptable results conditions allowing for a transition to Closure passive care would require a concluding statement in the geotechnical inspection reports, construction record, and as-built reports signed off by the North Pile Engineer of Record that the North Pile is performing as designed, physical stable and in a steady state. **2. Chemical Stability** Chemical stability specific to seepage from the North Pile is demonstrated when the Effluent Quality Criteria as described in MVLWB Water Licence MV2019L2-0004 is met in the North Pile influent storage ponds for a period of 5 years from the initiation of the Post-Closure period. **3. Future Use and Aesthetics** The principles of future use and aesthetics of the North Pile have been considered through identification of physical stability criteria for slope angles and maximum cover fill size to create a relatively smooth surface and facilitate wildlife passage, as well as to match surrounding terrain. Additional detail to support this criterion is provided under SW6.			
NP2 – Physically stable PK containment area to limit risk of failure that would affect safety of people or wildlife.	**1. Physical Stability** Closure design to support the long-term stability of the North Pile, and as-built report, prepared and signed off by the North Pile Engineer of Record and approved by the Water Board as necessary. The site geotechnical inspections completed and signed off by a professional engineer to state that the closed North Pile is performing as designed and is both physically stable and in a steady state condition when applicable. These inspection reports must demonstrate that the North Pile is in a steady state condition for a minimum of three years Post-Closure. This will include acceptable results from visual monitoring for deformation and degradation as defined in NP1-1.	Closure of the North Pile in accordance with the North Pile Closure Design (Appendix H) and QA/QC. QA/QC protocol and as-built reports completed and signed off by the North Pile Engineer of Record. The WMP and North Pile sumps will be covered to stabilize accumulated sediments. Re-grading the slope of the west perimeter embankment of the Starter & East Cells. Infilling of the interior compartments of the Starter & East Cells. Placement of a final cover layer of coarse material over the entire North Pile for erosion protection purposes.	Area inspected and as-built drawing is deemed acceptable and signed-off by a professional engineer. Geotechnical inspections (visual) of the North Pile will occur Post-Closure in concert with the site geotechnical inspection and monitoring program. The components of the visual inspections are provided in the North Pile Management Plan. Thermal monitoring will be completed using thermistors currently installed with additional thermistors that will be installed in the North Pile closure configuration. Water table in the North Pile will be monitored through vibrating wire piezometers. Both thermistors and vibrating wire piezometers are currently being	North Pile Management Plan Closure and Post-Closure Geotechnical Monitoring Plan (Appendix to the North Pile Management Plan) Surveillance Network Program Final Landform Design Plan

[16] CDA 2014 – Canadian Dam Association Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams. 2014.

Closure Objective	Revised Closure Criteria[a]	Primary Reclamation Activities	Post-Closure Inspections and/or Monitoring	Associated Monitoring Plans[b]
	2. Chemical Stability Not applicable as this is a physical stability objective. Chemical stability is addressed in SW3. 3. **Future Use and Aesthetics** The principle of Future Use has been considered through identification of physical stability criteria to limit risk of failure that would affect safety of people or wildlife as described in NP2-1. Final grading will be compatible with surrounding areas to provide continuity in wildlife habitat and support site aesthetics.	Construction of swales and spillways on the final surficial cover of the North Pile to the perimeter ditches and influent storage ponds. Final landscape inspected and submission of as-built conditions in a summary report completed by a professional engineer. Maintenance work recommended by the North Pile Engineer of Record as part of the annual geotechnical inspection report is implemented by the owner or otherwise addressed in a timely manner.	monitored remotely and expected to continue into Closure and Post Closure as needed. Permafrost establishment is not required to achieve stable slopes, but may enhance it.	
Underground				
UG1 – Flooding of the underground mine will have no impacts to aquatic habitat and community in source lakes.	1. Physical Stability Not applicable as physical stability of the underground mine is addressed in UG3. 2. Chemical Stability Not applicable as chemical stability of the underground mine is addressed in UG2. 3. Future Use and Aesthetics Not applicable as the principles of future use and aesthetics objectives will be achieved through SW3.	In accordance with the MVLWB approved Extended Care and Maintenance Plan, the underground mine was flooded between February and May 2017.	Post-Closure aquatic effects monitoring of Snap Lake.	Aquatic Effects Monitoring Program
UG2 – Underground mine should not contribute to the contamination of ground or surface water.	1. Physical Stability Not applicable as physical stability of the underground mine is addressed in UG3. 2. **Chemical Stability** The removal of all potential contaminant sources was completed prior to flooding in consultation with the GNWT Inspector. Water may be pumped to the underground mine during Closure. To meet this closure objective, the annual water quality concentrations at Snap Lake stations where water from the underground may enter the lake will be less than Aquatic Effects Monitoring Program (AEMP) benchmarks defined in the approved AEMP Design Plan for the period when water is pumped to the underground[17]. 3. **Future Use and Aesthetics** The principles of future use and aesthetics will be addressed through UG2-2 and SW3-2.	All potentially hazardous materials and equipment were removed from the underground mine. In the unlikely case that any water is released from the underground prior to capping of the portals, the water will be managed as surface runoff and covered by actions described under SW3.	Aquatic effects monitoring (water quality in Snap Lake). Site inspections by SLEMA and community fish-tasting (where requested) will be conducted to provide on-going community input into this objective.	Water Management Plan Aquatic Effects Monitoring Program
UG3 – Underground mine workings are physically stable.	1. **Physical Stability** Prior to flooding, the Mine was physically stable in accordance with the WSCC Northwest Territories' Mines Act requirements. All Mine openings to surface, and permanent seals, will be designed and inspected in accordance with Northwest Territories Mines Act and associated regulations and will be constructed and inspected for a minimum of three years Post-Closure by a professional engineer. 2. Chemical Stability	Construction of concrete caps for mine portals and raises in accordance with design prepared by a professional engineer. As-built report prepared and signed-off by a professional engineer.	Geotechnical inspections (visual) of the site will occur in Post-Closure in concert with the site geotechnical inspection and monitoring program (at the North Pile). Visual monitoring specific to the physical stability of the cap structures installed at the underground mine openings will include signs of cracks in the concrete, settlement, erosion, scaling, spalling, and discolouration. The design structural engineer or a designate will perform field reviews during construction to ensure the cap construction has	Closure and Post-Closure Geotechnical Monitoring Plan (Appendix to the North Pile Management Plan)

[17] If concentrations in Snap Lake are above an Aquatic Effects Monitoring Program benchmark but the exceedance is not related to groundwater (e.g., concentrations are not higher at locations above the underground mine compared to other locations in Snap Lake), then closure criteria for UG2 may still be met.

Closure Objective	Revised Closure Criteria[a]	Primary Reclamation Activities	Post-Closure Inspections and/or Monitoring	Associated Monitoring Plans[b]
	Not applicable as chemical stability of the underground mine is addressed in UG2. **3. Future Use and Aesthetics** The principle of future use is addressed through physical stability criteria as described in UG3-1, to be protective of people and wildlife. Where appropriate, aesthetic considerations will be included in designs.		been completed as per the design drawings and meets the design intent. The final sign off will be provided by the design structural engineer.	
Infrastructure				
I1 – Prevent remaining infrastructure from contaminating land or water.	**1. Physical Stability** Physical stability is addressed in SW4 and I2. **2. Chemical Stability** a) Confirmation that all potentially hazardous materials have been moved to an approved disposal facility or treated onsite as per the approved Waste Management Plan; b) Contaminated soils at the Mine are remediated to meet the Tier 1 levels for Industrial Sites as per the Environmental Guideline for Contaminated Site Remediation[18] and to the satisfaction of a professional engineer or geoscientist; and c) Refer to SW3-2b, SW3-2c, and SW3-2d criteria to confirm the remaining in-water infrastructure (fresh water intake and effluent diffuser) are chemically stable. **3. Future Use and Aesthetics** The principles of future use and aesthetics will be addressed through chemical stability criteria as described in I1-2.	All potentially hazardous materials and equipment will be removed from site. Infrastructure that will remain at the site in perpetuity are the freshwater intake and diffuser, laydown areas and gravel pad, stockpiles, airstrip, roads, quarries, and waste management facilities. Post-Closure Environmental Site Assessment of on-land remaining infrastructure and Remedial Action Plan will be completed by a professional engineer or geoscientist, in accordance with GNWT guidelines[18]. Remedial Activities of contaminated soils will be one of the following activities: Contaminated soil transferred off-site to an approved waste facility (primary means); In-situ biological or chemical amendments (i.e., bioremediation); Ex-situ Chemical Amendments (i.e., Chemical Oxidation); Landfarming (Bio-remediation); Soil Solidification/Stabilization (Low Temperature Asphalt/Concrete); or Low Temperature Thermal Desorption. Reclamation of fresh water intake facilities, the effluent diffuser will be completed as described in Section 5.3.4.1.	Final landscape inspected by a qualified professional and representatives of SLEMA. Submission of as-built conditions in a summary report completed by a qualified person. Water quality monitoring (at locations of concern across the site). Aquatic effects monitoring (water quality, fish heath, and fish tissue metal concentrations in Snap Lake).	Waste Management Plan Surveillance Network Program Aquatic Effects Monitoring Program Final Landform Design Plan
I2 – On-site disposal areas are safe for people, wildlife, and vegetation.	**1. Physical Stability** a) The on-site disposal areas (i.e., North Pile Landfills) will be designed and constructed by a professional engineer. b) Acceptable results of visual monitoring for deformation and degradation for a minimum of three consecutive years Post-Closure as part of site geotechnical inspections completed and signed off by a professional engineer. Acceptable results are defined as a concluding statement in the geotechnical inspection report signed off by the professional engineer that the North Pile closure configuration, including the Landfill areas, is performing as designed and is physically stable. **2. Chemical Stability** a) Chemical stability will be achieved by removing/treating all hazardous waste as described in objectives I1 and I3; and b) Confirmation that the on-site waste disposal areas are safe for people, wildlife, and vegetation is addressed through SW-3 criteria. **3. Future Use and Aesthetics** The principles of future use and aesthetics are addressed through physical stability criteria as described in I2-1 and as identified through engagement (FCRP, Appendix C.3)., to be protective of people and wildlife. Aesthetic considerations have been included in final landform designs to provide continuity with surrounding landscape.	Isolation of contaminated soils and non-hazardous waste within disposal areas designed and inspected by a professional engineer. Final landscape inspected and submission of as-built conditions in a summary report completed by a professional engineer. Post-Closure geotechnical monitoring at appropriate locations. Re-grading the slope of the west perimeter embankment of the Starter & East Cells. Infilling of the interior compartments of the Starter & East Cells. Placement of a final cover layer of coarse material over the entire North Pile for erosion protection purposes. Construction of swales and spillways on the final surficial cover of the North Pile to the perimeter ditches and influent storage ponds.	Area inspected and as-built drawing is deemed acceptable and signed-off by a professional engineer. Geotechnical inspections (visual) of the site will occur Post-Closure in concert with the site geotechnical inspection and monitoring program. Waste will be handled, stored and disposed of as described in the Waste Management Plan. Upon completion of demolition, the landfill will no longer be needed and it will be closed and capped as described in the North Pile Closure Cover Detailed Design (Section 4.1.2). The location of the landfill is illustrated (FCRP, Appendix F.1, Figure 1). Water quality monitoring (at influent storage ponds). Aquatic effects monitoring (water quality, fish heath, and fish tissue metal concentrations in Snap Lake).	North Pile Management Plan Closure and Post-Closure Geotechnical Monitoring Plan (Appendix to the North Pile Management Plan) Waste Management Plan Final Landform Design Plan Surveillance Network Program Aquatic Effects Monitoring Program

Closure Objective	Revised Closure Criteria[a]	Primary Reclamation Activities	Post-Closure Inspections and/or Monitoring	Associated Monitoring Plans[b]
I3 – Contaminated soils and waste disposal areas that cannot contaminate land and water.	1. **Physical Stability** Physical stability is addressed through SW4 and I2. 2. **Chemical Stability** Contaminated soils at the Mine are remediated to meet the Tier 1 levels for Industrial Sites as per the Environmental Guideline for Contaminated Site Remediation[18] and to the satisfaction of a professional engineer or geoscientist. 3. **Future Use and Aesthetics** The principles of future use and aesthetics are addressed through chemical stability criteria as described in I3-2 and I2, to be protective of people and wildlife. Aesthetic considerations have been included in in final landform designs to provide continuity with surrounding landscape.	Post-Closure Environmental Site Assessment and Remedial Action Plan completed by a professional engineer or geoscientist, in accordance with GNWT guidelines[18]. Remedial Activities of contaminated soils (as determined through the Environmental Hazards Assessment Program) will be one of the following activities: Contaminated soil transferred off-site to an approved waste facility (primary means); In-situ biological or chemical amendments (i.e., bioremediation); Ex-situ Chemical Amendments (i.e., Chemical Oxidation); Landfarming (Bio-remediation); Soil Solidification/Stabilization (Low Temperature Asphalt/Concrete); or Low Temperature Thermal Desorption.	Final landscape inspected by a qualified professional and representatives of SLEMA to confirm completion of remedial activities. For soils designated for treatment on site, the frequency of soil sampling will be bi-annual (spring and autumn). Seepage from the landfill and North Pile will be directed to North Pile sumps and monitoring completed as per I2.	Waste Management Plan Environmental Hazards Assessment

[a] *Revised Table 5.2 as provided in response to multiple recommendations on Version 0 of the FCRP; submitted to the MVLWB 3 July 2019 (De Beers, 2019g).*

[b] *Also listed in Table 9.1*

[18] Government of the Northwest Territories (GNWT), 2003. Environmental Guideline for Contaminated Site Remediation.