APPENDIX D

TEMPORAL VS SPATIAL CUMULATIVE EFFECTS AND UNDERESTIMATING INCREMENTAL EFFECTS FROM THE JAY PROJECT

TECHNICAL MEMORANDUM

DATE March 30, 2015 **PROJECT No.** 1407256-6000-92

TO Richard Bargery (Dominion Diamond)

CC Kristine Mason, Steven Strawson

FROM Jim Rettie, John Virgl **EMAIL** jrettie@golder.com

TEMPORAL VERSUS SPATIAL CUMULATIVE EFFECTS FROM THE JAY PROJECT ON CARIBOU

Introduction

Dominion Diamond is committed to engaging with potentially affected stakeholders on the Jay Project and has undertaken several engagement discussions with Diavik Diamond Mine Inc. (DDMI) following submission of the Developer's Assessment Report (DAR) for the Jay Project (Project) in November 2014. Dominion Diamond meetings with DDMI have focused on a number of technical questions arising from information presented in the DAR. Technical topics have included project description/engineering, water quality modelling, air quality, and caribou.

During the February 4, 2015 meeting, Dominion Diamond committed to providing additional analysis at the year 2027 with and without the Jay Project to add additional detail to the assessment of cumulative effects of the Project on caribou, specifically a future comparison that includes a "no Project" scenario wherein both the Ekati and Diavik Mines close according to their current schedules (i.e., 2019 and 2023 respectively). This memo provides the methods and results of the analyses used to determine how the addition of a temporal assessment period (i.e., temporal snapshot) in the Reasonably Foreseeable Development (RFD) Case would change the predicted magnitude of incremental effects from the Jay Project on caribou, relative to the local-scale cumulative effects from the Ekati and Diavik mines. Of key importance in the analyses is the change in the date of closure of Ekati Mine and the effect on when additional terrestrial habitat for caribou might become available.

In the assessment of the RFD case in the DAR for the Jay Project, a zone of influence (ZOI) of 15 km was placed around the footprints of all aspects of Jay Project, Ekati Mine (including the Sable project), and Diavik Mine operations. The ZOI was used to represent the extent of the effects of development activities on barren-ground caribou distribution and habitat quality. The spatial extent of the ZOI from mining developments on caribou distribution is expected to decline following mine closure. Operations at the Diavik Mine are scheduled to end in 2023. Without the Jay Project, Ekati operations are scheduled to end in 2019. The Jay Project will increase the spatial extent of the ZOI associated with the Ekati Mine and extend the operating life of the Ekati Mine until 2030.

If the ZOIs around Diavik and Ekati (with or without the Jay Project) are reduced following mine closure, then additional terrestrial habitat will become available to barren-ground caribou. Logically, the earlier mining

operations end, the sooner that additional terrestrial habitat would become available. The proximity of the Ekati and Diavik mines means that a 15 kilometre (km) ZOI from one operation will include some of the same areas within the 15 km ZOI around the other operation. Consequently, any reduction in the ZOI following closure of one mine will only be partially realized until both mines are closed. The approval of the Jay Project will extend the life of Ekati by ten years and will delay the increase in available terrestrial habitat until after 2030 when Ekati, including the Jay Project, is scheduled to close. The closure phase of the Jay Project is scheduled to occur from 2030 to 2033.

Background

In addition to natural variability, evidence suggests that caribou herds change their distribution around diamond mine developments, with caribou more likely to be found farther from developments (Boulanger et al. 2004, 2012; Johnson et al. 2005; Rescan 2007; Golder 2011). The combination of direct (physical footprint) and indirect (sensory disturbances) effects can create a ZOI around developments that changes the behaviour and occurrence (i.e., distribution) of caribou. This ZOI appears to be greater than the estimated spatial extent of the independent effects from infrastructure, activities, dust, air emissions, or noise. Johnson and Russell (2014) reported ZOIs of human disturbance on barren-ground caribou that varied with the type of disturbance; ZOIs whose effect distances were not always clearly defined by the data. Recent analyses by Boulanger et al. (2012) found that caribou were four times more likely to occur at distances greater than 11 to 14 km from the Ekati and Diavik mines.

The effects of development on caribou habitat were assessed in the DAR through two sets of analyses. These were divided into the effects of direct habitat loss (development footprints) and indirect habitat loss (in ZOIs around the footprints).

Direct Habitat Loss

In the DAR (Section 12.4.2.1), the quantities of habitat loss and fragmentation for barren-ground caribou within each seasonal range were determined for each Assessment Case (i.e., reference condition, Base Case, Application Case, RFD Case) after applying the footprints of all developments to each case. For mines, the actual development footprint was applied, while linear development footprints were represented as 200 m or 250 m corridors and point feature developments as 200 m or 250 m diameter circles (DAR, Table 12.4-2). In the DAR, the calculation of reductions in habitat quantity and the effects of habitat fragmentation were restricted to development footprints. For closed mines and inactive land use permits, the physical footprint was carried through the entire effects analysis (i.e., applied for all Assessment Cases) because it was assumed that direct disturbance to the landscape had not yet been reversed. Direct habitat losses were calculated following application of these footprints. Direct habitat losses are considered to be permanent and irreversible.

Indirect Habitat Loss

The effects of the Jay Project on barren-ground caribou habitat quality were presented in DAR Section 12.4.2.2. For each Assessment Case, development footprints were buffered by a set of ZOI buffers, a disturbance coefficient applied to each concentric buffer, and the changes in habitat quality calculated. The sizes of the buffers and the disturbance coefficients applied are discussed in Section 12.4.2.2 of the DAR and presented in DAR Table 12.4-15, with the largest (15 km) ZOIs being applied to mines and communities. In this way, the ZOI was used to determine the reduction in quality of habitat available to barren-ground caribou. Important to note is that all habitat was not considered lost, but considered to be of lower value based on its proximity to the development footprint (e.g., habitat between 5 km and 15 km from a mine was considered to have lost 25 percent (%) of its original value to caribou). Owing to an absence of information on post-closure caribou

behaviour, the changes to habitat quality were applied during operations and retained permanently following mine closure; the permanent application reflecting the maximum temporal extent of cumulative effects of mining activities. However, indirect habitat losses (and associated changes in distribution) as a consequence of sensory disturbance were anticipated to be reversible in five to ten years following closure (DAR Section 12.6.2, page 12-133).

The concern expressed in the request was specifically regarding post-closure scenarios and how the application of the Jay Project will not only increase the spatial extent of direct and indirect effects of the Ekati Mine on caribou but, more importantly, will extend the temporal effects of sensory disturbance from the Misery Road and Jay Pit and Road. The objective of the following analysis is to predict the amount of terrestrial habitat that may become available to barren-ground caribou from closure of the Diavik Mine and different closure scenarios for the Ekati Mine.

Methods

To determine the potential effect of the extended operations of the Ekati Mine, analyses were conducted on scenarios set in 2027, a time at which Diavik will be in post-closure phase; Ekati will also be in post-closure in 2027 without the Jay Project.

The analyses were completed for two separate future development scenarios:

Scenario 1. Post-closure of Diavik with Ekati in operation (where Diavik includes the A21 project and Ekati includes the Sable project and the Jay Project).

Scenario 2. Post-closure of both Diavik and Ekati (where Diavik includes the A21 project and Ekati includes the Sable project).

Key elements of the analyses are:

- The spatial scale of the assessment was defined by the current combined Diavik and Ekati caribou study area (approximately 5,900 square kilometres [km^2]). Future projects outside this study area were not included in the analyses.
- The metric of interest for all analyses was the amount of available terrestrial habitat.
- Terrestrial habitat was identified as all non-water landcover classes using 2011 land cover data from the Canada 250-m Land Cover Time Series (Version 2), obtained from Natural Resources Canada, completed in a Geographic Information System (GIS) platform.
- As in the analyses conducted in the DAR, development footprints were considered permanently unavailable as caribou habitat in both scenarios.
- In both scenarios, and for both Diavik and Ekati, the development footprints included all existing pits, roads, waste rock piles, and other infrastructure.
- For the purposes of these analyses, the 15 km ZOI is accepted as the RFD Case area of terrestrial habitat that is not available to caribou for both scenarios.
- All ZOIs were measured from the outer margins of development footprints; their contents represent the area between the outer footprint margin and the outer ZOI limit.

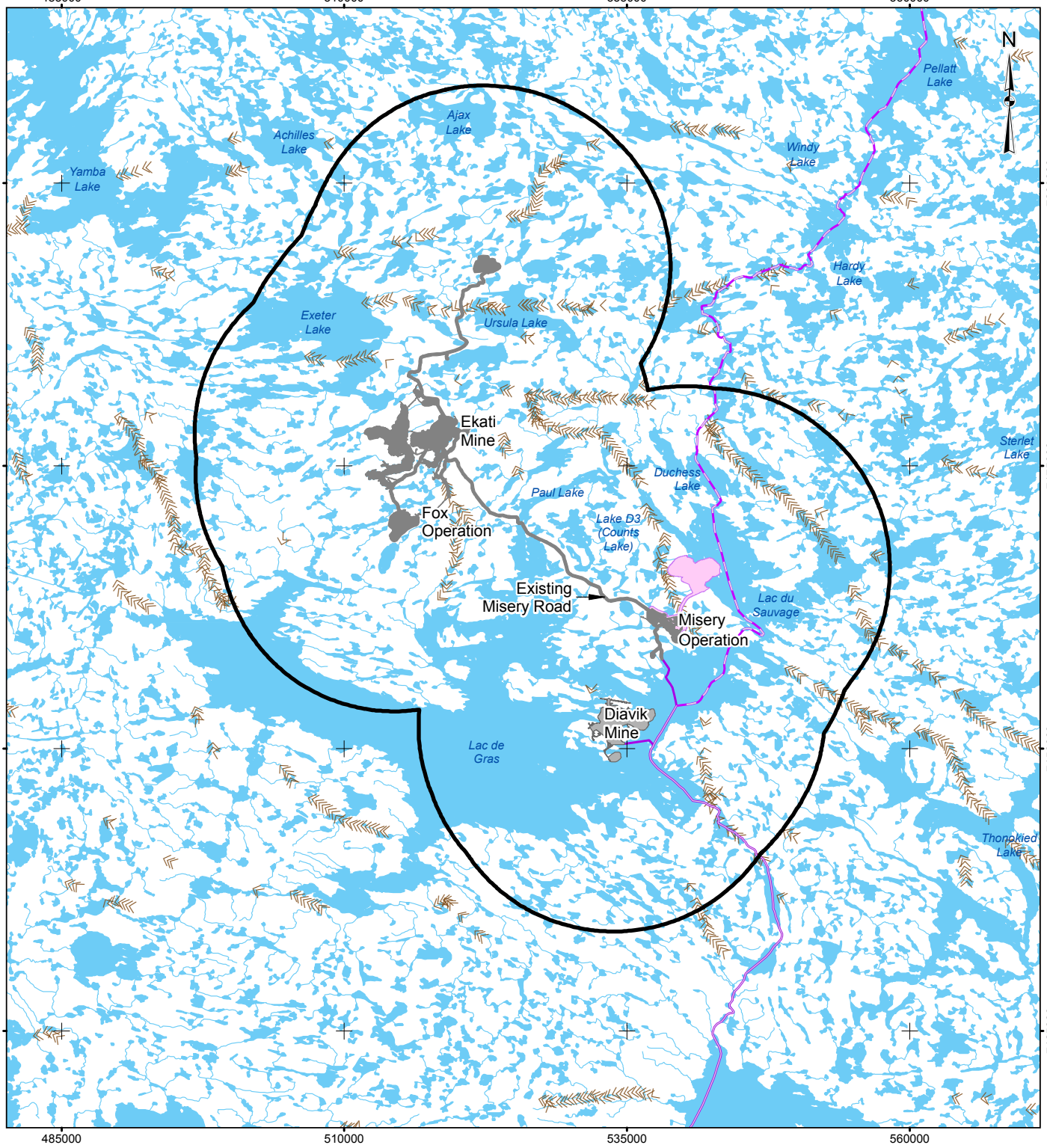
Steps in the analyses for each scenario were:

1) The amount of terrestrial habitat within the 15 km ZOI around the development footprints was determined. This is the approach taken in the DAR to determine the maximum area of effect.

2) The sum of terrestrial habitat within a 15 km ZOI around active developments and 0 km (i.e., footprint only), 2 km, and 5 km ZOIs around inactive developments was determined. The ZOIs and disturbance coefficients applied in the DAR were estimated from the published literature (Johnson et al. 2005; Vistnes and Nellemann 2008; Benítez-López et al. 2010; Boulanger et al. 2012). For mines and communities, concentric ZOIs of 1, 5, and 15 km were used in the DAR. For this request, in the combined Ekati and Diavik caribou study area, the effect of operating mines was of specific interest. Other ZOIs applied to in the DAR ranged from 1 km to 5 km with varying effects of disturbance applied depending on the nature of the development. As no disturbance coefficients were being applied for these analyses, an intermediate ZOI of 2 km was selected for assessment.

3) The amount of potentially available terrestrial habitat following mine closures was determined as the difference between the maximum effect (15 km ZOI around all developments) and the smaller ZOIs applied to mines in the post-closure phase.

Map 1 shows the locations and footprints of all developments and the limits of the 15 km ZOI applied in Scenario 1. The Jay Project is the only development that differs between the two scenarios. Map 2 shows Scenario 1, with Diavik Mine post-closure including a 2 km (orange line) and 5 km (green line) and partial 15 km (black line) ZOIs, and the Ekati Mine with the Jay Project and a 15 km ZOI (red line) around the Ekati Mine footprint. Map 3 shows Scenario 2, with both Diavik and Ekati (without the Jay Project) in post-closure, with 2 km (orange line), 5 km (green line), and 15 km (black line) ZOIs around the Ekati and Diavik mine footprints.



LEGEND

- EKATI MINE FOOTPRINT
- DIAVIK MINE FOOTPRINT
- PROPOSED JAY FOOTPRINT
- WINTER ROAD
- TIBBITT TO CONTWOYTO WINTER ROAD
- NORTHERN PORTION OF TIBBITT TO CONTWOYTO WINTER ROAD
- ESKER
- WATERCOURSE
- WATERBODY
- 15 km ZONE OF INFLUENCE AROUND JAY, EKATI AND DIAVIK FOOTPRINTS

10 0 10

SCALE 1:500,000 KILOMETRES

REFERENCE

NATIONAL TOPOGRAPHIC BASE DATA (NTDB) 1:250,000
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NATURAL RESOURCES CANADA, CENTRE FOR TOPOGRAPHIC INFORMATION, 2012
DATUM: NAD83 PROJECTION: UTM ZONE 12N

DOCUMENT

TEMPORAL VERSUS SPATIAL CUMULATIVE EFFECTS FROM THE JAY PROJECT ON CARIBOU

PROJECT
DOMINION DIAMOND

JAY PROJECT
NORTHWEST TERRITORIES, CANADA

TITLE

REASONABLY FORESEEABLE DEVELOPMENT CASE AND ZONE OF INFLUENCE (ZOI) WITH JAY PROJECT

Golder Associates

PROJECT		1419751	FILE No. POSTDAR_IR_Wild_016_GIS	
DESIGN	JR	02/05/25	SCALE AS SHOWN	REV. 0
GIS	JE	06/04/15		
CHECK	JR	06/04/15	MAP 1	
REVIEW	JV	06/04/15		

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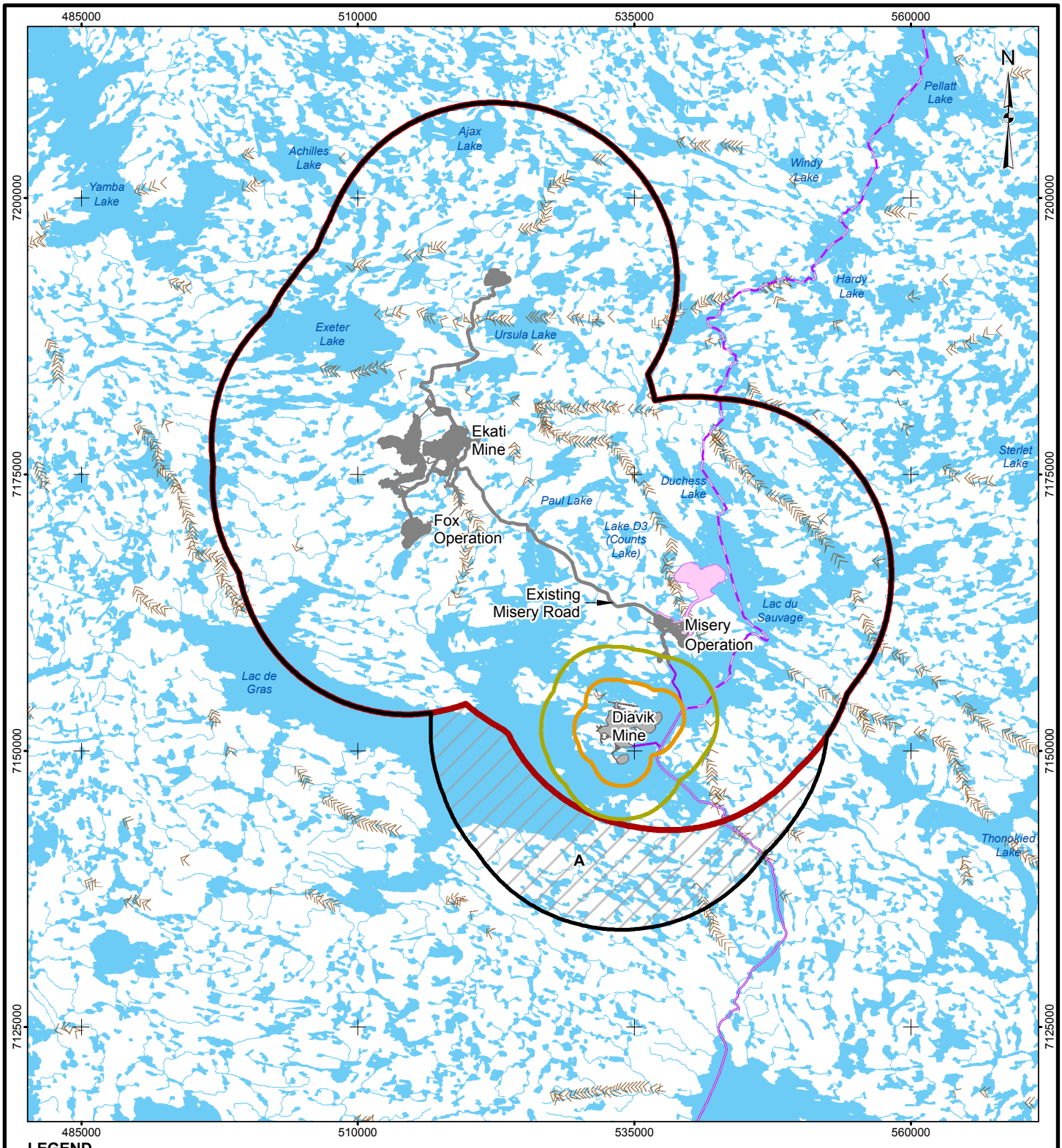

LEGEND

- EKATI MINE FOOTPRINT
- DIAVIK MINE FOOTPRINT
- PROPOSED JAY FOOTPRINT
- WINTER ROAD
- TIBBITT TO CONTWOYTO WINTER ROAD
- NORTHERN PORTION OF TIBBITT TO CONTWOYTO WINTER ROAD
- ESKER
- WATERCOURSE
- WATERBODY
- 15 km ZOI AROUND JAY, EKATI, AND DIAVIK FOOTPRINTS
- AREA INCLUDED IN 15 km ZOI AROUND DIAVIK FOOTPRINT AND NOT WITHIN 15 km ZOI AROUND JAY AND EKATI FOOTPRINTS
- 15 km ZOI AROUND JAY AND EKATI FOOTPRINTS
- DIAVIK FOOTPRINT 2 km ZOI
- DIAVIK FOOTPRINT 5 km ZOI

10 0 10

SCALE 1:500,000 KILOMETRES

REFERENCE

NATIONAL TOPOGRAPHIC BASE DATA (NTDB) 1:250,000
CANVEC © NATURAL RESOURCES CANADA, 2012
NATURAL RESOURCES CANADA, CENTRE FOR TOPOGRAPHIC INFORMATION, 2012
DATUM: NAD83 PROJECTION: UTM ZONE 12N

DOCUMENT

TEMPORAL VERSUS SPATIAL CUMULATIVE EFFECTS FROM THE JAY PROJECT ON CARIBOU

PROJECT
DOMINION DIAMOND

JAY PROJECT
NORTHWEST TERRITORIES, CANADA

TITLE
2027 REASONABLY FORESEEABLE DEVELOPMENT CASE AND ZONE OF INFLUENCE (ZOI) WITH JAY PROJECT AND FOLLOWING DIAVIK CLOSURE

Golder Associates

PROJECT		1419751	FILE No. POSTDAR_IR_Wild_017_GIS	
DESIGN	JR	02/05/25	SCALE AS SHOWN	REV. 0
GIS	JE	06/04/15		
CHECK	JR	06/04/15	MAP 2	
REVIEW	JV	06/04/15		

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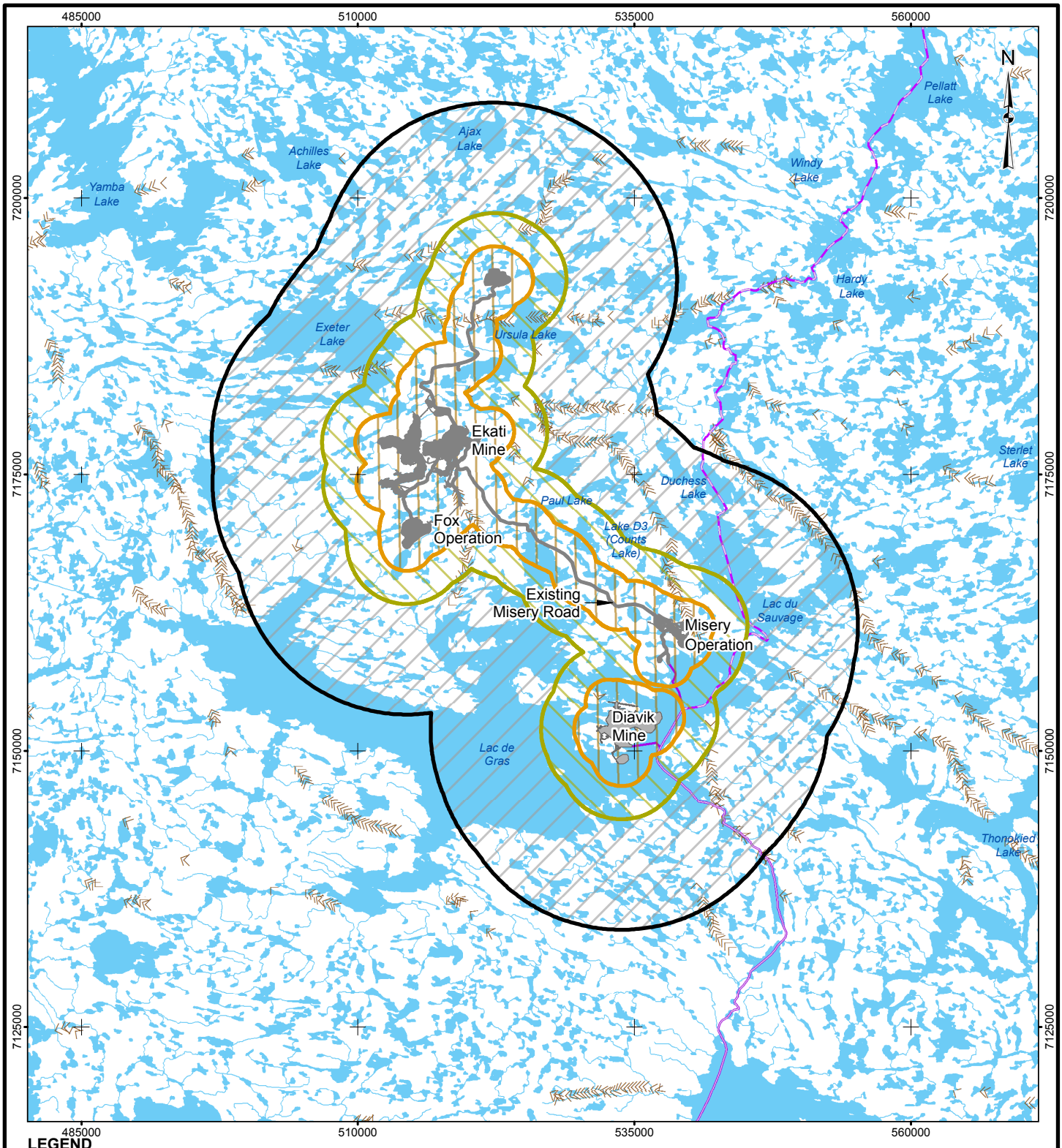

LEGEND

- EKATI MINE FOOTPRINT
- DIAVIK MINE FOOTPRINT
- WINTER ROAD
- TIBBITT TO CONTWOYTO WINTER ROAD
- NORTHERN PORTION OF TIBBITT TO CONTWOYTO WINTER ROAD
- ESKER
- WATERCOURSE
- WATERBODY
- 15 km ZOI AROUND EKATI AND DIAVIK FOOTPRINT
- 5 km ZOI AROUND EKATI AND DIAVIK FOOTPRINT
- 2 km ZOI AROUND EKATI AND DIAVIK FOOTPRINT
- AREA BETWEEN 5 km AND 15 KM ZOIs AROUND DIAVIK AND EKATI FOOTPRINTS
- AREA BETWEEN 2 km AND 5 KM ZOIs AROUND DIAVIK AND EKATI FOOTPRINTS
- AREA BETWEEN 2 km ZOI AND DIAVIK AND EKATI FOOTPRINTS

10 0 10

SCALE 1:500,000 KILOMETRES

REFERENCE

NATIONAL TOPOGRAPHIC BASE DATA (NTDB) 1:250,000
CANVEC © NATURAL RESOURCES CANADA, 2012
NATURAL RESOURCES CANADA, CENTRE FOR TOPOGRAPHIC INFORMATION, 2012
DATUM: NAD83 PROJECTION: UTM ZONE 12N

DOCUMENT

TEMPORAL VERSUS SPATIAL CUMULATIVE EFFECTS FROM THE JAY PROJECT ON CARIBOU

PROJECT

DOMINION DIAMOND

JAY PROJECT
NORTHWEST TERRITORIES, CANADA

TITLE

2027 REASONABLY FORESEEABLE DEVELOPMENT CASE AND ZONE OF INFLUENCE (ZOI) WITHOUT THE JAY PROJECT AND FOLLOWING DIAVIK AND EKATI CLOSURES

Golder Associates

PROJECT		1419751	FILE No. POSTDAR_IR_Wild_018_GIS	
DESIGN	JR	02/05/25	SCALE AS SHOWN	REV. 0
GIS	JE	06/04/15		
CHECK	JR	06/04/15		
REVIEW	JV	06/04/15		

MAP 3

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Results

The development footprint area (Map 1) decreases from 70 km^2 in Scenario 1 to 59 km^2 with the exclusion of the Jay Project in Scenario 2. This is consistent with the size of the Jay Project footprint reported in the DAR (Section 12.4.2.1.2).

The areas of terrestrial habitat within each ZOI for the two Scenarios are presented in Table 1. Under Scenario 1, the continued operation of the Ekati Mine in 2027, including the Jay Project, yields a 15 km ZOI that includes the entire areas described by 0 km, 2 km, and 5 km ZOIs around Diavik (Map 2). The terrestrial area with each of these post-closure ZOIs is the same: 1,584 km^2. Consequently, the post-closure effect of Diavik in 2027 will not add to the cumulative regional effect unless the ZOI is greater than 5 km. If the maximum extent of 15 km ZOI applied in the DAR is used, then Diavik will be accountable for cross-hatched Area A on Map 2 being added to the affected area. The size of Area A (167 km^2) on Map 2 is the difference between terrestrial areas under Scenario 1 with 5 km and 15 km ZOIs applied around Diavik (Table 1) (i.e., 1,751 km^2 less 1,584 km^2).

Table 1: Area of Terrestrial Habitat (Km^2) Contained within each Predicted ZOI for each 2027 Assessment Scenario

	Post-closure ZOI[(a)]			
2027 Scenario	**0 km**	**2 km**	**5 km**	**15 km[(b)]**
Scenario 1 (with the Jay Project)	1,584	1,584	1,584	1,751
Scenario 2 (without the Jay Project)	0	249	529	1,650
Additional terrestrial habitat affected in 2027 with the addition of the Jay Project[(c)]	1,584	1,335	1,055	101

(a) The ZOI around active developments was held constant at 15 km.

(b) This is the ZOI with maximum extent of cumulative effects on habitat quality, as applied in the DAR.

(c) Change within ZOI only, not including 11 km2 Jay Project footprint.

Under Scenario 2, the absence of the Jay Project and the closure of both Diavik and Ekati before 2027 yields smaller areas of terrestrial habitat being contained within each ZOI when compared to Scenario 1. The maximum difference is observed when the influence of the mines during post-closure is restricted to the combined physical footprints (i.e., 0 km ZOI). In that case, the continued operation of the Ekati Mine with the Jay Project will be accountable for 1,584 km^2 of terrestrial habitat being unavailable until Ekati is closed in 2030. The minimum difference between the two scenarios occurs when the maximum extent of a 15 km ZOI is applied to all developments post-closure. In that case, the continued operation of the Ekati Mine, including the Jay Project, will be accountable for an additional 101 km^2 of terrestrial habitat being permanently unavailable.

Discussion

One predicted effect of adding the Jay Project to the Ekati Mine is to delay the reversal of some of the indirect effects of the Diavik and Ekati mines on caribou habitat following closure of the Diavik Mine. While the degree and time required for the reversal of these effects is presently unknown, continued operation of the Ekati Mine after the closure of Diavik will likely delay complete reversal until after the closure of Ekati.

The amount of terrestrial habitat that may become available following the closure of Ekati and Diavik depends on the unknown residual post-closure ZOI. A set of plausible ZOIs was included in the analyses, from no ZOI beyond the development footprint to a 15 km ZOI (i.e., the ZOI estimated for the operations phase).

As shown in Map 2 and Table 1, when Ekati operations continue with the addition of the Jay Project, the maximum terrestrial area that might become available to caribou by 2027 following closure of the Diavik Mine is 167 km^2. Following closure of the Ekati Mine, the availability of caribou habitat will extend more broadly (Map 3 and Table 1). The addition of the Jay Project will have little effect in terms of the total area of habitat becoming available within the region, but will delay the reversibility of the Ekati Mine ZOI and a portion of the Diavik Mine ZOI until after 2030. In the time interval between the closure of Diavik and the closure of Ekati, the potential reversibility of available terrestrial caribou habitat is lower by between 101 km^2 and 1,584 km^2, based on the hypothetical ZOIs used in the analyses. As noted in the Indirect Habitat Loss section above, an important factor in the assessment was that the magnitude of effect of development on caribou habitat quality was expected to decline with distance from the development footprint; areas beyond 5 km from development being expected to retain 75% of their original habitat value.

Under reference conditions, Bathurst caribou would have had unimpeded access to travel across Lac de Gras, or west and east of Lac de Gras during the northern migration (DDMI 1998). Satellite collar movements from 1996 to present indicate that the location on the winter range typically determines the movement of female caribou west or east of the Lac de Gras area (e.g., Golder 2011). Caribou movements during the post-calving and autumn periods are less predictable, but animals do follow the shoreline of large lakes (e.g., Contwoyto, Point, and MacKay lakes). Prior to the construction of the Diavik Mine, Bathurst caribou would have had unimpeded access to travel along the eastern and western shorelines of Lac de Gras, and also from the West Island to the East Island (location of Diavik) and cross Lac de Gras to the eastern shoreline (DDMI 1998). Long-term monitoring has generally supported predictions made in the Environmental Effects Report for the Diavik Diamond Mine (DDMI 1998). In 12 of 15 years (1996 to 2010), the majority of collared females travelled east of Lac de Gras during the post-calving/autumn period and very few animals have been observed on the East Island since the construction of the Diavik Mine (Golder 2011, 2014).

Closure of the Diavik and Ekati (without Jay Project) mines is predicted to reverse the effect of the mines on caribou movement from the West to East islands and the eastern shoreline of Lac de Gras. Following closure of the Diavik Mine in 2023, reclaimed and undisturbed habitat on the East Island should become available for caribou. With the Jay Project, implementation of mitigation and adaptive management for traffic along the Misery and Jay roads should provide caribou with access to the historic West to East islands travel route (and the Lac du Sauvage – Lac du Gras Narrows). However, the ZOI from the Jay Project could delay the reversibility of the effect to caribou movement across the West to East islands and Lac de Gras and result in a decrease in the relative abundance (occurrence) of caribou along this route compared to reference conditions. West Island is outside the 5 km ZOI of Ekati operations while East Island is approximately 4.5 km from the nearest point of Ekati operations. Following the closure of Diavik, this route will have reduced effects from development and reversal of the effects on caribou movement through the area may begin prior to the closure of the Jay Project. Greater use of this historic travel route by caribou is expected to occur with increasing abundance of the Bathurst herd.

Associated with the delay in the reversal of indirect effects on caribou habitat is a prolongation of the period of monitoring caribou distribution in relation to the predicted ZOI (i.e., monitoring would be extended by the 10-year timeframe of the Jay Project). Data on caribou distribution and movements post-closure are important for the accurate assessment of residual disturbance and the duration and spatial extent of recovery around mining developments. Monitoring approaches and methods would be directed by the Zone of Influence Task Group, which is led by the Government of the Northwest Territories (GNWT), Department of Environment and Natural

Resources, and Dominion Diamond is a participant. These data will provide important information for future environmental assessments and the assessment and management of cumulative effects by the GNWT.

In the DAR, the effects from sensory disturbance on barren-ground caribou habitat quality and distribution were estimated from empirical studies. The results of those studies informed the selection of the concentric ZOIs and disturbance coefficients used in the residual effects assessment of the Jay Project. The approach taken in the DAR to reduce uncertainty associated with changes in habitat quality, and altered movement and behaviour of caribou, included assumptions intended to overestimate spatial effects of sensory disturbance. The reversibility of those effects is anticipated, but its timeframe is uncertain. Given the overlap of the ZOIs around the Diavik and Ekati mines, under Scenario 1 (with the Jay Project, Map 2) the reversibility of effects over some areas will be delayed until closure of the Ekati Mine when the Jay Project is completed in 2033. Monitoring in the post-closure period will begin later and end later than if Ekati closes in 2019. For any hypothetical period of post-closure monitoring, the effective extension of Ekati Mine operations with the addition of the Jay Project will extend monitoring requirements until 2043 (ten years after completion of Ekati Mine closure in 2033) or until reclamation objectives are met. Following closure of Diavik, the ZOIs around Diavik Mine and Ekati (with Jay Project) overlap, with effects at different magnitudes (Map 2). Consequently, there are likely to be overlapping monitoring needs: reclamation monitoring for Diavik, with Ekati mine monitoring to include monitoring of East Island as part of operational monitoring according to the Ekati/Jay Wildlife Effects Monitoring Program. Reclamation monitoring will also occur following closure of Ekati/Jay.

Conclusion

The post-closure ZOI around the Ekati and Diavik mines is expected to be smaller than the 15 km ZOI applied in the DAR. There is a high degree of uncertainty regarding the magnitude and duration of the decrease in ZOI on caribou distribution following the closure of diamond mines. However, it may be assumed that onset of the period of reversibility will be related to closure of both Ekati and Diavik mines, and to the end of post-closure activities of the two mines. The addition of the Jay Project will extend the operations at the Ekati Mine by ten years, seven years after the closure of Diavik. Full reversal of effects of the mines on terrestrial habitat within the 15 km ZOI around the Ekati and Diavik mines will likely be delayed until Ekati operations cease, though reversal of the higher disturbance effects in the smaller ZOIs around Diavik Mine are expected to begin following its closure. With the Jay Project, monitoring of caribou distribution will likely be extended until 2043 (ten years after completion of Ekati Mine closure in 2033) or until reclamation objectives are met.

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Senior Ecologist

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JR/JV/jr

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