Memorandum

Date:	March 31, 2017
To:	Oliver Curran, TMAC Resources Inc.
From:	ERM Consultants Canada
CC:	Nicole Bishop, ERM and Marc Wen, ERM
Subject:	**TMAC Resources Inc. – Information Requests received from the Kitikmeot Inuit Association regarding the Draft Environmental Impact Statement for the Madrid-Boston Phase 2 Project**

INTRODUCTION

This memorandum responds to Information Requests (IRs) provided by the Kitikmeot Inuit Association (KIA) in March 2017 with respect to TMAC Resources Inc.'s (TMAC) Draft Environmental Impact Statement (DEIS). Provided below is the response to KIA IRs 16, 17, and 30.

KIA INFORMATION REQUEST 16:

Defining Core Range for Caribou Current and Traditional

Please provide information on:

- *How the core calving range was derived for Bathurst caribou, including the proportion of caribou represented by the core and the years it represents.*
- *Please provide an additional figure showing the traditional calving range for this herd (based on earlier surveys prior to those used in Figure 9.2.11, and Inuit Traditional Knowledge covering several hundreds of years).*

TMAC RESPONSE ON MARCH 17:

Figure 9.2-1 in Volume 4, Section 9.2.6.1, displays the calving and annual ranges of the Bathurst, Beverly/Ahiak and Dolphin and Union caribou herds. The polygons which define the calving ranges of the Bathurst and Beverly/Ahiak herds were sourced from GIS data provided by the Nunavut Planning Commission (2016), which were calculated by Caslys (2016) for the NPC. The Bathurst calving range used data collected using satellite and GPS collars for the period of 1996-2015. The herd range of the Bathurst was calculated by TMAC using collar data from 2001-2015. These data indicate that the Bathurst herd does not overlap the Project site in any season during the last 20 years. Traditional knowledge (TK) information indicates that the Bathurst have historically used both east and west of Bathurst Inlet for calving. Aerial surveys

were conducted starting in the 1960s and indicated that during the 1960s-1980s, the Bathurst herd calved to the south-east of the Project. Mapping showing the distribution of historic aerial survey data are being compiled and will be delivered on March 31. TMAC notes that the Bathurst herd does not overlap the Project site, as indicated by the NPC (2016) and was therefore scoped out of the assessment, since the Project does not spatially overlap this herd. Potential effects of the Project were evaluated for the Dolphin and Union herd and the Beverly/Ahiak herd and are included in Volume 4, Section 9.8 and 9.9. The delivery of this map on March 31 should not impede the technical review of the DEIS.

REFERENCES:

Casly. 2016. Barren-ground Caribou Analysis Methods Summary Report - Draft. Submitted to the Government of Nunavut Department of Environment, Wildlife Research Branch by Caslys Consulting Ltd. February 2016.

TMAC ADDITIONAL INFORMATION PROVIDED ON MARCH 31:

TK data indicates that the Bathurst caribou calved on both east and west of Bathurst inlet and on the inlet itself. Spatial TK data delivered to TMAC was for the Regional Study Area (RSA) and does not cover the full range of the Bathurst herd.

Historic survey data is displayed in Figure KIA-IR16-1, sourced from Gunn et al. (2008) which reported the area of concentrated calving (polygons) and calving centroid (point) from 1966 to 1990 using aerial survey data and 1996 to 2007 using satellite collar data. These data indicate that prior to the 1990s, the Bathurst herd calved on the east side of Bathurst Inlet, generally to the south-east of the Boston site. During the 1990s, the Bathurst herd moved its calving grounds to the west side of Bathurst Inlet where they remain today.

The Nunavut Land Use Plan (NPC 2016) used satellite collar data to define the calving area of the Bathurst herd, which is presented as a polygon on Figure KIA-IR16-1. This calving polygon agrees with the yearly calving ranges identified by Gunn et al. (2008) on the west side of Bathurst Inlet.

These data indicate that the Bathurst Herd do not overlap with the proposed Project and were correctly scoped out of the DEIS assessment.

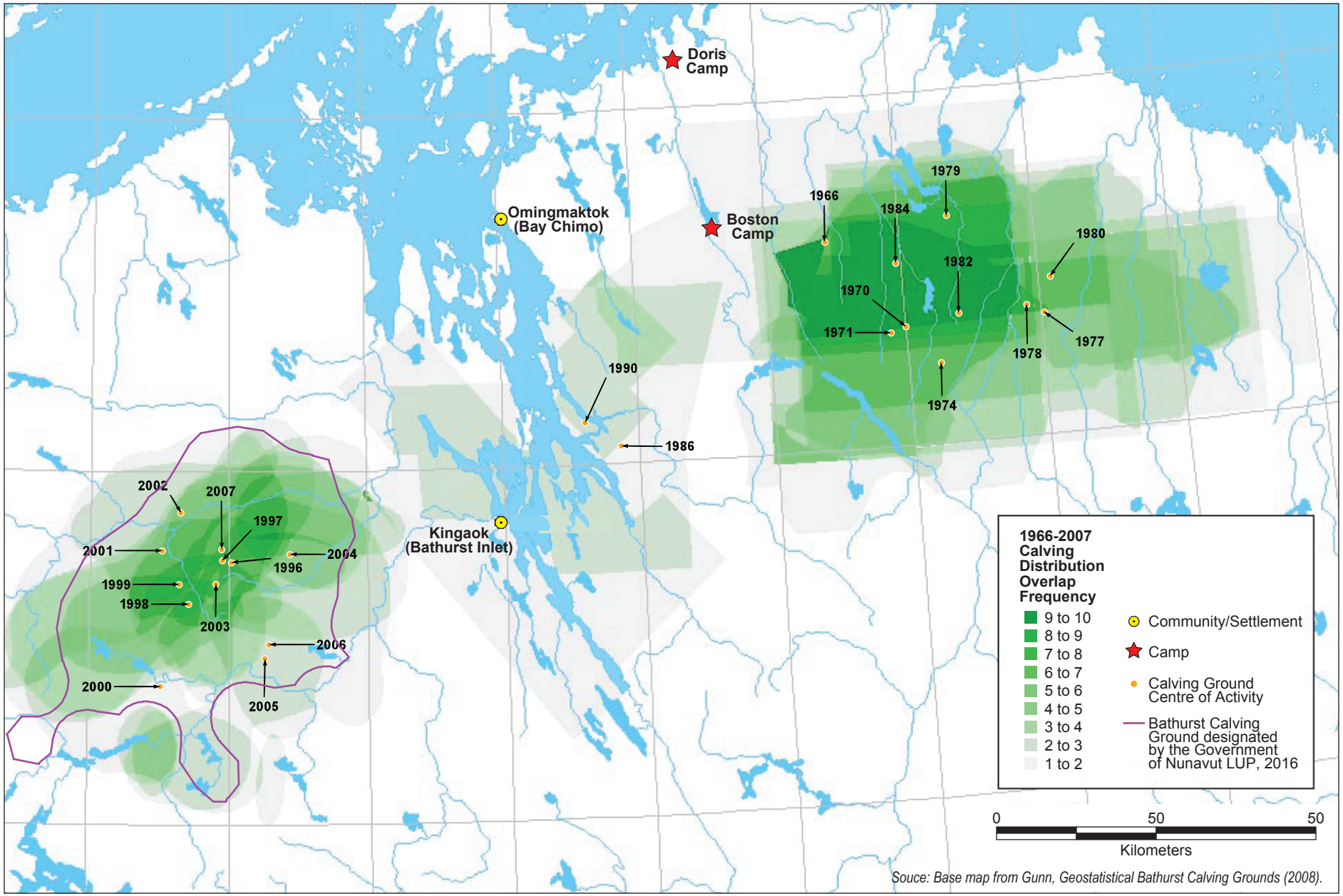
REFERENCES:

Gunn, A., K.G. Poole, J. Wierzchowski. 2008. *A geostatistical analysis for the patterns of caribou occupancy on the Bathurst calving grounds 1966–2007*. Submitted in fulfillment of CFA # 0708-00-000105. Indian and Northern Affairs Canada, Yellowknife, NWT.

NPC. 2016. *Draft Nunavut Land Use Plan.*

Figure KIA-IR16-1

The frequency of cumulative distribution of overlap in peak calving grounds for the Bathurst herd based on aerial surveys (1966-1990) and satellite telemetry (1996-2007)



KIA INFORMATION REQUEST 17:

Camera Monitoring of Caribou near Project

Please divide camera data into seasons in an equitable manner among years such that either the entire period encompassing the northward spring migration for the Dolphin and Union caribou herd (April-June) is included in EITHER the summer or winter data categories, or adjust the date ranges used for camera monitoring to include a separate category for migratory periods for Dolphin and Union caribou. At present, camera data is divided into summer and winter periods only, and the migratory period for Dolphin and Union caribou is included to different extents within summer or winter categories in camera monitoring data between years.

TMAC RESPONSE ON MARCH 17:

The KIA reviewer is requesting a re-analysis of the remote camera data. The data were presented in the DEIS in winter and summer periods because these periods are useful when discussing most wildlife in the RSA. TMAC is currently updating the remote camera data into seasons that represent caribou life stages. The analysis of this data takes considerable time, and will be provided on March 31, 2017, however, TMAC notes that this additional work goes beyond what is typically considered to be an IR, and the analysis is of a technical nature, thereby enabling the technical review period to commence upon the receipt of this IR package on March 17.

TMAC ADDITIONAL INFORMATION PROVIDED ON MARCH 31:

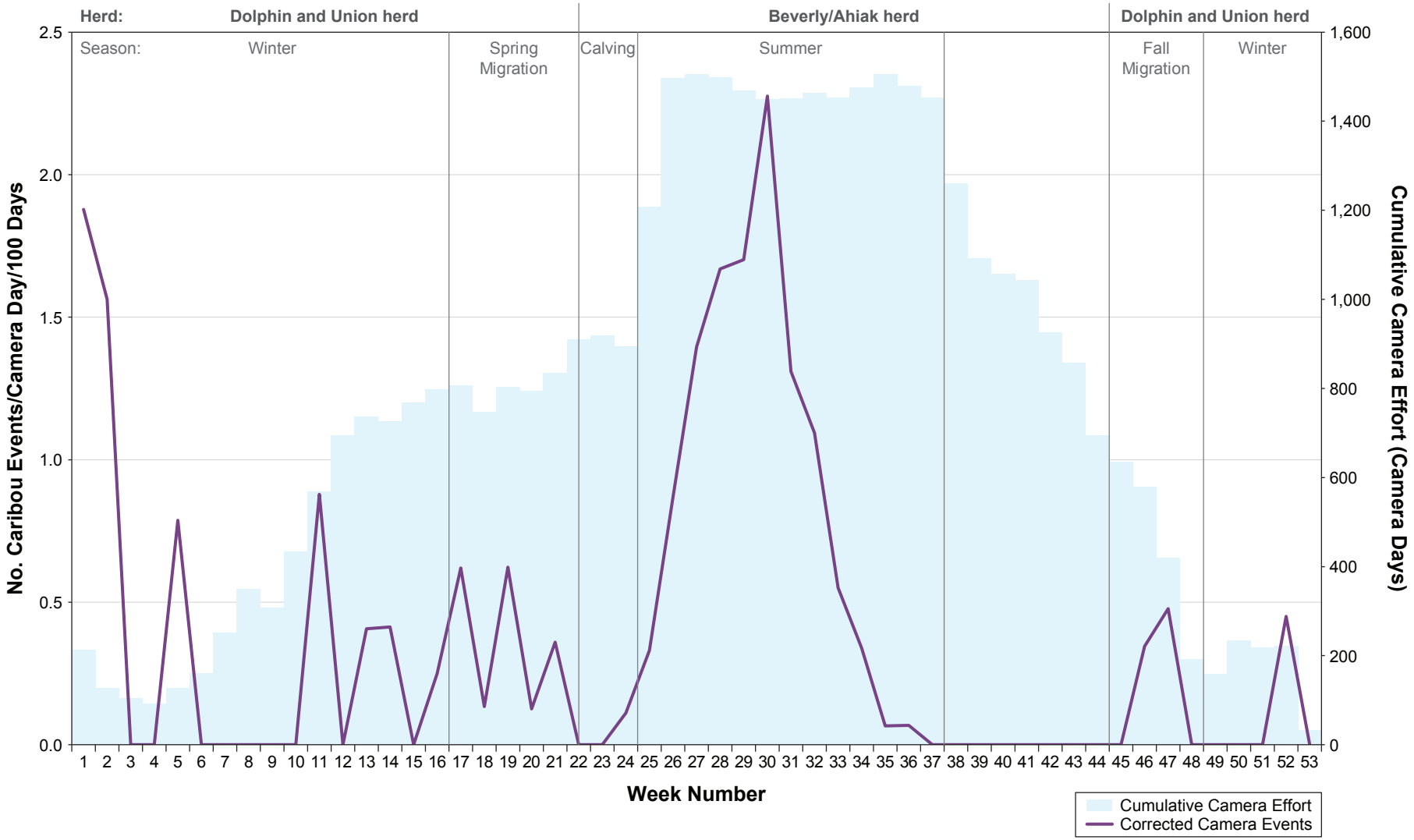
The remote camera data was summarized by "winter" and "summer" in the DEIS. In response to KIA IR17, these data have been re-summarized by week of the year in Figure KIA-IR17-1. Data are presented as "camera events" per operational camera day X 100. This correction removes bias due to different numbers of cameras being operational in summer vs. winter due to snow obstructions following storms.

This figure also displays the seasonal periods for caribou (winter, spring migration, calving, summer, fall migration) and which herd is expected in the RSA during this period; either Dolphin and Union [Island] caribou or Beverly/Ahiak caribou. Figure KIA-IR17-1 also displays the effort.

These data indicate that Dolphin and Union caribou are detected at a fairly low rate through winter, spring migration and fall migration. The majority of caribou detections by cameras were Beverly/Ahiak caribou recorded during summer. Few caribou were recorded during the calving period, supporting the analysis of satellite collar data that indicates that the Project does not overlap any calving areas. Note that Figure KIA-IR17-1 does not differentiate between males, females, and breeding animals.

Figure KIA-IR17-1

Caribou detection events per operational camera day (X 100) at Doris Project for each season and herd



KIA INFORMATION REQUEST 30:

2016 WMMP referenced, but not available to reviewers.

Please provide 2016 WMMP for review, or insert the referenced information into the DEIS.

TMAC RESPONSE ON MARCH 17:

The 2016 WMMP report is currently being produced and will be provided for review, including the description of analysis referred to the DEIS on March 31, 2017. TMAC notes that supplying the 2016 WMMP report is an attribute to the review process given that site specific monitoring is being provided. However, reviewers can commence their technical review of the DEIS prior to its receipt on March 31.

TMAC ADDITIONAL INFORMATION PROVIDED ON MARCH 31:

The 2016 WMMP has been submitted to the NIRB.