Ungulate Information Gaps: The Bipole III Transmission Line Project

Prepared for

Manitoba Metis Federation

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Acronyms

ATK	Aboriginal Traditional Knowledge
CEAA	Canadian Environmental Assessment Agency
EIS	Environmental Impact Statement
EnvPP	Environmental Protection Plan
FPR	Final Preferred Route
GHA	Game Hunting Area
IR	Information Request
LSA	Local Study Area
MESA	Manitoba Endangered Species Act
MMF	Manitoba Metis Federation
MSES	Management and Solutions in Environmental Science
MTR	Mammals Technical Report
O&MAMP	Operations and Maintenance Access Management Plan
ROW	Right-of-Way
TLUKS	Traditional Land Use and Knowledge Study
SARA	Species At Risk Act
SSEA	Site Selection and Environmental Assessment
VEC	Valued Environmental Component
MCWS	Manitoba Conservation and Water Stewardship

1.0 Introduction

The Manitoba Metis Federation (MMF) requested that Management and Solutions in Environmental Science Inc. (MSES) review and assess the analyses and results of the Environmental Impact Statement (EIS) of the Bipole III Transmission Line Project (the Project) proposed by Manitoba Hydro (MH). We have identified issues or concerns with the information presented in the EIS with respect to moose (*Alces alces*) and elk (*Cervus elaphus*) and have provided these to the MMF to be submitted as information requests in the regulatory process (July 2012). This report takes MH's responses to those information requests into consideration and highlights key information gaps that remain.

2.0 Setting

2.1.1 Traditional Resources

2.1.1.1 Ungulate Species and Traditional Use

A "traditional knowledge study", Manitoba Metis Traditional Use, Values and Knowledge of the Bipole III Project Study Area (MMF 2011; hereafter TLUKS), was produced by the MMF to assist in the identification of Metis rights and interests that may be impacted by the proposed Project. The TLUKS describes current use of lands and resources by the Manitoba Metis for traditional purposes and traditional values and knowledge about the lands and resources within the Project Study Area.

Section 4.4.1 (Large Animal Harvesting) of the TLUKS states that "*Moose is the most sought after species of large animals by Interviewees, followed by deer and then elk*" (MMF 2011). Therefore, any potential impacts on the availability and abundance of moose and elk, which the Manitoba Metis rely upon now and into the future to exercise their rights and interests in a meaningful way, are fundamental concerns.

2.1.1.2 Spatial Distribution of Traditional Use of Ungulates

The TLUKS indicates that Interviewees hunt moose and elk in specific geographic areas and that most Interviewees make separate trips to harvest the different species. The majority of moose and elk harvest occurs in the central part of the Project Study Area (TLUKS, Map B-Central). The north part of the Project Study Area (TLUKS, Map B-North) is also used for moose harvest, while the south part of the Project Study Area (TLUKS, Map B-South) is generally not utilized for large animal harvesting.

According to the TLUKS (MMF 2011), Manitoba Metis moose harvest north of Dawson Bay is largely located along waterways and roads. Within this northern region, Manitoba Metis moose harvesting is concentrated immediately north of Thompson and near Thicket Portage (south east of Thompson; TLUKS, Map C North). A broad area of Manitoba Metis moose harvesting roughly reaches from Dawson Bay south to the towns of Swan River and Minitonas. Within this area, the highest intensity of moose harvest by Manitoba Metis occurs immediately south of Red Deer Lake and southeast of Swan Lake. Manitoba Metis moose harvesting occurs in another wide area south of Swan River to Roblin and around the town of Grandview. Within this central region, Manitoba Metis moose harvesting is most intense in an area along the Saskatchewan border just west of Duck Mountain Provincial Park (TLUKS, Map C Central).

According to the TLUKS, Manitoba Metis elk harvesting occurs around Red Deer Lake, within an area that roughly reaches from Swan Lake south through the town of Swan River to the town of Roblin, and around the town of Grandview. Manitoba Metis elk harvest also occurs around the boundaries of Riding Mountain National Park. The highest intensity of elk harvesting by Manitoba Metis occurs in an area along the Saskatchewan border just west of Duck Mountain Provincial Park (TLUKS, Map E Central).

According to traditional ecological knowledge, elk and moose have been known to migrate through the southwest corner of the Duck Mountains. This area is also known to contain important summer and winter habitat for elk.

2.1.2 Ungulates

2.1.2.1 Moose

Population Status

Moose conservation initiatives, intended to increase moose populations to sustainable levels, have been underway in Manitoba since at least 2010 (Manitoba Conservation 2010a and 2012a). One conservation measure in place is the cancellation of all licensed moose hunting seasons and restrictions on rights-based harvest in several Game Hunting Area (GHA's) with declining moose populations. Those GHA's in western Manitoba that are closed to moose hunting include: 13, 13A, 14, 14A, 18, 18A, 18B, 18C. GHA's in western Manitoba that are partially closed to moose hunting include: 1A, 4, 7A (Manitoba Conservation 2012a; Figure 1).

We requested and received moose data from Manitoba Conservation in June 2012 (K. Rebizant, personal communication, July 5, 2012). Moose data from GHAs falling within the Bipole III Project Study Area and within Manitoba Metis moose harvesting areas from 1940-2011, as indicated on Map C (Central) of the TLUKS, were collected. This includes GHAs: 6, 6A, 8, 11, 12, 13/13A, 14/14A, 18-18C, and 19A (Figure 1). This region includes bottleneck areas for the proposed transmission line and both open and closed GHAs. This region also contains what appears to be the greatest spatial extent of Manitoba Metis moose harvesting and areas of highest intensity Manitoba Metis moose harvesting (TLUKS, Map C). Our intention is to test whether moose populations have significantly declined in this focal area or are simply showing a declining trend.

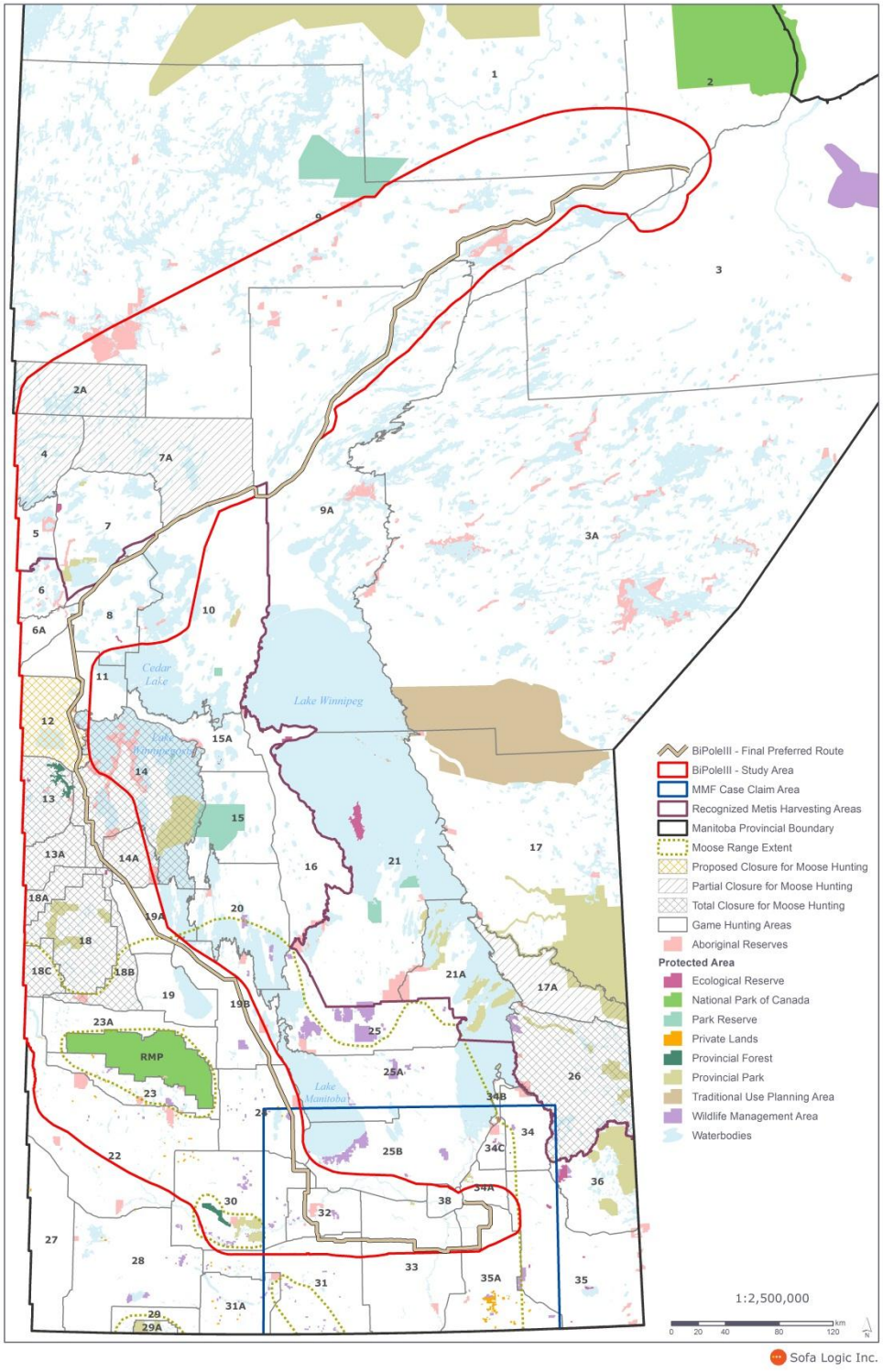

Figure 1: Open and closed Game Hunting Areas along the Bipole III Transmission Line Corridor (Figure provided by the MMF, September 2012)

The data provided by Manitoba Conservation contained current moose density estimates and estimates from the 1990s. Data were simplified to represent 2012 ("current") and 1990 ("1990s"). Mean moose densities were compared between years (1990 vs. 2012) with a paired t-test (paired by GHA) using Systat v.11.00.01 software (Systat Software Inc., 2004). The assumption that differences between pairs are normally distributed was satisfied (Kolmogorov-Smirnov, p=0.09, n=9). Mean moose density was significantly different between years (paired t-test, p=0.037, t=2.50, df=8) (Figure 2) with mean moose density decreasing by approximately 53% (from 0.23 to 0.11) from 1990 to 2012.

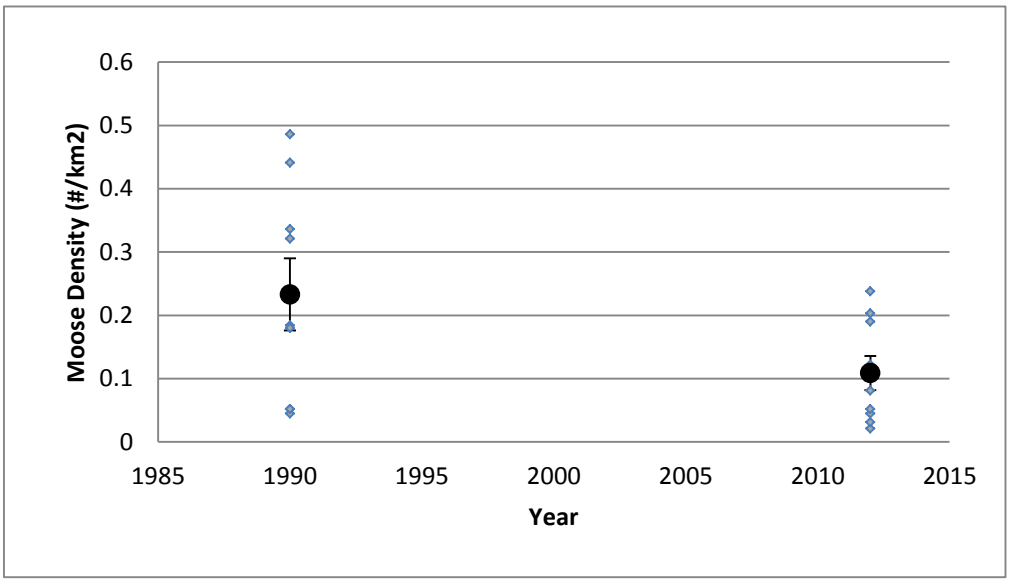

Figure 2: Mean Moose Densities (with standard error bars) in 1990 and 2012 for GHAs 6, 6A, 8, 11, 12, 13/13A, 14/14A, 18-18C, and 19A. Data Source: Manitoba Conservation

Moose populations have significantly decreased in the region and there does not appear to be evidence of moose population recovery. Although the ultimate cause of this decline is unclear, moose populations are less likely to increase and recover with additional environmental stressors.

Habitat Decline and Fragmentation

Unlike many ungulate species (Alverson et al 1998), the loss and fragmentation of habitat negatively affect moose population growth. Increased fragmentation and decreased habitat availability result in greater isolation of moose habitat patches as well as smaller patch sizes of moose habitat. Moose are less likely to use small and isolated patches of habitat because it may not be worthwhile to reach them (Collingham et al. 2000, Laurance et al. 2002). Evidence of moose reducing their use of habitat patches in highly fragmented areas has been documented in the Foothills Natural Region of Alberta (Figure 3; Stewart and Komers 2012, Stewart et al. 2010). The implication of these results is that the number of moose in an area declines faster than expected from the decline in habitat availability alone because moose are unlikely to use habitat patches that are small and isolated. Therefore, when evaluating

'available habitat' for moose, consideration must be given to both the amount and the configuration (e.g., fragmentation) of habitat in the landscape.

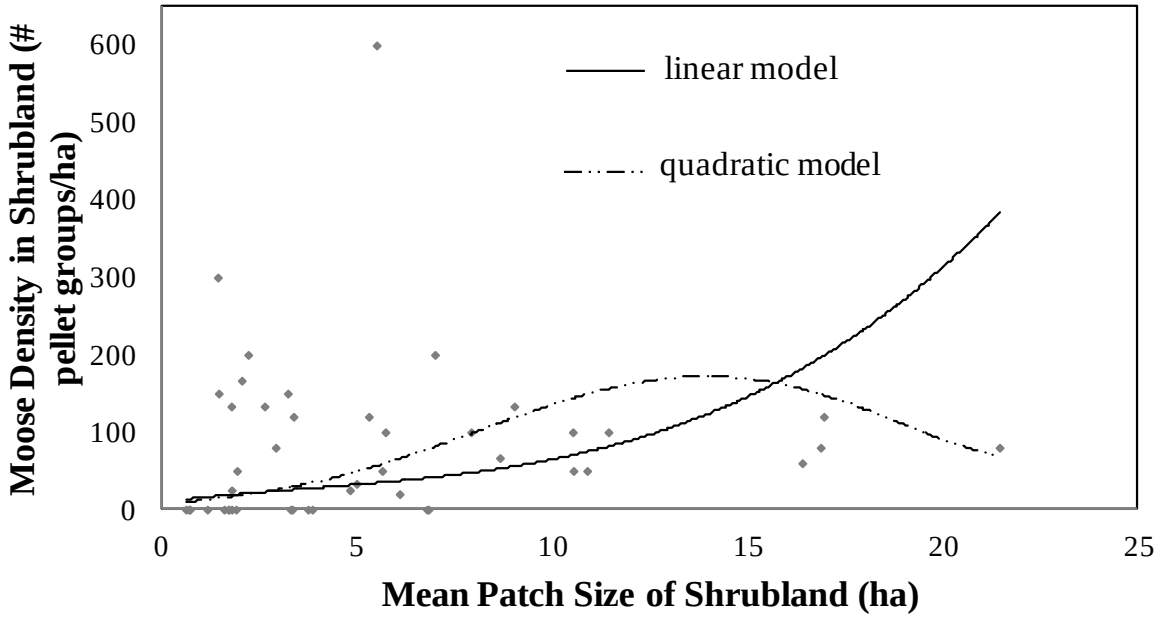

Figure 3: Moose pellet group density (indicating intensity of habitat use) in moose habitat increases as mean moose habitat patch size increases in the landscape (reprinted from Stewart and Komers 2012).

2.1.2.2 Elk

Population Status

According to Manitoba Conservation (2010b), the Manitoba elk population is stable and estimated at 6,500 animals. Specific herd/populations size estimates for the western portion of the province include:

- Duck Mountain: 1,700 animals
- Porcupine Mountain: 300 animals
- Spruce Woods: 600 animals
- Riding Mountain: 2,000 animals

The health of western elk populations in Manitoba is being monitored by Manitoba Conservation (Manitoba Conservation 2010b). Wildlife health monitoring (disease testing) is being conducted in GHA's 5, 6, 6A, 11, 12, 13, 13A, 18, 18A (A, B, & C), 22, 23, and 23A (Manitoba Conservation 2010b). Disease prevention initiatives are currently underway. Specific details of these initiatives can be found in Manitoba Conservation (2012c).

Manitoba Conservation manages elk harvesting through the issue of hunting licenses. Hunting is regulated by the Wildlife Act (Manitoba Conservation 2010a).

Habitat Decline and Fragmentation

Studies on elk have recognized the negative effects of human caused disturbance and landscape changes on elk populations. In general, elk avoid roads and other linear features (Rowland et al. 2000, Frair et al. 2008, Buckmaster et al. 1999). However, elk have been documented to make use of habitat near disturbance or habitat created by disturbance, but only under particular conditions (Gagnon et al. 2007, Poole and Mowat 2005). For instance, elk use of habitat adjacent to roads appears to be limited to areas containing high forage quality (Gagnon et al. 2007) or elk use of logged areas may be limited by snow depths that are greater than those in surrounding habitat (Poole and Mowat 2005). Other factors will also play a role in the level of use of disturbed areas by elk, such as traffic volume (Gagnon et al. 2007, Dodd et al. 2007) and type of human activity (Naylor et al. 2009). When traffic volume is light, elk are more likely to use areas adjacent to roads (Gagnon et al. 2007, Dodd et al. 2007). With respect to human activity, elk travel time was highest in response to all-terrain vehicle (ATV) riding in comparison to biking, hiking, and horseback riding (Naylor et al. 2009, Chranowski 2009). In addition, elk have been reported to avoid roads, become more active at night, and spend more time under cover in response to increased hunting pressure (Van Tighem 2001). Human activities may also interact with predator-prey dynamics in elk populations. Elk response to risk of predation is a powerful driver of habitat use and movement, thought to promote long-distance movements (Hebblewhite et al 2005), and alter vegetation communities (Ripple and Besctha 2004; Hebblewhite et al 2005). Moreover, responses to risk of predation from humans are greater than response to risk from natural predators (Proffitt et al 2009). It appears that lower levels of human disturbance correspond to higher levels of elk habitat use. However, multiple factors influence elk habitat use, making appropriate management critical for mitigating the effects of human disturbance on elk.

2.1.3 Disturbance on Conditions Supporting Traditional Resources

Large scale activities, including forestry, mining, and other transmission lines, are proposed or ongoing in and around the Project Study Area (listed in the Mammal Technical Report, Section 8.1 & Volume 9, Tables 9.2-1 to 9.2-3). These are in addition to existing disturbances such as roads, cities, communities, and agricultural activities. Generally, these activities all contribute to habitat loss, habitat fragmentation, and/or avoidance of the area by various wildlife species.

The description of regional disturbance presented in the EIS does not enable the reader to gain a complete understanding of the level of existing and future disturbance on the landscape. Little spatial information on the location of existing and future disturbance was provided in the EIS; however, maps showing the location of all development listed in Volume 9, Tables 9.2-1 to 9.2-3 were provided on August 30th, 2012 (See Appendix A). Although it is helpful to see the distribution and number of development activities occurring in the Project Area, it is not clear how much disturbance is or will be occurring as the maps only provide point location information and not project footprints. Furthermore, it does not appear that seismic lines have been included in the list of development activities indicating that actual disturbance is likely underestimated.

According to the Government of Manitoba, there are plans for continued exploitation of resources in western Manitoba, as indicated by the numerous mining claims, mineral leases, and mineral exploration licenses in place within Manitoba (Government of Manitoba, 2012; Figure 4). Given this, there is the potential for future impacts to wildlife species extending beyond the developments indicated by MH.

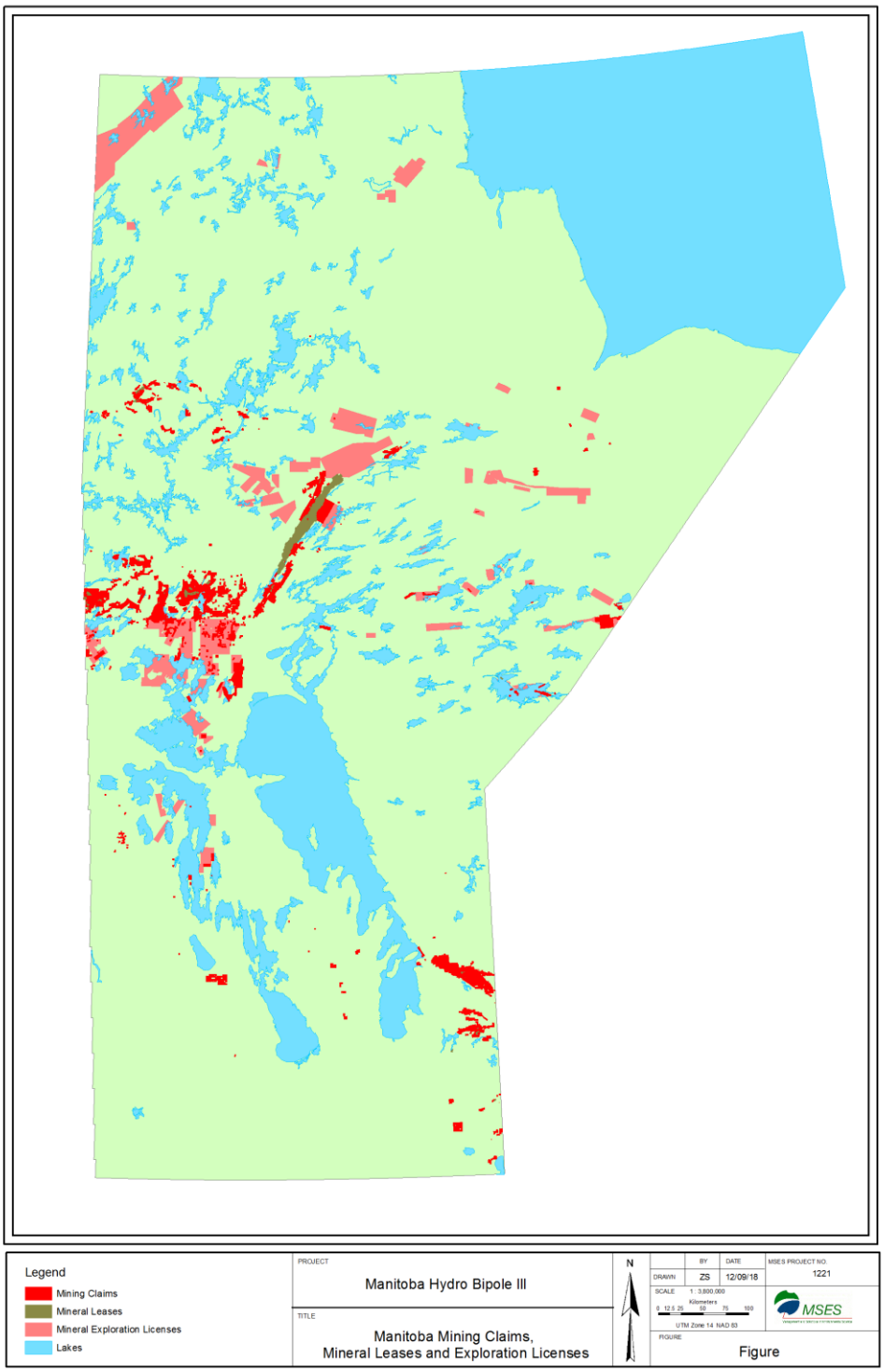

Figure 4: Locations of Manitoba existing mining claims, mineral leases, and mineral exploration licenses (data obtained from Government of Manitoba (2012)).

3.0 The Bipole III Project

3.1.1 Overview of Bipole III Project

MH is proposing the development of a transmission line extending north to south across western Manitoba. The Project includes the following new structures: two converter stations, two ground electrodes, northern alternating current (ac) collector lines, and a +/- 500 kV HV dc transmission line. The proposed transmission line is approximately 1,384 km in length and centred on a 66m wide right-of-way (ROW). The transmission line is proposed to be routed west of lakes Winnipegosis and Manitoba. This Final Preferred Route (FPR) for the transmission line and locations for other Project components were selected using a Site Selection and Environmental Assessment (SSEA) Process.

3.1.2 Foundation of Review

The foundation of our review centred on how the proponents determined significance of an impact. Significance was determined based on the assumption that mitigation will be successfully and effectively implemented. Therefore, it is critical to measure whether or not mitigation actually works as predicted. For that reason, follow-up and monitoring programs must be credible and objective.

Impact predictions, no matter how solid or robust, need to be tested during monitoring and follow-up programs (Morrison-Saunders and Arts 2004). To help improve our confidence in the predictions made, we highlight potential gaps in the baseline data and requirements for additional information to enable a better understanding of the effectiveness of mitigation measures. Our gap analysis is aligned with the EIS Scoping Document on p.21: "*Monitoring and follow-up involves verifying the accuracy of the environmental assessment and determining the effectiveness of measures implemented to mitigate adverse environmental effects.*" (Manitoba Hydro 2010). However, we understand that sometimes baseline information cannot be collected and a qualitative prediction must be made. Moreover, we understand that most predictions are made with some degree of uncertainty, no matter how good the baseline information may be, and decisions must be made in light of that uncertainty (Burgman et al. 2005). For the ongoing comparison with baseline data and for the detection of effects that were not predicted, the most fundamental necessity is that both the baseline and the monitoring information must be quantifiable. For a useful follow-up and monitoring program, testable questions must be developed (Burns & Wiersma 2004, CEAA 2009). Because of this fundamental necessity to provide certainty in the future environmental management of the proposed Project, we build the majority of our identified gaps on the need to develop testable questions for future monitoring programs. We also note that in order to measure the effectiveness of mitigation, the expectations of what effective mitigation would be must be clearly defined. We think that discussions which aim at gaining clarity on follow-up and monitoring programs are of utmost importance for the effective management of Project impacts.

3.1.3 High Level Gap Analysis

This section contains a list of overarching issues that remain outstanding after review of MH's written responses to our information requests (IRs) submitted in July 2012. IRs that were written and reviewed

by MSES specifically include IRs# CEC/MH-VI-200 through CEC/MH-VI-217. The following are the most salient outstanding issues related to MH's ability to assess and mitigate impacts of their project on moose and elk:

- MH's impact assessment is based on incomplete and inadequate environmental information resulting in poorly informed decisions regarding impact significance.
    - There are insufficient multispecies- and high quality moose habitat- aerial survey data to inform the impact assessment for moose and elk.
    - Aerial transect mammal surveys completed along the entire length of the FPR are not quantitative (do not provide statistically valid estimates of moose density) and cannot be used as a baseline for future monitoring programs.
    - There is a reliance on outdated (2000) Manitoba Conservation and Water Stewardship (MCWS) data for moose for some portions of the Project Study Area.
    - There are insufficient data for a quantitative comparison of alternative route options with respect to moose and elk.
    - The importance of the area south of Red Deer Lake for Manitoba Metis moose and elk harvest may not be adequately addressed with the limited baseline data collected.
    - There are insufficient data to outline the natural range of variability and sustainability thresholds for moose and elk populations which are used to determine the magnitude of an effect. Consequently, the significance of an effect cannot be determined using the impact criteria as defined by MH.
- MH asserts that a quantitative cumulative effects assessment is not required and that they have adequately assessed cumulative effects for moose.
    - In cases where management action is implemented to keep a population viable (GHA closures by MCWS), the completion of a quantitative cumulative effects assessment should be a high priority since the viability of the population is already a concern before any project activity has commenced.
    - By their own assertion, MH does not understand the cumulative effects of the Project on wildlife because of claims of "*unknown response of wildlife*" and "*unknown degree of spatial/temporal scales of activities*" (EIS, MTR, p. 123) in the Project Study Area.
- MH has not provided scientifically credible evidence for the success of proposed mitigation measures.
- Lack of scientifically credible monitoring programs that would measure the effectiveness of proposed mitigation strategies on moose and elk resources.
    - With respect to moose, uncertainty remains regarding whether or not mitigation success will be measured, who is responsible for measuring it (unclear whether MCWS is responsible for regional monitoring and/or Project-specific monitoring), and how it will be measured (No definitions or targets for mitigation success have been provided).

3.1.4 Specific Concerns

1) **Issue:** Access Roads and Fragmentation Effects
Reference: Mammals Technical Report (2011), Chapters 1.2.6, 3.3.1.4, pp. 4, 17, Map 6
Concern: "*Moose is the most sought after species of large animals by Interviewees, followed by deer and then elk*" (MMF 2011). Therefore, impacts on the availability and abundance of moose and elk, which the Manitoba Metis rely upon now and into the future to exercise their rights and

interests in a meaningful way, are fundamental concerns. New access roads could impact moose and/or elk through habitat alteration, increased mortality, and increased sensory disturbance.

The Mammals Technical Report (MTR) explains that some new access roads will need to be created for the Project; however, the location of new access roads or details on how much and what type of habitat may be impacted by these access roads is not provided, as required by EIS Scoping Document Reference 3.1. The assessment of the impacts of new access roads is incomplete without this information. This information is necessary to understand how new access roads might impact moose and elk populations.

This information is particularly relevant for moose, given that the MTR states that "*Map 6 illustrates the relationship of reduced moose densities with increased levels of fragmentation, which is thought to be a function of increased access for hunting (Crichton et al., 2004).*" (MTR, p. 17). MH has demonstrated with this figure that lower moose densities appear to correspond to high access density. This relationship should be tested using statistics. This information, along with that of rapidly decreasing moose populations in several GHAs (Manitoba Conservation 2011a and 2011b), must be considered in the evaluation of Project impacts to moose populations.

Information Request(s):

- Please provide information on the locations of new access roads associated with the Project and the amount of moose and elk habitat impacted by these roads. Please re-assess the impact of fragmentation on moose and elk considering this information.
- Please statistically test the relationship between moose density and access density (Map 6). If a significant relationship is found, re-assess the impact of additional linear access (both roads and ROW) on moose populations considering this information.

Manitoba Hydro Response:

Access for construction (and subsequent line maintenance) activities will generally occur along the right-of-way using existing public access roads or trails wherever possible minimizing the requirement for the development of new access (Section 3.4.8.2 of the Bipole III EIS). It is expected that any new access will minimally impact high quality moose or elk habitat thus no further assessment is required.

The surveys conducted for moose are qualitative. The data collected do not lend themselves to statistically test the relationship between moose density and access density.

Remaining Gaps:

MH's response does not provide enough detail to understand the potential impact of new access roads on moose and elk habitat. **MH has not yet provided the location of new access roads or details on how much and what type of habitat may be impacted by these access roads.** Without this information, the impact of access roads on moose and elk cannot be accurately assessed. Given the nature of this project, it is reasonable to expect MH to describe the percent increase in access density in moose and elk habitat, how many existing accesses there are, and how many and how accesses will be controlled.

Given that "*the surveys conducted for moose are qualitative*" (CEC/MH-VI-200), **it is unclear how MH plans to measure and monitor mitigation success if some baseline data are not quantifiable.** Collecting quantifiable baseline data is the foundation for future monitoring programs.

2) **Issue:** High-quality Moose Habitat Aerial Surveys
Reference: Mammals Technical Report (2011), Chapters 3.3.1.1 & 4.4.1, pp. 15, 45, Map 2. TLUKS, Map C
Concern: According to the TLUKS (MMF 2011), there is an area of high intensity moose harvesting by Manitoba Metis immediately south of Red Deer Lake (TLUKS, Map C Central). High-quality moose habitat aerial survey blocks did not include this area, and thus, the importance of the area south of Red Deer Lake for Manitoba Metis moose harvest may not be adequately addressed with the limited moose baseline data collected by MH. Adequate baseline data are required to improve our confidence in the predictions made by MH. For the ongoing comparison with baseline data and for the detection of effects that were not predicted, the most fundamental necessity is that both the baseline and the future monitoring information must be quantifiable.

The EIS Scoping Document Reference 7.4.2.9 requires that information on known moose habitat and critical areas for moose be provided, but we find that MH has not presented sufficient information to support their conclusions regarding the location of moose habitat. Aerial surveys of high-quality moose habitat, as defined through a habitat modeling exercise, were completed to compare wintering moose populations on alternative routes. Section 3.4.3 of the MTR discusses how models were validated, but model validation results do not appear to be provided. If the model has not been properly validated, the location of aerial survey blocks for "*high-quality moose habitat*" may not be correct. In addition, calculations of moose habitat loss due to Project facilities used to determine Project impact on moose may not be correct and thus the baseline data may be a questionable foundation for future monitoring programs.

The objective of these aerial surveys "*was to compare differences between alternative routes on wintering population of moose*" (MTR, p. 15). However, only a very small portion of a single 2010 survey block appears to overlap with the FPR (MTR, Map 2). It is not clear how all alternative routes could have been compared with respect to moose if the FPR did not receive adequate survey coverage.

The EIS Scoping Document References 3.2 and 7.2 require that the use of lands and resources for traditional purposes be considered in the environmental assessment and that Aboriginal Traditional Knowledge (ATK) be integrated throughout the document, respectively. Based on the location of the 2010 high-quality moose habitat aerial survey blocks, the importance of the area south of Red Deer Lake for Manitoba Metis moose harvest may not be adequately addressed with the limited moose baseline data collected by MH. This area falls within GHA 13 for which no data from past aerial moose surveys by Manitoba Conservation were presented (Section 3.3.1.2).

Information Request(s):

- Was the moose model validated? If so, please provide statistical results of moose habitat model validation. If not, please validate and, if necessary, adjust the moose habitat model and re-assess the impact of the Project on moose habitat.
- Provide a map of high-quality moose habitat aerial survey blocks in reference to all alternative routes (not just the FPR). Explain how the FPR was assessed in terms of wintering populations of moose given that such a small portion of the FPR fell within high-quality moose habitat aerial survey blocks.
- Considering the discrepancy in the location of high intensity moose hunting by Manitoba Metis and the location of aerial surveys for moose, is the baseline data collected for moose considered adequate to address any MMF concerns about the impacts of alternative routes to moose populations? (i.e., are the moose data for the area south of Red Deer Lake sufficient to understand the impacts of the alternative routes on moose populations in a key area for Manitoba Metis moose harvest?)

Manitoba Hydro Response:
The moose model was not statistically validated. Based on literature, professional judgment and field studies, the coarse scale LCCEB moose model (see the Bipole III Mammals Technical Report, Section 3.4.1) successfully identified areas of known high quality moose habitat in the province including Porcupine Hills, Duck Mountains and Riding Mountain and provides a fair representation of important moose habitat in the Project Study Area. Refinement of the model based on validation would not result in changes to the assessment of impacts as the loss or change in moose habitat is small compared to available habitat in the Local Study Area. No further assessment is required. Also refer to CEC/MH-VI-205 and CEC/MH-VI-206.

See attached map illustrating the quality moose habitat aerial survey blocks in reference to all alternative routes (See CEC/MH-VI-201(2)). The selection of the FPR which was based on avoidance of important wildlife areas and intact forest (core communities) included known high density moose areas (Duck Mountains and Porcupine Hills) and high quality habitat and where feasible routed in proximity to existing disturbance and linear development.

The baseline data for moose were considered adequate for assessing alternative routes in areas south of Red Deer Lake based on habitat modeling and review of past aerial surveys conducted by Manitoba Conservation and Water Stewardship. The importance of the Porcupine Hills and Duck Mountain areas were considered in the selection of the FPR which avoided these areas. Specific moose surveys would not have changed the evaluation of these areas as being important.

Remaining Gaps:
MH used "*GIS-based habitat models develop from expert knowledge of species habitat requirements*." (Section 3.4.1, MTR). **MH's response does not explain <u>how</u> it was determined that these habitat models "*successfully identified areas of known high quality moose habitat*"** (CEC/MH-VI-201). MH's response that "*The moose model was not statistically validated*" is contrary to the information provided in Section 3.4.3, MTR (namely: "*Habitat models were verified based on an analysis of field data from various sources, including aerial and field tracking surveys, through the use of statistical chi-square tests such as McNemar's test for paired-sample nominal*

scale data (Zar, 2010)."). **MH has provided contradictory information with respect to moose habitat model validation**. Our initial concern still stands: If the model has not been properly validated, the location of aerial survey blocks for "*high-quality moose habitat*" may not be correct. In addition, calculations of moose habitat loss due to Project facilities used to determine Project impact on moose may not be correct and thus the baseline data may be a questionable foundation for future monitoring programs.

The map provided illustrating the high quality moose habitat aerial survey blocks in reference to all alternative routes confirms that all routes do not appear to have received adequate survey coverage to allow for route comparison. As the answer provided by MH is very qualitative, we can only assume that the assessment was qualitative. The quantitative data collected appear to be insufficient to support the impact predictions and FPR selection being made by MH with respect to moose.

The area around Red Deer Lake is a "bottleneck area" with none of the alternative routes in this area avoiding all areas of high intensity Manitoba Metis moose harvesting. Moose will be impacted to some degree regardless of route selection. **A quantitative comparison of the impacts of the alternative routes has not been provided.**

3) **Issue:** Multispecies Aerial Surveys and Manitoba Metis Large Mammal Harvest
Reference: Mammals Technical Report (2011), Chapters 3.3.1.3, 5.1.4.2, pp. 16, Map 4, 76-77. TLUKS, Map C, Map E
Concern: According to the TLUKS (MMF 2011), there is an area of high intensity moose harvesting by Manitoba Metis immediately south of Red Deer Lake (TLUKS, Map C Central) and elk harvesting by Manitoba Metis in the Swan Lake area (TLUKS, Map E Central). Multispecies aerial survey blocks did not include these areas, and thus, the importance of the area south of Red Deer Lake for Manitoba Metis moose harvest and the Swan Lake area for elk harvest may not be adequately addressed with the limited baseline data collected by MH. Adequate baseline data are required to improve our confidence in the predictions made by MH. For the ongoing comparison with baseline data and for the detection of effects that were not predicted, the most fundamental necessity is that both the baseline and the future monitoring information must be quantifiable.

Aerial surveys were completed in 2010 and 2011 to provide estimates of Valued Environmental Component (VEC) winter distribution based on observations of animals and tracks. The selection of survey blocks appears to be driven by boreal woodland caribou ranges, though observations for caribou, moose, wolf, and wolverine were recorded. According to the TLUKS (MMF 2011), high intensity moose harvesting and elk harvesting by Manitoba Metis occurs south of the multispecies survey blocks shown in Map 4. The EIS Scoping Document References 3.2 and 7.2 require that the use of lands and resources for traditional purposes be considered in the environmental assessment and that ATK be integrated throughout the document, respectively. Given that the region south of Red Deer Lake is an important area for Manitoba Metis moose harvest and areas west and south of Swan Lake are important for Manitoba Metis elk harvest, it is not clear why multispecies aerial survey blocks were not completed for these regions.

MH states that *"…aerial surveys conducted in the winters of 2010 and 2011 in the northern portion of the Project Study Area indicate that the FPR route is favorable for existing moose populations.*" (MTR, p. 76-77). Rationale is needed to support this statement. Map 4 shows that only a small portion of the FPR actually falls within the 2010 and 2011 aerial survey blocks. It is not clear how conclusions about the favourability of the FPR can be made using data from just a small portion of the entire proposed transmission line. The EIS Scoping Document Reference 7.4.2.9 requires that information on mammals and mammal habitat be provided, but it appears that MH has not collected sufficient information to make conclusions about the favourability of the FPR.

Information Request(s):

- Please explain why sample survey blocks were not stratified across the Project area if the data collected are to be used to evaluate multiple species. Please explain why aerial surveys (other than those completed directly along the FPR) were not completed south of Red Deer Lake and south and west of Swan Lake, areas used by Manitoba Metis for large mammal harvest.
- Please explain why aerial survey blocks were not distributed along the entire FPR that falls within the moose and elk ranges in Manitoba.
- Provide further rationale for conclusions about the favorability of the FPR with respect to moose.

Manitoba Hydro Response:

Sample survey blocks were not stratified across the Project Study Area. Specific multi species surveys were conducted in boreal woodland caribou ranges to assess moose and wolf distribution and overlap with core boreal woodland caribou winter use areas. Historical moose survey data from Manitoba Conservation and Water Stewardship were used for areas south of Red Deer Lake. Based on these data, the Duck and Porcupine Mountain areas have low population counts, with the last density in GHA 12 estimated at 0.1 to 0.4 moose/km2 (between 1991 and 2000).

The Bipole III Study Area is very large, and it was not feasible to sample everywhere. As described in the Section 3.3.1 (also see Maps 2, 4 & 5, of the Bipole III Mammals Technical Report), four areas were sampled in the high-quality moose habitat block surveys. The entire FPR was flown to provide complete coverage of potential moose and elk concentrations along the FPR for assessment and mitigation purposes. Aerial surveys also detected a small number of elk along the FPR, which is located mainly outside their primary core ranges (see Map 23, Map 25 and Sections 4.4.2., Bipole III Mammals Technical Report).

The route selection criteria resulted in the selection of a FPR that minimized the potential effects of the Project to moose by avoiding alternative routes that traversed large core forest habitat and high quality moose habitat areas (e.g., Riding Mountain, Duck Mountain, and Porcupine Hills) and utilizes existing linear features where practicable.

Remaining Gaps:

It is understood that multispecies aerial surveys were also used "*to provide estimates of VEC winter distribution based on observations of animals and tracks (Map 4)*" (MTR, Section 3.3.1.3). If the data collected are to be used to evaluate and draw conclusions for VECs other than caribou, then sample stratification is necessary. **It is useful that historical moose survey data (1991-2000) were considered in the assessment; however, updated information was not gathered for the area south of Red Deer Lake.** Accurate, up-to-date information should be used to inform the assessment, particularly in light of the current state of moose populations.

Four areas were sampled in the high-quality moose habitat block surveys, however, the concern remains that a very small portion of the FPR actually fell within those aerial survey blocks. **As such, it is not clear how these data (i.e., high quality moose habitat aerial survey data) influenced the assessment for moose and elk. Likewise, it is not clear how multi-species survey blocks influenced the assessment for moose and elk.**

This response does not provide any new information and does not explain how MH concluded that "*…aerial surveys conducted in the winters of 2010 and 2011 in the northern portion of the Project Study Area indicate that the FPR route is favorable for existing moose populations.*" (MTR, p. 76-77). **The foundation for MH's conclusions about the favourability of the FPR with respect to moose is unclear.**

4) **Issue:** Potential Effect of ROW on Moose
Reference: Mammals Technical Report (2011), Chapter 5.1.4.3, pp. 80.
Concern: "*Moose is the most sought after species of large animals by Interviewees, followed by deer and then elk*" (MMF 2011). Therefore, impacts on the availability and abundance of moose, which the Manitoba Metis rely upon now and into the future to exercise their rights and interests in a meaningful way, are fundamental concerns. New ROWs could result in increased fragmentation of moose habitat which may result in a decrease in the number of moose in the area.

The EIS Scoping Document Reference 7.5 requires that environmental effects of the proposed Project be identified and described, but it appears that MH does not discuss the potential landscape level effects of moose habitat fragmentation. MH acknowledges the potential for increased hunting and predation of moose on ROWs. An additional effect of ROWs on moose is increased fragmentation of moose habitat resulting in smaller patch sizes of moose habitat. There is a great deal of evidence from research in landscape ecology that fragmentation and isolation of habitat patches affects the ability of animals to use the patches (Collingham et al. 2000, Laurance et al. 2002). Research on moose in Alberta appears to support this evidence (Stewart and Komers 2012; Stewart et al. 2010). Moose are less likely to use small and isolated patches of habitat because it may not be worthwhile to reach them. Evidence of moose reducing their use of habitat patches in highly fragmented areas has been documented in the Foothills Natural Region of Alberta (Stewart and Komers 2012). The implication of these results is that the number of moose in an area declines faster than expected from the decline in habitat availability alone because moose are unlikely to use habitat patches that are small and isolated. MH has also found that moose density appears to decrease with an increase in the number of existing access features (MTR, Map 6). These additional effects of ROWs on moose need to be considered in the impact assessment for moose. Mitigation measures need to be identified to

minimize any adverse effects of habitat fragmentation due to the Project, as per EIS Scoping Document Reference 7.6.

Information Request(s):

- Please explain how fragmentation effects were factored into the impact assessment for moose. If fragmentation effects have not been considered, please include an assessment with respect to moose.
- What mitigation measures, other than predator and access control, have been proposed to manage fragmentation effects on moose? If none have been provided, please do so.

Manitoba Hydro Response:

Fragmentation effects on moose were considered in the selection of the FPR. One of the main considerations was the avoidance of important wildlife areas and intact forest (core communities), which included known high density moose areas (Duck Mountains and Porcupine Hills) and high quality habitat. The route selection process resulted in the FPR being located away from these areas and in proximity to existing disturbance and linear development where feasible resulting in minimal habitat fragmentation for moose (See Section 7.3.2 of the Bipole III EIS).

Fragmentation was mitigated mainly through the route selection process as described above. The Bipole III ROW is not expected to have an effect on moose movement or habitat utilization on or near the ROW. General mitigation measures that address aspects of fragmentation are outlined in Section 8.2.6.4 of the Bipole III EIS. These include undertaking pre-construction surveys and the development of site specific prescriptions such as the establishment of buffers (wildlife corridors), timing of construction, reducing public access and restricting hunting by project personnel. See CEC/MH-III-044.

Remaining Gaps:

We understand that route selection is a primary mitigation measure for the transmission line. **However, in cases where it was not "feasible" to be in proximity to existing disturbance and linear development, it is unclear how fragmentation effects were factored into the impact assessment for moose.**

MH is of the position that "*The Bipole III ROW is not expected to have an effect on moose movement or habitat utilization on or near the ROW*". **Given the information presented in the IR, this position statement will have to be verified with monitoring.**

5) Issue: Potential Effect of ROW on Elk
Reference: Mammals Technical Report (2011), Chapter 5.1.5.1, pp. 80.
Concern: "*Moose is the most sought after species of large animals by Interviewees, followed by deer and then elk*" (MMF 2011). Therefore, impacts on the availability and abundance of elk, which the Manitoba Metis rely upon now and into the future to exercise their rights and interests in a meaningful way, are fundamental concerns. New ROWs could result in alterations to elk movement beyond the construction period due to increased hunting and predation on ROWs.

The EIS Scoping Document Reference 7.5 requires that environmental effects of the proposed Project be identified and described, but it appears that MH does not discuss the potential for long-term restricted use of ROW foraging habitat by elk. MH discusses how elk tend to avoid linear features; however, Project effects on elk movement would likely be short term (during construction) as browsing opportunities would be created by the ROW. Browsing opportunities may be provided by the ROW after construction, but elk use of these potential foraging habitats may be restricted due to the presence of predators and/or humans (Frair et al. 2005). Increased hunting and predation on the ROW, if not adequately controlled, could result in adverse effects on elk movement that extend beyond construction.

MH also states that "*Generally the highest quality forage available for elk exists in old-growth forests, particularly during the summer (Happe et al., 1990)*" (MTR, p. 80). The full reference for "*Happe et al., 1990*" is not provided. Assuming this reference refers to the article titled "*Nutritional quality and tannin astringency of browse in clear-cuts and old-growth forests*", the conclusion regarding the favourability of old-growth forests for elk forage appears to be taken out of context as only clear-cut and old-growth habitat were compared in the article. MH has not discussed or provided a reference for the relative quality of elk forage on ROWs. Potentially low forage quality, in combination with increased hunting and predation on the ROW, could result in adverse effects on elk.

Information Request(s):

- Please discuss if and how potential restrictions to elk use of the new ROW as foraging habitat were considered in the impact assessment.
- Please provide the full reference for "*Happe et al., 1990*".
- Please discuss and consider the expected quality of elk forage on the ROW in the assessment of Project effects on elk.

Manitoba Hydro Response:

The potential restrictions to elk, including sensory disturbances and increased risk of mortality, using the ROW as foraging habitat are discussed in Section 5.1.5.1 of the Bipole III Mammal Technical Report.

Elk are considered mixed feeders, as they both browse and graze. They demonstrate a preference for more open habitats where they can graze/browse on grasses, sedges, shrubs, forbes and other vegetation (Hudson et al. 2002). The habitat along the ROW is expected to produce a range of low to high quality forage opportunities for elk after construction. Section 5.1.5 of the Bipole III Mammals Technical Report details regarding elk foraging opportunities resulting from the project.

References:

Happe, P.J., K.J. Jenkins, E.E. Starkey, and S.H. Sharrow. 1990. Nutritional Quality and Tannin Astringency of Browse in Clear-cuts and Old-Growth Forests. Journal of Wildlife Management. 54(4): 557-566.

Hudson, R.J., J.C. Haigh, and A.B. Bubenik, 2002. Physical and Physiological Adaptations. North American Elk: ecology and management. Eds. D.E. Towell and J.W. Thomas. Smithsonian Institute Press. Washington, DC, USA. pp. 199-257.

Remaining Gaps:
Adequate response to first two bulleted IRs.

MH's response states that a range of forage quality will be available after construction (CEC/MH-VI-204), but does not link this information to the impact assessment. **MH has not described how forage quality influenced the impact assessment for elk.**

6) **Issue:** Potential Effects of all Project Facilities on Moose and Elk
Reference: EIS Volume #8, Chapter 8.1, pp. 8-3
Concern: "*Moose is the most sought after species of large animals by Interviewees, followed by deer and then elk*" (MMF 2011). Therefore, impacts on the availability and abundance of moose and elk, which the Manitoba Metis rely upon now and into the future to exercise their rights and interests in a meaningful way, are fundamental concerns. An assessment of the full scope of Project effects on elk and moose is needed for the MMF to have a complete understanding of how the Project may impact their traditional resources.

EIS Scoping Document Reference 7.5 does not indicate that the effects assessment is to be broken down by Project component. However, within the EIS, "B*iophysical effects are examined separately for linear project components (HVdc line and ac collector lines), the Keewatinoow Station and Area (and related construction camp, borrow pits, and other elements), the Riel Station and Area, and the Ground Electrodes and Lines*." (Volume 8, Section 8.1, p. 8-3). By breaking down the assessment of the biophysical effects of the Project into multiple components, it is difficult to see and understand the full scope of Project effects on elk and moose. A quantitative assessment, as indicated by EIS Scoping Document Reference 7.5, of the environmental effects of <u>all</u> Project components and activities combined on elk and moose should be completed. This information would also strengthen the cumulative effects assessment which considers the overall effects of the Project in combination with other projects in the Project Study Area.

Information Request(s):

- For transparency, please provide a summary of the total amount and percent of elk and moose habitat to be removed by the Project (including <u>all</u> Project facilities) in the Local Study Area (LSA). This can then be used to calculate the area and percent losses of elk and moose habitat in the Project Study Area (general regional study area) for use in the cumulative effects assessment.

Manitoba Hydro Response:
This information is provided in Sections 5.1.4 and Table 35 (moose) and Section 5.1.5 in Table 37 (elk) of the Bipole III Mammal Technical Report. The measured effects are less than 1% for moose and 1.4% for elk for the Local Study Area and would be considerably less for the Project Study Area. Further calculations will not change the effects assessment.

Remaining Gaps:
Adequate response. Please refer to Issue #12 for a discussion regarding the effects assessment on moose.

7) Issue: Functional Habitat Loss
Reference: Mammals Technical Report (2011), Chapter 5.5.1, pp. 90.
Concern: "*Moose is the most sought after species of large animals by Interviewees, followed by deer and then elk*" (MMF 2011). Therefore, impacts on the availability and abundance of moose and elk, which the Manitoba Metis rely upon now and into the future to exercise their rights and interests in a meaningful way, are fundamental concerns.

Baseline data are used to inform the impact assessment and the impact assessment must assess all potential impacts. Confidence in the impact assessment is reliant on whether or not baseline data adequately support impact predictions. Additional information is needed on how MH reached conclusions about the impact of the Project on moose and elk functional habitat to improve confidence in the impact assessment. Additional calculations may be required to ensure that functional habitat loss is properly considered in the impact assessment.

The EIS Scoping Document Reference 7.5 requires that environmental effects of the proposed Project be identified and described, quantitatively to the extent possible, but it does not appear that MH has quantitatively evaluated functional habitat loss for moose and elk. The summary of effects for all species concludes that moose and elk will likely shift to other areas (i.e., away from the ROW) of their home ranges in response to habitat removal (MTR, p. 90). There is further discussion that sensory disturbance will result in short-term avoidance of active Project Study Areas. It is not clear how or if loss of functional habitat was quantified for the impact assessment on moose and elk. It does not appear that any zones of influence (area adjacent to disturbance that is avoided by animals) were considered in the assessment.

Many peer-reviewed studies exist that document the negative effects of human caused landscape changes, such as roads and right-of-ways, on moose populations including Laurian et al. (2008), Kunkel and Pletscher (2000), Maier et al. (2005), Snaith et al. (2002), James and Stuart-Smith (2000), Gurarie et al. (2011). Likewise, studies on elk have demonstrated similar negative effects of landscape changes, including Frair et al. (2005), Frair et al. (2008), Rowland et al. (2000), and Buckmaster et al. (1999). These aspects of moose and elk habitat use may be an important consideration when evaluating functional habitat loss and considering a zone of influence for Project impacts.

Information Request(s):
- Please include a quantitative assessment of habitat loss that includes reduced habitat effectiveness (functional habitat loss) for both moose and elk.
- Please consider the use of zones of influence in the development of the moose and elk habitat models.

Manitoba Hydro Response:

After construction, functional loss (sensory disturbance) of habitat is not expected as moose and elk will utilize edge and early seral habitat created in the ROW therefore a revised quantitative assessment is not required. Please see Tables 35 and 37 of the Bipole III Mammals Technical Report, Sections 5.1.4 and 5.1.5. Habitat evaluation using the moose and elk habitat models was conducted for the Local Study Area (3 mile corridor), which would account for a "zone of influence" relative to the actual project footprint. Moose and elk models are described in Section 5.1.4.2 and 5.1.5.2 respectively of the Bipole III Mammals Technical Report. The amount of habitat contained in the Local Study Area is less than one tenth of 1 % of that in the Project Study Area.

Remaining Gaps:

Functional habitat loss does not only include sensory disturbance, but generally includes a reduced habitat effectiveness that may occur due to any type of disturbance along the ROW such as predator and human use of the ROW. Kunkel and Pletscher (2000) reported that moose avoided areas in proximity to trails, Maier et al. (2005) and Stewart and Komers (2012) reported that moose avoided areas fragmented by non-habitat, and James and Stuart-Smith (2000), and Gurarie et al. (2011) reported that moose likely avoid linear features because of mortality risk from predation and hunting. In general, elk avoid roads and other linear features (Rowland et al. 2000, Frair et al. 2008, Buckmaster et al. 1999). However, elk have been documented to make use of habitat near disturbance or habitat created by disturbance, but only under particular conditions (Gagnon et al. 2007, Poole and Mowat 2005). For instance, elk use of habitat adjacent to roads appears to be limited to areas containing high forage quality (Gagnon et al. 2007) or elk use of logged areas may be limited by greater snow depths in those areas (Poole and Mowat 2005). Other factors will also play a role in the level of use of disturbed areas by elk, such as traffic volume (Gagnon et al. 2007, Dodd et al. 2007) and type of human activity (Naylor et al. 2009). Please see Section 2.1.2 of this report for more details. These studies indicate that habitat effectiveness can be reduced adjacent to human caused landscape changes and that avoidance of these areas may not be solely due to sensory disturbance. Moose and elk may utilize habitat in the ROW after construction, but the EIS has not provided specific information on the quality of forage expected along the ROW other than "*The habitat along the ROW is expected to produce a range of low to high quality forage opportunities*" (IR Response CEC/MH-VI-204). Reduced moose or elk habitat effectiveness adjacent to the ROW could occur in areas with low quality forage on the ROW after construction. Based on MH's response that "*Habitat evaluation using the moose and elk habitat models was conducted for the Local Study Area (3 mile corridor), which would account for a "zone of influence" relative to the actual project footprint*" (CEC/MH-VI-206) and evidence that moose and elk may avoid linear features outside of construction periods, moose and elk habitat within the 3 mile corridor may be avoided after construction (during operations) particularly in areas of low forage quality. **It does not appear that the potential for a prolonged impact (during operations) to moose and elk habitat was taken into consideration in the impact assessment (i.e., functional habitat loss during operations was not quantitatively evaluated).**

8) **Issue:** Mitigation of ROW Impacts - Hunting
Reference: Mammals Technical Report (2011), Chapter 5.5.1.1, pp. 91, 96.

Concern: *"Moose is the most sought after species of large animals by Interviewees, followed by deer and then elk"* (MMF 2011). Therefore, impacts on the availability and abundance of moose and elk, which the Manitoba Metis rely upon now and into the future to exercise their rights and interests in a meaningful way, are fundamental concerns.

In an attempt to improve our confidence in the predictions made, we need a better understanding of the mitigation measures proposed and the effectiveness of those mitigation measures. It is essential that the agency or agencies identified as being responsible for the implementation and enforcement of successful mitigation provide a clear commitment to do so. Agencies responsible for the testing of mitigation effectiveness and the implementation, monitoring, evaluation, and adjustment of follow-up programs need to be clearly identified.

Mitigation measures need to be identified to minimize any adverse effects of the Project (EIS Scoping Document Reference 7.6) and the effectiveness of mitigation measures needs to be verified (EIS Scoping Document Reference 10.0). In response to improved hunter access to moose and elk due to the proposed transmission line ROW and associated access roads, MH states that "*Provincial harvest management strategies are expected to be an important tool in ensuring stable game species populations.*" (MTR, p. 91 and 96). The accuracy of predictions of residual Project effects is dependent on successful mitigation measures. Therefore, it is necessary to have a clear understanding of what mitigation measures are proposed, confidence that mitigation measures will be successfully implemented, and verification of mitigation measure success.

Information Request(s):

- Please elaborate on what "*harvest management strategies*" are specifically being referred to in this statement.
- Please verify that provincial agencies are aware that they are partially responsible for managing the impacts of the MH ROW and access roads on moose and elk populations.
- Please indicate how the success of mitigation will be gauged and what agencies are involved in determining mitigation success.
- In GHA's that are still open for moose hunting, what are the restrictions on the number of moose harvested?

Manitoba Hydro Response:

Manitoba Conservation and Water Stewardship (MCWS) is the resource manager for wildlife and is responsible for developing harvest management strategies for moose, deer and elk. Manitoba Hydro is currently discussing mitigation and monitoring strategies with MCWS and will participate in any future stakeholder meetings as and when requested. As such MCWS is well aware of the Bipole III Transmission Project and continues to provide input on mitigation and monitoring. Manitoba Hydro's Draft Environmental Protection Program provides the framework for implementing, managing, monitoring and evaluating wildlife mitigation measures consistent with regulatory requirements, corporate commitments, best practices and public expectations. The Draft Environmental Protection Plan will be updated based on the results of ongoing consultations with regulators and stakeholders and finalized in accordance with the Environment Act Licence for the project. Annual monitoring reports will provide a summary of:

- Potential effects as outlined in the EIS

- Mitigation activities associated with these effects
- Monitoring activities conducted to assess the potential effects
- Results of monitoring and success of mitigation
- Recommendations for adaptive management if required
- Summaries and conclusions

These reports are generally required as part of the licensing process and will be provided to Manitoba Conservation and Water Stewardship.

In regards to moose harvest, Manitoba Conservation and Water Stewardship is the responsible authority for the management of moose hunting. Information on allowable bag limits is available in the annual hunting guide and website or through contacting Manitoba Conservation and Water Stewardship.

Remaining Gaps:
MH has indicated that Harvest Management Strategies are the responsibility of MCWS and MH is currently discussing mitigation and monitoring strategies with MCWS. **The outcome of discussions between MH and MCWS are currently unknown. The final Environmental Protection Plan (EnvPP) is not yet available.** Given that a final EnvPP, which includes various management plans, will not be developed until a license is granted, a complete list of mitigation measures intended to minimize potential environmental impacts will not be available until after a license is granted. A fundamental component of the license or final EnvPP is the inclusion of a mechanism to ensure that predicted residual impacts (success of mitigation) are verified through monitoring, One potential mechanism could be a license or EnvPP condition for the establishment of an independent monitoring board to carry out monitoring programs through the life of the Project (e.g. Environmental Monitoring Advisory Board (EMAB) for De Beers Diavik Diamond Mine, NWT).

MCWS "*continues to provide input on mitigation and monitoring*" (CEC/MH-VI-207). **However, it is unclear if MCWS will be conducting regional monitoring and Project-specific effects monitoring with respect to moose and elk**.

MH states that Draft Environmental Protection Program provides the framework for implementing, managing, monitoring, and evaluating wildlife mitigation measures and that annual monitoring reports will contain the information requested. **However, details of how mitigation success will be measured, including targets or definitions of success, are not provided. A follow-up program for the Project is not yet available.**

MH's response directs us to MCWS for an answer to the IR. Presumably the management of moose hunting will be a topic during MH discussions with MCWS regarding mitigation and monitoring strategies. **The outcome of discussions between MH and MCWS are currently unknown.**

9) Issue: Mitigation of ROW Impacts – ROW Access and Maintenance

Reference: EIS Volume #11, Attachment 11-1 Draft Environmental Protection Plan (Envpp), Chapters 3.5.8, 3.6.9, 3.7.4, 5.4.9, Appendix E, Appendix F, pp. Tables 12, 19, 30, 34
Concern: *"Moose is the most sought after species of large animals by Interviewees, followed by deer and then elk"* (MMF 2011). Therefore, impacts on the availability and abundance of moose and elk, which the Manitoba Metis rely upon now and into the future to exercise their rights and interests in a meaningful way, are fundamental concerns.

In an attempt to improve our confidence in the predictions made, we need a better understanding of the mitigation measures proposed and the effectiveness of those mitigation measures. Mitigation measures must also be thorough to ensure that all adverse effects of the Project are managed effectively.

Mitigation measures need to be identified to minimize any adverse effects of the Project (EIS Scoping Document Reference 7.6) and the effectiveness of mitigation measures needs to be verified (EIS Scoping Document Reference 10.0). The following highlights selected environmental protection measures listed by MH in the Draft EnvPP and identifies aspects that require clarification:

PC-1.2, Table 12, EnvPP: "*Public use of access roads and trails during construction will be controlled through the Access Management Plan*."

PC-1.19, Table 12, EnvPP: "*Access roads and trails required for future monitoring, inspection or maintenance will be maintained in accordance with the Access Management Plan.*"
The Access Management Plan has not yet been prepared for the Project. Therefore, details of how public access to roads and trails will be managed and how access roads and trails will be maintained are, as yet, unavailable. Without knowledge of how access management is intended to work, it is not possible to form an opinion of how effective the management might be. Given that the ROW has the potential to serve as habitat for VECs such as moose and elk if left undisturbed, deterring human access is critical to mitigating the effects of this Project on habitat loss, fragmentation and mortality.

PC-1.21, Table 12, EnvPP: "*Vegetation control along access roads and trails will be in accordance with contract specifications and Manitoba Hydro guidelines (Appendix E)."*
Appendix E states: "*Transmission Line and Transmission Station Vegetation Management Strategies (Manitoba Hydro (2006) provide background information and a general understanding of Manitoba Hydro's transmission line system vegetation management practices. The report provides information on responsibilities and the methods used to control tree growth on transmission line rights of way.*"
Without knowledge of vegetation control measures specific to the Bipole III Project, it is not possible to form an opinion of how effective the management might be.

PC-8.10, Table 19, EnvPP: "*Vegetation control along rights-of-way during construction will be in accordance with the Vegetation Management Plan*."
The Vegetation Management Plan has not yet been prepared for the Project. It is expected to be completed and implemented prior to the commencement of the construction phase for the Project (EnvPP, Section 5.4.9). Without knowledge of vegetation management specific to the

Bipole III Project, it is not possible to form an opinion of how effective the management might be.

EC-9.4, Table 30, EnvPP: "*Clearing will occur during late fall and winter to the extent possible to avoid the spring/summer nesting season for birds and parturition times for mammal species and breeding windows for frog species*."

EC-9.7, Table 30, EnvPP: "*Construction activities will not be carried out during prescribed timing windows for wildlife species (Appendix F).*"
Late fall and winter are critical times of year for ungulates as they enter a negative energy balance due to reduced food quality and food access in combination with harsher environmental conditions (Van Tighem 2001). Construction activities should be avoided during this time period, particularly in critical winter ranges for moose and elk. Critical winter ranges for moose and elk in western Manitoba should be identified.
Within Appendix F, MH states that *"Table 1 outlines draft wildlife reduced risk work windows applicable to the Project.*" Table 1 is not included in Appendix F. Without knowledge of the wildlife reduced risk work windows specific to the Bipole III Project, it is not possible to form an opinion of how effective the management might be.

EI-4.23, Table 34, EnvPP: "*Pesticide storage will be in accordance with provincial legislation (Appendix C) and Manitoba Hydro guidelines (Appendix E).*"
The time, location, and requirement for the expected use of pesticides does not appear to be indicated in the Envpp. Without knowledge of the details of pesticide use specific to the Bipole III Project, it is not possible to form an opinion of how effective the management might be.

Information Request(s):

- Please describe how access will be managed and how linear features will be maintained. How will MH ensure that human access to the ROW is minimal during the operational stages of the Project? What enforcement and physical measures can be placed to achieve compliance?
- Given the remoteness of some areas of the ROW, how will access management plans be prioritized with respect to distance to human communities, proximity to adjacent and intersecting roads, and habitat quality of VECs?
- Please describe expected vegetation control measures specific to the Bipole III Project.
- Please describe the potentially negative impact on wildlife health from the use of herbicides for vegetation control.
- Please identify areas along the FPR that are potentially critical winter range for elk and moose.
- Please provide the wildlife reduced risk work windows for review (Table 1, Appendix F, EnvPP).
- Please describe when and where pesticide use is expected in association with the Project.
- Please describe the potentially negative impact on wildlife health from pesticide use.
- Provide details as to how the effectiveness of proposed mitigation measures will be measured.

Manitoba Hydro Response:

1. The Operations and Maintenance Access Management Plan (O&MAMP) will be implemented once the Bipole III Transmission Project has been constructed and commissioned, and remain in effect for the life of the Project. Based on Manitoba Hydro's experience with existing transmission line ROWs, it is anticipated that traffic volumes on most portions of the Bipole III ROWs will be low and largely seasonal (winter) during the operations and maintenance phases of the Project. New access onto and along the ROWs is limited to seasonal trails. Natural terrain conditions, remoteness and private property restrictions are expected to limit traffic on the Bipole III Transmission Project ROW at all times of the year but, in particular, during the non-frozen ground period. Opportunities will increase during the frozen ground period and although anticipated traffic levels are expected to be low, the following strategies have been identified and are currently being developed for inclusion in the Access Management Plan to minimize potential access opportunities to the ROW and to address issues of safety and system reliability:

- Education and communication (e.g., public, stakeholders, between maintenance crews and resource users, etc.);
- Vegetation management plan (strategies to promote desirable species on the ROW that create beneficial habitat and limit line of sight);
- Timing windows and logistic for operations and maintenance activities particularly in environmentally sensitive sites;
- The continued maintenance and management of identified environmentally sensitive sites;
- Maintenance of riparian buffers and wildlife corridors established during the construction phase;
- Case by case assessment and evaluation, in conjunction with Manitoba Conservation and Water Stewardship, of applications for ROW use for industrial and recreational purposes;
- In specific environmentally sensitive sites limit activities as much as possible to air access (e.g., caribou ranges);
- Access will be restricted to all site components (e.g., Keewatinoow Converter Station, camps, etc.)
- Signage (e.g., safety, respect, responsible use, use at own risk);
- Decommissioning of access by way of slash spreading, trenching, cross ditching or berming;
- Manitoba Conservation and Water Stewardship is responsible for managing wildlife resources within the province. Where required, the Minister can impose wildlife harvest limitations and travel restrictions.

Remaining Gaps:

The provision of detailed mitigation measures is appreciated. **MH should provide examples from other projects/locations where these mitigation measures were successful.**

An Access Management Plan has not yet been prepared for the Project, nor has a sample plan been provided, where success of mitigation is defined and measured.

Manitoba Hydro Response:

2. Aside from the standard access management strategies that will be identified in the AMP and those identified above, focus is placed on specific environmentally sensitive sites as identified

through the SSEA studies (e.g. caribou ranges, moose hunting closure areas) some of which may change over time. Where specific values exist or evolve over time and access becomes an issue, then Manitoba Hydro will work with Manitoba Conservation and Water Stewardship to address those issues.

Remaining Gaps:
In the IR, several concerns related to functional habitat loss, fragmentation, and mortality from hunting and predation by carnivores are explicitly linked to the nature of human activity along the ROW. **Disclosure of the density of public access to the ROW during the operational phase of this project is a critical information gap required to understand the extent of project impacts on 'specific values'** ; i.e., the VEC identified by MMF. **Without defined goals for access management, it is unclear if and how MH will limit disturbance along the ROW. MH does not provide information on how access 'issues' will be identified (e.g., how human use will be monitored; what the thresholds of acceptable human use are along the ROW; how the type of human activity may change the response by MH).**

Manitoba Hydro Response:
3. Manitoba Hydro utilizes an integrated approach to vegetation management and utilizes both mechanical and herbicide vegetation control methods. These methods may include; shear blading, mowing, hand cutting, feller bunchers, and selective herbicide application using ground or aerial equipment,

Remaining Gaps:
The IR was perhaps ill-worded as we were interested in the state vegetation will be kept in along the ROW rather than the method of vegetation control. **MH has not provided definitions of success for vegetation management.**

Manitoba Hydro Response:
4. Negative impacts on wildlife health are not expected from the limited application of herbicides used for vegetation control during the Bipole III operational period. All herbicides that are employed by Manitoba Hydro are done so in accordance with their recommended and Provincially permitted rates and under normal circumstances. See CEC/MH-II-022b.

Remaining Gaps:
MH has not provided peer-reviewed literature confirming the expectation that herbicide application will not impact wildlife health. MH does not describe what would constitute "*normal circumstances*" (or, conversely, abnormal circumstances) as referred to in their response.

Manitoba Hydro Response:
5. High quality habitat was identified and discussed for moose and elk ranges in the Bipole III Study Area (see Mammals Technical Report, Maps 10 & 11, and Bipole III EIS, Chapter 6, Sections 6.2.6.5 and 8.2.6.4). Moose and elk are both common species in the Study Area, and

since habitat availability does not appear to be a limiting factor, none of the moose or elk habitat was determined to be critical.

If areas are deemed "potentially critical winter ranges for elk and moose", they will be discussed with Manitoba Conservation and Water Stewardship and if required, identified and addressed in the Environmental Protection Plan. Game Hunting Areas with moose hunting closures will be included in these discussions (see CEC-MH-III-050).

Remaining Gaps:
The outcome of discussions between MH and MCWS are currently unknown.

Manitoba Hydro Response:
6. The table noted above was inadvertently not included in the EnvPP. The table has been attached as file CEC/MH-VI-208(2).

Remaining Gaps:
Table 1 Draft Wildlife Reduced Risk Timing Window (CEC/MH-VI-208(2)) indicates that June through August is a Sensitive Time Period for Wildlife with respect to moose and elk. This is contrary to typical recommendations (e.g. ASRD 2010) to avoid disruptive activities during the critical winter period when environmental conditions are harsher and when food is of lower quality and less accessible, resulting in a negative energy balance for ungulates (Van Tighem 2001, ASRD 2010).

The construction phase should occur primarily during a time period that minimizes disturbance to most wildlife. **MH currently plans to have construction activities occur during the winter period, a critical period for ungulates. It is not clear if MCWS will be making recommendations on appropriate timing for clearing and construction.**

Manitoba Hydro Response:
7. Both the construction and operation phase EnvPPs will include a vegetation management plan that outlines pesticide use. Pesticide use may occur when the need to mitigate the establishment of invasive plants is required. Borrow sites may require treatment to remove noxious weeds and/or invasive plants as part of the vegetation management program for the operation of the project.

Remaining Gaps:
A Vegetation Management Plan has not yet been prepared for the Project.

Manitoba Hydro Response:
8. Negative impacts on wildlife health are not expected from the limited application of pesticides used during the Bipole III operational period. All pesticides that are employed by Manitoba Hydro are done so in accordance with their recommended and Provincially permitted rates and under normal circumstances.

Remaining Gaps:

MH has not provided peer-reviewed literature confirming the expectation that pesticide application will not impact wildlife health. MH does not describe what would constitute "*normal circumstances*" (or, conversely, abnormal circumstances) as referred to in their response.

Manitoba Hydro Response:
9. Manitoba Hydro's Draft Environmental Protection Program provides the framework for implementing, managing, monitoring and evaluating wildlife mitigation measures consistent with regulatory requirements, corporate commitments, best practices and public expectations. The Draft Environmental Protection Plan will be updated based on the results of ongoing discussions with regulators and stakeholders and finalized in accordance with the Environment Act Licence for the project. Annual reports will provide a summary of wildlife monitoring activities related to wildlife mitigation measures and recommendations for further monitoring if required. These reports will be provided to Manitoba Conservation and Water Stewardship and will be available to the public.

Remaining Gaps:
MH states that Draft EnvPP provides the framework for implementing, managing, monitoring, and evaluating wildlife mitigation measures and that annual monitoring reports will contain the information requested**. However, details of how mitigation success will be measured, including targets or definitions of success, are not provided. A follow-up program for the Project is not yet available.**

10) Issue: Decommissioning
Reference: Mammals Technical Report (2011), Chapter 5.5.7, pp. 96.
Concern: Safe-guarding Manitoba Metis rights and interests is a fundamental concern. To understand whether Metis rights and interests will be protected, the capacity and accessibility of traditional resources to meet the needs of current and future generations should be determined.

MH has not provided an assessment of decommissioning plans due to the long (>50 year) anticipated operating life of the Project (Volume 4, Section 4.2.2). With no goals provided for the future, it is not clear if or how the Project footprint will be rehabilitated post-operations such that a similar level of accessibility to traditional resources as today exists in the future for Manitoba Metis.

EIS Scoping Document References 3.1 and 7.3.5 require that the EIS describe concepts for decommissioning Project components, but additional detail is required to understand MH's vision for decommissioning. MH anticipates that "*…all components of the proposed Project are fully reversible*" (MTR, p. 96) and that *"…biophysical disruption resulting from the Project should be outweighed by ongoing naturally occurring variation (e.g. succession, wildfire)*". It is not clear what MH is suggesting with this statement. Are Project impacts fully reversible or just the presence of infrastructure and facilities? Are natural processes expected to have a greater impact on the biophysical environment than the Project itself? Whatever the intentions of this statement, there are no supporting references to corroborate MH's expectations.

Information Request(s):

- Please elaborate on what MH expects for decommissioning using peer-reviewed literature to support the argument.

Manitoba Hydro Response:

Chapter 3 of the Bipole III EIS (i.e., Project Description) provides the concept for transmission line decommissioning (Section 3.4.10), decommissioning the Keewatinoow Converter Station (Section 3.5.6) and decommissioning the Riel Converter Station (Section 3.6.6). Furthermore, as alluded to in Chapter 11 under section 11.2.6, a detailed Decommissioning Phase Environmental Protection Plan would be prepared prior to the eventual decommissioning of the Project that would incorporate best practices and meet regulatory and legislative requirements.

Regarding decommissioning transmission lines and all facilities, the goal of Manitoba Hydro is to rehabilitate the landscape to its natural state, which would accommodate various land use activities similar to what occurs on the landscape today. Current methods of transmission line decommissioning entail the dismantling of structures and salvage or disposal of all steel structure components, as well as removal and salvage of insulators, conductors and ground wires. Decommissioning rights-of-way currently involves clean-up and/or remediation to a standard commensurate with local environmental conditions, including the existing land use and policy with respect to future development. Decommissioning of marshalling yards currently involves the removal of all new and used equipment and materials, dismantling of any ancillary equipment or structures, and the remediation of the yard property.

Remaining Gaps:

MH's goal "*is to rehabilitate the landscape to its natural state*", but MH has not provided any description of how this will be achieved or any references of peer-reviewed literature indicating that this goal is indeed achievable.

11) Issue: Moose and Elk Populations – Natural Range of Variability

Reference: Mammals Technical Report (2011), Chapter 6.1, pp. 105, Table 43. EIS Volume #4, Chapter 4.2.10, pp. 4-32.

Concern: "*Moose is the most sought after species of large animals by Interviewees, followed by deer and then elk*" (MMF 2011). Therefore, impacts on the availability and abundance of moose and elk, which the Manitoba Metis rely upon now and into the future to exercise their rights and interests in a meaningful way, are fundamental concerns. MH has predicted that moose and elk populations will be maintained within their natural ranges of variability once the Project commences. Any claim of no adverse effects on moose and elk must be tested in the future. For that reason, data sufficient to produce testable predictions must be produced prior to Project implementation, so that monitoring results depicting future conditions can be compared to baseline conditions.

EIS Scoping Document References 7.2 and 7.4.2.9 require that sufficient information about the existing environment be provided so that environmental effects can be identified and mitigated; However, MH has not provided the information that, according to their definitions, would be

used to determine significance of residual effects (as required by EIS Scoping Document Reference 3.2). Table 43 of the MTR lists the residual environmental effects for moose and elk as "*populations maintained with the natural range of variability*" (MTR, p.105). This implies that the natural ranges of variability in Manitoba moose and elk populations are known. The natural ranges of variability for moose and elk are needed to verify impact predictions after the Project commences. This information is also needed to accurately determine "*Magnitude*" of an effect (which is, in turn, necessary to determine significance of an effect). The definition for Magnitude (Volume 4, Section 4.2.10, p. 4-32) requires a comparison of effects to "*established thresholds of acceptable change*". The current presentation of data for moose and elk does not clearly indicate the natural range of variability or any thresholds for Manitoba moose and elk populations.

Information Request(s):

- Please present data outlining the natural range of variability and thresholds in moose and elk populations (i.e., please provide upper and lower targets in moose and elk populations, beyond which adaptive management action would need to be implemented).

Manitoba Hydro Response:

Neither Manitoba Hydro nor Manitoba Conservation and Water Stewardship (MCWS) have sufficient data to outline the natural range of variability and sustainability thresholds for moose and elk populations province-wide. Manitoba Hydro's statement in the summary of residual effects on the natural range of variability is meant to indicate that moose and elk populations will continue to increase or decline (or fluctuate through time) as a result of natural processes, habitat succession, habitat alteration as well as from hunting and predation. The Bipole III Transmission Project will not significantly contribute to the increase or decline of these populations. Manitoba Conservation and Water Stewardship is the agency responsible for establishing thresholds for area closures to moose, elk and deer. Currently MCWS is in the process of developing moose management plans and hunting strategies, including working with stakeholders in setting harvest and population targets. Manitoba Hydro also continues to work MCWS on site specific mitigation where required including access management and wildlife prescriptions during construction and operation.

Remaining Gaps:

MH has stated that it does not have sufficient data to outline the natural range of variability and sustainability thresholds for moose and elk populations which are used to determine the magnitude of an effect. Consequently, the significance of an effect cannot be determined using the impact criteria as defined by MH. MH needs to provide data or other evidence to support their conclusion of no significant effect of the Project on moose populations.

12) Issue: Determining Residual Environmental Effect - Moose

Reference: Mammals Technical Report (2011), Chapter 7.4, pp. 110-111. EIS Volume #4, Chapter 4.2.10, pp. 4-32, 4-36, Figure 4.2-2. EIS Volume #8, Chapter 8.2.6.2, pp. 8-103 to 8-104.

Concern: "*Moose is the most sought after species of large animals by Interviewees, followed by deer and then elk*" (MMF 2011). Therefore, impacts on the availability and abundance of moose, which the Manitoba Metis rely upon now and into the future to exercise their rights and interests in a meaningful way, are fundamental concerns.

MH has predicted that the Project will not have a significant effect on moose populations. Confidence in the impact assessment is reliant on whether or not baseline data adequately support impact predictions. To improve confidence in the impact assessment, additional rationale is needed in support of MH's conclusion of no significant impact of the Project on moose populations. Furthermore, any claim of no adverse effects on moose must be tested in the future. For that reason, data sufficient to produce testable predictions must be produced prior to Project implementation, so that monitoring results depicting future conditions can be compared to baseline conditions.

EIS Scoping Document References 7.2 and 7.4.2.9 require that sufficient information about the existing environment be provided so that environmental effects can be identified and mitigated. However, MH has not provided the information that, according to their definitions, would be used to determine significance of residual effects (as required by EIS Scoping Document Reference 3.2).

MH concludes that "*Based on the dual nature of the positive and negative residual effects listed here, it is anticipated that the overall residual effects of the Project on moose populations will be minimally negative to nil and not significant.*" (MTR, p.111). The only positive effect of the Project listed was that "*Moose habitat <u>may</u> become enhanced due to the presence of palatable forage species growing in the newly cleared ROW.*" (p.110, MTR). Ricard and Doucet (1999) is cited in support of this statement. However, Ricard and Doucet (1999) concluded that the rights-of-way studied did not actually offer very good moose feeding habitat and a small sample size limited them from making any conclusions about whether moose browsed more or less intensively in rights-of-ways than adjacent woods. Given the number of negative impacts listed including: increased parasite transmission, increased predator/prey interaction, increased accessibility by human hunters, increased recreational use of ROW, and increased moose-vehicle collisions, it is not clear how it was concluded that there would be only a "*minimally negative to nil and not significant*" impact. Furthermore, conservation initiatives by Manitoba Conservation (Manitoba Conservation 2012), including recent management decisions to cancel moose hunting seasons in various GHA's (Manitoba Conservation 2011a and 2011b) along the FPR to protect remaining moose and hopefully ensure future sustainability of Manitoba's moose population, indicate that moose populations may not tolerate much more disturbance. As it stands, there is little substantive justification for MH's conclusion regarding moose populations. Further rationale is required, particularly in light of the current status of moose in Manitoba.

Within Volume 8, MH concludes that "*The residual effects on moose from Project construction and operation include potential for: overharvest from increased access; sensory disturbance; some functional habitat loss; increased predation; and increased parasites and disease. The residual effects are characterized as negative in direction, <u>small in magnitude</u>, Local Study Area in geographic extent, medium term in duration (operation), regular/continuous in frequency, reversible and therefore*

considered not significant." [Emphasis Added] (Volume 8, p. 8-103 to 8-104). Small Magnitude is described as: "*no definable or measurable effect or below established thresholds of acceptable change*" (Volume 4, p. 4-32). Further rationale is required to support the conclusion of "*Small in Magnitude*" by MH. First, thresholds for moose (habitat, density, mortality, etc.) do not appear to be established in the EIS. Second, moose populations are apparently measurably decreasing in the region - rapidly enough to result in management actions (Manitoba Conservation 2011a and 2011b). Therefore, it is probable that Project effects on moose could be of Moderate or Large Magnitude given the definitions provided by MH and the, as yet, undefined thresholds for moose.

If Project effects were of Moderate or Large Magnitude, according to [updated] Figure 4.2-2 (Volume 4, p. 4-36), this would result in a "Potentially Significant Effect" and therefore "Moderate Residual Effect". This level of effect could be enough to further contribute to moose population declines in the region and result in unsustainable moose populations. Furthermore, MH states that *"….thresholds or guides may identify highly vulnerable environmental VECs where the loss of even a few individuals may affect the long-term status of the population.*" (p.4-36). Considering the recent implementation of management actions by Manitoba Conservation (Manitoba Conservation 2011a and 2011b), the range of variability in Manitoba moose populations and thresholds should be clearly defined to support any determination of Magnitude of effect of the Project.

Information Request(s):

- Taking into consideration the above comments, please re-assess the Project impact on moose populations using supporting peer-reviewed literature and information available on Manitoba moose populations.

Manitoba Hydro Response:

Manitoba Hydro's characterizations regarding residual effects on moose relate to the overall Project Study Area and associated mitigation measures. The predicted effects as outlined in the EIS do not change. However, given the concerns expressed about moose populations in some specific areas of the Province (i.e. Duck Mountains), Manitoba Hydro is discussing mitigation and monitoring strategies with Manitoba Conservation and Water Stewardship to address site specific issues.

Remaining Gaps:

Please see Remaining Gaps outlined in Issue 11 above. Confidence in the impact assessment is reliant on whether or not baseline data adequately support impact predictions.

Furthermore, MH states that "*Manitoba Conservation and Water Stewardship is the agency responsible for establishing thresholds for area closures to moose, elk and deer*." (IR CEC/MH-VI-210 Response). It appears that a threshold of acceptable change has already been reached because MCWS has implemented area closures with respect to moose. **Given this information, MH does not have adequate support for their conclusion that the Bipole III Project is "*below established thresholds of acceptable change*".**

13) Issue: Potential Cumulative Effects - Moose

Reference: Mammals Technical Report (2011), Chapter 8.1, 8.2, pp. 116-121, 123. EIS Volume #9, Chapter 9.2.1, pp. 9-17, Table 9.2-1 to 9.2-3
Concern: "*Moose is the most sought after species of large animals by Interviewees, followed by deer and then elk*" (MMF 2011). Therefore, impacts on the availability and abundance of moose, which the Manitoba Metis rely upon now and into the future to exercise their rights and interests in a meaningful way, are fundamental concerns.

As per EIS Scoping Document Reference 8.0 and CEAA (2008), MH must complete a cumulative effects assessment for the Project study area. An analysis of cumulative effects must permit an understanding of the incremental contribution of all projects or activities in the delineated study areas, and of the Project alone, to the total cumulative effects on moose over the life of the Project. MH has predicted that the Project will not have a significant incremental cumulative effect. However, the information provided does not allow for an understanding of the potential cumulative effects, particularly spatially as little information is provided regarding the location of various projects and activities, but also with respect to insufficiency of baseline data on moose populations.

Several large scale activities, including forestry, mining, and other transmission lines, are proposed or ongoing in and around the Project Study Area (listed in the Mammal Technical Report, Section 8.1 & Volume 9, Tables 9.2-1 to 9.2-3). Generally, these activities all contribute to habitat loss, habitat fragmentation, and/or avoidance of the area.

With respect to moose, MH concluded that "*a small magnitude, medium-term cumulative effect is expected…due to impacts on habitat in the Local Study Area and consequent fragmentation…*" (Volume 9, p. 9-17). However, due to mitigation measures such as access management, harvest management, regional planning for access roads, and lower speed limits, MH considers the incremental cumulative effects of the Project not to be significant.

Conservation initiatives by Manitoba Conservation (Manitoba Conservation 2012), including recent management decisions to cancel moose hunting seasons in various GHA's (Manitoba Conservation 2011a and 2011b) along the FPR to protect remaining moose and hopefully ensure future sustainability of Manitoba's moose population, indicate that moose populations may not tolerate much more disturbance. The fact that these actions have occurred prior to the development of the Bipole III Project indicates that these concerns exist even before any Project impacts are considered. Therefore, it is difficult to understand, without more detailed information on moose population variability and thresholds, how MH can conclude that the Project is unlikely to have a significant effect on moose and is unlikely to have an incremental cumulative effect.

MH also states that "*Severity of these cumulative effects cannot be fully measured due to unknown response of wildlife to these activities and the unknown degree of spatial/temporal scales of activities which may occur within and around the Project Study Area.*" (MTR, p. 123), indicating that MH does not understand the cumulative effects of the Project on wildlife. To understand the potential cumulative impact to Manitoba moose populations, more detail with respect to the location of

the projects discussed in the Mammal Technical Report, Section 8.1 & Volume 9, Tables 9.2-1 to 9.2-3 and a quantitative assessment of cumulative effects is warranted.

Information Request(s):

- Please provide a map showing the location of all development listed in Volume 9, Tables 9.2-1 to 9.2-3.
- Please provide information on moose population variability and moose population thresholds.
- Please provide a quantitative assessment of the cumulative effects of habitat loss and fragmentation in relation to moose.
- Please demonstrate that mitigation measures in the region have been successful at avoiding significant impacts to moose.

Manitoba Hydro Response:

Please see CEC/MH-VI-210 for more information. Maps denoting development listed in Volume 9, Tables 9.2 to 9.2-3 can be found in CEC/MH-VI-212(2), CEC/MH-VI-212(3), and CEC/MH-VI-212(4).

As the cumulative effects in relation to moose are anticipated to be minimal, a quantitative assessment is not required. Site specific mitigation will be undertaken where required as will be identified in the Environmental Protection Plan. To date, no mitigation measures specifically relating to moose have been implemented on transmission lines in the region, as there has not been a need to do so.

Remaining Gaps:

Maps showing the location of all development listed in Volume 9, Tables 9.2-1 to 9.2-3 were provided on August 30th, 2012 (See Appendix A). Although it is helpful to see the distribution and number of development activities occurring in the Project Area, **it is still not clear how much disturbance is or will be occurring as the maps only provide point location information and not project footprints.**

MH asserts that "*As the cumulative effects in relation to moose are anticipated to be minimal, a quantitative assessment is not required*" (CEC/MH-VI-212). Contrary to this assertion, evidence shows that moose may be significantly impacted by this project (please see Responses to CEC/MH-VI-210 and 211 regarding predicted magnitude of effects and existing closures to moose hunting) and have already experienced significant declines in population density in the region. An analysis of mean moose density from GHA's 6, 6A, 8, 11, 12, 13/13A, 14/14A, 18-18C, and 19A has demonstrated a significant decrease between 1990 and 2012 (paired t-test, p=0.037, t=2.50, df=8) (Figure 2). There does not appear to be evidence of moose population recovery and, although the ultimate cause of this decline is unclear, moose populations are less likely to increase and recover with additional environmental stressors. (Please also see Section 2.0 "Habitat Decline and Fragmentation" for moose).

It is not clear what method MH adopted to arrive at the conclusion that cumulative effects on "*moose are anticipated to be minimal*" and therefore "*a quantitative assessment is not required*". According to the Cumulative Effects Practitioners Guide by

Hegmann (1999): "*Significance may decrease as the significance of local effects decrease: It has been argued that if the conclusions of an EIA indicate that none of the residual direct effects are significant, then there will be no cumulative effects (as therefore there are no effects remaining to act cumulatively with other actions). While this may be true for some types of effects, this may not always be the case: an insignificant local effect may still contribute to a significant cumulative effect.*" In cases where management action is implemented to keep a population viable, the completion of a quantitative cumulative effects assessment should be a high priority since the viability of the population is already a concern before any project activity has commenced. **MH has not completed a quantitative cumulative effects assessment.**

MH states that there has not been a need to implement mitigation measures for moose with respect to transmission lines in the region. This statement indicates that there is no evidence for the region that the mitigation measures proposed for the Bipole III transmission line will be successful. If there is no evidence of success, then there is little confidence in the predicted residual impacts. **MH has not provided evidence that the proposed mitigation measures with respect to moose have been successful elsewhere for similar projects. Additionally, MH has not provided clear and detailed information on how mitigation measure success will be determined** (reference to a draft Envpp and annual reports is not adequate). Detailed follow-up program information should be available prior to Project construction (CEAA 2011).

14) Issue: Mitigation Measures for Moose and Elk
Reference: EIS Volume #7, Chapter 7.2.2.2, pp. Map 7-8, Table 7.2-1, Map 7-14. Habitat Fragmentation Technical Report (2011), pp. Map 6.
Concern: "*Moose is the most sought after species of large animals by Interviewees, followed by deer and then elk*" (MMF 2011). Therefore, impacts on the availability and abundance of moose, which the Manitoba Metis rely upon now and into the future to exercise their rights and interests in a meaningful way, are fundamental concerns.

Although an elaborate route selection process was undertaken on the west side on Lake Winnipegosis, as per EIS Scoping Document References 3.2 and 4.0, some route sections may not be ideal for minimizing Project impacts to moose and elk. In an attempt to improve our confidence in the predictions made and meet the requirements of EIS Scoping Document Reference 7.1, we need a better understanding of the mitigation measures proposed and the effectiveness of those mitigation measures.

MH identifies numerous constraints (Volume 7, Table 7.2-1) that they have tried to work around (Volume 7, Map 7-8). Within Section 5 of the route selection options, a bottleneck area, route option B11C13 was rated as High (level of constraint) because of concerns about further fragmentation of habitat along this particular route segment. This route segment also has a High rating for caribou and a Medium rating for mammals (Section 7.2.2.1) and has been identified as containing prime moose habitat according to ATK (Map 7-8). Alternative route options for this section contain "*moose concentration areas*" and "*core winter area and calving complex*". The FPR follows segment B11C13 (Map 7-14).

GHA's within this bottleneck (GHA's 7 and 8) appear to remain open for moose hunting. It is not clear whether or not the effects of potential concentrated moose hunting within GHA's 7 and 8 in response to closures of GHA's to the north and south have been considered when determining the Project impact on moose. Furthermore, the addition of a linear corridor in this region will improve hunter access to moose populations and increase access density in the region. MH has illustrated a relationship between reduced moose densities and increased levels of fragmentation (a function of increased access for hunting) (Habitat Fragmentation Technical Report, Map 6). The combined effects of high hunting pressure and increased hunter access may adversely affect moose in the area.

MH identifies constraints they have tried to work around within the bottleneck area south of Red Deer Lake (Section 7 of route selection options; GHAs 13 and 14). Within Section 7, none of the proposed route options appear to run along existing ROWs which could reduce impacts to moose and elk. The FPR follows segment B18 (Map 7-14).

Information Request(s):

- What assurance can MH provide that moose populations will not be adversely affected in Section 5 of the FPR?
- How will access be managed in GHA's still open to moose hunting? Is any alternative mitigation for moose proposed for Section 5 of the FPR?
- How is increased access density expected to influence moose density in Section 5 of the FPR?
- Discuss options for alternative routing of the transmission line in Section 7 (GHA's 13 and 14) such that the transmission line follows existing linear features to a greater extent.

Manitoba Hydro Response:

The routing of Bipole III in Section 5 parallels the existing Wuskwatim transmission line thus minimizing the regional fragmentation effects on moose by utilizing existing access. Although segment B11C13 in this section was ranked a high concern based on ATK, this option provided the least overall effect on moose in a larger by paralleling existing linear development. Selection of other segments (AA2, A 12 and A 13) would have resulted in fundamental re-routing in Section 4, 6 and 7, which would have further increasing effects on wildlife as other segments would have to connect with these options. Segments A 13 also bisects a locally important moose areas in GHAs 6 and 6A, and if selected would require routing through critical habitat in The Bog boreal woodland caribou range. This westerly route (if selected) would also have resulted in the selection of important moose and elk habitat through the Red Deer River, Porcupine Hills and Duck Mountains, which was avoided. Manitoba Conservation and Water Stewardship (MCWS) is the regulating body for GHA hunting activities and harvest level within each GHA. With respects to Project sites in which Manitoba Hydro operates, an Access Management Plan will be provided by Manitoba Hydro for addressing access to Project Sites and Infrastructure. The FPR is not expected to contribute to increased access densities as it parallels existing transmission line facilities. Manitoba Hydro is working with MCWS on options for mitigation in Section 7 (GHAs 13 and 14).

Remaining Gaps:

The question was: "What assurance can MH provide that moose populations will not be adversely affected in Section 5 of the FPR?" The constraints outlined in the SSEA were already discussed in the EIS. The route option selected (B11C13) has the "*least overall effect on moose*" (CEC/MH-VI-213), but assurance that moose population will not be adversely affected in Section 5 was not provided (i.e., no mitigation measures specific to this section of the route were provided). **MH did not answer the original information request regarding adverse impacts to moose in Section 5 of the FPR.**

Examples of the success of the mitigation proposed in the Access Management Plan should be provided by MH. Additionally, the effectiveness of mitigation measures must be determined by a monitoring approach that is based on testable questions and includes adequate sampling and statistical procedures.

MH states that "*the FPR is not expected to contribute to increased access densities as it parallels existing transmission line facilities*" (CEC/MH-VI-213). We would like to clarify that, in the EIS, MH indicates "*potential*" use of existing road/rail transmission linear features in Section 5 and does not appear to follow existing linear features in Section 7 of the FPR. Therefore, the FPR could contribute to increased access densities. Regardless, the accuracy of predictions in the environmental assessment must be verified using a follow-up program.

The outcome of discussions between MH and MCWS regarding Section 7 of the FPR are currently unknown. Baseline data should be provided for any proposed alternative routes.

15) Issue: Monitoring and Follow-up

Reference: Mammals Technical Report (2011), Chapter 9.0, pp. 121-122. EIS Volume #8, Chapter 8.2.6.6, pp.8-132. EIS Volume #11, Chapter 11.3.4.2, pp. 11-15 to 11-16. Attachment 11-1 (EnvPP), Chapter Appendix H, pp. Appendix H 1-16.

Concern: Safe-guarding Manitoba Metis rights and interests is a fundamental concern. To understand whether Metis rights and interests will be protected, the capacity and accessibility of traditional resources to meet the needs of current and future generations needs to be determined. That is, MH's predictions about alleviating Project impacts on moose and elk rely on how well the mitigation will work. Therefore, the effectiveness of mitigation must be measured. This requires that both the baseline and the future effects can be quantified. The effectiveness of mitigation measures can only be determined by a monitoring approach that is based on testable questions and includes adequate sampling and statistical procedures. MH's application must discuss how the effectiveness of the proposed mitigation and how the monitoring program would be designed to test mitigation effectiveness.

MH states that "*Follow-up monitoring is employed in cases where there is uncertainty about the effectiveness of the mitigation measures for a cumulative effect, or in cases where a cumulative effects assessment is based on a new and/or innovative approach (Hegmann et al, 1999)*." (MTR, p. 121). However, according to the EIS Scoping Document Reference 10.0, monitoring and follow-up initiatives are not necessarily limited to cases where there is uncertainty about the effectiveness of mitigation measures.

MH discusses plans for on-going monitoring of caribou populations. No other VECs are mentioned within Volume 8, Section 8.2.6.6, although Section 9.0 of the MTR indicates that MH is involved in a "*series of mammalian monitoring programs*". Within Volume 11, MH generally discusses monitoring plans further and in Appendix H of the draft EnvPP only caribou are included under mammal monitoring requirements. The rationale for the inclusion of caribou as an environmental indicator is that they are of regulatory importance (i.e., Species at Risk Act (SARA) and Manitoba Endangered Species Act (MESA) listed). The EIS Scoping Document Reference 10.0 (MH 2010) requires that monitoring programs describe the parameters to be monitored and the methods to be followed. However, with respect to moose, it appears that there is no discussion as to the effectiveness of the proposed mitigation or how the monitoring program would be designed to test mitigation effectiveness. Mitigation measures cannot be presumed effective once implemented and the success of mitigation measures must be verified through monitoring.

Although MH does provide a Biophysical Monitoring Framework that outlines monitoring requirements (Appendix H of the draft EnvPP), a Biophysical Monitoring Plan has not yet been developed and submitted. MH has committed to do so prior to the commencement of the Project construction phase. Critiques of monitoring programs have highlighted the need for well-designed programs with quantifiable questions that include targets for measuring progress (Yoccoz et al. 2001; Lindenmayer et al. 2008; Lindenmayer and Likens 2010). Programs lacking in testable questions may be incapable of adequately detecting outcomes and trends (Lindenmayer and Likens 2010). This is further supported by the adaptive management operational policy of the CEAA (2009) which states that: "*It is important to establish testable EA predictions when planning a follow-up program or potential adaptive management measures.*" Currently, there is a lack of monitoring detail and it is not clear if MH will meet this objective outlined in the CEAA policy (2009).

Information Request(s):

- Please verify that follow-up monitoring is not only being employed in cases where there is uncertainty with respect to cumulative effects, but is implemented to verify <u>all</u> predictions in the EIS.
- Please explain why follow-up and monitoring plans are only discussed with respect to caribou populations. Please discuss follow-up and monitoring plans with respect to moose populations, particularly given the current decline in moose populations in western Manitoba.
- If MH will not be conducting any monitoring with respect to moose, please indicate who will be responsible for ensuring that mitigation measures applicable to moose are effective. Please consider including moose in the biophysical monitoring plan given the importance of moose to the Manitoba Metis (as outlined in the TLUKS).
- Please provide supporting literature or data that would demonstrate the effectiveness of the proposed mitigation measures for moose in similar projects. If there is no supporting literature or data, please discuss how MH will evaluate mitigation success for moose.
- Please explain how MH would ensure that the biophysical monitoring programs are designed and implemented prior to construction, in accordance with CEAA's policy (2009).

Manitoba Hydro Response:
Please see CEC/MH-VI-207. All monitoring activities will be directly related to the Environment Act licence terms and conditions and Manitoba Hydro's Draft Environmental Protection Plan. Boreal woodland caribou currently has some specific monitoring attached to them as they are a listed species under both provincial and federal legislation and is a collaborative project between Manitoba Hydro and Manitoba Conservation and Water Stewardship (MCWS). Please see CEC/MH-III-044, CEC/MH-III-050 and CEC/MH-III-052 for further information. The need for monitoring programs to be undertaken by Manitoba Hydro is being discussed with MCWS as part of on-going review of mitigation and monitoring planning.

Remaining Gaps:
No new information has been provided by MH in response to this set of IRs. With respect to moose, uncertainty remains regarding if mitigation success will be measured (i.e., effects monitoring), who is responsible for measuring it (unclear whether MCWS is responsible for regional monitoring and/or Project-specific monitoring), and how it will be measured. **No demonstration of the effectiveness of the proposed mitigation measures for moose for similar projects has been provided. A follow-up program for the Project is not yet available.**

16) Issue: Wolf Population Estimates
Reference: Mammals Technical Report (2011), Chapter 4.5.1, pp 61. EIS Volume #6, Chapter 6.2.6.5, pp 6-87. EIS Volume #8, Chapter 8.2.6.2, pp. 8-83.
Concern: "*Moose is the most sought after species of large animals by Interviewees, followed by deer and then elk*" (MMF 2011). Therefore, impacts on the availability and abundance of moose which the Manitoba Metis rely upon now and into the future to exercise their rights and interests in a meaningful way are fundamental concerns. Confidence in the impact assessment is reliant on whether or not baseline data adequately support impact predictions. Additional information on wolf populations in the Project Study Area is needed to improve confidence in the impact assessment and to determine appropriate management actions.

EIS Scoping Document References 7.2 and 7.4.2.9 require that sufficient information about the existing environment be provided so that environmental effects can be identified and mitigated. However, MH has not provided consistent information with respect to wolf population estimates in the Project Study Area.

Increased mortality of ungulate VECs from wolves has been cited by MH as one of the key topics for potential environmental effects. The magnitude of this effect depends on several assumptions that still need to be addressed, such as foraging behaviour by wolves, habitat selection by prey, and the importance of predation to population growth versus other sources of mortality. Even if these assumptions are met, risk of population decline from predation depends on the size of the predator and prey populations. For example, a wolf population density of 6.5 individuals/ 1000km^2 has been suggested as the point at which caribou populations may decline from predation alone (Bergerud and Elliot 1986, Latham et al. 2011). For moose, a

ratio of 1:20 wolves per moose has been cited as the point at which wolves become very limiting to moose population growth (Franzmann 1981).

The MTR reports a wolf density of 1.5-2.1 individuals/ 1000km^2, over a study area >39,000 km^2 (p. 60-61). Conversely, Volume 8- Environmental Effects Assessment (p. 6-87) reports a wolf density of 5 individuals/ 1000km^2, over an area of 17,000 km^2. The discrepancy in these values has important management implications because if the MTR value is correct then it suggests that caribou populations are unlikely to suffer declines from predation even if this was a major source of mortality. Yet if the Volume 8- Environmental Effects Assessment values are correct, it suggests that the wolf population may be high enough that there could be a risk to the sustainability of secondary prey, such as caribou. Similarly, for moose counts in the high quality habitat areas (median = 74, range 16-132 individuals/km^2), the ratio of 1:20 is exceeded in Webb Lake under a wolf estimate of 5 individuals/ 1000km^2 for median moose densities, but not for other habitat blocks or wolf population estimates provided in the MTR.

Information Request(s):

- Please provide a single wolf population estimate for this study area, along with confidence estimates reflecting detection probability.

Manitoba Hydro Response:

Consideration was given to conduct wolf population estimates using Sample Unit Probability Estimator (SUPE) (Patterson, Quinn, Becker, & Meier, 2004). This method has been used in areas where there are no radio collared individuals that are in the population and sightability is low. Snow conditions were not suitable for conducting SUPE surveys during the course of studies conducted. The objective of the Bipole III wolf surveys was to obtain minimum counts within boreal woodland caribou ranges, utilizing data from locating radio collared wolves and stratified searches to locate un-collared packs/individuals. The purpose of these surveys was to assess relative risk of predation by wolves on boreal woodland caribou and to gather baseline data on wolves as part of collaborative research being conducted jointly with Manitoba Conservation and Water Stewardship. The data from these surveys cannot be used to produce population estimates as per the SUPE method.

References:

Patterson, B. R., Quinn, N. W. S., Becker, E. F., & Meier, D. B. (2004). Estimating wolf densities in forested areas using network sampling of tracks in snow. Wildlife Society Bulletin, 32(3), 938-947. doi:10.2193/0091- 7648(2004)032[0938:EWDIFA]2.0.CO;2

Remaining Gaps:

As noted in the original IR, MH did provide two population density estimates. **It is unclear which wolf population density value is being used to determine how the project will affect predator-prey relationships and how was that value calculated.** Confidence in the impact assessment is reliant on whether or not baseline data adequately support impact predictions.

17) Issue: Heterogeneity of Biophysical Environment

Reference: EIS Volume #8, Chapter 8.2.6.2, pp. 8-83 to 8-85.

Concern: "*Moose is the most sought after species of large animals by Interviewees, followed by deer and then elk*" (MMF 2011). Therefore, impacts on the availability and abundance of moose, which the Manitoba Metis rely upon now and into the future to exercise their rights and interests in a meaningful way, are fundamental concerns.

Restoration of plant biomass to the ROW and minimizing risk of predation to ungulate VECs was prioritized as mitigation actions by MH. In an attempt to improve our confidence in the predictions made, we need a better understanding of the mitigation measures proposed and the effectiveness of those mitigation measures.

Mitigation measures need to be identified to minimize any adverse effects of the Project (EIS Scoping Document Reference 7.6). MH has identified measures to mitigate habitat loss and ungulate mortality but additional details are required to understand if and how mitigation measures will be tailored to address variability in plant and wildlife communities across the FPR. At northern latitudes, temperature and precipitation often limit primary productivity and constrain predatory-prey interactions (Kittle et al. 2008; Franzmann 1981). Given the importance of mitigating the impacts of the ROW on habitat loss and ungulate mortality, it is important to understand how these biophysical variables change across the Project Study Area. In the south, where it is presumably warmer and more productive, restoration of woody-browse in the ROW may only take a few years. Conversely, in the north end of the Project, temperature, photoperiod and snow depth may create different limits on plant community regeneration. Likewise, snow depth, rather than habitat per se, has been identified as the critical factor in explaining spatial variation in risk for moose and caribou. A snowfall of 90-100cm is described as critically limiting (reviewed in Franzmann 1981) to moose populations.

Information Request(s):

- To what extent will biophysical variables limit proposed mitigation measures across the north-south expanse of this Project?
- Are snow-fall records available for across the FPR? If so, please provide and incorporate into the assessment where applicable.
- Discuss how mitigation measures can be tailored to address variability in biophysical limitations to plant and wildlife communities across the FPR.

Manitoba Hydro Response:

Biophysical variables where necessary will be taken into account in the application and monitoring of mitigation measures along the FPR (see CEC/MH-VI-207). Precipitation information is provided in Section 6.2.2.4 of the Bipole III EIS. Average accumulated snow fall in the study area rarely exceeds 100cm (Environment Canada, 2012). Please see (see CEC/MH-VI-207).

Reference:

Environment Canada. 2012. National Climate Data and Information Archives. Canadian Climate Normals. 1971-2000.<http://www.climate.weatheroffice.gc.ca/climate_normals/index_e.html> Accessed 26 July 2012.

Remaining Gaps:
No new information has been provided by MH. **MH has not provided clear and detailed information on how biophysical variables will be taken into account in the application and monitoring of mitigation measures along the FPR**. Detailed information should be available prior to Project construction.

18) Issue: Ungulate Sign Reliability and Independence
Reference: Mammals Technical Report (2011), Chapter 3.3.1.4, pp. 17.
Concern: "*Moose is the most sought after species of large animals by Interviewees, followed by deer and then elk*" (MMF 2011). Therefore, impacts on the availability and abundance of moose which the Manitoba Metis rely upon now and into the future to exercise their rights and interests in a meaningful way are fundamental concerns. Confidence in the impact assessment is reliant on whether or not baseline data adequately support impact predictions. Additional information on the methods used for deriving track count estimates is needed to improve confidence in the impact assessment.

The EIS Scoping Document Reference 7.4.2.9 requires that information on mammals and mammal habitat as it relates to the Project be provided, but we find that MH has not provided consistent information with respect to aerial survey methods used to estimate moose densities. MH states that *"…parallel transects flown 2 km on either side of the entire FPR*", but then contradicts this statement with " *The use of 2.5 km for the buffer diameter ensured that all animal and track observations within the 1 km (emphasis added) transect were included in the species counts*." (MTR, p. 17). Furthermore, points were centered on a 2 km interval, yet a 2.5 buffer was created at each point to create a "*buffer circle*". This means that there may be double counts of tracks along some sections of the FPR. Finally, there is a possibility that some tracks were made by the same individual since a 2.5 km wide circle (ca.20km^2) is within the maximum reported home range size of moose 2-16 km^2 (Franzmann 1981).

Information Request(s):
- Please clarify how far the control transects were from the FPR.
- Please describe how moose density estimates from track counts were screened for double counts.

Manitoba Hydro Response:
The survey and associated GIS analysis was not intended as a quantitative assessment of moose density along the FPR, but rather to identify areas of high moose use, independent of actual numbers. Deriving statistically valid estimates of moose density would not have changed the identification of areas where moose utilization was observed. Concern for double counting tracks was considered, however if few moose were heavily using an area, and not just travelling through, the subsequent analysis would indicate an important area. Concern for double counting

was dismissed as this method provides a liberal assessment of areas of concern, which is "precautionary" in making sure all "hot spots" were identified. Therefore, the Methods described in Section 3.3.1.4 of the Mammals Technical Report did not require control transects. The aerial transect surveys were conducted along the entire FPR to characterize the relative density of VEC mammal species as (high, medium, and low) through observations of animals and tracks (please see Section 3.3.1.4 of the Bipole III Mammals Technical Report) for environmental assessment and environmental protection planning purposes and to identify hot spots for VECs including moose. These data are being used in refining the locations of areas requiring mitigation through establishing various wildlife buffers and corridors along the FPR ROW.

Remaining Gaps:
MH states that "*Deriving statistically valid estimates of moose density would not have changed the identification of areas where moose utilization was observed*." (CEC/MH-VI-217). However, collecting quantifiable baseline data is the foundation for future monitoring programs. **Please see Remaining Gap outlined in Issue 1 above.**

4.0 Closure

The review of the Bipole III Project EIS and MH's responses to submitted information requests reported herein presents the conclusions arrived at by MSES. Given our comments herein, we hope to gain further clarification on several details of the EIS to facilitate future deliberations by the MMF about the rigor of predictions and the ability of validating the predictions in the course of the life time of the Project.

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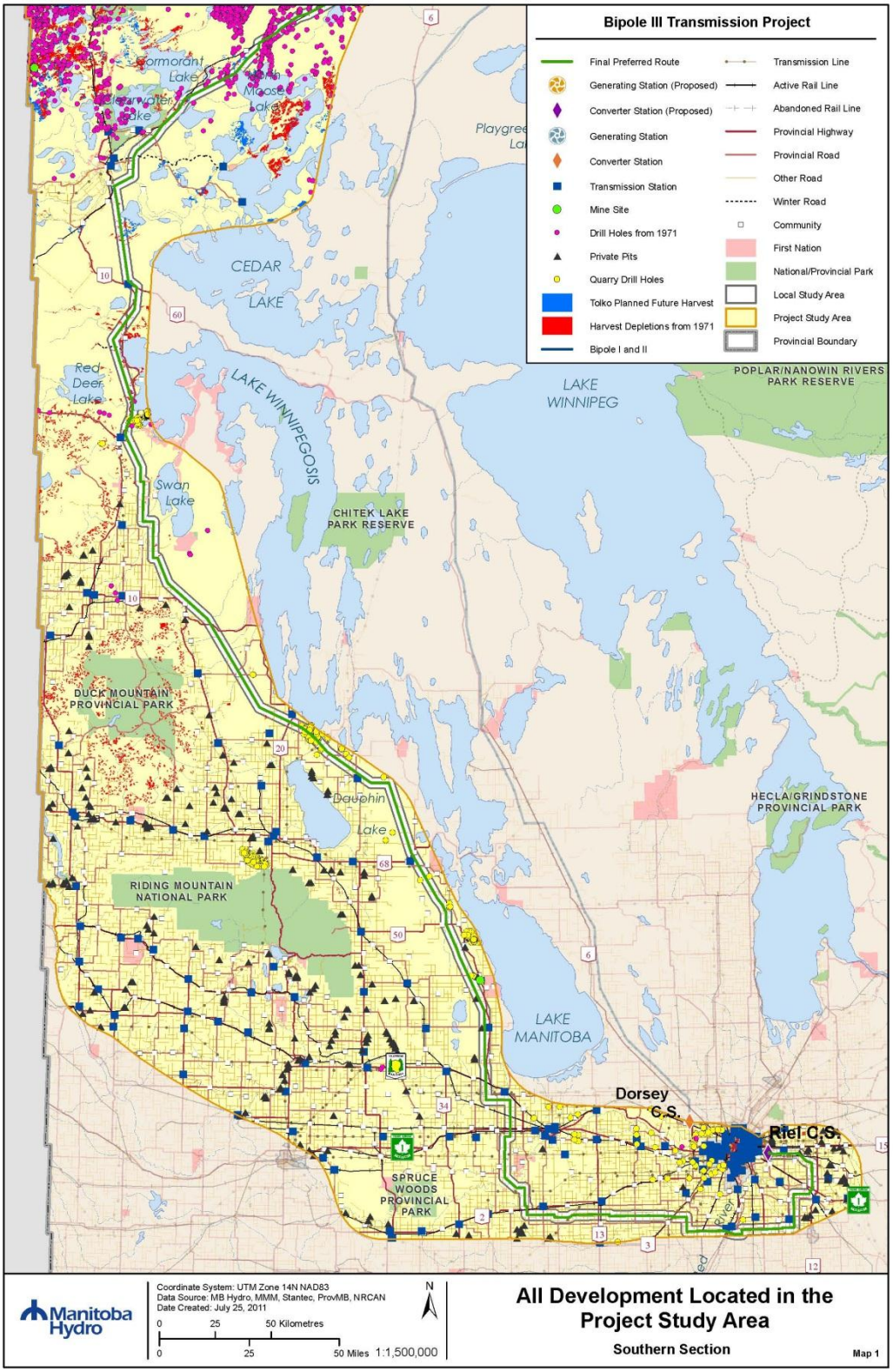
Appendix A:
All Development Located in the Project Study Area (Bipole III)


Bipole III Transmission Project
Final Preferred Route
Generating Station (Proposed)
Converter Station (Proposed)
Generating Station
Converter Station
Transmission Station
Mine Site
Drill Holes from 1971
Private Pits
Quarry Drill Holes
Tolko Planned Future Harvest
Harvest Depletions from 1971
Bipole I and II
Transmission Line
Active Rail Line
Abandoned Rail Line
Provincial Highway
Provincial Road
Other Road
Winter Road
Community
First Nation
National/Provincial Park
Local Study Area
Project Study Area
Provincial Boundary
CEDAR LAKE
LAKE WINNIPEGOSIS
LAKE WINNIPEG
LAKE MANITOBA
POPLAR/NANOWIN RIVERS PARK RESERVE
CHITEK LAKE PARK RESERVE
DUCK MOUNTAIN PROVINCIAL PARK
RIDING MOUNTAIN NATIONAL PARK
SPRUCE WOODS PROVINCIAL PARK
HECLA/GRINDSTONE PROVINCIAL PARK
Dauphin Lake
Swan Lake
Red Deer Lake
Cormorant Lake
Dorsey C.S.
Riel C.S.
Manitoba Hydro
Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, MMM, Stantec, ProvMB, NRCAN
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0 25 50 Miles
1:1,500,000
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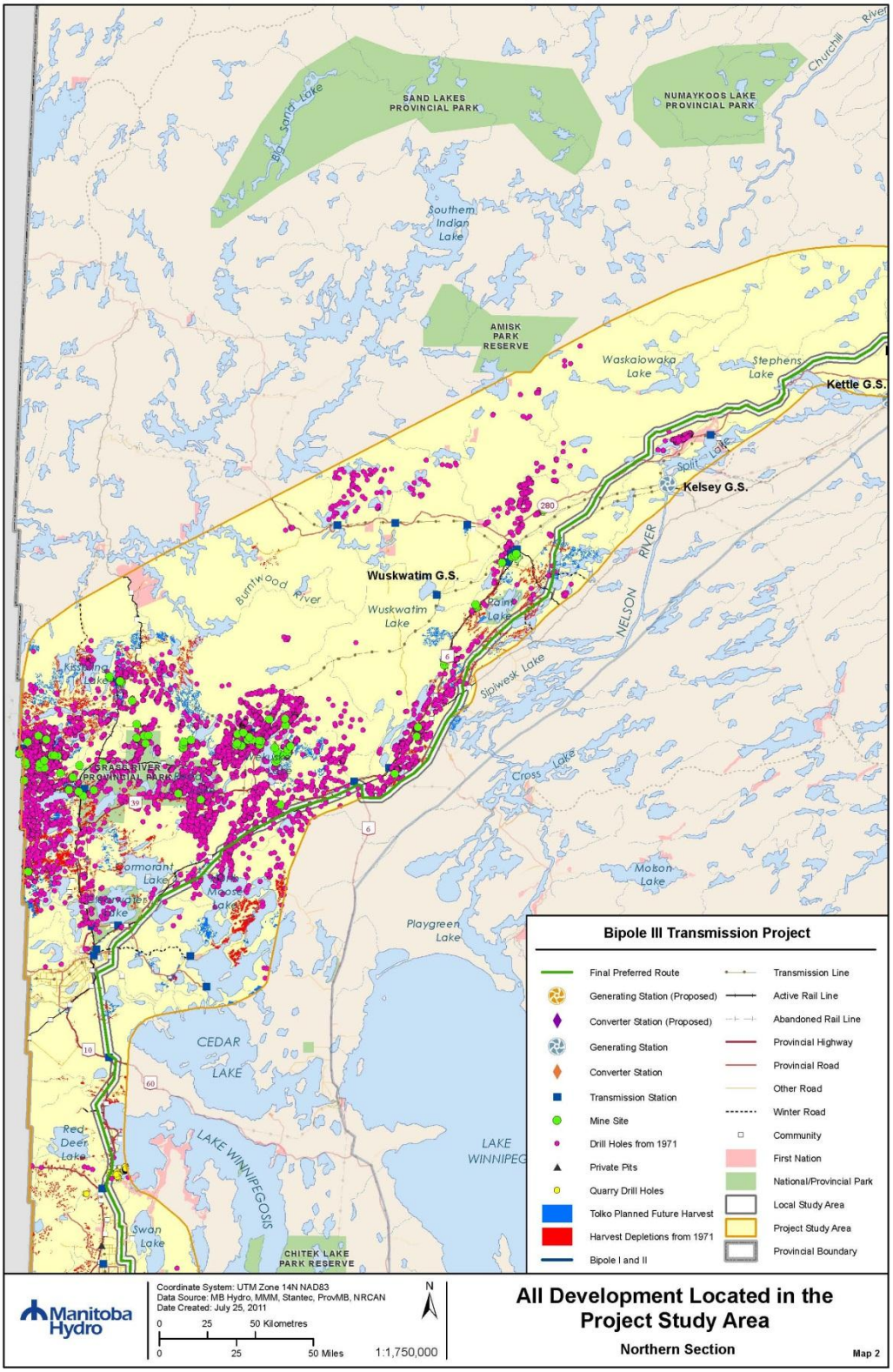
All Development Located in the Project Study Area
Southern Section
Map 1


SAND LAKES PROVINCIAL PARK
NUMAYKOOS LAKE PROVINCIAL PARK
AMISK PARK RESERVE
Big Sand Lake
Southern Indian Lake
Churchill River
Waskaiowaka Lake
Stephens Lake
Kettle G.S.
Split Lake
Kelsey G.S.
Wuskwatim G.S.
Burntwood River
Wuskwatim Lake
Paint Lake
NELSON RIVER
Sipiwesk Lake
Cross Lake
Kississing Lake
GRASS RIVER PROVINCIAL PARK
Cormorant Lake
Moose Lake
Molson Lake
Playgreen Lake
CEDAR LAKE
LAKE WINNIPEGOSIS
LAKE WINNIPEG
Red Deer Lake
Swan Lake
CHITEK LAKE PARK RESERVE
Bipole III Transmission Project
Final Preferred Route
Generating Station (Proposed)
Converter Station (Proposed)
Generating Station
Converter Station
Transmission Station
Mine Site
Drill Holes from 1971
Private Pits
Quarry Drill Holes
Tolko Planned Future Harvest
Harvest Depletions from 1971
Bipole I and II
Transmission Line
Active Rail Line
Abandoned Rail Line
Provincial Highway
Provincial Road
Other Road
Winter Road
Community
First Nation
National/Provincial Park
Local Study Area
Project Study Area
Provincial Boundary
Manitoba Hydro
Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, MMM, Stantec, ProvMB, NRCAN
Date Created: July 25, 2011
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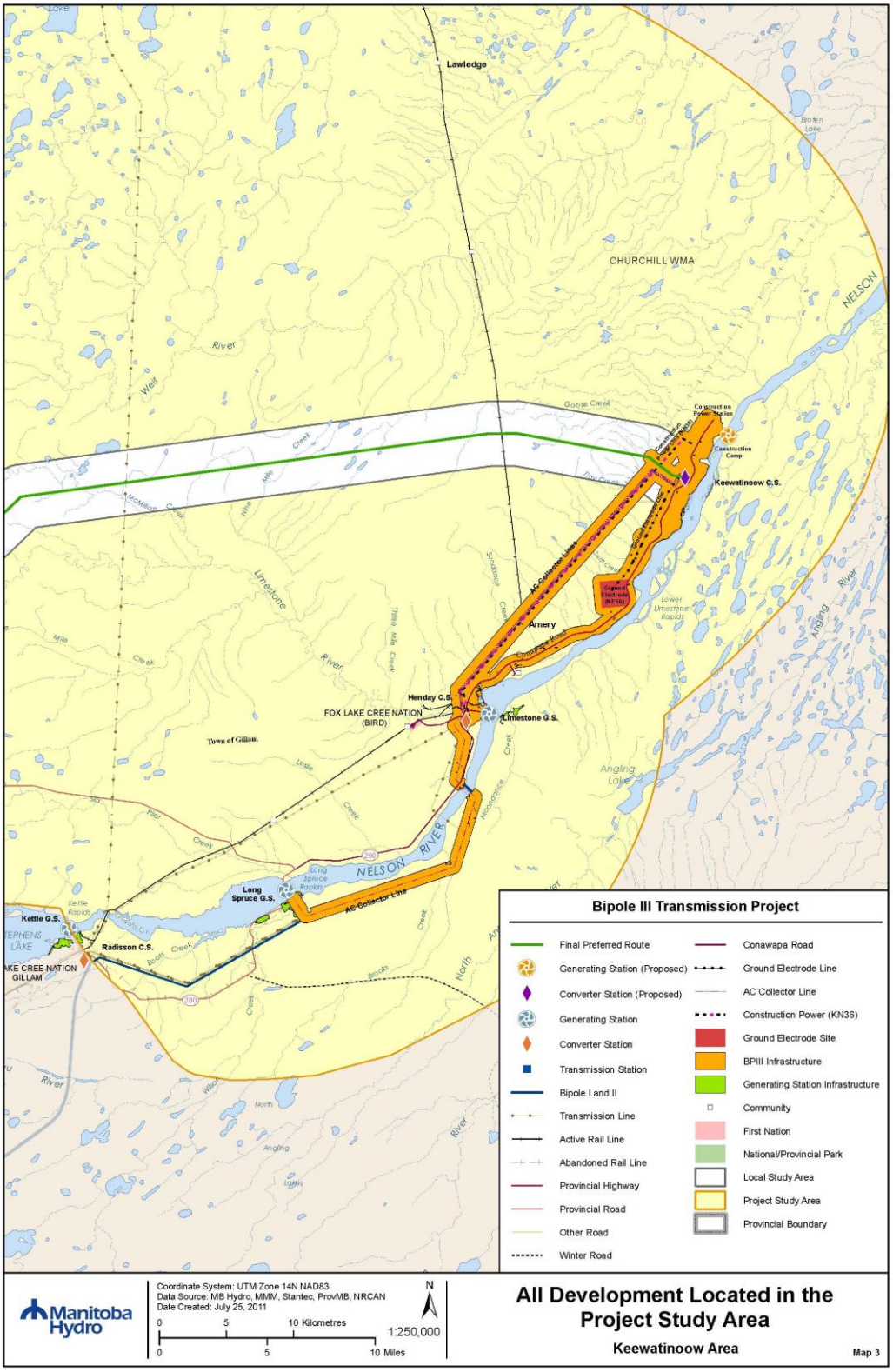
0 25 50 Miles
1:1,750,000
N
All Development Located in the Project Study Area
Northern Section
Map 2


Lawledge
CHURCHILL WMA
NELSON
River
Weir
Goose Creek
Keewatinoow C.S.
Construction Camp
AC Collector Lines
Amery
Henday C.S.
FOX LAKE CREE NATION (BIRD)
Limestone G.S.
Town of Gillam
Limestone River
Angling River
Angling Lake
NELSON RIVER
Long Spruce G.S.
AC Collector Line
Kettle G.S.
Radisson C.S.
Bipole III Transmission Project
Final Preferred Route
Generating Station (Proposed)
Converter Station (Proposed)
Generating Station
Converter Station
Transmission Station
Bipole I and II
Transmission Line
Active Rail Line
Abandoned Rail Line
Provincial Highway
Provincial Road
Other Road
Winter Road
Conawapa Road
Ground Electrode Line
AC Collector Line
Construction Power (KN36)
Ground Electrode Site
BPIII Infrastructure
Generating Station Infrastructure
Community
First Nation
National/Provincial Park
Local Study Area
Project Study Area
Provincial Boundary
Manitoba Hydro
Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, MMM, Stantec, ProvMB, NRCAN
Date Created: July 25, 2011
0 5 10 Kilometres
0 5 10 Miles
1:250,000
N
All Development Located in the Project Study Area
Keewatinoow Area
Map 3