

Bipole III Transmission Project Socio-Economic Monitoring Program Summary Report for Construction



Manitoba Hydro
Bipole III transmission project

Socio-economic monitoring program
summary report for
construction

Prepared by
Manitoba Hydro

For the period of 2014 to 2018

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Appendix A: Final Preferred Route

Abbreviations

ATK	Aboriginal Traditional Knowledge
CHRPP	Cultural and heritage resources protection plan
EIA	Economic impact assessment
EIS	Environmental impact statement
ESS	Environmentally sensitive sites
FLCN	Fox Lake Cree Nation
HRIA	Heritage resources impact assessment
HVDC	High voltage direct current
KCS	Keewatinohk Converter Station
km	Kilometer
kV	Kilovolt
m	Meter
MHTIS	Manitoba Highway Traffic Information System
MI	Manitoba Infrastructure
MPI	Manitoba Public Insurance
MVKT	Million vehicle-kilometres of travel
OCN	Opaskwayak Cree Nation
PR	Provincial road
RCS	Riel Converter Station
ROW	Right-of-way
RTL	Registered traplines
SE	Socio-economic
SEMP	Socio-economic monitoring program
TCN	Tataskweyak Cree Nation
VEC	Valued environmental component
WIS	Worker Interaction Subcommittee

1.0 Introduction

This document describes the overall construction socio-economic monitoring program (SEMP) results for the Bipole III Transmission Project (the Project) from construction start in 2014 to September 2018. Monitoring the Project socio-economic (SE) effects was a commitment in the Bipole III Environmental Impact Statement (EIS) (Section 11.3.4.4). Monitoring SE effects is also a condition of the Bipole III *Environment Act* Licence No. 3055. The monitoring program focused on key components of the SE environment that may be affected, including both direct and indirect effects during the construction phase of the Project. Monitoring program results from year to year were used to document mitigation measure effectiveness and identify adaptive management measures, if warranted, for future monitoring. Annual monitoring reports were generated for each construction year (2014¹, 2014-2015², 2015-2016³, 2016-2017⁴, and 2017-2018⁵) as documentation. The subject report provides a summary of the data from the constituent years and a general comparison to the SE forecasts and commitments made in the Project EIS as noted in the CEC report.

¹ Manitoba Hydro (n.d). *Bipole III Transmission Project Socio-Economic Monitoring Program For Construction 2014*. Winnipeg. MB.

² Manitoba Hydro (n.d). *Bipole III Transmission Project Socio-Economic Monitoring Program For Construction 2015*. Winnipeg. MB.

³ Manitoba Hydro (n.d). *Bipole III Transmission Project Socio-Economic Monitoring Program For Construction 2016*. Winnipeg. MB.

⁴ Manitoba Hydro (n.d). *Bipole III Transmission Project Socio-Economic Monitoring Program For Construction 2017*. Winnipeg. MB.

⁵ Manitoba Hydro (n.d). *Bipole III Transmission Project Socio-Economic Monitoring Program For Construction 2018*. Winnipeg. MB.

2.0 Project overview

The purpose of the Project is to provide enhanced reliability to Manitoba Hydro's electrical system, and to reduce the severity of the consequences of major outages. Approximately 70% of Manitoba's hydroelectric generating capacity is delivered to southern Manitoba, where most of the demand for energy is, via the Bipole I and Bipole II high voltage direct current (HVDC) transmission lines. Bipoles I and II share the same transmission corridor through the Interlake region over much of their length from northern Manitoba to a common terminus at the Dorsey Converter Station (DCS), northwest of Winnipeg. The existing transmission system was vulnerable to the risk of catastrophic outage of either (or both) Bipoles I and II in the Interlake corridor and/or at the DCS due to unpredictable events, particularly severe weather. This vulnerability, combined with the significant consequences of prolonged, major outages, justified a major initiative to reduce dependence on the DCS and the existing HVDC Interlake transmission corridor.

The Project included:

- A new converter station, the Keewatinohk Converter Station (KCS);
- A northern ground electrode site connected by a low voltage feeder line to the KCS;
- New 230 kV transmission line linking the KCS to the northern AC collector system at the existing 230 kV switchyards, located at the Henday Converter Station and Long Spruce Generating Station;
- Modifications to the 230 kV switchyards at the Henday Converter Station and the Long Spruce Generating Station to accommodate the new collector lines;
- The development of a new +/-500 kV HVDC transmission line, approximately 1,400 km in length, centered on a 66 meter right-of-way (ROW), originating at the KCS, following a westerly route to southern Manitoba and terminating at a new converter station, the Riel Converter Station (RCS), immediately east of Winnipeg;
- The completion of the RCS - development of the RCS site was completed pursuant to a separate licence from Bipole III; and
- A southern ground electrode site connected by a low voltage feeder line to the RCS.

3.0 Purpose and objectives

The purpose of the SEMP for the Project was to document conditions over time for SE Valued Environmental Components (VECs) and other environmental parameters. The objectives were to:

- Confirm impact predictions in the EIS;
- Identify unanticipated effects;
- Confirm adherence to EIS commitments regarding follow-up monitoring;
- Monitor the effectiveness of mitigation measures;
- Identify other mitigation or remedial actions that may be implemented;
- Confirm compliance with regulatory requirements including Project approvals and environmental regulations; and
- Provide baseline data and development information and experience for other Manitoba Hydro projects.

The SEMP focuses on important effects to key components of the SE environment. The program builds on the assessment studies conducted for the EIS using established methods for data collection and analysis. Where quantitative information was not available, qualitative information is provided in the monitoring report.

A separate monitoring program has been undertaken in relation to the physical, terrestrial and aquatic components.

4.0 Socio-economic monitoring management

The SEMP is part of the overall environmental protection program for Bipole III that provides a framework for the delivery, management and monitoring of environmental protection measures that satisfy corporate policies and commitments, regulatory requirements, environmental protection guidelines and best practices, and inputs from interested parties, Indigenous communities and the public. The environmental protection program describes how Manitoba Hydro is organized and functions to deliver timely, effective, and comprehensive solutions and mitigation measures to address potential environmental effects. Roles and responsibilities for Manitoba Hydro employees and contractors are defined, along with management, communication and reporting structures for implementation of the Program. The Environmental Protection Program includes the what, where, and how aspects of protecting the environment during the pre-construction, construction, operation and decommissioning of the project.

5.0 Socio-economic monitoring geographic area

Monitoring activities occurred throughout the Project Study Area (PSA) in relation to the final preferred route (see Appendix A). For routing, the relatively large study area allowed for an appropriate range of planning choices for consideration based on the collection of environmental information about its physical and biological characteristics (including vegetation, wildlife and aquatic resources), as well as SE and land use characteristics (including locations of communities, conservation areas, economic land uses [e.g., agriculture], archaeological and heritage resources). The PSA defines the area used to provide spatial context and comparison to the Project components (with allowance for some SE topics that require a larger regional context such as northern Manitoba and communities just outside the study area such as Gillam). The majority of the SE monitoring activities occurred at the PSA level.

6.0 Socio-economic topics

Monitoring activities linked to environmental components of the SE environment that were identified in the EIS included:

- Economy (employment/workforce, business, labour income and tax revenue)⁶;
- Community services (community concerns, service/infrastructure-related matters, worker interaction)⁷;
- Resource use (trapper education); and
- Personal and community well-being (public safety, worker interaction⁶, transportation); and
- Culture and heritage resources.

Monitoring activities focused on those effects that were potentially significant, effects where there was high uncertainty regarding the effects prediction, or effects that discipline specialists identified as requiring further monitoring. In addition to the SE environmental components identified above, this final overview report includes the reporting on monitoring of cultural and heritage resources.

Monitoring activities occurred throughout the PSA and are presented by the three primary Project components, KCS, transmission line construction, and the RCS.

6.1 Economy

Economic monitoring includes monitoring of employment and business activities associated with the Project. The objectives of economic monitoring for the Project were as follows:

- To track employment outcomes;
- To track construction business outcomes; and

⁶ The monitoring results for Economy includes activities described in the Keewatinohk Construction Camp Lagoon and Start-up Camp - Environment Proposal for which Environment Act Licence No. 3015 was issued. These activities occurred prior to the issuance of Environment Act Licence No. 3055 but the activities were part of the overall Bipole III Transmission Project and included in the EIS (Construction Schedule and Workforce Table for Keewatinohk Converter Station within the project description (figures 3.5-15 & 3.5-16 of the EIS).

⁷ Manitoba Hydro established a Worker Interaction Subcommittee (WIS) as part of a corporate wide initiative intended to address anticipated increases in the Gillam area workforce resulting from the Bipole III Project and other Manitoba Hydro projects being constructed in an overlapping timeframe.

- To track the effect on Project income levels, including labour income resulting from direct employment, as well as estimated taxes paid to the government.

The economic monitoring included data collected for the entire reporting period of October 1, 2014 to September 30, 2018. Data was collected to compare the actual economic effects from the Project with the predicted results presented in the Project EIS.

6.1.1 Employment outcomes

The EIS estimated the workforce for all Project components. Estimates varied by Project component and year depending on the activity. The majority of employment opportunities were predicted to occur during the construction phase of the Project with fewer opportunities during the operations phase of the Project. Due to seasonality constraints for some aspects of the work, certain Project components had activities concentrated at specific times of the year (e.g., clearing and construction of the transmission line in the winter months for certain areas), while other Project construction components occurred throughout the entire year (e.g., Riel and Keewatinohk Converter Stations).

During construction, employment data was collected on-site by contractors through an employee self-declaration form designed specifically for the Project (Employee Report-Bipole III Transmission Project, Employee Report-Bipole III Keewatinohk Converter Station Project, and Employee Report-Bipole III Riel Converter Station Project). All completed forms were provided by on-site contractors to Manitoba Hydro and stored in a central database for the Project. Contractors also provided information to Manitoba Hydro on hours worked and labour income to enable calculations for person years and income estimates during construction.

Employment data was provided in the categories outlined below:

- Person years - For work that involves part-time and/or seasonal, it is useful to standardize the hires in terms of person years of employment. Person years of employment are defined as the amount of work that one worker could complete during twelve months of full-time employment. For economic planning purposes and to compare to the economic impact assessment (EIA),

the number of hours worked per year is approximately 2,000 hours per year (assuming 40-44 regular hours weekly) in most trade categories. For construction comparison purposes, the number of hours worked per year is approximately 3,000 hours per year (assuming 60 regular hours weekly). As this report can be used for various types of comparisons, the data has been presented in terms of 2,000 and 3,000 hours per year.

- Hires - Refers to the number of people hired on the Project site for any duration.
- Employees - Refers to the number of individuals hired. The variance between hires and employees can be attributed to an individual being hired to the Project more than once.
- Duration - Refers to average duration of work on the Project.
- Type - Refers to job classifications of work available from the Project.

6.1.1.1 Person years

Over the duration of the Project construction, direct Project employment for on-site Manitoba Hydro and contractor employees was estimated at 5,194 person-years in the EIS (3,181 for the transmission line and 2,013 for the converter facilities)⁸. During construction, the actual hours of direct employment totaled 4,857 person-years in terms of a 2,000 hour per year basis (3,238 person-years in terms of a 3,000 hour per year basis). This number (4,857) represents approximately 94% of the total estimated person years of employment for the construction phase of the Project. Of the 4,857 person-years of direct employment generated, 79% was derived from within the Province of Manitoba. The actual hours of direct employment for the transmission line construction totaled 1,643, representing 52% of the EIS prediction (3,181) and the actual hours for the converter stations totaled 3,214, representing 160% of the EIS prediction (2,013). See Tables 6-1 through 6-4 below for a further breakdown of person years of employment by Project component.

⁸ *Bipole III Transmission Project, Economic Impact Assessment Technical Report Manitoba Bureau of Statistics - November 2011: Table 1, Economic Impact on Manitoba - Construction Phase [Transmission Line 3,181; Converter Facilities 2,013]*

Table 6-1 Total Cumulative Person years of employment 2014-2018 for transmission line construction

Measure	Transmission line construction									
	2014		2015		2016		2017		2018	
	Person years 2,000 ¹ (3,000) ²	% of total Project hours	Person years 2,000 ¹ (3,000) ²	% of total Project hours	Person years 2,000 ¹ (3,000) ²	% of total Project hours	Person years 2,000 ¹ (3,000) ²	% of total Project Total hours	Person years 2,000 ¹ (3,000) ²	% of total Project hours
Indigenous	28 (19)	1.7%	185 (123)	11.3%	216 (144)	13.2%	520 (347)	31.7%	667 (445)	40.6%
Non-Indigenous	58 (38)	3.5%	137 (91)	8.3%	339 (226)	20.6%	702 (468)	42.7%	975 (650)	59.3%
Total	86 (57)	5.2%	322 (214)	19.6%	555 (370)	33.8%	1222 (815)	74.4%	1642 (1095)	100%
Northern Manitoba Indigenous ³	19 (13)	1.2%	57 (38)	3.5%	100 (66)	6.1%	187 (125)	11.4%	229 (153)	13.9%
Northern Manitoba non-Indigenous ⁴	3 (2)	0.2%	6 (4)	0.4%	12 (8)	0.7%	15 (10)	0.9%	16 (11)	1.0%
Total	22 (15)	1.3%	63 (42)	3.8%	112 (99)	6.8%	202 (135)	12.3%	245 (164)	14.9%
Manitoba	83 (55)	5.1%	224 (150)	13.6%	490 (327)	29.8%	994 (663)	60.5%	1263 (842)	76.9%
non-Manitoba	3(2)	0.2%	97 (65)	5.9%	161 (108)	9.8%	228 (152)	13.9%	380 (253)	23.1%
Total	86 (57)	5.2%	322 (215)	19.6%	555 (70)	33.8%	1222 (815)	74.4%	1643 (1095)	100%

Notes:
 Table above is not additive
¹ - This parameter is used for economic comparison purposes.
² - This parameter is used for construction planning purposes and to compare to estimates in the EIS.
³ - Northern Manitoba Indigenous is a subset of Indigenous
⁴ - Northern Manitoba non-Indigenous is a subset of non-Indigenous

Table 6-2 Total Cumulative Person years of employment 2014-2018 for Keewatinohk converter station construction

Measure	Keewatinohk Converter Station									
	2014		2015		2016		2017		2018	
	Person years 2,000 ¹ (3,000) ²	% of total Project hours	Person years 2,000 ¹ (3,000) ²	% of total Project hours	Person years 2,000 ¹ (3,000) ²	% of total Project hours	Person years 2,000 ¹ (3,000) ²	% of total Project hours	Person years 2,000 ¹ (3,000) ²	% of total Project hours
Indigenous	128 (85)	6.0%	286 (191)	13.4%	405 (270)	18.9%	587 (391)	27.4%	701 (467)	32.7%
non-Indigenous	203 (135)	9.5%	416 (277)	19.4%	730 (487)	34.1%	1214 (810)	56.7%	1440 (960)	67.3%
Total	331 (220)	15.5%	702 (468)	32.8%	1135 (757)	53.0%	1801 (1201)	84.1%	2141 (1427)	100%
Northern Manitoba Indigenous ³	86 (57)	4.0%	175 (116)	8.2%	261 (174)	12.2%	362 (241)	16.9%	423 (282)	19.8%
Northern Manitoba non-Indigenous ⁴	9 (6)	0.4%	21 (14)	1.0%	31 (21)	1.5%	52 (34)	2.4%	61 (41)	2.9%
Total	95 (63)	4.4%	196 (130)	9.2%	292 (195)	13.6%	414 (275)	19.4%	484 (323)	22.6%
Manitoba	274 (183)	12.8%	533 (356)	24.9%	865 (577)	40.4%	1363 (908)	63.7%	1638 (1092)	76.5%
non-Manitoba	57 (38)	2.7%	168 (112)	7.9%	271 (181)	12.7%	438 (292)	20.5%	503 (335)	23.5%
Total	331 (221)	15.5%	702 (468)	32.8%	1136 (758)	53.1%	1801 (1200)	84.1%	2141 (1427)	100%

Notes:

Table above is not additive

¹ - This parameter is used for economic comparison purposes.

² - This parameter is used for construction planning purposes and to compare to estimates in the EIS.

³ - Northern Manitoba Indigenous is a subset of Indigenous

⁴ - Northern Manitoba non-Indigenous is a subset of non-Indigenous

Table 6-3 Total Cumulative Person years of employment 2014-2018 for Riel converter station construction

Measure	Riel Converter Station									
	2014		2015		2016		2017		2018	
	Person years 2,000 ¹ (3,000) ²	% of total Project hours	Person years 2,000 ¹ (3,000) ²	% of total Project hours	Person years 2,000 ¹ (3,000) ²	% of total Project hours	Person years 2,000 ¹ (3,000) ²	% of total Project hours	Person years 2,000 ¹ (3,000) ²	% of total Project hours
Indigenous	-	-	7 (5)	0.7%	40 (27)	3.7%	104 (69)	9.7%	145 (97)	13.5%
non-Indigenous	-	-	10 (6)	0.9%	218 (145)	20.3%	637 (425)	59.4%	928 (619)	86.5%
Total			17 (11)	1.6%	258 (172)	24.1%	741 (494)	69.1%	1073 (716)	100%
Northern Manitoba Indigenous ³	-	-	0 (0)	0.0%	3 (2)	0.3%	6 (4)	0.6%	7 (4)	0.7%
Northern Manitoba non-Indigenous ⁴	-	-	0 (0)	0.0%	0 (0)	0.0%	1 (1)	0.1%	1 (1)	0.1%
Total			0 (0)	0.0%	3 (2)	0.3%	7 (5)	0.7%	8 (5)	0.8%
Manitoba	-	-	12 (8)	1.1%	225 (150)	21.0%	657 (438)	61.2%	935 (624)	87.1%
non-Manitoba	-	-	5 (4)	0.5%	33 (22)	3.1%	84 (256)	7.8%	138 (92)	12.9%
Total	-	-	17 (12)	1.6%	258 (172)	24.1%	741 (694)	69.1%	1073 (716)	100%

Notes:
 Table above is not additive
¹ - This parameter is used for economic comparison purposes.
² - This parameter is used for construction planning purposes and to compare to estimates in the EIS.
³ - Northern Manitoba Indigenous is a subset of Indigenous
⁴ - Northern Manitoba non-Indigenous is a subset of non-Indigenous

Table 6-4 Total Cumulative Person years of employment 2014-2018 for total Bipole III project construction

Measure	Total Bipole III construction									
	2014		2015		2016		2017		2018	
	Person years 2,000 ¹ (3,000) ²	% of total Project hours	Person years 2,000 ¹ (3,000) ²	% of total Project hours	Person years 2,000 ¹ (3,000) ²	% of total Project hours	Person years 2,000 ¹ (3,000) ²	% of total Project hours	Person years 2,000 ¹ (3,000) ²	% of total Project hours
Indigenous	157 (104)	3.2%	478 (319)	9.8%	661 (441)	13.6%	1210 (807)	24.9%	1513 (1009)	31.2%
non-Indigenous	261 (174)	5.4%	563 (375)	11.6%	1288 (858)	26.5%	2553 (1702)	52.6%	3344 (2229)	68.9%
Total	418 (278)	8.6%	1041 (694)	21.4%	1949 (1299)	40.1%	3763 (2509)	77.5%	4857 (3238)	100%
Northern Manitoba Indigenous ³	105 (70)	2.2%	232 (155)	4.8%	364 (243)	7.5%	556 (370)	11.5%	658 (439)	13.6%
Northern Manitoba non-Indigenous ⁴	12 (8)	0.2%	27 (18)	0.6%	85 (57)	1.8%	67 (45)	1.4%	79 (53)	1.6%
Total	117 (78)	2.4%	259 (173)	5.3%	449 (300)	9.2%	623 (415)	12.8%	737 (492)	15.2%
Manitoba	357 (238)	7.4%	770 (513)	15.9%	1580 (1054)	32.5%	3014 (2009)	62.1%	3836 (2558)	79.0%
non-Manitoba	60 (40)	1.2%	271 (180)	5.6%	465 (246)	9.6%	750 (500)	15.4%	1021 (680)	21.0%
Total	417 (278)	8.6%	1041 (693)	21.4%	2045 (1300)	42.1%	3764 (2509)	77.5%	4857 (3238)	100%

Notes:
 Table above is not additive
¹ - This parameter is used for economic comparison purposes.
² - This parameter is used for construction planning purposes and to compare to estimates in the EIS.
³ - Northern Manitoba Indigenous is a subset of Indigenous
⁴ - Northern Manitoba non-Indigenous is a subset of non-Indigenous

6.1.1.2 Hires

Hires were not a parameter used in the EIS but are tracked by Manitoba Hydro for its projects. Hires refers to the number of people hired on the Project site for any duration. For the entire duration of the construction phase of the Project, there were 15,387 hires including 38.3% for construction of the transmission line, 38.2% for the KCS, and 23.5% for the RCS. See Table 6-5 to 6-9 for a further breakdown of total hires.

Table 6-5 Total Cumulative hires 2014-2018 for the transmission line construction

Measure	Transmission Line Construction									
	2014		2015		2016		2017		2018	
	Hires	% of Total Project Hires	Hires	% of Total Project Hires	Hires	% of Total Project Hires	Hires	% of Total Project Hires	Hires	% of Total Project Hires
Indigenous	194	3.3%	673	11.4%	1153	19.6%	2393	40.6%	2720	46.2%
non-Indigenous	223	3.8%	529	9.0%	1024	17.4%	2480	42.1%	3172	53.8%
Total	417	7.1%	1202	20.4%	2177	37%	4873	82.7%	5892	100%
Northern Manitoba Indigenous ¹	126	2.1%	402	6.8%	612	10.4%	1055	17.9%	1163	19.7%
Northern Manitoba non-Indigenous ²	<5	0.0%	28	0.5%	46	0.8%	81	1.4%	89	1.5%
Total	131	2.1%	430	7.3%	658	11.2%	1136	19.3%	1252	21.3%
Manitoba	396	6.7%	1054	17.9%	1838	31.2%	3585	60.8%	4027	68.3%
non-Manitoba	21	0.4%	148	2.5%	339	5.8%	1288	21.9%	1865	31.7%
Total	417	7.1%	1202	20.4%	2177	36.9%	4873	82.7%	5892	100%

Notes:
 Table above is not additive
¹ - Northern Manitoba Indigenous is a subset of Indigenous
² - Northern Manitoba non-Indigenous is a subset of non-Indigenous

Table 6-6 Total Cumulative hires 2014-2018 for the Keewatinohk converter station construction

Measure	Keewatinohk Converter Station									
	2014		2015		2016		2017		2018	
	Hires	% of Total Project Hires	Hires	% of Total Project Hires	Hires	% of Total Project Hires	Hires	% of Total Project Hires	Hires	% of Total Project Hires
Indigenous	482	8.2%	760	12.9%	1339	22.8%	1921	32.7%	2185	37.1%
non-Indigenous	544	9.2%	955	16.2%	2020	34.3%	3015	51.2%	3698	62.9%
Total	1026	17.5%	1715	29.2%	3359	57.1%	4936	83.9%	5883	100%
Northern Manitoba Indigenous ¹	316	5.4%	497	8.5%	819	13.9%	1145	19.5%	1248	21.2%
Northern Manitoba non-Indigenous ²	19	0.3%	33	0.6%	65	1.1%	105	1.8%	116	2.0%
Total	335	5.7%	530	9.0%	884	15.0%	1250	21.3%	1364	23.2%
Manitoba	871	14.8%	1451	24.7%	2610	44.4%	3935	66.9%	4832	82.1%
non-Manitoba	155	2.6%	264	4.5%	749	12.7%	1001	17.0%	1051	17.9%
Total	1026	17.4%	1715	29.2%	3359	57.1%	4936	83.9%	5883	100%

Notes:

Measure	Keewatinohk Converter Station									
	2014		2015		2016		2017		2018	
	Hires	% of Total Project Hires	Hires	% of Total Project Hires	Hires	% of Total Project Hires	Hires	% of Total Project Hires	Hires	% of Total Project Hires
Table above is not additive										
¹ - Northern Manitoba Indigenous is a subset of Indigenous										
² - Northern Manitoba non-Indigenous is a subset of non-Indigenous										

Table 6-7 Total Cumulative hires 2014-2018 for the Riel converter station construction

Measure	Riel Converter Station									
	2014		2015		2016		2017		2018	
	Hires	% of Total Project Hires	Hires	% of Total Project Hires	Hires	% of Total Project Hires	Hires	% of Total Project Hires	Hires	% of Total Project Hires
Indigenous	-	-	11	0.3%	248	6.9%	458	12.7%	560	15.5%
non-Indigenous	-	-	98	2.7%	1224	33.9%	2399	66.4%	3052	84.5%
Total	-	-	109	3.0%	1472	40.8%	2857	79.1%	3612	100%
Northern Manitoba Indigenous ¹	-	-	0	0.0%	15	0.4%	23	0.6%	23	0.6%
Northern Manitoba non-Indigenous ²	-	-	0	0.0%	2	0.1%	4	0.1%	4	0.1%
Total	-	-	0	0.0%	17	0.5%	27	0.7%	27	0.7%
Manitoba	-	-	104	2.9%	1356	37.5%	2554	70.7%	3136	86.8%
non-Manitoba	-	-	5	0.1%	116	3.2%	303	8.4%	476	13.2%
Total	-	-	109	3.0%	1472	40.8%	2857	79.1%	3612	100.0%
Notes:										
Table above is not additive										
¹ - Northern Manitoba Indigenous is a subset of Indigenous										
² - Northern Manitoba non-Indigenous is a subset of non-Indigenous										

Table 6-8 Total Cumulative hires 2014-2018 for the Bipole III project construction

Measure	Total Bipole III Project Construction									
	2014		2015		2016		2017		2018	
	Hires	% of Total Project Hires	Hires	% of Total Project Hires	Hires	% of Total Project Hires	Hires	% of Total Project Hires	Hires	% of Total Project Hires
Indigenous	676	4.4%	1444	9.4%	2740	17.8%	4772	31.0%	5465	35.5%
non-Indigenous	767	5.0%	1582	10.3%	4268	27.7%	7894	51.3%	9922	64.5%
Total	1443	9.4%	3026	19.7%	7008	45.5%	12666	82.3%	15387	100%
Northern Manitoba Indigenous ¹	442	2.9%	899	5.8%	1446	9.4%	2223	14.4%	2434	15.8%
Northern Manitoba non-Indigenous ²	23	0.1%	61	0.4%	113	0.7%	190	1.2%	209	1.4%
Total	465	3.0%	960	6.2%	1559	10.1%	2413	15.7%	2643	17.2%
Manitoba	1267	8.2%	2609	17.0%	5804	37.7%	10074	65.5%	11995	78.0%
non-Manitoba	176	1.1%	417	2.7%	1204	7.8%	2592	16.8%	3392	22.0%
Total	1443	9.4%	3026	19.7%	7008	45.5%	12666	82.3%	15387	100%

Notes:
 Table above is not additive
¹ - Northern Manitoba Indigenous is a subset of Indigenous
² - Northern Manitoba non-Indigenous is a subset of non-Indigenous

Table 6-9 Total hires 2014-2018 by project component

Project component	Total hires (2014-2018)	% of total
Transmission line	5,892	38.3%
Keewatinohk Converter Station	5,883	38.2%
Riel Converter Station	3,612	23.5%
Total of Bipole III Project	15,387	100%

6.1.1.3 Employees

The number of total employees is not a parameter predicted in the EIS but is tracked by Manitoba Hydro for its projects. The total number of employees is less than the total number of hires because the same individual may have been hired more than once. For example, an individual may have moved to work on a different contract or moved to a different job classification to improve their position. For the construction phase of the Project, a total 9,337 employees were hired on. A total of 73.7% of the

total employees resided in Manitoba. See Table 6-10, Table 6-11, Table 6-12 and Table 6-13 for the breakdown of total employees.

Table 6-10 Total cumulative project employees for transmission line construction (2014-2018)

Measure	Transmission line construction									
	2014		2015		2016		2017		2018	
	Employees	% of total project employees	Employees	% of total project employees	Employees	% of total project employees	Employees	% of total project employees	Employees	% of total project employees
Indigenous	192	5.0%	525	13.7%	823	21.4%	1531	39.8%	1647	42.8%
non-Indigenous	198	5.2%	423	11.0%	760	19.8%	1810	47.1%	2197	57.2%
Total	390	10.2%	948	24.7%	1583	41.2%	3341	86.9%	3844	100%
Northern Manitoba Indigenous ¹	125	3.3%	321	8.4%	450	11.7%	683	17.8%	719	18.7%
Northern Manitoba non-Indigenous ²	6	0.2%	21	0.6%	33	0.9%	59	1.5%	63	1.6%
Total	131	3.4%	342	8.9%	483	12.6%	742	19.3%	782	20.3%
Manitoba	369	9.6%	811	21.1%	1297	33.7%	2318	60.3%	2457	63.9%
non-Manitoba	21	0.5%	137	3.6%	286	7.4%	1023	26.6%	1387	36.1%
Total	390	10.1%	948	24.7%	1583	41.2%	3341	86.9%	3844	100%
Notes:										
Table above is not additive										
¹ - Northern Manitoba Indigenous is a subset of Indigenous										
² - Northern Manitoba non-Indigenous is a subset of non-Indigenous										

Table 6-11 Total cumulative project employees for Keewatinohk Converter Station construction (2014-2018)

Measure	Keewatinohk Converter Station									
	2014		2015		2016		2017		2018	
	Employees	% of total project employees	Employees	% of total project employees	Employees	% of total project employees	Employees	% of total project employees	Employees	% of total project employees
Indigenous	328	10.2%	522	16.2%	827	25.7%	1016	31.5%	1030	32.0%
non-Indigenous	445	13.8%	789	24.5%	1520	47.2%	2086	64.7%	2193	68.0%
Total	773	24%	1311	40.7%	2347	72.8%	3102	96.3%	3223	100%
Northern Manitoba Indigenous ¹	207	6.4%	332	10.3%	495	15.4%	574	17.8%	575	17.8%
Northern Manitoba non-Indigenous ²	19	0.6%	33	1.0%	56	1.7%	73	2.3%	77	2.4%
Total	226	7.0%	365	11.3%	551	17.1%	647	20.1%	652	20.2%
Manitoba	624	19.4%	1062	33.0%	1744	54.1%	2355	73.1%	2454	76.1%
non-Manitoba	149	4.6%	249	7.7%	603	18.7%	747	23.2%	769	23.9%
Total	773	24.0%	1311	40.7%	2347	72.8%	3102	96.2%	3223	100%
Notes:										
Table above is not additive										
¹ - Northern Manitoba Indigenous is a subset of Indigenous										
² - Northern Manitoba non-Indigenous is a subset of non-Indigenous										

Table 6-12 Total cumulative project employees for Riel Converter station construction (2014-2018)

Measure	Riel Converter Station									
	2014		2015		2016		2017		2018	
	Employees	% of total project employees	Employees	% of total project employees	Employees	% of total project employees	Employees	% of total project employees	Employees	% of total project employees
Indigenous	-	-	11	0.4%	238	8.2%	397	13.7%	442	15.2%
non-Indigenous	-	-	98	3.4%	1147	39.6%	2152	74.2%	2457	84.8%
Total			109	3.8%	1385	47.8%	2549	87.9%	2899	100%
Northern Manitoba Indigenous ¹	-	-	0	0.0%	14	0.5%	18	0.6%	18	0.6%
Northern Manitoba non-Indigenous ²	-	-	0	0.0%	2	0.1%	4	0.1%	4	0.1%
Total			0	0.0%	16	0.6%	22	0.7%	22	0.7%
Manitoba	-	-	104	3.6%	1276	44.0%	2270	78.3%	2531	87.3%
non-Manitoba	-	-	8	0.3%	109	3.8%	279	9.6%	368	12.7%
Total	-	-	112	3.8%	1385	47.8%	2549	87.9%	2899	100%
Notes:										
Table above is not additive										
¹ - Northern Manitoba Indigenous is a subset of Indigenous										
² - Northern Manitoba non-Indigenous is a subset of non-Indigenous										

Table 6-13 Total cumulative project employees for Bipole III project construction (2014-2018)

Measure	Total Bipole III Transmission Line Project									
	2014		2015		2016		2017		2018	
	Employees	% of total project employees	Employees	% of total project employees	Employees	% of total project employees	Employees	% of total project employees	Employees	% of total project employees
Indigenous	520	5.6%	1017	10.9%	1800	19.3%	2768	29.6%	2921	31.3%
non-Indigenous	643	6.9%	1266	13.6%	3262	34.9%	5683	60.9%	6416	68.7%
Total	1163	12.5%	2283	24.5%	5062	54.2%	8451	90.5%	9337	100%
Northern Manitoba Indigenous ¹	332	3.6%	624	6.7%	908	9.7%	1188	12.7%	1219	13.1%
Northern Manitoba non-Indigenous ²	25	0.3%	52	0.6%	89	1.0%	132	1.4%	139	1.5%
Total	357	3.8%	676	7.2%	997	10.7%	1320	14.1%	1358	14.5%
Manitoba	993	10.6%	1896	20.3%	4093	43.8%	6448	69.1%	6878	73.7%
non-Manitoba	170	1.8%	387	4.1%	969	10.4%	2003	21.5%	2459	26.3%
Total	1163	12.5%	2283	24.5%	5062	54.2%	8451	90.5%	9337	100%
Notes:										
Table above is not additive										
¹ - Northern Manitoba Indigenous is a subset of Indigenous										
² - Northern Manitoba non-Indigenous is a subset of non-Indigenous										

The number of employees to date does not reflect the number of employees on-site at a given time. The number of employees on-site at any given time varied depending on the work in progress and the time of year. The actual number of employees on-site over the course of a year ultimately depends upon the work plans and schedules of the contractors for the various project components. As of September 30, 2018, the Project had employed 634 persons who have worked on multiple project components.

6.1.1.4 Duration

Employment duration is not a parameter used in the EIS but is tracked by Manitoba Hydro for its projects. From October 1, 2014 to September 30, 2018, the average employment duration was 5.0 months. Data for the calculation includes both separated and active hires (hires that were still working on September 30, 2018). As of September 30, 2018, 119 hires were active. See Table 6-14 for a breakdown of employment duration.

Table 6-14 Breakdown of employment duration 2014-2018

Measure	Average employment duration (months)																				
	Transmission line construction					KCS construction					RCS construction					Total Bipole III project construction					
Year	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018	Average 2014-2018 ³
Indigenous	1.9	2.7	2.8	4.2	4.1	2.7	5.4	6.1	8.1	8.5	-	4.7	4.6	6.6	7.6	2.4	4.2	4.7	6.2	6.5	4.9
non-Indigenous	2.3	2.8	2.9	3.8	4.1	3.7	5.8	5.9	7.8	7.6	-	3.6	4.9	7.1	8.2	3.4	4.8	5.1	6.8	7.1	5.1
Average																					
Northern Manitoba Indigenous ¹	1.8	2.6	2.5	3.8	3.6	2.6	5.3	6.1	8.3	8.9	-	0	0.0	5.9	6.5	2.4	4.2	4.6	6.3	6.4	4.3
Northern Manitoba non-Indigenous ²	2.6	2.8	2.8	3.6	3.4	3.9	4.4	4.2	7.0	8.0	-	0	0.0	4.2	6.3	3.6	3.9	3.7	5.6	6.2	4.0
Average																					
Manitoba	2.1	2.8	2.9	4.2	4.3	2.9	5.4	6.0	7.8	7.8	-	3.8	4.8	7.2	8.4	2.7	4.4	5.0	6.9	7.4	5.1
non-Manitoba	2.9	2.3	2.6	3.6	3.7	5.0	6.6	5.8	8.3	8.4	-	2.4	5.1	5.5	6.1	4.6	5.1	4.9	5.7	5.6	5.1
Total	2.1	2.7	2.8	4.0	4.1	3.2	5.6	6.0	7.9	7.9	-	3.7	4.9	7.0	8.1	2.9	4.6	5.0	6.6	6.9	5.0

Notes:
 Table above is not additive
¹ - Northern Manitoba Indigenous is a subset of Indigenous
² - Northern Manitoba non-Indigenous is a subset of non-Indigenous
³ - Average of table values

6.1.1.5 Type

The EIS did not quantitatively estimate the number of hires in each job classification but did make general predictions regarding the type of work that would be required for the Project including: catering, security, labourers, operators, teamsters, carpenters, steelworkers, electricians, and pipefitters. These job classifications were

represented throughout the Bipole III construction (Table 6-15). Total hires by job classification are also provided in Table 6-15 below.

In total there were 30 job categories in which 15,387 workers were hired. The top three combined categories as a percentage of total hires were labourers (17%), "other" (16%), and equipment operators (15%). For employee privacy and confidentiality reasons, the numbers of hires by residency cannot be disclosed, as the numbers are low for some of the classifications listed.

Table 6-15 Total hires by job classification 2014-2018

Project Component	Transmission line construction		KCS construction		RCS construction		Total Bipole III project construction	
	Total hires (2014-2018)	% of Total Project Hires	Total hires (2014-2018)	% of Total Project Hires	Total hires (2014-2018)	% of Total Project Hires	Total hires (2014-2018)	% of Total Project Hires
Labourers	1300	8.5%	829	5.4%	520	3.4%	2649	17.2%
Equipment operators (includes HD Mechanics)	1346	8.8%	760	4.9%	244	1.6%	2350	15.3%
Linemen and associated collector line trades	1785	11.6%	41	0.3%	102	0.7%	1928	12.5%
Electrical workers	34	0.2%	558	3.6%	666	4.3%	1258	8.2%
Teamsters, chauffeurs, warehousemen and helpers	246	1.6%	274	1.8%	177	1.2%	697	4.5%
Carpenters	32	0.2%	327	2.1%	298	1.9%	657	4.3%
Catering and janitorial staff	210	1.4%	334	2.2%	23	0.2%	567	3.7%
Iron workers	<5	0.0%	217	1.4%	133	0.9%	351	2.3%
Office and professional employees	109	0.7%	634	4.1%	94	0.6%	837	5.4%
Plumbers and pipefitters	<5	0.0%	124	0.8%	146	1.0%	273	1.8%
Crane operators	170	1.1%	36	0.2%	60	0.4%	266	1.7%
Rodmen	<5	0.0%	123	0.8%	40	0.3%	167	1.1%

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Project Component	Transmission line construction		KCS construction		RCS construction		Total Bipole III project construction	
	Total hires (2014-2018)	% of Total Project Hires	Total hires (2014-2018)	% of Total Project Hires	Total hires (2014-2018)	% of Total Project Hires	Total hires (2014-2018)	% of Total Project Hires
Insulator workers	0	0.0%	88	0.6%	58	0.4%	146	1.0%
Sheet metal workers	0	0.0%	53	0.3%	72	0.5%	125	0.8%
Lathing and drywall workers	0	0.0%	28	0.2%	54	0.4%	82	0.5%
Roofers	0	0.0%	48	0.3%	34	0.2%	82	0.5%
Painters	0	0.0%	32	0.2%	35	0.2%	67	0.4%
Security guards	<5	0.0%	64	0.4%	0	0.0%	65	0.4%
Cement masons	0	0.0%	35	0.2%	15	0.1%	50	0.3%
Sprinkler system installers	0	0.0%	21	0.1%	32	0.2%	53	0.3%
Millwrights	0	0.0%	0	0.0%	61	0.4%	61	0.4%
Bricklayers and allied craftsmen	0	0.0%	15	0.1%	20	0.1%	35	0.2%
Sheeters, deckers and cladders	0	0.0%	23	0.1%	10	0.1%	33	0.2%
Floor covering installers	0	0.0%	17	0.1%	13	0.1%	30	0.2%
Glass workers	0	0.0%	6	0.0%	6	0.0%	12	0.1%
Boilermakers	0	0.0%	10	0.1%	0	0.0%	10	0.1%
Refrigeration workers	0	0.0%	<5	0.0%	5	0.0%	7	0.1%
Elevator constructors	0	0.0%	<5	0.0%	<5	0.0%	<5	0.0%
Plasterers	0	0.0%	0	0.0%	<5	0.0%	<5	0.0%
Other ¹	651	4.2%	1183	7.7%	690	4.5%	2524	16.4%
Total hires	5892	38.3%	5883	38.2%	3612	23.5%	15387	100.0%

Notes:
¹ - The "other" category refers to hires in job classifications not covered by the BNA, i.e., "out of scope" positions. This would include managerial and supervisory staff (both Contractor and Manitoba Hydro), other Manitoba Hydro on-site and certain technical staff (engineers and technicians).

6.1.2 Business outcomes

Construction of the Project has resulted in business opportunities locally, regionally and throughout the province and Canada. Manitoba Hydro has policies in place to promote Indigenous business participation on its projects. For example, Manitoba Hydro's Northern Purchasing Policy's objective is to guide procurement actions with the aim of promoting business, contract and employment opportunities for northern Indigenous people through a variety of measures, including scoping, restricted tenders, direct negotiated contracts, and other Indigenous content provisions.

Monitoring both direct and indirect business effects provides data on the success and effectiveness of efforts to enhance local business participation, as well as being an indication of the general economic impact of the Project in communities in the vicinity of Bipole III. Business outcomes for the subject report are measured in terms of data on the direct expenditures of the Project for goods and services with a focus on Indigenous and northern spending. Indirect business effects are summarized in Section 6.1.2.2.

6.1.2.1 Direct project expenditures

There was a total of \$3,465.4 million dollars spent on goods and services for the construction of the Project. The estimated total construction phase expenditures reported in the EIS was \$2,115.2⁹ million dollars. The actual value is approximately 164% of the total planned construction phase Project expenditures. Table 6-16 summarizes the breakdown of total direct purchases for 2014-18.

⁹ *Bipole III Transmission Project, Economic Impact Assessment Technical Report Manitoba Bureau of Statistics- November 2011*

Table 6-16 Direct purchases 2014-2018

Measure	KCS construction		RCS Construction		Transmission line construction		Bipole III Project Construction Total	
	\$ (Millions) (2014-2018)	% of Total Project	\$ (Millions) (2014-2018)	% of Total Project	\$ (Millions) (2014-2018)	% of Total Project	\$ (Millions) (2014-2018)	% of Total Project
Indigenous	\$131.40	3.8%	\$ -	0%	\$237.30	6.9%	\$368.70	10.6%
non-Indigenous	\$1,104.80	31.9%	\$788.30	22.8%	\$1,204.60	34.8%	\$3,096.70	89.4%
Total	\$1,236.20	35.7%	\$788.30	22.8%	\$1,441.90	41.6%	\$3,465.40	100%
Northern Manitoba Indigenous ¹	\$106.20	3.1%	\$ -	0%	\$175.80	5.1%	\$282.00	8.1%
Northern Manitoba non-Indigenous ²	\$14.60	0.4%	\$ -	0%	\$6.10	0.2%	\$20.70	0.6%
Total	\$120.80	3.5%	\$ -	0%	\$181.90	5.3%	\$302.70	8.7%
Manitoba	\$785.80	22.7%	\$436.70	12.6%	\$413.80	11.9%	\$1,636.30	47.2%
non-Manitoba	\$449.40	13.0%	\$351.50	10.1%	\$1,028.10	29.7%	\$1,829.10	52.8%
Total	\$1,235.20	35.6%	\$788.30	22.8%	\$1,441.90	41.6%	\$3,465.40	100%
Notes:								
Table above is not additive								
¹ - Northern Manitoba Indigenous is a subset of Indigenous								
² - Northern Manitoba non-Indigenous is a subset of non-Indigenous								

6.1.2.2 Indirect business effects

Indirect business effects arise from the Project-related purchases by Manitoba Hydro and its principal contractors while induced business effects arise from the spending of income earned by workers (and their families) employed on the Project. These effects can be both beneficial and adverse. The EIS predicted general indirect benefits including purchase of meals, gasoline and accommodations by the contractors and incidental purchases of repairs and parts for construction vehicles and equipment as well as the purchase of some materials.

A survey was conducted by Manitoba Hydro of the area, (related to the Keeyask Project), which identified indirect effects on businesses in Thompson, Gillam, and local First Nations. The results of the survey (MB Hydro, 2018) indicated that:

- For First Nations businesses, direct effects are likely limited.
- For Gillam businesses, positive effects are expected; however, there is the potential for some negative effects from the Project, including community members being away working at the site, and concerns related to workers drinking and driving.
- For Thompson businesses, positive effects are expected; however, there is potential for some negative effect on employment levels and on the pool of available workers. Negative effects on businesses may also occur related to infrequent or isolated incidents of rowdy behavior from construction workers.

It is expected that effects of similar nature and magnitude would be applicable to the Bipole III construction.

6.2 Labour income and tax revenue

Labour income is an important indicator of the direct economic impact of a project. Income levels affect the general standard of living of individuals and families by influencing the acquisition of basic human needs including housing, food and clothing. Consequently, monitoring income levels can provide a general indication of a project's contribution to an overall standard of living. The estimate of labour income reflects the direct income of wages and salaries associated with direct person-years of employment.

Regarding taxation, direct taxes paid reflect incremental revenue sources generated for governments as a result of a project. The incremental revenues, in turn, contribute to societal programs and general well-being. The following parameters were monitored during the Project construction phase:

- Labour income - direct income earned by workers from employment on the Project.

- Taxes paid
 - Provincial sales tax
 - Payroll tax
 - Corporate capital tax
 - Fuel tax

The EIS estimated the Project construction expenditure would contribute \$482.3 million in labour income and \$352.4 million in tax revenue to Manitoba. The EIS also estimated the Project would contribute \$721.3 million in labour income and \$489.1 million in tax revenue to all of Canada.

6.2.1 Labour income

The estimate of labour income reflects the direct income earned by workers from employment on the Project. It is the sum of wages and salaries associated with direct person years of employment¹⁰. Total Manitoba labour income earned was approximately \$355.2 million for the October 2014 to September 30, 2018 period, accounting for approximately 74% of the Manitoba-based labor income predicted in the EIS (\$482.3 million).

The \$576.5 million total labour income for the Project construction was 80% of the predicted labour income to Canada resulting from the Project (\$721.3 million). Table 6-17 lists the breakdown of labour income earned on the Project.

¹⁰ Labour income is calculated based on information provided by contractors and collected by Manitoba Hydro.

Table 6-17 Labour income for 2014-2018

Measure	KCS construction		RCS construction		Transmission line construction		Bipole III Project total construction	
	Labor income (millions) 2014-2018	% of total project	Labor income (millions) 2014-2018	% of total project	Labor income (millions) 2014-2018	% of total project	Labor income (millions) 2014-2018	% of total project
Indigenous	\$56.30	9.8%	\$14.70	2.6%	\$51.50	8.9%	\$122.50	21.3%
non-Indigenous	\$267.20	46.4%	\$99.80	17.3%	\$87.00	15.1%	\$454.00	78.8%
Total	\$323.50	56.1%	\$114.50	19.9%	\$138.50	24.0%	\$576.5	100%
Northern Manitoba Indigenous ¹	\$28.70	5%	\$44.70	7.8%	\$15.30	2.7%	\$44.70	7.8%
Northern Manitoba non-Indigenous ²	\$4.90	0.9%	\$6.60	1.1%	\$1.50	0.3%	\$6.60	1.1%
Total	\$33.60	5.8%	\$51.30	8.9%	\$16.80	2.9%	\$51.30	8.9%
Manitoba	\$158.40	27.5%	\$95.10	16.5%	\$101.60	17.6%	\$355.20	61.6%
non-Manitoba	\$165.10	28.6%	\$19.40	3.4%	\$36.90	6.4%	\$221.30	38.4%
Total	\$323.50	56.1%	\$114.50	19.9%	\$138.50	24.0%	\$576.50	100%
Notes:								
Table above is not additive								
¹ - Northern Manitoba Indigenous is a subset of Indigenous								
² - Northern Manitoba non-Indigenous is a subset of non-Indigenous								

6.2.2 Taxes

The Project also contributed to government revenues. This includes revenues received by federal and provincial governments such as payroll tax, personal income tax, capital tax, fuel tax and provincial sales tax. Not all of these taxes are payable by the Project; however, they are generated as a result of the work undertaken. The estimated total tax impact from October 1, 2014 to September 30, 2018 was \$302.3 million. The estimate included \$12.4 million in payroll taxes¹¹, \$72.6 million in personal income taxes¹², \$22.1 million in capital tax, \$4.5 million in fuel tax¹³ and

¹¹ Health and Post-secondary Education Tax (Payroll tax) is calculated as 2.15 percent of the labour income of \$576.5 million.

¹² Personal income taxes are paid by individual employees to the federal and provincial governments. Each individual's personal tax situation (and therefore taxes payable) will vary. However, this estimate is based on a range of reasonable assumptions.

¹³ The fuel tax estimate is based on provincial taxes of 14 cents/litre for both diesel and gasoline and federal taxes of 4 cents/litre for diesel fuel and 10 cents/litre for gasoline.

\$190.7 million in provincial sales tax¹⁴. The estimate did not include taxes received by the local or municipal government or taxes associated with indirect or induced employment. The project construction resulted in 85.8% of the EIS predicted total tax impact of the 352.4 million.

6.3 Community services

Community-based services (e.g., emergency, health and social) have the potential to be impacted in communities in close proximity to various components of the Project. The EIS predicted effects on community services during the construction phase of the Project such as increased pressure on local community, health and emergency response services; including effects on the Gillam airport such as increased air traffic and reduced seat availability and parking for local residents. With the implementation of a charter flight for Manitoba Hydro workers, it was predicted that existing local services have capacity to meet additional demands. Such effects were determined to be more likely to occur in proximity to the KCS than for the Bipole III transmission line, given the differences in workforce magnitude and the use of mobile construction camps for the transmission line. Monitoring the extent of the Project's construction effects on community services in the Gillam area forms an important component of the Bipole III SEMP and provided opportunities to respond through adaptive management to adverse effects.

Information related to Project impacts was sought, in part, through the Worker Interaction Subcommittee (WIS) that was established by Manitoba Hydro in 2013. The WIS is part of a corporate-wide initiative intended to address anticipated increases in the Gillam area workforce resulting from the construction of the KCS, the Keeyask Generation Project, and other Manitoba Hydro projects being constructed in the area in an overlapping timeframe. The subcommittee is intended as a forum for information sharing and communication for early identification of potential worker interaction and community concerns, prevention of issues to the extent possible, and identification of ways to work cooperatively to address issues as they arise including any related increases in the demand for services and accommodation in Gillam.

¹⁴ PST is based on estimates of taxes paid directly by the project and PST on materials provided by suppliers under real property contracts.

In the SE monitoring plan, the measurable parameters included identifying demands on the Gillam hospital and demands on policing services. Given privacy requirements in data collection, as well as the variety of developments currently taking place in the area, it was not always possible to link demands for services (e.g., health and policing services) over the period to specific projects. In addition, due to the sensitive nature of the topics addressed, data gathered by the WIS will remain confidential. Manitoba Hydro will continue to use the information provided by community and service providers' representatives on the WIS to assist in identifying areas where the Corporation may implement future adaptive measures to reduce Project impacts. A summary of the WIS activities is provided below.

6.3.1 Summary of 2014-2018 monitoring activities

WIS members from 2014- through 2018 included representatives from Manitoba Hydro, Fox Lake Cree Nation (FLCN), the Town of Gillam, the RCMP (Gillam Detachment), the Gillam Hospital, and the Gillam School.

From October 1, 2014 to September 30, 2018, the WIS met 14 times. During the construction phase of the Project, the WIS developed and refined plans and processes for monitoring and considered areas of community interest regarding potential Project impacts. This included the development of an ongoing reporting and tracking process for specific community concerns and incidents identified by or to its members. Through these mechanisms, as well as subcommittee meetings and ongoing communications between members, the WIS discussed service and infrastructure-related matters in areas such as local road conditions (e.g., Provincial Road (PR) 280, PR 290, and Butnau Road), traffic safety and Gillam facility use (e.g., the Gillam hospital, Gillam fitness center, the Gillam airport). In addition, the WIS continued to monitor updates provided by the Gillam Hospital related to demands for health services (e.g., non-local non-urgent visits to the Gillam hospital), and by the Gillam RCMP related to demands on policing (e.g., RCMP calls).

Manitoba Hydro activities undertaken during the 2014-18 period in relation to concerns and topics discussed at the WIS included:

- Providing a hospital services information sheet to all workers (regarding hospital facilities, medical staff availability, and related hours);

- PR 280/PR 290 Task Force transportation management plan developed to reduce the impacts of Project-related traffic on the roads;
- Providing instructions to shuttle/bus drivers regarding parking at the Gillam Airport, and relocation of Keeyask charter flights from Gillam to Thompson to address, in part, congestion and flight schedule issues at the Gillam airport; and
- Providing funding to Manitoba Infrastructure (MI) for an enhanced road maintenance program on PR 280/PR 290 and funding a provincial weigh scale near Thompson to facilitate enforcement of weight restrictions.

Through the SEMP and the information obtained through the WIS, it was determined that existing capacity in some instances (such as the air traffic and vehicle congestion at the Gillam Airport), was not able to meet demand, as predicted in the EIS and therefore, additional mitigation measures were implemented (e.g., re-location of Keeyask flights to reduce air traffic). Additional information on the WIS and the additional mitigation measures implemented through adaptive management is provided under 6.6 Public safety - worker interaction.

6.4 Resource use

6.4.1 Trapper education

The furbearer and trapline monitoring program¹⁵ focuses on commercial trappers who are trapping on active registered traplines (RTL) set aside by Manitoba Conservation and Climate (formerly Manitoba Sustainable Development) as Community/Youth RTLs. The main purpose of the program is to help Manitoba Hydro and local communities better understand the impacts of transmission facilities on furbearer behaviour and trapper success. The SE nature of the furbearer and trapline monitoring program includes a trapper education component to train youth on trapping so that they can qualify for certification and allow them to successfully trap on the community traplines to sell their fur. This program aligns with the CEC recommendation to make best efforts to accommodate the continuation of educational programs on community traplines that are affected by the Project¹⁶.

¹⁵ This program is based on the Wuskwatim Transmission Line Furbearer Pilot Project

¹⁶ CEC. 2013. Bipole III Transmission Project. Report on Public Hearing. Clean Environment Commission. Winnipeg, MB.

Through trapping education, the Project is also contributing indirectly to community economic gains through the sales of fur.

Initially, six potential community RTLs were identified for the monitoring program (FLCN, Tataskweyak Cree Nation (TCN), Thicket Portage, Wabowden, Cormorant, and Opaskwayak Cree Nation (OCN)). To date, Wabowden, OCN, Thicket Portage, FLCN, and TCN have participated in the program. Monitoring of furbearers began in 2015 under the biophysical monitoring plan with an assessment of pre-construction fur harvest levels along the transmission line. Trapper success will be evaluated in the biophysical monitoring program and reported in the overall post-construction biophysical monitoring and mitigation report.

The educational component of the furbearer and trapline monitoring program began in October 2014 consisting of trapper education workshops with the participating Community/Youth RTLs. Trapper education workshops were conducted in the communities of The Pas, Camperville, and Alonsa. The Trapper Education workshops consisted of a course conducted by the Manitoba Trappers Association where participants learned about the different trap types, trapping regulations and fur preparation. In the evening, there was an opportunity for Elders from each community to educate the participants about traditional harvesting techniques. Each participant wrote the provincial exam and received a certificate allowing them to purchase a trapper's licence. A summary of the trapper education workshops is presented below and in Table 6-18.

In 2014, two Trapper Education courses were conducted, one with FLCN and one at TCN. The courses involved approximately ten youth from each participating community.

In 2015, two kickoff meetings each were held with OCN and Thicket Portage. OCN identified 12 participants in their environmental studies curriculum and students received a presentation and trapping supply kit. Thicket Portage identified the need to select a community coordinator.

In 2016, two additional trapper education courses were conducted, one with FLCN and one at TCN. The courses involved approximately ten youth from each participating community.

In 2017, Wabowden, OCN, and Thicket Portage each held Trapper Education workshops. The courses involved approximately 12 participants from Wabowden, 16 participants from OCN and eight participants from Thicket Portage.

In 2018, Wabowden, OCN, Thicket Portage, and FLCN each held Trapper Education Workshops. The courses involved approximately 12 participants from Wabowden, 24 participants from OCN, four participants from Thicket Portage, and ten participants from Fox Lake¹⁷.

Table 6-18 Trapper education 2014-2018 summary

Year	Participant communities	Approximate # of participants
2014	Fox Lake Cree Nation	10
	Tataskweyak Cree Nation	10
2015	Opaskweyak Cree Nation	n/a-Kickoff Meeting
	Thicket Portage	n/a-Kickoff Meeting
2016	Fox Lake Cree Nation	10
	Tataskweyak Cree Nation	10
2017	Wabowden	12
	Opaskweyak Cree Nation	16
	Thicket Portage	8
2018	Wabowden	12
	Opaskweyak Cree Nation	24
	Thicket Portage	4
	Fox Lake Cree Nation	10

All community programs reported furbearers being harvested by participants and a very positive experience by all involved. Manitoba Hydro continued to support the program, involving both elders and youth with deliverables including documentation of program meetings and other communications, trapper/community involvement summaries, Project mapping, trapper diaries, program results and reports.

6.5 Personal and community well being

Personal, family and community life can be affected by a variety of Project-related effects (e.g., physical changes to the land; noise and nuisance effects during

¹⁷ Trevor Barker, Environmental Specialist, Manitoba Hydro, pers. comm. April 2019.

construction). The experience of such effects will vary for individuals, families, and communities as a whole.

A potential Project-related effect identified in the EIS was related to public safety and the interaction of workers with community members in Gillam and the surrounding area.

Manitoba Hydro is in the process of undertaking measurements at a Bipole III testing site near Dugald, Manitoba to monitor electric and magnetic fields (EMFs). The measurements will allow for a comparison of EMF levels to those modeled for the EIS. Measurable parameters to be reported on include EMFs, space charge, ion counts, and weather data. Identified potential changes from baseline conditions will be summarized in a separate final report. The monitoring at the Dugald site is expected to get underway in 2019 and is expected to be conducted for over a 1.5-year time period (with the possibility of extension).

6.6 Public safety – worker interaction

The construction of the KCS and associated facilities required a sizeable workforce drawn from a wide geographic area. Neighboring communities identified concerns regarding potential adverse effects associated with increased numbers of construction workers in the area. The WIS, established by Manitoba Hydro to serve as a forum for information sharing and communication related to such effects.

The WIS met 14 times over the 2014-18 period to discuss areas of community interest and potential Project effects. An ongoing reporting and tracking process for specific community concerns and incidents identified by, or to, its members was developed and maintained throughout this period. Through this process, as well as subcommittee meetings and ongoing communications between members, the subcommittee considered members' concerns related to public safety/worker interactions, community services, and infrastructure. These concerns included the behaviour of non-local persons (e.g., at the Gillam airport); the presence of drugs in Gillam; and other concerns related to community infrastructure and services as described in 6.3.

In addition, WIS continued to monitor updates provided by the Gillam Hospital related to demands for health services (e.g., “out of town” visits to the Gillam hospital), and by the Gillam RCMP related to demands on policing (e.g., RCMP calls). Given privacy requirements in data collection, as well as the various developments taking place in the area over the period, it was not always possible to link concerns or demands for services to specific projects. Nonetheless, during this time period, the pressures relating to hospital visits and air congestion were primarily associated with the Keeyask Project due to its relatively larger workforce than other active projects.

Activities undertaken during the 2014-18 period in relation to concerns and topics discussed at the WIS include those described in Section 8.0 as well as the following activities related to public safety and well-being:

- Continued monitoring of non-local visits at the Gillam hospital; this monitoring contributed to the hiring of a Nurse Practitioner to provide on-site health care services at the Keeyask site and reduction of non-urgent visits by Project workers to the Gillam hospital; and
- FLCN’s implementation of cultural awareness training for short-term contractors.

The effects on personal and community well-being predicted in the EIS included effects on health and safety, aesthetics of the Project, and effects from adverse worker interactions and illegal substance use from increased disposable income in the Gillam area. Through the SEMP and the information obtained through the WIS, it was determined that mitigation measures in some instances were not able to adequately meet demand, as predicted in the EIS (such as increased use of the Gillam hospital), and therefore, additional mitigation measures were implemented (e.g., hiring a Nurse Practitioner at the Keeyask site). The information provided by WIS will continue to be used to assist in identifying potential adaptive measures to reduce the impacts of hydroelectric development in the region. (Additional information on WIS membership, and additional monitoring activities is provided under Section 6.3 Community services).

6.7 Transportation

6.7.1 Road traffic monitoring

During construction, Project-related effects on road-based travel were anticipated to stem from increased vehicular traffic associated with the transport of people (construction personnel and service providers), equipment and materials on roads in the area, particularly PR 280 and PR 290. The Project EIS predicted that existing transportation networks and plans for PR 280 and PR 290 upgrades would be able to accommodate the changes in road use associated with Project construction; however, a commitment was also made to conduct transportation monitoring in the vicinity of northern project infrastructure, to confirm this prediction.

2014

Different technologies were researched, traffic counters constructed, and necessary agreements signed to ensure comprehensive data collection could be achieved during construction. Two permanent traffic monitoring stations (traffic counters) were to be installed on PR 280 to compile traffic volumes for traffic entering/exiting the intersection of PR 280 at PR 290. The traffic counters were to be installed north of PR 290, prior to any major construction access, and south of PR 290, west of Long Spruce Generating Station. These two traffic counters were to provide data on background traffic volumes and construction traffic volumes when used with gate counts at KCS. In the fall of 2014, the Province established the PR 280 Joint Advisory Committee. The committee comprised representatives from the Province of Manitoba, Manitoba Hydro, the Town of Gillam and the partner First Nations communities to involve the latter directly in the planning of upgrades to PR 280 and PR 290.

2015

The traffic counters were scheduled to be installed; however, upgrades to PR 280 required an alternate approach and trail cameras were used. The trail cameras were installed north of PR 290, prior to any major construction access, and south of PR 290. Both sites were deployed on February 10, 2015 with final retrieval in fall 2015. While traffic volume data was collected during this period, the data was not robust enough to facilitate analysis and present results. During the summer and fall of 2015, five in-pavement permanent loop counters were installed by MI on PR 280 and PR 290

(Figure 6-1). The locations of the monitoring stations are presented in Figure 6-2 below.



Figure 6-1 Traffic monitoring station

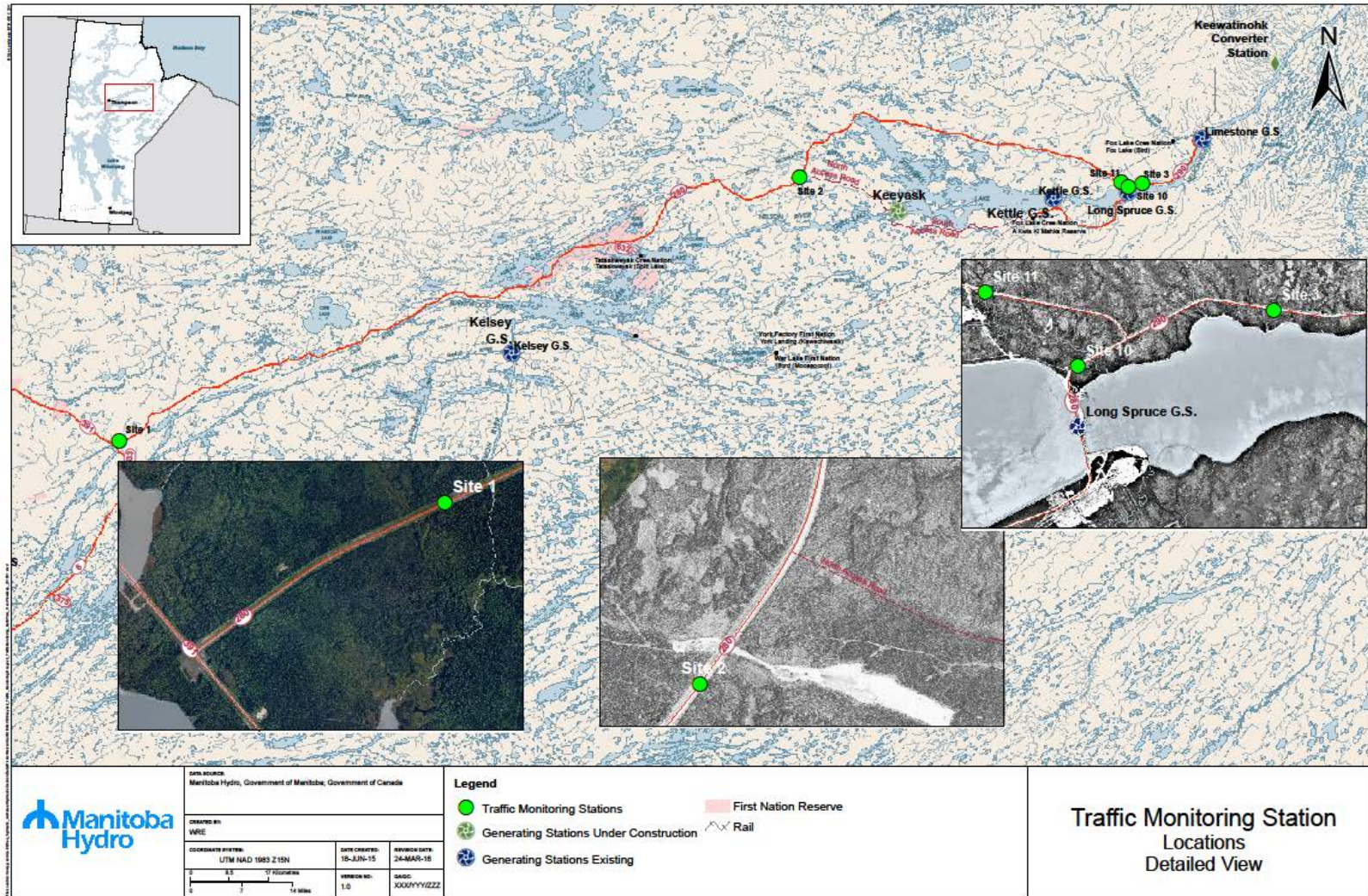


Figure 6-2 Traffic monitoring station locations

While the Project EIS predicted that existing transportation networks and plans for PR 280 and PR 290 upgrades would be able to accommodate the changes in road use associated with Project construction, community concerns remained regarding traffic safety and road conditions as evidenced by feedback received from the WIS and the PR 280 Joint Advisory Committee. In particular, concerns were expressed regarding speeding, truck weights, convoys, road surface conditions (making travel difficult), vehicle damage and dust. As a result of discussions among in-vicinity First Nations, Manitoba Hydro and the Province, additional mitigation measures were adopted to reduce the impact of additional traffic on PR 280 and PR 290. Measures including road reconstruction and increased maintenance efforts, operation of the Provincial Trunk Highway (PTH) 6 weigh station near Thompson and communicating driver expectations to contractors were implemented in an effort to promote appropriate driving behaviour on PR 280 and PR 290.

2016

Manitoba Hydro developed a comprehensive transportation management plan to reduce the impacts of Project traffic on PR 280 and PR 290. The plan included the following strategies:

- Pre-hauling construction materials to site during the winter months;
- Night hauling of some materials when the weather is cold at night and warm in the daytime;
- Reductions in Manitoba Hydro truck traffic and reductions in truck weights during periods when the road has deteriorated significantly; and
- Increased communications with staff, contractors, and other road users to provide awareness of the initiatives Manitoba Hydro has undertaken to improve conditions and safety on PR 280/290.

The plan was to help reduce wear and tear on the roads and allow MI to focus on areas requiring increased maintenance. MI is responsible for the existing provincial highway system, including the maintenance and upgrade of PR 280 and PR 290. Monitoring efforts were undertaken in collaboration with MI, Manitoba Public Insurance (MPI), and the RCMP to assess mitigative efforts in relation to EIS predictions and respond to community concerns. The results and conclusions of the

monitoring efforts are presented below and were reported on in the 2016/2017 and 2018/2019 annual reports.

2017 and 2018

Traffic volume information was obtained from the Manitoba Highway Traffic Information System (MHTIS) website for the years 2005, 2007, 2009, 2011, 2013 and 2015. This information is based on data collected by MI for PR 280 and PR 290 on a biennial basis and includes estimates of annual average daily traffic (AADT), which is the number of vehicles passing a point on an average day of the year.

Traffic data from the MHTIS for PR 280 and PR 290 is divided into five segments; PR 391 to Split Lake; Split Lake to the PR 280/PR 290 intersection the PR 280/PR 290 intersection to Gillam; PR 290 east of the intersection; and another section of PR 290 west of Sundance. A summary of the AADT for the segments relative to this report for past years is presented in Table 6-19 (combined for northbound and southbound traffic rounded to the nearest five). While there is some variation across years, use of PR 280 and PR 290 has steadily increased since 2003. A more substantial increase in use has been observed since the start of construction on the KCS, as anticipated. Traffic volumes have more than doubled over the past ten years likely due to increased construction projects.

Table 6-19 Summary of AADT for segments of PR 280 and PR 290 from 2003 to 2016

Highway	Segment	EIS Projected cumulative traffic volumes	Annual Average Daily Traffic (AADT)						
			2003	2005	2007	2009	2011	2013	2016
PR 280	PR 391 to Split Lake (Site 1)	255	230	155	135	175	210	270	340
	Split Lake to PR 280/290 (Site 2)	255	115	95	95	120	140	160	230
	PR 280/290 to Gillam (Site 10)	535	205	210	235	225	255	375	450
PR 290	East of PR 280 (Site 3)	440	100	100	130	150	140	240	295
	West of Sundance	-	10	30	50	50	40	80	150

Based on data collected since October 2015, trends in traffic volumes appear to be cyclical with peaks occurring during the winter months from January to March. Traffic volumes tended to decrease later in the spring and then flatten out over the summer months. However, it should be noted that there was very little difference in truck traffic counts throughout the year as shown in Figure 6-3.

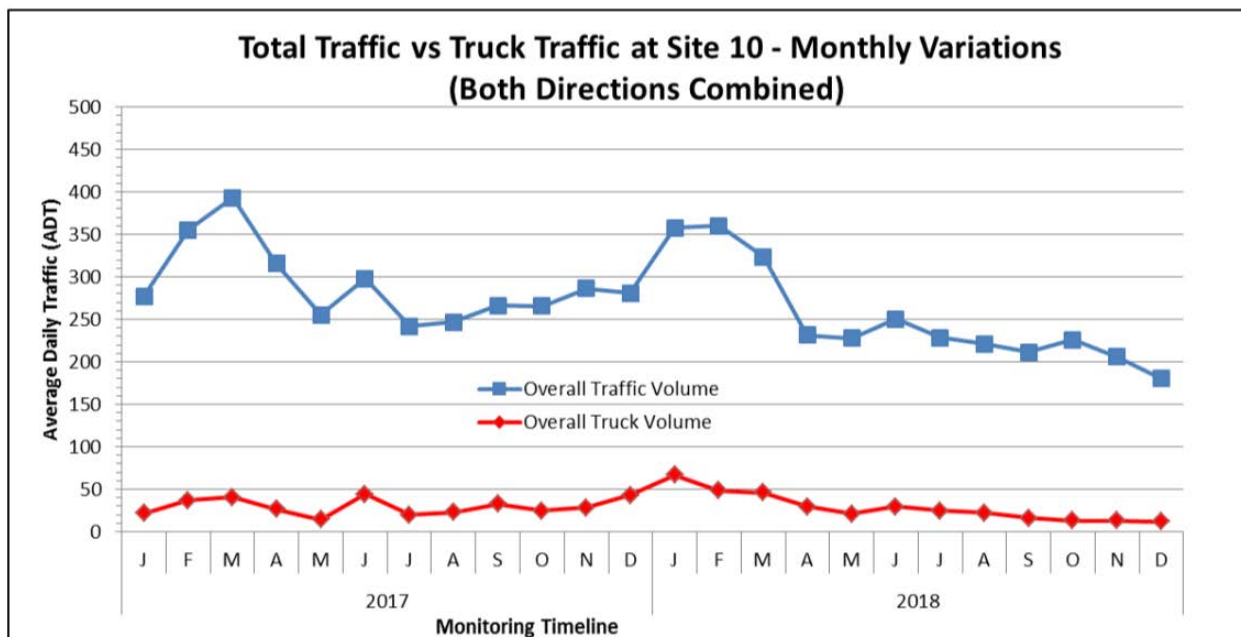


Figure 6-3 Total traffic vs truck traffic at site 10 (PR 280 between PR290 and Gillam) - 2017-2018 monthly variations (both directions combined)

There was typically a slight increase in truck traffic during the winter months, but the main driver of the increase in traffic during winter was small vehicles (i.e., cars, pick-up trucks, vans). This increase may be attributed to a couple factors, including an increase in the number of trips from communities while the winter road system is in operation, and traffic related to Bipole III Transmission Line construction, which occurred mainly during the winter months. As the Bipole III construction was completed in 2018, it is expected that the traffic counts over the winter months will decrease.

Comparison between predicted traffic volumes and actual counts

The Transportation Technical Report prepared for the Project EIS provided projected traffic flows for key highway segments within the Keewatinohk Study Area. Table

6-19 shows the projected traffic volumes from the EIS to allow comparison with actual counts for the road segments identified.

The results of the comparison indicate that some roads experienced higher traffic flows than predicted and others saw lower traffic flows. In particular:

- PR 280, from PR 391 to Split Lake experienced a continuous increase in traffic from 2011 through 2016. The 2016 count averages were 85 vehicles per day (vpd) higher than predicted and 110 vpd higher than 2003 preconstruction values.
- PR 280, from Split Lake to the PR 280/PR 290 intersection has experienced continuous growth from 2011 through 2016. The 2016 count averages were 25 vpd lower than predicted and 115 vpd higher than 2003 preconstruction values.
- PR 280, from the PR 280/PR 290 intersection to Gillam experienced a continuous increase in traffic from 2011 through 2016. The 2016 count averages were 105 vpd lower than predicted in the EIS but still 240 vpd higher than preconstruction values in 2003.
- PR 290 from east of PR 280 experienced a continuous increase in traffic from 2003 through 2016. The 2016 count averages were 145 vpd lower than predicted and 195 vpd higher than 2003 preconstruction values.
- PR 290 west of Sundance was not included in the projected traffic flow list, but traffic flows increased from 2011 through 2016. The 2016 count averages were 140 vpd higher than 2003 preconstruction flows.

The traffic monitoring results indicate that there is other activity happening between Thompson and the Community of Split Lake that seems to be unrelated to the construction activity. It also indicates that the predicted construction related traffic is trending lower than predicted in certain road segments.

The instances where there was lower than predicted traffic flow may be attributable to several factors including, but not limited to, the following:

- Lower than anticipated workforce
- More carpooling by workers
- Less material delivery trips
- More trips being taken by air to Gillam or other work sites
- Predictions were based on factors that did not materialize

6.7.2 Collisions

An anticipated direct correlation exists between traffic levels and collision rates. In those instances where there was an increase in traffic, there would be a corresponding increase in reported collisions (property damage¹⁸, injury, or fatality). There were 88 collisions on PR 280 in the years prior to construction of the KCS in 2014; an average of ten collisions per year. From the start of construction on the KCS to the end of this report period (2014-2018) there have been a total of 138 collisions on PR 280; an average of 18 collisions per year. Although the average number of collisions has increased, collision severity has decreased with fewer collisions resulting in injuries or fatalities over comparable time periods. In 2012, the responsibility for collection and reporting of collision data transferred from the RCMP to MPI and this change may have affected the number of collisions reported prior to, and during, construction. The collision rate at the Project site for 2015-2016 (1.20 incidents per million vehicle-kilometres of travel [MVKT]) remains below the industry standard threshold of 1.5 incidents per MVKT. MPI has not provided a new collision rate for 2017 or the first quarter of 2018 but it is expected that it would remain below the industry threshold standard of 1.5 incidents per MVKT.

Collisions during the spring (March, April, May) and fall (September, October, November) months were most frequent, accounting for 58% of all collisions over the thirteen-year period of monitoring (2005-2017), likely due to inclement weather

¹⁸ Property damage can be attributed to collisions with wildlife, running off the road into a fixed object, head on or side swipe collisions with other vehicles, overturned vehicles, damage to vehicles as a result of hitting potholes/ruts, etc. Property damage does not include cracked or chipped windshields.

conditions and wildlife movement. Single vehicle collisions accounted for nearly all collisions during the analysis period.

6.7.3 KCS site access

The Conawapa Access Road connects PR 290 to the construction site. It is a private road with restricted access, which is controlled by means of a security gate. The gate office is staffed 24 hours per day, seven days per week and security staff document all authorized vehicles entering and exiting the road. Monitoring of traffic volumes on the access road is based on the gate's records and through security reports from patrols.

Traffic counts from the monitoring station located at Site 3 (closest station to the Conawapa Access Road) were compared with gate counts at the site in order to quantify the percentage of Project construction related traffic to overall traffic on PR 290. A summary of the annual construction related traffic is provided below.

- Over the 2013/2014 reporting period (January-September 2014)¹⁹, on average 123 vpd used the road; however, monitoring of all traffic on PR 290 had not been initiated for comparison.
- Over the 2014/2015 reporting period (October 2014-September 2015)²⁰, on average 76 vpd used the road; however, monitoring of all traffic on PR 290 had not been initiated for comparison.
- Over the 2015/2016 reporting period (October 2015-September 2016)²¹, the two sets of traffic counts indicate that Keewatinohk-related construction traffic (average of 93 vpd) account for approximately 40% of all traffic on PR 290.
- Over the 2016/2017 reporting period (October 2016-September 2017)²², traffic counts indicate that KCS-related construction traffic (average of 161 vpd) accounted for approximately 34% of all traffic on PR 290.
- Based on the 2018 Northern Road Traffic Monitoring Report (January-March 2018)²³, traffic counts indicate that KCS-related construction traffic (average of

¹⁹ MB Hydro. (n.d.) *Bipole III Transmission Project Socio-Economic Monitoring Program For Construction 2014*. Winnipeg. MB.

²⁰ MB Hydro. (n.d.) *Bipole III Transmission Project Socio-Economic Monitoring Program For Construction 2015*. Winnipeg. MB.

²¹ MB Hydro. (n.d.) *Bipole III Transmission Project Socio-Economic Monitoring Program For Construction 2016*. Winnipeg. MB.

²² MB Hydro. (n.d.) *Bipole III Transmission Project Socio-Economic Monitoring Program For Construction 2017*. Winnipeg. MB.

²³ MB Hydro. (n.d.) *Bipole III Transmission Project Socio-Economic Monitoring Program For Construction 2018*. Winnipeg. MB.

97 vpd) accounts for approximately 33% of all traffic on PR 290 (average 292 vpd).

Table 10-2 provides a summary of vehicle access to the Keewatinohk site from January 2014 to June 2018. On average, 110 vpd used the road during the construction phase of the Project.

Table 6-20 Security gate counts at Keewatinohk Converter Station, January 2014 to March 31, 2018

Period		Gate count total	Daily average
2014	January	3537	136
	February	4537	162
	March	4844	156
	April	5135	171
	May	4232	137
	June	3268	109
	July	2693	87
	August	2028	65
	September	2814	94
	October	2899	94
	November	1743	58
	December	1255	40
2015	January	2178	70
	February	2993	107
	March	2672	86
	April	2963	99
	May	1599	52
	June	2287	76
	July	2473	80
	August	2366	76
	September	2510	84
	October	2,482	80
	November	2,578	86
	December	2,604	84
2016	January	3,253	105

	Period	Gate count total	Daily average
	February	2,805	97
	March	3,148	102
	April	3,875	129
	May	2,166	70
	June	2,886	96
	July	2,889	93
	August	2,352	76
	September	2,784	93
	October	3,830	124
	November	3,714	124
	December	3,981	128
	2017	January	4,732
February		8,512	304
March		9,624	310
April		6,412	214
May		5,869	189
June		2,946	98
July		3,284	109
August		3,088	103
September		2,397	80
October		3,196	103
November		2,690	90
December		2,907	94
2018	January	4,362	141
	February	4,689	167
	March	3,914	126
	April	2,001	67
	May	1,827	59
	June	2,208	74
	July	2,308	74
	August	2,556	82
	September	2,024	88
		Total	187,919

Note: * Gate record keeping began January 6, 2014 Source: Keewatinohk Converter Station Master Gate Log

6.8 Cultural and heritage monitoring

For the environmental assessment of cultural and heritage resources, Aboriginal Traditional Knowledge (ATK) played an important role in identifying areas of potential cultural and heritage concern for the Project. Various methods and sources of information identified areas of high heritage potential, known as heritage Environmentally Sensitive Sites (ESS). Locations included water crossings; level, well-drained terrain; and proximity to known archaeological sites. As noted in the effects assessment in the EIS (Chapter 8), construction activities such as excavation and clearing could cause changes to the physical environment, which could potentially indirectly affect cultural and heritage resources.

ATK assisted in providing the cultural context for the heritage ESS locations. Some of the ESS were not able to be investigated prior to filing the EIS but were investigated subsequently during the monitoring of clearing and construction activities. Examples of areas of interest along the final preferred route for Bipole III identified by archaeological methods and ATK information are presented in the following subsection. A brief description is provided below for each of the heritage ESS locations, and monitoring that has taken place during the construction phase of the Project.

6.8.1 Cultural and Heritage Resources Protection Plan

A Cultural and Heritage Resources Protection Plan (CHRPP) was developed for the Project. The role of the CHRPP in the Environmental Protection Program was to describe processes and protocols developed with communities to allow Manitoba Hydro to safeguard cultural and heritage resources and appropriately handle human remains or cultural and heritage resources discovered or disturbed during the construction of the Project. Recorded cultural and heritage resources and their protection measures were incorporated into the applicable Construction Environmental Protection Plans. The Operations and Maintenance Environmental Protection Plans include protection measures to be used for the ongoing protection of cultural and heritage resources during operations.

Heritage Resources Training has occurred every year since 2014 to familiarize environmental monitors, community liaisons, construction supervisors, and contractors with protocols related to the CHRPP. Examples of heritage or cultural

resources were presented along with illustrated examples of artifacts, features, or evidence of cultural practices (e.g., prayer ribbons hanging in trees) that may be found in the Project area. The training also provided an overview of governing legislation protecting heritage resources, as well as status and results of the ongoing heritage monitoring program.

The focus of the overall Heritage Monitoring Program from 2014-2018 was to monitor for cultural or heritage resources during clearing and construction activities as part of the Project. The main heritage monitoring activities are summarized chronologically below (see Appendix A for a map of the Project with section identifications). Detailed descriptions of the sites and monitoring activities are provided in Sections 6.8.2 to 6.8.7.

- In 2014, monitoring occurred at two sites south and north of the KCS. These sites consisted of a possible Palaeo-Inuit occupation/burial and possible tent rings, respectively. Monitoring included a pedestrian survey and GPS documentation. No further mitigation measures beyond the provision of protective fencing were undertaken. Monitoring also occurred in 2014 at the Cormorant Petroform site within the Project right of way. Additional mitigation to the site was provided through permanent fencing.
- In 2015, monitoring occurred at the Assiniboine River Crossing by conducting field surveys as well as a post-clearing impact assessment. Six registered archaeological sites were visited and tested with negative results. Thirteen additional crossings were also investigated and did not result in the discovery of heritage resources.
- In 2016, monitoring occurred at heritage ESS locations that had not yet been cleared on sections N4 through C2 along the transmission line right-of-way (ROW).
- In 2017, monitoring occurred at the KCS for fibre optic cable installation and along section S1 of the transmission line ROW in the rural municipality of Westlake-Gladstone.

- In 2018, monitoring occurred at the KCS for fibre optic cable installation, at site S2-Hert-105 at the east side of the Rat River (southeast of the community of Ste. Agathe), and at ESS locations along sections C1 and N4.

6.8.2 Keewatinohk converter station sites

The Heritage Resources Impact Assessment (HRIA) of the KCS footprint in 2010 identified two archaeological sites, HdKI-01 the “Oasis in the Marsh” and HdKI-02 “Keewatinohk Converter Station”. The outcome of the initial investigation was the discovery of a large number of lithic (stone) flakes associated with left over stone from tool manufacturing at both sites and the discovery of a small number of tools.

The mitigation measures undertaken have been avoidance through modifying the footprint of the KCS and erecting seven foot chain-link fencing to enclose both sites to prevent disturbance (winter 2013/14). Fencing in place extends past the actual boundary of the archaeological sites by 20 m on each side to provide a mitigative buffer.

Additional monitoring activities took place in April 2017 in response to a video of a back-blading incident near HdKI-01, approximately ten meters from the perimeter fencing of the archaeological site. The video caused concerns from the FLCN environmental monitor regarding potential presence of cultural rock formations, including the possible presence of grandfather stones related to sweat lodge ceremonies. The April 2017 monitoring consisted of an archaeological survey of the excavation trench, where members of the archaeological team (including FLCN members and Manitoba Hydro personnel) examined the ground surface for exposed artifacts and heritage features, along with three test trenches (1 m x 3 m) that were excavated to a depth of 50 centimeters. No evidence of cultural layers or artifacts were discovered.

A follow up site visit was conducted in June 2017 as part of corrective action as requested by FLCN. The exposed ground surface of the trench line was re-examined for artifacts, cultural layers, or indication that the area may have been used or modified by human activity. No further evidence of cultural layers or artifacts was discovered; therefore, it was determined that no additional buffers outside the fence would be required.

An ancillary concern expressed by FLCN at site HdKI-01 related to the potential disturbance within the perimeter fencing at the site associated with the presence of instrumentation and a portion of the fence being down. It was determined that the equipment had been in place since 2014 and that a small section of the fence was left down at FLCN's request to accommodate the passage of spirits.

Based on the mitigation and monitoring, it was determined that there were no further concerns with the two archaeological sites.

6.8.3 Cormorant bottleneck

The Cormorant Petroform site was mitigated through avoidance and the establishment of a series of snow fence buffers in February 2014 with openings to allow for wildlife passage. Prescribed mitigation measures included tree removal by hand-clearing or using a feller buncher arm to reach into the buffered area. The trees where the fencing had been attached were cut off at a four-foot height and left in place. The site was revisited during the August 2014 summer field survey to ensure mitigative actions were implemented and successful. During the summer field survey, there was evidence that disturbance to the petroform rocks had occurred at some time in the recent past as a number of rocks had been overturned, likely by animals in pursuit of bugs and fungus. Snow fencing was still in place protecting the petroform. A permanent fence was installed to provide ongoing protection.

6.8.4 ESS locations along sections N4, C1, AND C2

6.8.4.1 Section N4

Seven heritage ESS sites were assessed in section N4: 5 sites identified as heritage ESS locations (along the Swan River and Red Deer River), and two sites identified in the 2015 program as requiring further investigation (i.e., Bell River and Woody River). Traditional knowledge had indicated the potential for burial locations in proximity to Bell River; therefore, the surrounding area was examined through a pedestrian survey and 20 shovel tests. No heritage resources were identified, and no depressions or mounds that would be indicative of possible burial locations were found. Areas along the Woody River were examined as well, with 6 shovel tests yielding negative results with no further concerns. Three sites along the Swan River were investigated, which

included a total of 17 shovel tests and an extensive pedestrian survey. No heritage resources or concerns were identified.

In 2018, two additional sites in Section N4 were investigated via a pedestrian survey and shovel testing. Artifacts recovered within the ROW consisted of a chert flake (an isolated find) and a chert flake scraper (of unknown cultural affiliation). Based on these findings, new archaeological sites were created and respective Borden number identifiers assigned.

6.8.4.2 Section C1

In the 2015/2016 field seasons, 21 heritage ESS locations were assessed in Section C1, including locations along Bigstone Creek, Wellburns Creek and Cork Cliff Creek. Shovel testing and pedestrian surveys were conducted in the area of Bigstone Creek, Wellburns Creek and Cork Cliff Creek, and in an open agricultural location. No heritage resources were identified, and the areas were determined to require no further heritage mitigation. Two sites were not examined through shovel testing as an aerial overflight determined that the environmental conditions in the area limited the potential for heritage resources (e.g., marshland, areas of frequent flooding). A large section in C1 had restricted access and was not assessed. At the end of the 2016 field season there were eight outstanding assessments required. These areas were investigated in 2018 through pedestrian surveys and shovel testing where access was possible. No heritage materials or resources were recovered from the eight areas of interest in Section C1. This concluded the investigation of heritage ESS locations along Section C1 of the Project ROW.

6.8.4.3 Section C2

Heritage monitoring of section C2 was completed in 2015, but further investigation occurred in 2016 subsequent to the identification of a potential Red River Cart trail through traditional knowledge studies. The area identified was visited and it was determined that the trail had become the mile road in the area, and no further heritage concerns remained.

6.8.5 Section S1 prayer tree sites

A realignment of Section S1 in the RM of Westlake-Gladstone was required to avoid an existing NAV CANADA radar site. The realignment was approximately 20 km in length. On February 9, 2017 crews discovered a number of prayer trees within the transmission line ROW that had fabric cloths tied around their trunks. The trees were found in 16 separate locations concentrated in two main areas, along mile road 87N (22 trees), and along mile road 92N and 53W (13 trees). Prayer trees are associated with an Indigenous traditional practice whereby offerings back to the earth represent prayers, hopes, or thanks. Swatches of colourful cloth are tied to trees usually following a ceremony conducted by a First Nation group. The cloth is often tied due east of the ceremonial site to weather and disintegrate as the energy from the prayer is released.

Operations were halted and the construction supervisor was immediately notified upon the discovery of the prayer trees located in Section S1. Ebb and Flow First Nation, Sandy Bay Ojibway First Nation, and landowners were contacted per the CHRPP protocol for newly discovered cultural resources. Mitigation measures included a ceremony conducted on February 13, 2017 to remove the prayer trees that were within the ROW, followed by burning and handling of the removed trees under the guidance and instruction of the Elders from both First Nations. A further recommendation was made that archaeological monitoring occur for those tower structures that were located within 100 meters of a prayer tree.

On-site monitoring activities of tower footing excavations at four locations occurred on February 22nd and 23rd, 2017. The monitoring consisted of examining exposed soils within each of the tower footprints and excavating (in 10-15 cm levels due to the nature of frozen ground) to depths of 1.25 meters. Evidence of cistern and modern debris associated with an abandoned farmyard was found near one tower location. Evidence of modern debris of no heritage significance littered the general area. No additional cultural or heritage resources were found at the tower footprints and construction proceeded.

6.8.6 Assiniboine river crossing

The Assiniboine River Crossing was identified by Long Plain, Dakota Tipi, Swan Lake and Dakota Plains First Nations as an area of concern. Both banks of the Assiniboine River Crossing were assessed during the 2015 field survey; a post-clearing impact assessment was also undertaken at the southern crossing at the request of Swan Lake First Nation. The Assiniboine River crossing was examined in partnership with a representative from Swan Lake First Nation, Manitoba Hydro and the Project Archaeologist due to the presence of a number of archaeological sites in the area. Adjustments to the northern alignment of the transmission line ROW resulted in the avoidance of one heritage ESS site from the ROW. The remaining six registered archaeological sites were revisited and tested with negative results, indicating that these sites were small, isolated finds and no further mitigation was required. Overall, 13 areas were investigated and did not result in the discovery of heritage resources. It was determined that the northern crossing would require a post-clearing assessment and monitoring of tower locations on either side of the Assiniboine River by a professional archaeologist. This work was undertaken in 2016.

6.8.7 ESS location S2-Hert-105

The Heritage ESS location S2-Hert-105 is located in a portion of the transmission line in NW4-7-3 EPM, approximately 5 km southeast of the community of Ste. Agathe, Manitoba. The area is situated on ancient and active riverine features (i.e., Rat River, relic oxbows of the Rat River), and is considered to have high potential for heritage resources.

As no site had previously been recorded at the S2-Hert-105 location, a site form was submitted to the Historic Resources Branch and a Borden number identifier for the Rat River site was assigned.

Heritage monitoring occurred at the S2-Hert-105 site in August 2018 including a pedestrian survey, controlled artifact collection, and subsurface testing in the transmission line ROW and adjacent area (i.e., terrace above the relic oxbow), which recovered a total of six artifacts. The artifacts consisted of a grooved maul, scrapers, flakes, and a projectile point tip. The archaeological monitoring verified heritage

resources and registered a new archaeological site. This concluded the monitoring of heritage ESS locations within Section 2 of the Project.

6.9 Plant species important to Indigenous Peoples

As noted in the Biophysical Monitoring and Mitigation Report (Manitoba Hydro 2014), during the environmental assessment and approval process for the Project, a number of plant species were identified for protection based on their importance to Indigenous people who gather them for food, medicinal and traditional purposes. The Cowan blueberry site was the focus of monitoring in 2014, and again in 2015, 2016, 2017 and 2018 as it was identified by many people as a highly valued local resource.

For this annual monitoring, community members from Pine Creek and Duck Bay joined Manitoba Hydro staff and the vegetation team to visit the Cowan blueberry site and other sites noted to support blueberries. In 2014, ten sites were investigated with side-by-side paired surveys. Two species of blueberries were observed at the Cowan Blueberry Resource Area (velvetleaf blueberry - *Vaccinium myrtilloides* and low sweet blueberry - *Vaccinium angustifolium*). Species richness, cover and diversity were not significantly different between the paired sites. Blueberry occurrence was similar on ROW and off ROW sites.

These sites were re-visited from year to year and overall, it was observed that cover conditions for blueberries had improved over the previous year, with more blueberry plants being recorded on-site and an overall increase since the initial pre-clearing ROW surveys in 2014. Other berry plants recorded in the resource area, based on greatest cover, included smooth wild strawberry (*Fragaria virginiana*), trailing dewberry (*Rubus pubescens*), raspberry (*Rubus idaeus*), Saskatoon (*Amelanchier alnifolia*), pin cherry (*Prunus pensylvanica*), and chokecherry (*Prunus virginiana*). Productive blueberry habitat and other berry plant growth was observed in 2018.

6.10 Liaising with communities

Many mitigation measures relating to culture and heritage resources focused on continuous dialogue and involvement of local communities to ensure matters relating to heritage and culture are addressed in an appropriate manner. Some of the

activities that communities were involved in since construction began are outlined below.

6.10.1 Fur, Feathers, Fins and Transmission Lines' youth camp

A pilot Fur, Feathers, Fins and Transmission Lines youth camp was held August 29 to September 2, 2016 at the Sandilands Discovery Centre. Pursuant to a Bipole III licence condition to invest in educational and/or knowledge transfer programs that promote trapping as well as plant harvesting to communities, the one-week camp focused on trapping, traditional plant use, environmental monitoring and included Elder participation. Eight youth aged 12-16 from Dakota Tipi First Nation, Roseau River Anishinabe First Nation, Swan Lake First Nation and the Manitoba Metis Federation participated. Feedback received was highly favourable.

6.10.2 Wabowden

Wabowden community members participated with consultants in ground transect surveys during the winter of 2015 as part of the mammal monitoring program. Community members snowshoed along transects up to one kilometer off the ROW and noted animal track observations to determine the presence and extent of furbearer activity both on and off the ROW.

In 2017, Wabowden community members also participated in a medicinal plant project where medicinal plants were harvested both on and off the Project ROW. In October 2017, a wrap-up meeting took place regarding Wabowden's Medicinal Plant Project where youth from the community presented their findings.

6.10.3 Opaskwayak Cree Nation

In 2015 and 2016, an OCN community member participated in camera deployment and maintenance for access monitoring for the Project. In addition to the above, a traditional use survey and field tour with the Opaskwayak Cree Nation Natural Resource Council also occurred to determine the efficacy of ROW clearing prescriptions.

In 2017, OCN members participated in an aquatics/mammal monitoring program conducted on OCN's Youth trapline.

6.10.4 Pine Creek and Duck Bay

As noted in the previous section, in 2016, Pine Creek and Duck Bay community members participated in vegetation monitoring related to blueberry abundance in areas of importance to the communities. Survey plots on and off the ROW were investigated to determine blueberry abundance and the efficacy of ROW clearing.

6.10.5 Swan Lake First Nation

In 2015 and 2016, Members of Swan Lake First Nation participated in heritage resource monitoring activities in the S1 and S2 construction segments. Community members conducted shovel testing, ground surveys and artifact collection.

In 2017, members of Swan Lake First Nation participated in ground transect surveys.

6.10.6 Other monitoring and community liaison activity

In addition to the above activities, Manitoba Hydro has developed the following positions: environmental monitors and community liaisons. The intent of these positions is to ensure on-going dialogue and capacity building activities for communities. For the 2014-2018 period, Manitoba Hydro used the expertise of nine environmental monitors and 18 community liaisons hired from 20 different communities.

Primary activities for the environmental monitors included contributing to the design, implementation and reporting of the environmental monitoring program, and contributing ATK to the environmental monitoring program.

For the community liaisons, key activities and responsibilities included:

- Providing traditional knowledge of the area and bringing Indigenous perspective and cultural awareness to the Project site;
- Participating in site safety meetings as required including daily tailboard / job planning meetings;
- Being familiar with, and adhering to, Manitoba Hydro's Life Saving Rules, Safe Work Procedures, and all other regulations, approved practices and procedures;
- Making regular reports to the community, Manitoba Hydro Construction

Supervisor and Chief and Council regarding inspection and monitoring activities, construction schedules, community interests and concerns;

- Sharing Project information and community concerns with environmental monitors;
- Assist in making recommendations for improving mitigation measures; and
- Providing local knowledge about the Project area to facilitate construction (e.g. identify creeks that freeze over, access trails, contact information, timing and type of use by resource users, and community values).

Examples of activities undertaken by some of the community liaisons and environmental monitors during construction were:

- Touring of the Keeyask Generating Station site and KCS site;
- Conducting school tours (i.e., Sandy Bay, Alonsa, Winnipegosis, Langruth, Pine Creek) and trapper education workshops (i.e., The Pas, Camperville, Alonsa);
- Observations of construction activities (e.g., clearing, tower and anchor installations);
- Reviewing sensitive caribou areas with Natural Resource Officers;
- Participating in the Cultural Awareness Training for contractors (i.e., Winnipegosis, Fox Lake, Ponton, Wekusko, Mafeking);
- Noting wildlife observations;
- Participating in daily construction tailboard meetings;
- Flagging sensitive sites (including heritage and cultural sites of importance); and
- Reviewing buffer zones.

7.0 Mitigation

A number of measures were prescribed to mitigate SE effects and address local concerns as documented in the EIS and subsequently identified and initiated by Manitoba Hydro. Below are some examples of the mitigation measures implemented to reduce or monitor effects:

- Manitoba Hydro is working to undertake measurements at a Bipole III testing site near Dugald, Manitoba to monitor EMFs. The measurements will allow for a comparison of EMF levels to those modeled for the EIS. Manitoba Hydro will make the EMF monitoring report available upon completion.
- Manitoba Hydro participated in WIS meetings to provide an opportunity to share information related to the increased workforce in the Gillam area as a result of Manitoba Hydro projects and activities, as well as to identify and work cooperatively to address related issues (e.g., traffic safety, non-local person behavior at facilities in and near the communities, and presence of drugs);
- A comprehensive transportation management plan was developed to reduce the impacts of Project traffic on PR 280 and PR 290, including pre-hauling in winter months, night hauling where possible, management of truck weights and increased communication;
- Cultural Awareness training was provided for workers;
- A regular air transportation charter service was implemented to accommodate the Keewatinohk workforce to ensure that scheduled flights are still available for local residents. There was also a shuttle service to transport workers to and from the airport;
- Keeyask contractor charters were relocated from Gillam to Thompson, in part, to address congestion and flight schedules issues at the Gillam airport;
- Prior to construction activities, registered trapline holders were notified of the schedule for construction activities;
- A Nurse Practitioner was hired to provide onsite health care services at the Keeyask site to reduce non-urgent visits by project workers to the Gillam hospital.
- Lodge owners, recreational resource users, and snowmobile associations were notified in advance of 2013/14 clearing and construction;

- Upon encountering prayer trees, construction activities were halted until a ceremony was conducted to remove prayer trees identified within the ROW, followed by burning and handling of the removed trees under the guidance and instruction of the Elders from Ebb and Flow and Sandy Bay Ojibway First Nations. Additional archaeological monitoring was conducted for tower structures located within 100 meters of a prayer tree as recommended by the First Nations;
- To avoid disturbance to two sites (HdKI-01 and HdKI-02) near the KCS, the footprint of the Converter Station was reduced and seven-foot chain-link fencing was erected to protect the sites from disturbance; and
- Based on continuing investigation of the transmission line ROW, three new archaeological sites were found, one located at the Rat River near Ste. Agathe and two along Sections C1 and N4. Site forms were submitted to the Historic Resources Branch and Borden number identifiers were assigned to each new find.

8.0 Summary

This report documents overall SEMP results for Project construction from October of 2014 to September 30, 2018. Monitoring the Project SE effects meets the commitment identified in the Bipole III EIS as well as the Bipole III *Environment Act* Licence No. 3055.

The results of the four-year monitoring program have provided the information to evaluate long-term changes or trends. Summaries of SE monitoring activities over the 2014-2018 period are presented below by monitoring topic area.

Economy:

The monitoring objective of tracking employment outcomes, construction business outcomes and the effect of Project income levels on government taxes is ongoing. In comparing estimated employment, it was noted that 79% of direct Project employment was derived within Manitoba, and that 31% of Project employment was Indigenous. Approximately 94% of the person years of direct employment on the Project construction, compared to that predicted in the EIS, was realized (Figure 8-1). The construction of the transmission line and converter stations resulted in approximately 34% and 206% of EIS-predicted direct project employment (Figure 8-1).

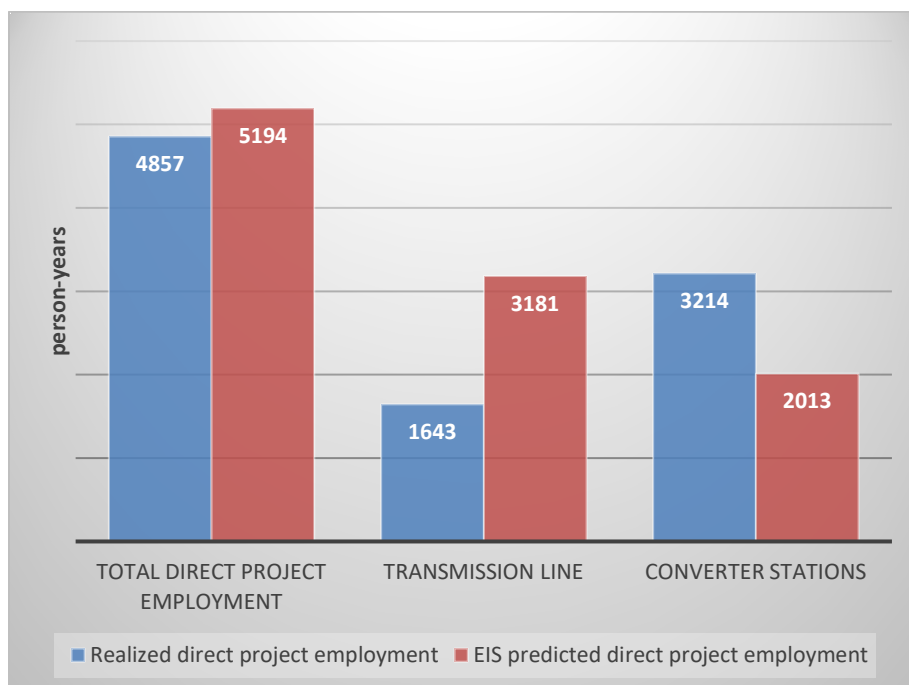


Figure 8-1 Actual and predicted person years of direct employment (2,000 hours per year basis)

For direct Project impacts, approximately 119% of the total project labor income (\$576.5 million), relative to EIS predictions (\$482.3 million), was realized and approximately 84% of tax revenue predicted to be generated for the Province of Manitoba has been realized. Approximately 164% of the predicted direct Project expenditures for the construction phase have been realized (Figure 8-2).

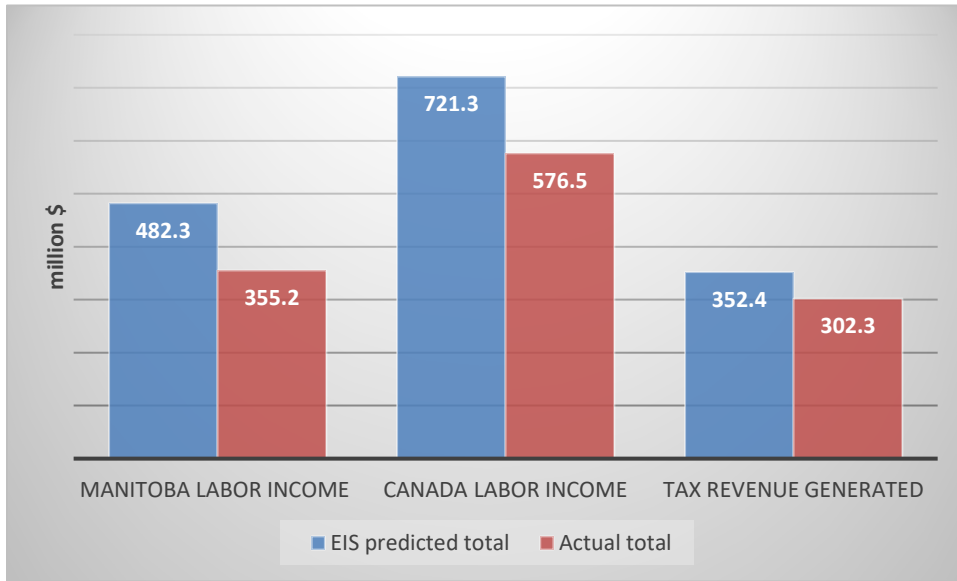


Figure 8-2 Actual and EIS-predicted direct project impacts (\$ million)

A total of \$3,465.4 million dollars was expended for goods and services for the construction of the Project. The actual value is approximately 164% of the total EIS-predicted construction phase Project expenditures (\$2,115.2 million) (Figure 8-3).

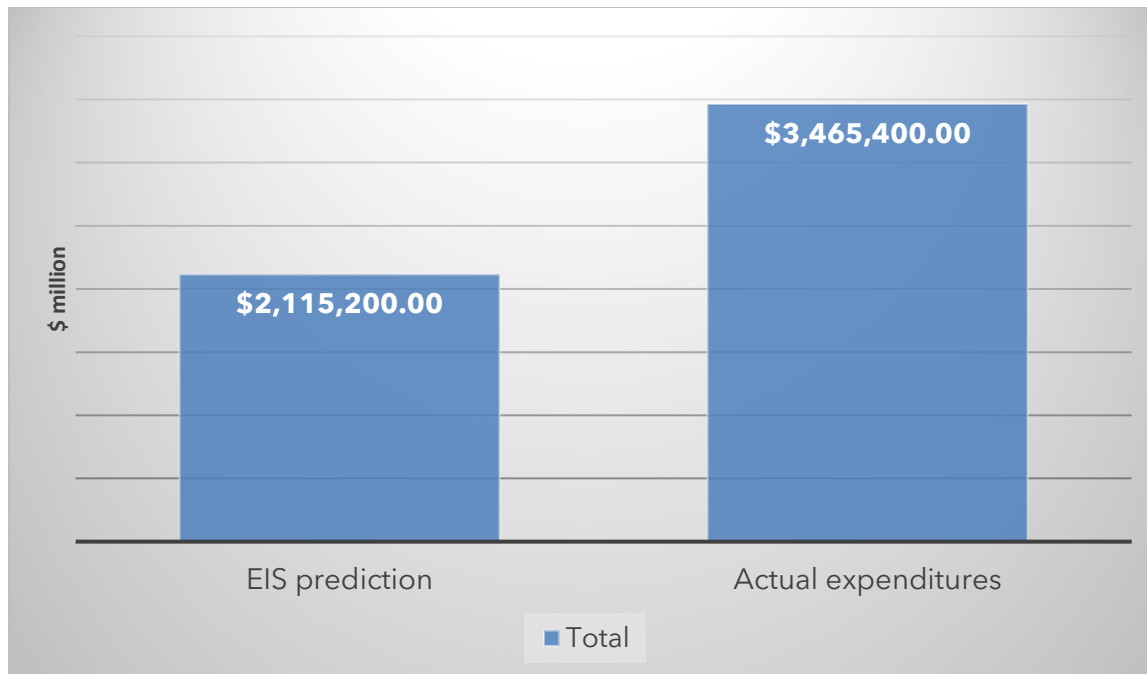


Figure 8-3 Actual and EIS-predicted direct project expenditures

Community services:

Monitoring the extent of Project effects on community-based services such as emergency, health and social services continued during the reporting period. The WIS met regularly and discussed service and infrastructure-related matters throughout the construction phase of the Project (e.g., demands on Gillam hospital from non-locals, use of the Gillam fitness center, congestion at the Gillam airport with buses/shuttles to Keeyask and Keewatinohk, and demands on policing). The WIS also discussed several issues related to traffic/roadway infrastructure (e.g., road conditions and traffic safety, traffic volume, collection of traffic speed data, road maintenance, and increased weight restriction enforcement on PR 280 and PR 290). Based on the outcomes of the discussions, Manitoba Hydro in turn took several actions including monitoring of non-local visits at the Gillam hospital, relaying hospital information to Project staff, addressing congestion and flight schedule issues at the airport through instructions on parking and relocation of Keeyask charter flights from Gillam to Thompson, hiring of a Nurse Practitioner at the Keeyask site to reduce hospital demand, and implementation of the PR 280/PR 290 Task Force traffic management plan to address traffic impacts on PR 280 and PR 290.

Resource use:

The SE component of the furbearer and trapline monitoring program focused on trapper education for potential commercial trappers on active RTLs set aside by Manitoba Conservation and Climate (formerly Manitoba Sustainable Development) as Community/Youth RTLs during the reporting period. Manitoba Hydro sponsored eleven trapper education courses (conducted in The Pas, Camperville, Alonsa, OCN, Wabowden, and Thicket Portage). The communities of Wabowden, OCN, Thicket Portage, FLCN, and TCN participated in the trapping program, with a total of 126 participants. The SE effects monitored are those associated with the trapper education program relating to traditional and general economic gains. All community programs reported that participants harvested furbearers resulting in a positive experience by all involved. Community participants learned about the different trap types, trapping regulations and fur preparation, and in the evening, Elders educated the participants about traditional harvesting techniques. Participants in the trapper education program wrote the provincial exam and received a certificate allowing them to purchase a trapper's licence.

Personal and community well-being:

Monitoring of the extent of Project effects on personal and community well-being was done through the WIS for the four-year construction phase monitoring period. Manitoba Hydro heard concerns regarding EMFs during public open houses and is in the process of undertaking measurements at a Bipole III testing site near Dugald, Manitoba to monitor EMFs. The measurements will allow for a comparison of EMF levels to those modeled for the EIS. The monitoring at the Dugald site (to be reported on separately) is scheduled to commence in 2019 and is expected to be conducted for over a 1.5-year time period (with the possibility of extension).

Concerns regarding personal and community well-being were identified throughout the construction phase of the Project and were brought forward to the WIS. Based on the outcomes of the discussions, the following monitoring activities and mitigative actions were undertaken:

- A PR 280/PR 290 task force transportation management plan was developed, and traffic counters and additional weigh scales were installed to monitor and develop mitigation for the impacts of Project traffic on roads;

- Continued monitoring of “out-of-town” visits at the Gillam hospital and provision of a hospital services information sheet to all workers (regarding hospital facilities, medical staff availability, and related hours). This led to the hiring of a Nurse Practitioner to provide onsite health care services at the Keeyask site to reduce non-urgent visits by project workers to the Gillam hospital;
- Providing instructions to bus/shuttle drivers regarding parking at the Gillam Airport and subsequently, the relocation of Keeyask contractor charters from Gillam to Thompson, in part, to address congestion and flight schedules issues at the Gillam airport; and
- The continued implementation of cultural awareness training for short-term contractors by FLCN to reduce adverse interactions with Project workers.

With respect to traffic safety, collision rates are expected to continue to be below the industry standard threshold (1.5 incidents per MVKT). Monitoring of traffic volumes on the Conawapa Access Road to the KCS during the four-year construction monitoring period identified that on average, 110 vpd were logged at the security gate as using the road during the reporting period. Collisions occurred on PR 280 at a rate of approximately 18 collisions per year and collisions during spring and fall accounted for 58% of all collisions; all collisions were single vehicle collisions.

Cultural and heritage monitoring:

Cultural and Heritage Monitoring during the 2014-18 period included monitoring several heritage ESS locations including: the KCS sites recorded as HdKI-01 and HdKI-02 by the HRIA; the Assiniboine River Crossing; the Cormorant Bottleneck; the S1 Prayer Tree location, the S2-Hert-105 location, and locations along the transmission line ROW in Sections N4, C1 and C2. Monitoring of the Cowan blueberry site was also undertaken on an annual basis.

- At the KCS sites (HdKI-01 and HdKI-02) mitigation included avoidance and erecting a seven-foot chain-link fencing to enclose both sites. Monitoring included an archaeological survey. No evidence of cultural layers or artifacts were discovered upon further monitoring; and no additional mitigation measures were required.

- At the S1 prayer tree location, mitigation included immediately halting operations and performing notifications as per the CHRPP protocol. A ceremony was conducted to remove the prayer trees that were within the ROW, followed by burning and handling of the removed trees under the guidance and instruction of the Elders from potentially affected First Nations.
- At the Assiniboine Crossing heritage locations, mitigation and monitoring included avoidance, archaeological field surveys, and construction monitoring by a professional archaeologist. Overall, investigations did not result in the discovery of additional heritage resources.
- At the Cormorant Bottleneck location, mitigation measures undertaken were avoidance and erecting snow fencing, followed by the additional monitoring resulting in installation of permanent fencing.
- At the S2-Hert-105 site, monitoring undertaken included pedestrian surveys, controlled artifact collection, and subsurface testing, which verified heritage resources and registered a new archaeological site.
- At the Section N4 sites, monitoring included pedestrian surveys and shovel tests, yielding negative results (with no further heritage concerns). Artifacts were recovered at two sites within the ROW in 2018 which verified heritage resources and registered two new archaeological sites.
- At the Section C1 and C2 sites, monitoring included pedestrian surveys and shovel tests. No heritage resources were identified, and the areas were determined to not require further heritage mitigation.
- At the Cowan blueberry site, monitoring was conducted on an annual basis. Overall, community members from Pine Creek and Duck Bay, along with Manitoba Hydro staff and the vegetation team, observed that cover conditions for blueberries had improved year over year.

Liaising with Wabowden, OCN, Pine Creek, Duck Bay, and Swan Lake First Nation was done throughout the four-year construction phase. Engagement activities included ground transect surveys, camera deployment, access maintenance, a traditional use

survey, vegetation monitoring, and heritage resources monitoring. A pilot youth camp was held at Sandilands Discovery Centre and involved youth from Dakota Tipi First Nation, Roseau River Anishinabe First Nation, Swan Lake First Nation and the Manitoba Metis Federation. In addition, Manitoba Hydro used community-based expertise by hiring nine environmental monitors and 18 community liaisons from 20 different communities throughout the four-year construction phase. Activities undertaken by some of the community liaisons and environmental monitors during construction included: reviewing sensitive caribou areas; observing construction activities; observing wildlife; attending daily construction tailboard meetings; flagging sensitive sites (including heritage and cultural sites of importance); and reviewing buffer zones.

9.0 Next steps

Through the operation and maintenance phase of the Project, Manitoba Hydro will continue to implement the Project Environmental Protection Program, using adaptive management to address issues and concerns that arise. Manitoba Hydro will also adhere to the requirements outlined in *Environment Act* Licence No. 3055 issued by Manitoba Conservation and Climate, including the maintenance of a Project website containing information related to monitoring and assessing environmental mitigation and management committed to in the EIS. Contact information is posted to respond to additional issues and concerns that may arise during Project operation and maintenance.

10.0 References

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Appendix A: Final preferred route



Available in accessible formats upon request