TABLE OF CONTENTS

LIST OF TABLES

10.0 SUSTAINABILITY ASSESSMENT

This chapter responds to Section 9.0 of the Environmental Assessment Scoping Document regarding a sustainability assessment of the Project. The chapter examines how Manitoba Hydro's corporate sustainable development policies are incorporated into the planning, design, construction, operation and maintenance, and eventual decommissioning of the Project, as well as how Manitoba's Principles and Guidelines of Sustainable Development, as scheduled under *The Sustainable Development Act* (SDA), have been met. Examples of sustainability indicators are also noted. The indicators will be finalized prior to the initiation of construction and incorporated into the follow-up program for the Project.

10.1 SUSTAINABLE DEVELOPMENT

Manitoba has adopted the general definition for sustainable development from the Brundtland Commission Report entitled *Our Common Future* (1987) which is to "meet the needs of the present without compromising the ability of future generations to meet their own needs". Sustainable development is considered a general philosophy, ethic and approach to guide individual and collective behaviour with respect to the environment, the economy and social well-being. In 1998, the Province of Manitoba established the SDA to create a framework through which sustainable development is implemented in the provincial public sector and promoted in private industry and society in general. The SDA contains principles and guidelines as the framework for implementing sustainable development in the Province. Manitoba's Crown Corporations are required to establish and adopt a corporate sustainable development policy to complement sustainable development in the Province.

As a responsible corporate citizen, Manitoba Hydro strives to be a leader in stewardship and is guided by the principles of sustainable development outlined in the SDA. Manitoba Hydro uses a Plan-Do-Check Environmental Management System (EMS), registered to the ISO 14001 Environmental Management System standard, as a vehicle to enable environmental compliance and protection. A keystone of this system is Manitoba Hydro's Environmental Management Policy that guides all of the corporation's operations (Manitoba Hydro 2008). In addition to the policy commitments identified below, the corporation has identified transmission line construction as a significant environmental activity. This recognition highlights internally the need for allocation of resources and prevention of impact over and above other activities Manitoba Hydro is engaged in including:

- Preventing or minimizing any adverse impacts, including pollution, on the environment and enhancing positive impacts;
- Continually improving our EMS;
- Meeting or surpassing regulatory requirements and other commitments;

- Considering the interests and utilizing knowledge of our customers, employees, communities, and stakeholders who may be affected by our actions;
- Reviewing our environmental objectives and targets annually to ensure improvement in our environmental performance; and
- Documenting and reporting our activities and environmental performance.

Manitoba Hydro is committed to the incorporation of sustainability into all aspects of its operations to achieve environmentally sound and sustainable economic development. Manitoba Hydro established and adopted its corporate sustainable development policy in 1993 to complement the provincial framework, which also pre-dates the development of the SDA enacted in 1998. The policy and its 13 principles are based on the principles and guidelines initially developed by the Manitoba Round Table on the Environment and the Economy. Through its decisions and actions to provide electrical services, Manitoba Hydro strives to meet the needs of the present without compromising the ability of future generations to meet their needs. Outlined below are the thirteen guiding principles that are considered in all aspects of Manitoba Hydro's operations:

1. Stewardship;
2. Shared responsibility;
3. Integration of environmental and economic decisions;
4. Economic enhancement;
5. Efficient use of resources;
6. Prevention and remedy;
7. Conservation;
8. Waste minimization;
9. Access to adequate information;
10. Public participation;
11. Understanding and respect;
12. Scientific and technological innovation; and
13. Global responsibility (Manitoba Hydro 1993).

Manitoba Hydro is also a member of the Canadian Electricity Association (CEA) Sustainable Electricity Program. This is an industry specific program focused on enabling the Canadian electricity sector to manage sustainability from a holistic perspective. As a participant in the program Manitoba Hydro reports on sustainability indicators covering social, environmental and economic performance. Although not presented at a utility or regionally specific level, the CEA releases an annual report of industry performance relative to these sustainability indicators.

10.2 BIPOLE III PROJECT SUSTAINABILITY ASSESSMENT

Table 10.2-1 indicates how Manitoba Hydro and the Province of Manitoba's sustainable development principles and guidelines are incorporated into the planning, design, construction, operation and maintenance, and eventual decommissioning of the Project, where applicable. The Province's sustainable development principles and guidelines are only presented in the table and some principles are combined that are similar in nature. Manitoba Hydro's sustainable development principles are based on the Provincial Principles and Guidelines. Examples of sustainability indicators are also included in the table. The indicators will be finalized prior to commencing construction and will be incorporated into the Project follow-up program.

Table 10.2-1: Bipole III Project Sustainability Assessment

MB Sustainable Development Principles and Guidelines	Comment	Indicator
Integration of environmental and economic decisions Economic decisions should adequately reflect environmental, human health and social effects Environmental and health initiatives should adequately take into account economic, human health and social consequences	The goal of the site selection process for the Project was to balance environmental, economic and social considerations in identifying alternative routes and ultimately selecting the preferred route. Through the route selection process, alternate alignments were selected to avoid sensitive areas such as national parks, ecological reserves, provincial wilderness parks, provincial protected areas and critical habitat for species at risk. Technical feasibility and cost effectiveness were also considered. A total of 28 factors were used to evaluate the alternative route segments and to select the preferred route in five general categories: biophysical, socio-economic, land use, technical and stakeholder input. The biophysical and land use factors addressed the environmental considerations. Technical considerations addressed the economic aspects of the project through the consideration of line length, construction access and use of angle towers. The ultimate goal of the process was to select a route that was technically feasible, had the least impact on the environment and communities, and was the most cost effective of the alternatives. Once the preferred route was selected, environmental and economic considerations were further considered in the environmental assessment of the preferred route. The scoping document guided the assessment and included assessing the effects of the project on mammals and mammal habitat, birds and bird habitat, infrastructure and services, and resource use, for example.	Report on Environmental Protection Plan and mitigation effectiveness through the Environmental Inspection Program (see Environmental Protection Plan, Chapter 11, Attachment 11-1). Environmental Inspectors will conduct frequent inspections of work sites and report daily, weekly and monthly. The number and type of incidents will be reported on, tracked and addressed during the construction phase of the Project.

MB Sustainable Development Principles and Guidelines	Comment	Indicator
Stewardship The economy, the environment, human health and social well-being should be managed for the equal benefit of present and future generations Manitobans are the caretakers of the economy, the environment, human health and social well-being for the benefit of present and future generations Today's decisions are to be balanced with tomorrow's effects **Integrated decision-making and planning** …encouraging and facilitating decision making and planning processes that are efficient, timely, accountable and cross-sectoral and which incorporate an inter-generational perspective of future needs and consequences	The existing transmission system is vulnerable to the risk of catastrophic outage if both Bipole lines and/or the Dorsey Converter Station are damaged due to severe weather events, fire or sabotage. System reliability studies have concluded that the likelihood of such events occurring, when combined with severe consequences of prolonged major outages, warrant substantial system improvements to reduce dependence on Bipoles I and II and the Dorsey Station. The potential effects of such an event could have serious consequences to the health, safety and security of Manitobans. The Project will reduce dependence on the existing Bipole I and II transmission lines and the Dorsey Station to ensure that a reliable supply of electricity is accessible to Manitobans today as well as to future generations. The Project will provide substantial economic benefits to Manitobans with the major economic benefit from the construction phase. In total, the entire project construction expenditure is expected to contribute to Manitoba: • 8,782 person-years of direct and indirect employment • $482.3 million in labour income • $688.7 million in GDP • $352.4 million in tax revenue	Goods and services purchased in or from: • Manitoba • Local businesses/suppliers • Aboriginal businesses/suppliers Percent of total project workforce that is Aboriginal. Health and safety - Accident frequency: Number of accidents per 200,000 hours worked.

MB Sustainable Development Principles and Guidelines	Comment	Indicator
Shared responsibility and understanding Manitobans should acknowledge responsibility for sustaining the economy, the environment, human health and social well-being, with each being accountable for decisions and actions in a spirit of partnership and open cooperation Manitobans share a common economic, physical and social environment Manitobans should understand and respect differing economic and social views, values, traditions and aspirations Manitobans should consider the aspirations, needs and views of the people of the various geographical regions and ethnic groups in Manitoba, including aboriginal peoples, to facilitate equitable management of Manitoba's	In understanding the dated nature of information and the need for current data to conduct the Bipole III SSEA, Manitoba Hydro collaborated with Manitoba Conservation on a number of strategic monitoring and research initiatives to acquire data to be used in the selection of a route that would minimize impacts on caribou ranges by avoiding core use areas and critical habitat. The monitoring conducted by Manitoba Hydro was developed and peer reviewed by outside experts prior to execution of Project specific monitoring and research. This involved an independent threat assessment using Environment Canada's guidelines for species at risk recovery planning. Planning, designing, constructing, operating and maintaining the proposed Project involves many departments within Manitoba Hydro, as well as external consultants and contractor staff. Personnel gained an awareness of technical and environmental issues associated with the project and considered such concerns to arrive at balanced project decisions. An EnvPP is submitted with the EIS to provide for the effective implementation of mitigation measures and follow-up requirements. Construction Phase EnvPPs will be created for the construction phase of the Project, followed by an Operations Phase EnvPP. The purpose of the plans are to provide for the effective implementation of mitigation measures and follow-up actions, as well as the application of regulatory requirements, environmental guidelines and best practices identified in	Number of Environmental Inspectors on-site during construction. Number of training sessions for contractors on EnvPPs. Number of community members involved in implementation of EnvPPs.

MB Sustainable Development Principles and Guidelines	Comment	Indicator
common resources	the Bipole III EIS. EnvPPs help to ensure that contractors and field staff effectively fulfill their responsibilities for protecting the environment during the life of the Project. Environmental Inspectors will be on-site during construction, and detailed inspection and reporting functions are identified to ensure construction activities occur in a responsible fashion. Successful and effective implementation of EnvPPs is dependent on the shared responsibilities of Manitoba Hydro, regulators, contractors and stakeholders. An inclusive four round consultation program was undertaken with governments, local stakeholders, Aboriginal groups and the general public to identify the preferred route for the proposed Project. Input received during the consultations facilitated a better understanding of the perspectives, values, and aspirations of communities. It was instrumental in the selection of the preferred route and identifying key issues to be addresses during the environmental assessment process. After round two of the public consultation process a decision was made to limit diagonal crossing through cultivated lands to accommodate concerns raised by the agricultural community, for example. Also, habitat of species at risk has been avoided, to the extent possible (e.g., Boreal Woodland Caribou). Project information has been and will continue to be shared with all individuals and communities that are interested and/or potentially affected by the proposed Project during the regulatory review, project construction and operation phases.	

MB Sustainable Development Principles and Guidelines	Comment	Indicator
Efficient use of resources Encouraging and facilitating development and application of systems for proper resource pricing, demand management and resource allocations together with incentives to encourage efficient use of resources; and Employing full-cost accounting to provide better information for decision-making.	The decision to proceed with the development of a Bipole III transmission line was made after careful consideration of a range of other options (See Chapter 2). The site selection process was employed to facilitate the selection of a route with minimal and efficient use of monetary resources and natural capital. For example, with the assessment of alternatives, fragmentation of wildlife and plant habitat, avoiding caribou habitat to the extent possible, the number of angle towers and construction access were all factors taken into consideration to arrive at a balanced decision in the selection of the preferred route. The selection of sites for converter stations and ground electrode facilities also considered a range of options. During construction of the project all activities and personnel will be working under the auspices of the EMS framework and governance including Manitoba Hydro's Environmental Management Policy.	Total volume of recycled materials used during project construction. Total volume of wood made available to communities through ROW clearing.
Prevention Manitobans should anticipate, and prevent or mitigate, significant adverse economic, environmental, human health and social effects of decisions and actions, having particular careful regard to decisions whose impacts are not entirely certain but which, on	A proactive approach was taken through the identification of alternative routes and ultimately the selection of the preferred route to avoid adverse environmental effects and enhance positive project effects. Habitat of species at risk such as the Boreal Woodland Caribou has been avoided, future residential development in rural municipalities was accommodated and the route was adjusted to accommodate mining sector interests.	Number and volume of spills (m^3) during the construction phase of the Project. Number of available project components decommissioned/restored (e.g., total number of borrow areas reclaimed).

MB Sustainable Development Principles and Guidelines	Comment	Indicator
reasonable and well-informed grounds, appear to pose serious threats to the economy, the environment, human health and social well-being **Rehabilitation and reclamation** Manitobans should: Endeavour to repair damage to or degradation of the environment; and, Consider the need for rehabilitation and reclamation in future decisions and actions	Through the comprehensive environmental assessment process it has been determined that there will be no significant residual adverse effects with the application of mitigation measures. Reclamation and remediation plans will be prepared for the Project. The reclamation plan will be prepared to manage reclamation activities at construction sites for the Project. The plan will be completed and implemented prior to demobilizing and cleaning up construction sites. Remediation plans will be prepared to manage remediation activities and any contaminated sites identified as a result of the Project. Borrow areas, construction sites, access roads and other Project components that are no longer required will be decommissioned and lands will be restored as required. EnvPPs will be implemented during the construction and operation phases of the Project to ensure contractors and field staff can effectively fulfill their responsibilities for protecting the environment. An adaptive management approach will be implemented for the project and what is learned through project monitoring will be taken into account in making any necessary changes to activities to address issues in an expeditious manner and to remedy any unforeseen issues.	

MB Sustainable Development Principles and Guidelines	Comment	Indicator
Waste minimization and substitution Encouraging and promoting the development and use of substitutes for scarce resources where such substitutes are both environmentally sound and economically feasible; and Reducing, reusing, recycling and recovering the products of society	It is recognized that hazardous and non-hazardous waste materials will be generated during construction of the transmission line and associated facilities. Waste generated by the Project will be collected, managed and disposed of in accordance with provincial legislation and guidelines. Hazardous materials will be managed in accordance with Manitoba Hydro's Hazardous Material Management Policy (2003). Opportunities to reduce, reuse and recycle non-hazardous wastes will be taken whenever possible, and identified in a Waste Management and Recycling Plan. This Plan will be completed and implemented prior to the construction phase of the Project. The objective of this Plan will be to provide for effective waste management in accordance with provincial legislation and guidelines, and corporate policies and procedures for the protection of human health and the environment. The Plan's scope will be limited to solid non-hazardous wastes and will include waste reduction, recycling and reusing initiatives. Environmental Inspectors will conduct regular inspections of construction activities including waste management. Furthermore, Plan implementation will be reviewed annually and results from the reviews will be used to adjust plan provisions to ensure continued effectiveness.	Total quantity of waste generated (per thousand tonnes) during the construction phase of the project. Total quantity of waste materials diverted from landfills.

MB Sustainable Development Principles and Guidelines	Comment	Indicator
Public participation Establishing forums that encourage and provide opportunity for consultation and meaningful participation in decision-making processes by Manitobans; Endeavouring to provide due process, prior notification and appropriate and timely redress for those adversely affected by decisions and actions; and, Striving to achieve consensus among citizens with regard to decisions affecting them. **Access to information** Encouraging and facilitating the improvement and refinement of economic, environmental, human health and social information; and Promoting the opportunity for equal and timely access to	An extensive four round consultation program was undertaken with governments, stakeholders, Aboriginal groups and the public to assist in the selection of the preferred route and to identify issues to be addressed in the environmental assessment of the preferred route. The principles adopted for the Bipole III consultation process included: ensuring the process is accessible and fair; providing multiple means of communication with stakeholders; providing opportunities for ongoing stakeholder input; and allowing the process to be flexible. Early and ongoing consultation and information sharing was critical to ensuring meaningful public involvement. Over 4,500 individuals participated in the consultation process and over 400 consultation activities occurred over the four rounds of consultation through a variety of engagement mechanisms (e.g., one-on-one meetings, open houses, landowner information centres and electronic communication via the project website). Input received was critical in making adjustments to the route alternatives and ultimately selecting the preferred route (e.g., limiting diagonal crossing through cultivated lands to accommodate concerns raised by the agriculture community; adjustments made to the route to accommodate mining interests that were concerned about possible interference of the transmission line with geo-physical exploration). Opportunities for the public to be engaged in discussions about the proposed Project will also occur post-EIS submission through the regulatory review process. Information from the assessment will be on	Number of notifications sent to communities/property owners prior to construction on their property/jurisdiction. Number of locations where project information is made available to the public.

MB Sustainable Development Principles and Guidelines	Comment	Indicator
information by all Manitobans.	Manitoba Hydro's project website, as well as on Manitoba Conservation's public registry located throughout Manitoba for the public to review and comment on the document. Project information has been and will continue to be shared with all stakeholders affected and interested in the Project through a variety of means such as a project website, as well as other public consultation forums including public accountability meetings that are held throughout the province annually.	
Research and innovation Encouraging and assisting the researching, development, application and sharing of knowledge and technologies that further our economic, environmental, human health and social well-being.	A number of modern technologies and software were used in the design of the Bipole III transmission line and associated facilities (i.e., towers) that results in improved reliability and more cost effective solutions. Light Detection and Ranging (LiDAR) was used to survey the preferred route and played an instrumental role in many aspects of design. LIDAR is a remote sensing technology that can measure the distances to objects or properties of a target using pulses from a laser. For the Bipole III Project the information from LiDAR was imported into a software program to create 3D visual renderings that assisted in generation of the line profile, span optimization and development of the tower family. With respect to design, the application of the Reliability Based Design method will deliver design of the Bipole III transmission line to a prescribed reliability level with higher confidence than traditional deterministic methods. The following factors are expected to contribute	Bipole III reliability and successful operation with minimal outages. Number of customer complaints related to electrical device interference. On-going research on woodland caribou and application to sustaining populations.

MB Sustainable Development Principles and Guidelines	Comment	Indicator
	to the overall reliability of the Project: Design loads: Selection of design loads have been based on statistical analysis of the most current weather data as recorded at various weather stations. Scientific analysis of the data was used to predict these loads for a chosen reliability level corresponding to a 150-year return period. Material Strength: Load and strength factors have been derived from statistical functions separately for each of the transmission line components. This allows one to design transmission lines in such a way that will allow it to fail in a prescribed mode if it is exposed to weather loads in excess of its capacity. Consequences of such failure can be easier handled by the use of proper mitigation measures. Security Measures: The transmission line will be designed to resist uncontrolled failures through the introduction of special security load cases and the provision of "anti-cascading" towers. Should the line fail due to a weather event exceeding line capacity, the damage is expected to be contained to the line section rather than allow the propagation of the failure in an uncontrolled manner. Due to concerns raised through the public consultation process about the effects of HVdc transmission lines on GPS use in an agricultural setting, Manitoba Hydro commissioned two independent studies to understand the ability of Global Navigation Satellite System (GNSS) receivers to operate under HVdc power lines. The tests showed no interference with any type of GPS or Global	

MB Sustainable Development Principles and Guidelines	Comment	Indicator
	Navigation Satellite System (GNSS) technology tested, including RTK and other correction systems. These studies have contributed to improving understanding of a subject area that is currently not well documented in the literature. Woodland caribou are the subject of on-going research and study due to their protected status and habitat requirements. Information on their movements and habitat use is required to ensure the sustainability of the caribou herds.	
Global responsibility Manitobans should think globally when acting locally, recognizing that there is economic, ecological and social interdependence among provinces and nations, and working cooperatively, within Canada and internationally, to integrate economic, environmental, human health and social factors in decision-making while developing comprehensive and equitable solutions to problems.	Manitoba Hydro considers the potential transboundary effects (e.g., GreenHouse Gas (GHG) emissions) from its projects and takes them into account during project planning. For the proposed Bipole III Project, for example, a detailed GHG life-cycle assessment was undertaken as part of the environmental assessment process. The purpose of the assessment was to quantify the life-cycle GHG emissions associated with the construction, operations and decommissioning of the Project. Overall, It is anticipated that the project will not have any significant adverse transboundary effects through GHG emissions.	Amount of atmospheric emissions of GHGs from Project vehicle fleet.

MB Sustainable Development Principles and Guidelines	Comment	Indicator
Conservation and enhancement Maintain the ecological processes, biological diversity and life-support systems of the environment; harvest renewable resources on a sustainable yield basis; Make wise and efficient use of renewable and non-renewable resources; and, Enhance the long-term productive capability, quality and capacity of natural ecosystems.	The Bipole III Project is subject to a comprehensive environmental assessment to identify the effects of the project on the environment and communities and to mitigate any adverse effects. Through the routing process the most sensitive ecological areas, such as ecological reserves, provincial protected areas and critical habitat for species at risk were avoided. The conclusion from the Environmental Impact Statement is that the Project is not expected to result in any significant adverse effects with the implementation of mitigation measures. Any potentially sensitive sites along the preferred route and at associated facilities will be protected through specific measures for each site that were identified by discipline experts and through the ATK process.	Total number and kilometres of available access roads/trails decommissioned. The success of the EnvPP implementation as measured by annual review and auditing.

10.3 CONCLUSIONS

Based on the analysis undertaken, the Project is an excellent example of sustainable development. It is a project that will reduce dependence on the existing Bipole I and II transmission lines and associated corridor, and will also reduce dependence on the Dorsey Converter Station to ensure that a reliable supply of electricity is accessible to Manitobans today as well as to future generations. The Project embodies sustainable development principles in ensuring that there is consideration of the environment, economy, health and social well-being through integrated decision-making. Environmental and social effects are avoided, minimized or compensated for as a result of a comprehensive environmental assessment process that included public, stakeholder and Aboriginal participation. Plans will also be in place to minimize waste, protect the environment and rehabilitate construction sites.

10.4 REFERENCES

Government of Manitoba. 1997. The Sustainable Development Act. C.C.S.M c.S270.

Manitoba Hydro. 1993. Sustainable Development Policy/Principles. http://www.hydro.mb.ca/environment/policy/sdp.shtml

Manitoba Hydro. 2008. Environmental Management Policy. October 30, 2008. http://www.hydro.mb.ca/environment/policy/ems_policy.pdf.

United Nations World Commission on Environment and Development. Our Common Future (1987) Oxford: Oxford University Press.