TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

5.0 ENVIRONMENTAL PROTECTION AND SUSTAINABLE DEVELOPMENT

This chapter outlines the environmental protection measures that have been integrated within the Project development and describes mitigation specifications and plans that will be implemented throughout the Project design, construction planning, construction, and the operations and maintenance phases. Environmental protection measures are derived from ESRA's corporate environmental and safety policies and include such measures as: design mitigation measures; environmental protection procedures; detailed construction and operational phase environmental management plans; contract specifications; health and safety protocols; and contractor plans such as the Emergency Response Plan. Collectively these measures are incorporated into the Project's Environmental Management Plan. Encompassed within ESRA's environmental protection measures is a commitment to sustainable development (**Section 5.6**).

ESRA's Environmental Protection Policy, Environmental Protection Procedures and Specifications, health and safety protocols, design mitigation measures, and the contractor's emergency response plans are examples of the environmental protection tools and guidance that will be implemented for this Project.

Specific mitigation measures that will be applied to avoid or minimize potential adverse effects on environmental components, including measures to mitigate the effects of the environment on the Project and measures to mitigate accidents and malfunctions, are provided in **Chapters 7 through 12**. ESRA's commitments to environmental monitoring and follow-up are provided in **Chapter 14**.

5.1 ESRA's Environmental Program

ESRA's commitment to environmental protection is outlined in the Authority's Environmental Protection Policy which states that:

"The Manitoba East Side Road Authority consultants, contractors and agents are committed to being a positive and creative force for the protection and enhancement of the environment. This includes having respect for the public that could be affected by our decisions and actions and being responsible stewards of the environmental resources in our care. In recognizing that our construction activities could affect the environment, we are committed to proper understanding of these potential environmental impacts and have adopted measures aimed at protecting and preserving our environment …"

The full policy statement is provided in **Appendix 5-1**. The Policy outlines ESRA's commitment to environmental matters including regulatory requirements and provides the framework for ESRA's Environmental program. Similar to the Environment Policy, ESRA's Safety Policy outlines corporate expectations for safety performance in relation to Project development.

ESRA's Environmental Program stems from the commitments outlined in the Policy and addresses all stages of the project including:

- Project Planning;
- Construction Planning;
- Construction; and
- Operations and Maintenance (**Figure 5-1**).

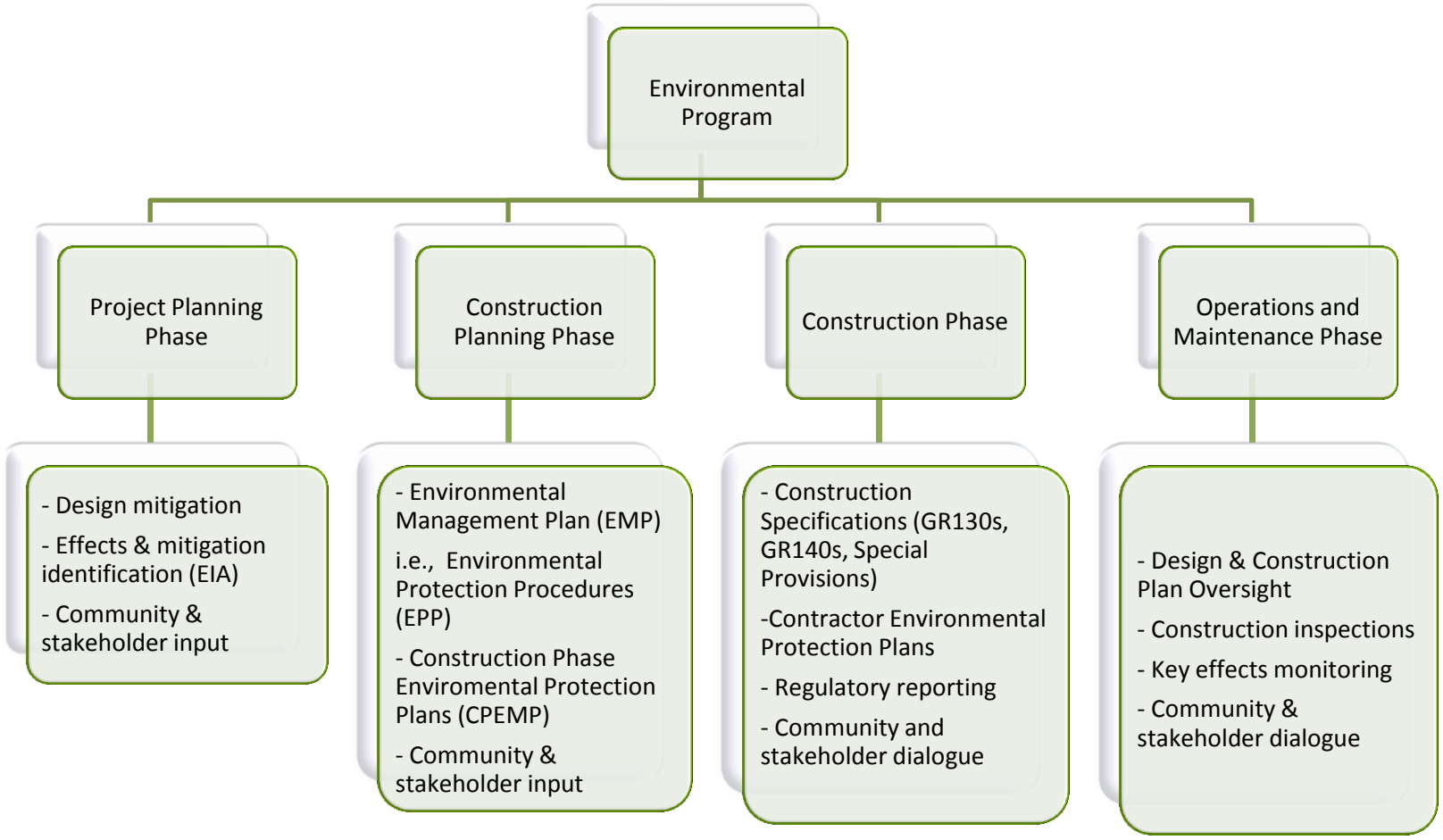

Figure 5-1: ESRA's Environmental Program across Project Stages

5.2 Environmental Protection - Project Planning

5.2.1 Design Mitigation and Community and Stakeholder Input

Design mitigation involves modifying the design of a proposed project to mitigate potential adverse environmental effects at the environmental impact assessment stage prior to completion of the final design and commencement of construction. At this current Planning Phase for the Project, design mitigation has been accomplished by various means including complying with legislation, adopting national and international design standards and codes, adhering to established design guidelines and best management practices, and implementing mitigation measures identified from the environmental impact assessment process including:

- Information from baseline studies;
- Input from the Aboriginal and Public Engagement Program (**Chapter 4**); and
- Environmental effects identification, assessment and mitigation.

A particularly important influence on the Project design mitigation has been Project-specific input received from elders, elected officials and members of the local First Nations as well as other aboriginal communities and stakeholders during the Large Area Transportation Network Study (SNC-Lavalin *et al.* 2010a,b,c; 2011a,b). Receipt of local and traditional knowledge of environmentally and culturally sensitive areas allowed for the mitigation of potential adverse effects through a series of modifications to the proposed road corridor culminating in the selection of the preferred road alignment as proposed and assessed in this EIS. The history of Project route alternatives and mitigation incorporated into revised alignments is provided in **Chapter 2** (Project Alternatives and Selection Process). A summary of the design modifications that were incorporated into the current proposed alignment to mitigate adverse environmental and socio-economic effects identified through the Aboriginal and Public Engagement Program (**Chapter 4**) is provided in **Table 5.1**. Additional design mitigation measures identified through the EIA process (identified in **Chapters 7** through **10**) will be incorporated into a design requirements document for the design engineer. ESRA will maintain responsibility for design oversight to monitor that these measures are implemented as planned.

A particularly important influence on the Project design mitigation has been input received from the local First Nations communities, other aboriginal communities and stakeholders.

Table 5.1: Design Mitigation Resulting from Community Feedback Related to Changes in the P4 All-Season Road Route Options

Identified through Engagement	Design Mitigation	Resulting Benefit
Poor soil conditions and possible flooding of initial proposed alignment options between winter road and Lake Winnipeg due to bog and fen areas.	Road route moved east from Lake Winnipeg and existing winter road.	Better soil conditions for construction, locally available building materials reducing the project footprint. Lower risk of flooding.
Potential effects on traditional use areas and important habitat in proximity to Poplar River.	Road route moved west from Poplar River and associated traditional use areas.	Minimized potential adverse effects to traditional use areas and important habitat associated with Poplar River.
Potential effects on traditional use areas in proximity to Etomami River.	Road route moved east from Etomami River and associated traditional use areas.	Minimized potential impacts to traditional use areas associated with Etomami River.
Potential effects on traditional use areas around Many Bays Lake.	Road route moved east away from Many Bays Lake to the extent feasible.	Minimized potential impacts to traditional use areas associated with Many Bays Lake.
Consideration of safe crossing locations for trails.	Design mitigation at trapline access points and other community access points along the all-season road: ▪ Gradual road platform slopes to accommodate snowmobile access across the alignment; and ▪ Enhanced visibility at access points.	Facilitates travel along established snowmobile/travel routes which will preclude the need to cut additional/alternative trails.
Consideration of watercourse navigation and fish passage requirements.	Watercourse crossings designed with appropriate vertical clearance and will be clear-span, where possible, to avoid in-water piers.	Minimized potential for obstructing navigation and fish passage as well as reduced potential of adverse effects to instream fish habitat.

References: SNC-Lavalin *et al.* 2010a,b,c,d; 2011a,b; MFESRA 2012. See **Chapter 2, Figure 2-1** for a map of the history of the P4 all-season road alignment alternatives.

5.3 Environmental Protection - Construction Planning

5.3.1 Environmental Management Plan (EMP)

The purpose of the Environmental Management Plan (EMP) is to provide an overall environmental management framework for the Project to address environmental risks associated with the Project.

An Environmental Management Plan (EMP) will be developed by ESRA during the Design Phase and will be submitted to the Environmental Assessment and Licensing Branch of Manitoba Conservation and Water Stewardship prior to commencing Project construction. The purpose of the EMP is to provide an overall environmental management framework for the Project to address environmental risks associated with the Project development. The EMP is intended for use at the corporate level for checking that commitments made in corporate policy statements, this environmental impact statement, licences, permits and approvals are implemented and monitored. The EMP incorporates the regulatory requirements stemming from CEAA approval, *The Environment Act* Licence and other approvals. It will be implemented during the detailed design, construction, and operations and maintenance phases of the Project and updated as required to respond to substantive changes such as new information, regulatory changes, or adaptive management measures that may be implemented. A framework for the EMP is provided in **Appendix 5-2**.

The EMP documents the framework that will be used to manage the environmental aspects of the Project and includes metrics to: incorporate mitigation commitments made in the EIS into the design of the Project; monitor mitigation procedures during construction; and evaluate mitigation measures following Project completion. The EMP provides information and procedures for this Project and for use in future road projects relating to environmental awareness training, environmental protection methods, and site-specific environmental protection procedures to be implemented. Key components of the EMP include:

- Schedule and Activity Tracking;
- Detailed Design Requirements;
- Environmental Protection Procedures;
- Environmental Inspection Plan;
- Quarry Requirements Plan;
- Construction Phase Environmental Management Plans;
- Monitoring and Follow-up;
- Reporting;
- Management Review; and
- Plans and measures to address other conditions of *The Environment Act* Licence and environmental approvals as appropriate.

The EMP is supported by ESRA's Environmental Protection Procedures and Environmental Protection Specifications for contractors. ESRA's EMP is modeled after the ISO 14001 Environmental Management System (EMS) and comprises the corporate Environment Policy and the EMS steps of planning and implementation, checking and management review (**Figure 5-2**). The EMP provides the overarching framework for the management of environmental components relative to the Project. The EMP requires development of the following plans and procedures:

- Construction Phase Environmental Protection Plans;
- Environmental Inspection Plan;
- Monitoring and Follow-up Plan; and
- Environmental Protection Procedures.

Figure 5-2: ISO 14001 Environmental Management System Structure

ESRA's environmental protection requirements for road construction projects are documented in ESRA's Environmental Protection Procedures and Environmental Protection Specifications, referred to as GR130s. The GR130s will form part of the tender packages and construction contracts for the Project.

5.3.2 Environmental Protection Procedures (EPPs)

ESRA's Environmental Protection Procedures (EPPs) are designed to provide guidance on environmental protection practices for preconstruction and construction activities. The current EPPs are founded on both best practices and regulatory requirements and include the following:

1. Clearing and Grubbing
2. Petroleum Handling and Storage
3. Spill Response
4. Noise Control
5. Materials Handling and Storage
6. Working Within or Near Fish Bearing Waters
7. Stream Crossings
8. Temporary Stream Diversions
9. Fish Passage
10. Fish Salvage
11. Culvert Maintenance and Replacement
12. Blasting Near a Watercourse
13. Heritage Resources
14. Wildlife
15. Wildfires
16. Erosion and Sediment Control
17. Concrete Area Management Practices
18. Dust Suppression Practices
19. Borrow Pit Decommissioning
20. Quarry Site Selection and Requirements
21. Site Selection – Temporary Work

Copies of ESRA's EPPs are presented in **Appendix 5-3**. Included in several EPPs, including EPP 19, 20, and 21, are details on the selection criteria for Project components such as borrow areas and quarries, as well as temporary works.

5.4 Environmental Protection – Construction

Environmental protection is incorporated into the construction phase through a variety of contract specifications and special provisions and contractor submittals.

5.4.1 Contract Specifications

Construction contract specifications detail the technical design as well as Project-specific restrictions in how the work is to be completed. For the proposed all-season road Project, multiple contracts will be tendered for specific Project components (e.g., road segment, bridge). Contract specifications will be tailored to the component-specific conditions. Each contract will include site-specific requirements for environmental protection. For example, bridge and stream crossing designs incorporate erosion and sediment controls to provide permanent protection for local watercourses.

The GR130 environmental specifications that are included in ESRA construction contracts provide general environmental protection direction and requirements for environmental topics encountered for most road construction projects (GR130s are presented in **Appendix 5-4**). ESRA will update the GR130s

periodically to capture current best practices and regulatory requirements. Examples of GR130s of relevance to the proposed all-season road Project include the following:

- Record keeping;
- Inspections;
- Designated Areas and Access;
- Materials Handling, Storage and Disposal;
- Spills and Remediation and Emergency Response;
- Dust and Particulate Control;
- Noise and Noise Limitations;
- Planned and Unplanned Shutdowns;
- Staff Training and Awareness;
- Working Within or Near Water;
- Erosion and Sediment Control;
- Clearing and Grubbing;
- Heritage Resources;
- Wildlife;
- Wildfires; and
- Cement Batch Plant and Concrete Wash-out Area.

In addition to the implementation of ESRA's GR130 specifications in their construction activities, the contractor is required to develop and implement a series of detailed environmental submittals specific to the contract (e.g., Materials Safety Data Sheets, copies of all required approvals, clearances, permits, licences, and certificates). To assist the contractor in their environmental submittals outlined in the GR130s, guidance materials will be provided to the contractor upon award.

In addition to ESRA's Environmental Protection Specifications (i.e., GR130s), ESRA's Workplace Safety and Health Specifications (GR140s) also form part of the tender packages for construction contracts for the Project. ESRA's GR140s developed for the Project 1 all-season road (PR 304 to Berens River) are provided in **Appendix 5-5** for illustration purposes. A Project-specific set of GR140s will be developed for inclusion in the tender packages for the proposed P4 Project. Examples of key topics expected to be addressed in ESRA's GR140s for the P4 Project include the following:

- Safety and Health Program Requirement;
- Safe Work Plan[1];
- Safety Representative;
- Orientation and Training;
- Monthly Reporting Procedures;
- Project Safety Information Board;
- Workplace Safety and Health Committee;
- Required Acts/Regulations on Site;
- Public Safety;
- Personal Protective Equipment;
- Fall Protection;
- Emergency Procedures;
- Incident Reporting;
- Sanitary Facilities;
- Inspections;
- Housekeeping;
- Magazine License and Explosives Storage;
- Equipment Maintenance;
- Lockout/Tagout;
- Excavations;
- Traffic Management;
- Smoking;
- Compressed Gases;
- Clearing;
- Quarry;
- Crushing;
- Drilling;
- Blasting;
- Utilities;
- Explosives Transportation (By Ground);
- Explosives Transportation (By Air); and
- Summary of Required Submission.

[1] An outline of the Safe Work Plan ESRA will require contractors to provide is in **Appendix 5-6.**

- Material Safety Data Sheets (MSDS);

5.4.2 Contractor-Required Plans

Specific environmental protection plans that each construction contractor will be responsible for providing are outlined in ESRA's GR130.3.1 (**Appendix 5-4**). To provide consistency in the standard and approach required, ESRA provides all contractors with an environmental pre-construction guidance document and associated Contractor reporting forms. Prior to construction, the contactor is required to submit plans in accordance with the GR130s for acceptance by the Contract Administrator. Examples of contractor-required plans are presented below.

Waste Management Plan

The contractor will be responsible for managing wastes associated with the construction contract. The management of various wastes that must be collected, stored, transported, and disposed of in accordance with provincial and federal legislation and guidelines are described in a plan submitted as per the specifications. Wastes will include solid non-hazardous waste, kitchen waste, liquid wastes (sewage and grey water), and hazardous wastes including contaminated soil. The Waste Management Plan will include procedures to check that the collection, storage, transportation, and disposal of all wastes generated will be conducted in a safe, environmentally responsible, and compliant manner. The plan will define roles and responsibilities to be undertaken by the various site contractors and project personnel and establish guidelines for storing and processing the wastes. The intent is to provide a high degree of control over the management of wastes thereby minimizing adverse environmental effects. The Waste Management Plan will also make appropriate references to other environmental component management plans with regard to health and safety, hazardous materials management, and emergency response.

Dust Control

Fugitive dust will be generated by road construction activities by: operating construction equipment and vehicles, blasting, rock quarrying and crushing, batching concrete, excavating, placing fill, and grading. A Dust Control Plan may be required to establish procedures for the control of dust during Project construction.

Explosives and Blasting Management Plan

As indicated in ESRA's Workplace Safety and Health Specifications (GR140s; **Appendix 5-5**), an Explosives and Blasting Management Plan for the Project will be prepared and submitted by applicable contractors after contract award for each segment of road tendered for construction and prior to initiation of blasting activities. The plan will outline best practices and regulatory requirements for the safe transportation, handling, storage, and use of explosives. Storage facilities for explosives at quarry sites will meet the federal standards and licensing requirements as specified in the *Explosives Regulation* of the *Explosives Act* as well as provincial standards and licensing requirements as specified in the *Operation of Mines Regulation* of *The Workplace Safety and Health Act* of Manitoba. Where applicable,

blasting restriction "windows" for the protection of aquatic and terrestrial species will be indicated in the plan and as indicated in **Chapters 8 and 9** of this EIS.

Emergency Response Plan

An Emergency Response Plan will be developed by the contractor to provide procedures to be followed in the event of unanticipated emergency situations that may occur during construction of the Project. The Emergency Response Plan will adhere to regulatory requirements and ESRA's Workplace Safety and Health Specifications for the Project as described in the GR140s.

An Emergency Response Plan will be developed by the contractor to provide procedures to be followed in the event of unanticipated emergency situations that may occur during construction of the Project.

The objective of the construction Emergency Response Plan is to provide procedures for the safety and protection of life, environment and property, identifying a predetermined course of actions and responsible personnel for emergency situations arising from incidents, release of hazardous/toxic substances, or other emergency situations during the construction phase of the Project. The Emergency Response Plan will be structured to provide clear and easily-accessible information and will define:

- Roles and responsibilities of response personnel and organizations;
- Internal and external communication structure;
- Mandatory response actions and procedures to be executed;
- Reporting protocols to be followed; and
- Follow-up actions to be taken.

The Emergency Response Plan will cover various emergency response situations that are most likely to occur such as personal injury, fire, explosions, and hazardous substance spills. The construction Emergency Response Plan will be refined and finalized in preparation for construction permitting and in consultation with communities and relevant regulatory authorities. The procedures may be revised at any time during construction or should unanticipated circumstances warrant.

5.5 Environmental Protection – Operations and Maintenance

During the operations and maintenance phase of the Project, standard operating procedures and environmental best management practices will be implemented to promote the protection of environmental values along the all-season road. As required through discussions with regulatory agencies, Project-specific environmental protection measures may be developed for implementation during this project phase. On-going communications with local communities and all-season road users to advise of routine and unscheduled maintenance activities or changes in operations.

5.6 Management Structure, Compliance and Reporting

Monitoring is conducted to check that environmental protection measures are being implemented as planned. The implementation of environmental obligations are managed by ESRA's Environment Unit under the Vice President of Engineering and Construction. Environmental performance is communicated to the Executive at regular management meetings. Additional information regarding environmental monitoring, and the management structure and reporting during all phases of Project development, is provided in **Chapter 14**.

5.6.1 Project Design

ESRA's Engineering Unit works closely with ESRA's Environment Unit during the preliminary/functional design phase to incorporate comments from communities and other stakeholders and to identify measures to mitigate potential environmental effects. During the detailed design phase, ESRA contracts with various engineering specialists to complete design details and plan the construction staging. These activities are undertaken with oversight provided by ESRA's Engineering Unit and input from ESRA's Safety and Environment units. Prior to the release of a contract, ESRA's Engineering, Environment, and Safety units review the construction documents to check that specific mitigation measures applicable to the contract have been appropriately incorporated into the construction drawings and specifications.

5.6.2 Project Construction

ESRA's project delivery program includes working with local First Nations to develop capacity in the construction sector. This program delivery includes training programs for construction including heavy equipment operators, mentoring of First Nation-owned construction companies and provision of construction contracts under Community Benefits Agreements (CBAs) to the First Nation Construction Corporations to provide economic development and capacity building. The First Nation Corporation incorporated for the East Side Transportation Initiative is required to have a Board of Directors, General Manager, and finance, safety, and environment staff. Part of the mentoring program includes mentoring the First Nation Corporation's environment and safety staff, as well as the construction company, on the environmental and safety requirements and obligations regarding construction activities. To monitor compliance with the construction specifications including environmental and safety requirements, construction activities are overseen and mentored by an ESRA on-site-inspector, with ESRA and First Nation safety and environment officers providing additional inspection support.

In addition, ESRA oversees the delivery of the construction of the Project via tendered construction contracts. The contractor is required to adhere to the specific construction specifications (GR 130s and GR140s) and environmental protection measures covered under special provisions, including those described in the accompanying drawing package. ESRA's inspectors and Contract Administrators oversee the construction activities of both the CBA contracts and the tendered contracts, and monitor for compliance with the construction specifications and regulatory requirements.

5.6.3 Contractor's Requirements

The prime contractor will have several key personnel on their construction team who will have responsibilities for environmental protection and safety. These individuals will generally be responsible for:

- Facilitating implementation of the environmental policy;
- Implementing required environmental protection plans;
- Planning for environmental protection during construction;
- Conducting environmental inspections during site construction activities;
- Implementing the emergency response and health and safety plans; and
- Checking that environmental issues are resolved in a timely and sensitive manner.

5.7 Commitment to Sustainable Development

ESRA is committed to sustainable development as the Authority proceeds with its mandate under the *Manitoba East Side Road Authority Act*. As indicated in the Introduction **Chapter 1**, **Section 1.2.1**, The East Side Road Transportation Initiative evolved from the Government of Manitoba's commitment to support sustainable development in Manitoba through its acceptance in July 2000 of the Report of the Consultation on Sustainable Development Implementation (COSDI) (Government of Manitoba 1999). COSDI was a multi-stakeholder, consensus-based process commissioned in 1997 by the government of Manitoba to "*consider and make recommendations… on how Manitoba can best implement sustainable development principles and guidelines into decision-making, including environmental management, licensing, land-use planning, and regulatory processes*."

ESRA is committed to sustainable development as the Authority proceeds with its mandate under the Manitoba Floodway and East Side Road Authority Act.

The proposed P4 all-season road Project is part of the East Side Planning Initiative based on the COSDI report which recommended that the implementation of sustainable development include the creation of broad area plans across the province. Broad area planning was defined as integrated and coordinated planning that is based on the sustainability of the ecosystem. This type of planning process considers the environmental, social, health, cultural, and economic needs of the public, local communities, First Nations, and various stakeholders and interest groups in future land, resource, and development decisions.

Schedules A and B to Manitoba's *The Sustainable Development Act* define the principles and guidelines of sustainable development. These principles and guidelines form the basis of a sustainability evaluation framework that can be used to describe and assess the sustainability of the proposed Project. Actions taken by ESRA in relation to the principles and guidelines of sustainable development are provided in **Appendix 5-7.**

Examples of specific initiatives that will be undertaken to promote sustainable development as part of the proposed all-season road Project, and have been undertaken as part of ESRA's P1 all-season road currently under construction, include:

- **Community Benefits Agreements** – provide training and economic development opportunities for First Nation communities and members; encourage involvement in the Project through local employment, equipment rentals, and the generation of revenues and profits by band-owned construction companies.
- **Local Procurement** – provide opportunities for east side residents to be employed by the project through minimum hiring requirements, local procurement of goods, and preferential use of local equipment.
- **Project Engagement** – provide engagement opportunities for east side residents and other Aboriginal peoples to address environmental interests in the Project including the mitigation of potential impacts on the environment.
- **Traditional Knowledge Studies** – Provide opportunities to learn about traditional ways and land and resource use in order to reduce impacts on trappers, resource users, and to protect cultural and heritage resource sites.
- **Native Grass Re-vegetation Program** – Implement ESRA's native grass re-vegetation program to help restore native plants in areas affected by construction; provide employment opportunities for the gathering and propagation of local native grass seed by east side residents.
- **Wildlife Monitoring – Trapper Program** – Involve east side trappers in data collection from their traplines to mitigate impacts on wildlife, ESRA has undertaken a multi-year wildlife monitoring study that is providing valuable information on caribou, wolves, moose, furbearers, small animals, and bird species.