

## **Environmental Assessment**

# **Guidance for Registration of Onshore Wind Energy Generation and Green Hydrogen Production Projects**

Department of Environment and Climate Change  
Government of Newfoundland and Labrador

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## A. Purpose

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The Department of Environment and Climate Change (the Department) has prepared this guidance document as a companion document to the *Environment Assessment: A Guide to the Process*, to assist proponents in preparing for the environmental assessment (EA) registration of onshore wind energy generation and/or green hydrogen production projects. Although not prescriptive, this document aims to provide proponents guidance on the information that may be needed for the Department to effectively assess a wind energy generation and/or green hydrogen production project.

This document is intended to guide the proponent in:

- describing the potential benefits and adverse environmental effects of project;
- proposing measures to minimize or eliminate adverse environmental effects;
- determining the significance of residual environmental effects;
- consulting with Indigenous groups and the public and addressing concerns;
- and
- planning and designing a project that optimizes environmental protection and sustainability.

This guide should not be considered a final authority or legal document. Proponents are also encouraged to consult Part X of the **Environmental Protection Act** (the **Act**) and the Environmental Assessment Regulations and to contact the Department by email at [EAProjectComments@gov.nl.ca](mailto:EAProjectComments@gov.nl.ca) before submitting a project for registration.

Proponents of wind energy projects seeking to develop their project on Crown lands, are also required to proceed through the Department of Industry, Energy and Technology's (IET's) Crown Land Call for Bids for Wind Energy Projects process, as well as the Department of Fisheries, Forestry and Agriculture's (FFA's) Crown Land application process (see [Crown Land Call for Bids for Wind Energy Projects - Industry, Energy and Technology \(gov.nl.ca\)](#); and [Crown Lands - Fisheries, Forestry and Agriculture \(gov.nl.ca\)](#), respectively).

EA guidance documents are posted on the Department's web page at <https://www.gov.nl.ca/ecc/env-assessment/>

## B. Requirement for Environmental Assessment

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Electrical power generation projects with a capacity of greater than 1 megawatt (MW) and/or projects engaged in the manufacture of green hydrogen and ammonia are required to be registered for EA under the **Act**.

Following the assessment of an EA registration document, there are three pathways in which a project may proceed:

Pathway 1	Release from EA	If sufficient information is provided in the registration document to assess the project, it may be released from EA with conditions with which the proponent must comply to proceed.
Pathway 2	Environmental Preview Report (EPR)	If additional readily available information is needed, the Proponent will be requested to complete an EPR.
Pathway 3	Environmental Impact Statement (EIS)	If additional original data or studies to are needed, the Proponent will be requested to complete an EIS.

Proponents may register proposed projects at any time during project development, however underdeveloped or conceptual registration documents may result in extending the EA process, as further information may be required.

EA is legislatively-driven and the process, timelines, and decision points are outlined in Part X of the **Act** and Environmental Assessment Regulations. A link to the **Act** and

Regulations can be found at the [Department of Environment and Climate Change](#) web site.

The overall timeline for a project to move through EA depends on a number of factors including the completeness of information in the documentation received from the proponent, availability of baseline data on key environmental components, and comments received through Indigenous and public consultation.

Once released from EA, a project is subject to licenses, permits, approvals and other authorizations required by law, and the regulatory oversight of federal, provincial and municipal governments where applicable.

### **C. EA Registration Document: Considerations**

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Registration is the first step in the EA process and proponents are advised to take the time to ensure the registration document is as comprehensive as possible. During an EA, proponents should identify the important environmental effects associated with the project, identify measures to mitigate against any adverse effects, determine the significance of residual environmental effects, and consult with Indigenous groups and the public and respond to their concerns. Fulfilling these requirements during the registration phase will facilitate an effective and efficient EA process.

It is the proponent's responsibility to ensure that information submitted for registration is complete and accurately describes all components that are needed to make the project operational and viable.

Before registering, it is important to consider the existing environment within the project scope, as well as consultations that may be needed to understand the concerns of those who may be affected by the project.

When considering the project scope and existing environment, proponents should:

- define the project in terms of the spatial and temporal boundaries of each component of the project;
- consider the existing environment within the project scope, and identify valued components (VCs);
- consider the benefits and potential adverse effects of the project on the biophysical and socioeconomic environment over the lifetime of the project, including construction, operation and maintenance, decommissioning and rehabilitation phases; and
- consult with relevant government departments to determine whether original data collection and modeling may be required to establish existing conditions and predict environmental effects. Proponents may contact the Environmental Assessment Division at [EAProjectComments@gov.nl.ca](mailto:EAProjectComments@gov.nl.ca) to receive contact information for key government departments.

The registration document will be shared on the Department's website to facilitate government, Indigenous and public consultation. The comments received during consultation will inform the Minister's project-decision.

#### **D. Format and Content for Registration Document**

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The following format outlines the type of information that may be needed to assess the environmental effects of a wind energy generation and green hydrogen production project. Individual projects may vary, depending on the project components and location. Proponents may use this format as a template for developing their registration document.

The information should be comprehensive, yet concise. A minimum of one paper copy and one digital copy of the registration document, including maps, should be submitted to [EAProjectComments@gov.nl.ca](mailto:EAProjectComments@gov.nl.ca).

Proponents are encouraged to submit a separate cover letter with the registration document attached. The cover letter should include the telephone number and mailing address for the proponent and the principle contact person for the purpose of EA.

## **FORMAT**

### **1.0 Introduction**

- 1.1 Proponent
- 1.2 Overview of Undertaking

### **2.0 Proposed Undertaking**

- 2.1 Study Area(s)
- 2.2 Rationale for the Undertaking
- 2.3 Project Description
  - 2.3.1 Construction Activities
  - 2.3.2 Operation and Maintenance Activities
  - 2.3.3 Decommissioning and Rehabilitation
- 2.4 Alternative Methods of Carrying Out the Undertaking
- 2.5 Regulatory Framework

### **3.0 Environment**

- 3.1 Description of existing environment and VCs
  - 3.1.1 Atmospheric environment
  - 3.1.2 Aquatic environment
  - 3.1.3 Terrestrial environment
  - 3.1.4 Land and resource use
  - 3.1.5 Heritage and cultural resources
  - 3.1.6 Communities
  - 3.1.7 Economy, employment, and business
- 3.2 Baseline studies
  - 3.2.1 Data Gaps
- 3.3 Predicted Future Condition of the Environment without the Undertaking



- 4.0 Environmental Effects**
  - 4.1 Predicted Environmental Effects of the Undertaking
  - 4.2 Accidents and Malfunctions
  - 4.3 Effects of the Environment on the Project
  - 4.4 Mitigations
  - 4.5 Plans
- 5.0 Residual Effects**
- 6.0 Cumulative Effects**
- 7.0 Assessment Summary and Conclusions**
- 8.0 Public and Indigenous Consultation**
- 9.0 Environmental Protection Plan**
- 10.0 References**
- 11.0 Personnel**
- 12.0 Commitments Made in the Registration Document**
- 13.0 Copies of Reports**

## **APPENDIX A**

## **APPENDIX B**

### **1.0 Introduction**

The **introduction** section is intended to identify the key project components, rather than provide a detailed description of the project. All components that are required to make the project operational and viable should be described in the registration document. For ease of reference during the EA process, it is recommended that the **project name** identify the project's location first, followed by the primary operation or activity (e.g., St. John's Wind Farm).

## 1.1 Proponent

This section should **describe the proponent**, including contact information for the Corporate Body, Chief Executive Officer, Principal Contact Person for the EA, and a describe any relevant previous or current projects.

## 1.2 Overview of Undertaking

This section should provide an **overview of the undertaking**, including the annual estimated installed capacity of the wind energy generation, maximum annual energy and water use requirements for hydrogen/ammonia production facility(ies), auxiliary power sources and total length and voltage of new power lines and access roads. If a phased approach is planned, then the information and projected timelines should be provided for each phase of development.

## 2.0 Proposed Undertaking

### 2.1 Study Area(s)

This section should contain a description of the **study area** in which the project will take place. The study area is the broad geographic area where the project will be located and where potential environmental effects may occur. A precise description of the boundary of the project should be presented in relation to the study area for each VC, accompanied by maps and aerial imagery of appropriate scale showing the entire project area with principle structures and appurtenant works, topographical features including waterbodies and wetlands, and overlapping/adjacent land use.

Proponents should explain the rationale used to delineate the boundaries of the study area. Conceptual/aerial images of all proposed project sites should be provided (e.g. wind turbines, transmission lines and infrastructure, access roads, hydrogen/ammonia facilities, water resources, and any auxiliary power sources).

## 2.2 Rationale for the Undertaking

A **rationale for the undertaking** in terms of its need and purpose should be provided, including opportunities that the project is intended to satisfy, such as the immediate and future use of the wind energy and hydrogen/ammonia produced from the project (e.g. domestic or export use, information on markets). If the objectives of the project are related to broader private or public sector policies, plans or programs, it is recommended that this information be included. This information establishes the fundamental justification or rationale for the project. The need for and purpose of the project should be established from the perspective of the proponent and provide the context for the consideration of alternatives.

## 2.3 Project Description

The **project description** should be more detailed than the overview of the undertaking in section 1.2. It should focus on those aspects of the project and its setting that are important in order to understand the potential environmental effects of the project. A written and graphic description (e.g. maps, aerial imagery, site plans, drawings, etc.) of the physical features of the undertaking and the distance to nearest VCs should be described and illustrated. Physical features of the undertaking should include, at a minimum, if applicable:

- wind turbines and base areas;
- transmission lines and infrastructure;
- access roads;
- hydrogen/ammonia facilities and any associated buildings/structures;
- auxiliary energy sources;
- water supply and associated infrastructure;
- real-time water quality/quantity monitoring if water electrolysis is proposed;
- waste management components, including waste water;
- hydrogen/ammonia storage;
- pipelines;

- transportation methods and routes to markets; and
- carbon sequestration sites .

Proximity to the nearest VCs should be provided for, but may not be limited to the following:

- nearest temporary and permanent residential dwellings and commercial and industrial sites;
- electrical infrastructure;
- municipal boundaries and infrastructure;
- unincorporated communities, including Indigenous communities;
- cultural and traditional sites;
- tourist and recreational sites;
- environmentally sensitive areas, such as national, provincial, and regional parks and reserves; ecologically and biologically significant areas (EBSA); protected areas and proposed protected areas; estuaries, rivers, and habitats of federally or provincially listed species at risk; and other sensitive areas;
- industrial, private and protected public water supplies;
- commercial and recreational fishing areas and aquaculture sites;
- marine navigation routes if incoming or outgoing marine transportation is proposed;
- identification of any project location overlap with existing land and industrial users;
- foreseeable modifications of all project-related facilities; and
- closure, decommissioning and rehabilitation of project sites.

### 2.3.1 Construction Activities

Details of materials, methods, schedule, and locations of all **construction activities** (including permanent and temporary infrastructure related to physical features) should be described. Depending on the project components, this may include:

- construction planning and development schedule;

- site preparation, clearing , blasting etc., for the installation of each construction site, including access roads, laydown areas, wind turbines, transmissions lines and infrastructure, and the hydrogen/ammonia facility(ies) and infrastructure;
- planned establishment of project structures and infrastructure in protected public water supply areas, wellhead protected areas, and any work in water that is not a protected water supply;
- timing and duration of in-water works;
- consideration of species at risk and related habitats;
- locations of any quarry sites, and classes and quantities of materials that are needed for road construction and upgrading;
- details of development of each salt deposit or other feature intended for the underground storage of hydrogen/ammonia, and carbon dioxide if applicable;
- sources and intensity of noise, vibration and light emissions;
- identification of any non-combusted and industrial process emissions;
- annual energy consumption by type and annual GHG emissions by source for construction activities outside the project boundary such as on-road, air and marine transportation, solid waste, and significant purchased services from providers outside the project boundary (e.g., a marine port facility);
- list of all heavy equipment to be used during construction, fuel sources and estimated emissions, including greenhouse gas emissions;
- personnel requirements for each phase and component of construction, including projected workforce by month, employment equity, hiring practices, journeypersons, apprentices, students, local preference, etc.;
- transport, storage, and use of all hazardous construction materials, fuels and lubricants; and
- liquid and solid waste expected to be generated by construction of the project and project-related construction.

### 2.3.2 Operation and Maintenance Activities

Details of the **operation and maintenance** of the undertaking should be described in this section of the registration document. Proponents should include detailed descriptions of the following, if applicable:

- phases of the development (if the operation of the project will be conducted in phases);
- any regulatory restrictions related to the incremental development of the project, requiring the proponent to demonstrate that the project is being conducted in an environmentally acceptable manner prior to increasing production;
- operation and maintenance activities for wind turbines at each wind energy site that are needed to make the project operational and viable, including the storage, transportation and use of fuels, lubricants and hazardous materials;
- operation and maintenance of transmission lines and substations associated with each wind energy generation site and the transport of energy to the hydrogen and ammonia production facility(ies);
- sources, decibels, duration and geographic reach of noise (including long-term, low frequency), light emissions and shadow flicker, and vibrations during operation and maintenance of wind turbines and hydrogen production facilities;
- operating procedures and equipment associated with hydrogen/ammonia production (including standard operating procedures of electrolyzers);
- transport of hydrogen/ammonia (road, marine and/or pipeline if applicable);
- options for the above ground and underground storage of hydrogen/ammonia including preferred options for the project;
- if applicable, procedures for carbon capture, transport and storage, and estimated volume of carbon sequestered by year of operation;
- estimates of fuel consumption and greenhouse gas (GHG) emissions associated with fuel combustion, and GHG emissions from any non-combusted and industrial process sources at the hydrogen/ammonia production facility(ies), by source per year of operation;

- annual energy consumption by type and annual GHG emissions by source for activities outside the project boundary such as on-road, air and marine transportation and purchased electricity (i.e., from Newfoundland and Labrador Hydro or Newfoundland Power), solid waste, and significant purchased services from providers outside the project boundary (e.g., a marine port facility);
- procedures for, and estimated frequency of, flaring and/or venting of hydrogen/ammonia;
- assessment of the proposed water requirements and sources for the operation of all components of hydrogen/ammonia production, including cooling; the required water quality for the desired use; and any treatment needed to meet the required water quality;
- characterization of wastewater effluent from hydrogen and ammonia production, estimation of annual volume of effluent discharge, a description of the receiving environment for wastewater discharge, and a description of any treatment needed to meet effluent discharge regulations;
- procedures for regular source water and wastewater quality and quantity monitoring, including real-time water quality/quantity monitoring;
- characterization and estimation of annual and daily atmospheric discharges from hydrogen and ammonia production, including detailed specifications and air emission estimates on emergency back-up power generation;
- potential sources of quarry materials required for operation and maintenance of the project, including primary and alternate sites for all classes of quarry materials required for the project;
- energy use plan, including amount and frequency of energy and capacity to be provided to or from the electrical grid, and “energy buffering” needs;
- offtake/purchase arrangements for all end products;
- procedures and methods for spill response; and
- personnel requirements for each phase and component of operations, including projected workforce by month, employment equity, hiring practices, journeypersons, apprentices, students, local preference, etc.

### 2.3.3 Decommissioning and Rehabilitation

Finally, the proponent should predict the lifespan of the undertaking and present an approach for **decommissioning and rehabilitation** of each project site, including but not limited to dismantling and removal of infrastructure and facilities, and estimates of fuel consumption and GHG emissions by source per year during decommissioning and rehabilitation.

### 2.4 Alternative Methods of Carrying Out the Undertaking

The registration document should identify and consider the environmental effects of **alternatives to** the undertaking, and **alternative methods** of carrying out the undertaking that satisfy the need for the undertaking. The description of alternatives to the undertaking should analyze the advantages and disadvantages to the environment of the undertaking as proposed, justify the selection of the preferred alternative, and explain rejection of other alternatives.

If applicable, the proponent should indicate known experience, effectiveness and reliability of the equipment, techniques and procedures and policies for each alternative, particularly under weather and climate conditions in Canada and elsewhere, and their relation to best practice in Newfoundland and Labrador. The information provided should include analysis and comparison of the design alternatives for the project in relation to their environmental and social costs and benefits, including those alternatives which cost more to build and/or operate but which cause less harmful environmental effects. The range of alternatives considered for the annual production and scale of the wind energy operation should be discussed, and the chosen alternative justified.

### 2.5 Regulatory Framework

Proponents should demonstrate understanding of the **regulatory framework** under which the project will be constructed and operate. The registration document should



include any legislation; government policies; resource management plans; and relevant land use plans, land zoning, or community plans pertinent to the project and/or the EA, including a list of permits and/or regulatory approvals required for the project.

Any regional, provincial, and/or national objectives, standards, codes and/or guidelines that have been used by the proponent to assist in the development of the registration document should be referenced.

### 3.0 Environment

#### 3.1 Description of existing environment and VCs

The registration document should describe the **existing environment** prior to implementation of the proposed project, which constitutes the reference state of the environment.

Using qualitative and quantitative surveys, this section should include a description of the existing bio-physical and socio-economic environment that will or may be affected by the project with an emphasis on the VCs. If the information available from government or other agencies is insufficient or no longer current, the proponent should complete the description of the environment by conducting original surveys and research according to generally accepted practices.

##### 3.1.1 Atmospheric environment

The proponent should describe the relevant components of the **atmospheric environment** in the project area, which may include the following:

- a) climate information (e.g. monthly and annual minimum, maximum and mean values for precipitation, temperature and wind speed, prevailing wind direction, and storm events);
- b) provincial climate change and coastal sea level rise projections;

- c) indications of recent climate change observations and trends;
- d) provincial GHG emissions including emissions specifically from the industrial sector;
- e) existing sources of greenhouse gas emissions in/near the study area;
- f) existing weather radar monitoring in/near the study area;
- g) ambient light, vibration and noise level, including low frequency noise; and
- h) ambient air quality, including dust and particulate matter.

### 3.1.2 Aquatic environment

The proponent should describe the relevant components of the **aquatic environment** within the study area of the VCs, which may include the following:

- a) protected public water supply areas, protected wellhead areas, unprotected public drinking water source areas;
- b) industrial water supply availability and use;
- c) surface and groundwater resources and locations, including identification of those resources planned to supply the hydrogen and ammonia production facilities;
- d) surface-water flow, groundwater movement and aquifer recharge zones, and the delineation of drainage basins, including wetlands, at appropriate scales;
- e) hydrologic and hydrogeologic assessment of the proposed water-supply for hydrogen production facilities, and all testing results for water quantity and quality, including metals;
- f) commercial, recreational, and Indigenous fisheries, including aquaculture facilities;
- g) marine navigation (e.g. commercial and recreational boat traffic) and identification of the marine transportation route for incoming and outgoing supplies and products associated with the project;
- h) biosecurity at the port in relation aquatic invasive species and the movement of international vessels;
- i) characterization of fish habitat and fish populations by species and life stage including a description of critical and sensitive habitats for spawning, nursing,

rearing, feeding, and migration by fish species;

- j) species of special interest (including invasive species) or conservation concern and their habitat, (e.g. species listed in the **Endangered Species Act** or the **Species at Risk Act**); and
- k) assessment of work windows and sensitive times of the year (e.g. migration, feeding and spawning) which are critical for fish populations identified in the project area.

### 3.1.3 Terrestrial environment

The proponent should describe the relevant components of wetlands and the **terrestrial environment** within the study area of the VCs, which may include the following:

- a) terrestrial flora, fauna and avifauna, including ecological land classifications;
- b) species and areas of conservation concern (e.g. **Endangered Species Act**, **Species at Risk Act**); and
- c) human and wildlife interaction with the project.

### 3.1.4 Land and resource use

Descriptions of the relevant **land- and resource-use** within the study area of the VCs should be included. Proponents should describe industrial (electrical infrastructure, mining, mineral exploration and aquaculture), commercial (tourism, outfitter, commercial and domestic wood harvesting, business operations), recreational (hiking, trail riding, hunting, fishing, swimming, berry picking, etc.), and Indigenous land use within or adjacent to the study area. Unique sites or special features in the study area, environmentally sensitive areas, reserves, proposed protected and protected areas, conservation agreement lands and habitat enhancement projects should be referenced. Landscapes, including visual aesthetics and land tenure (Crown, private, etc.) should be described.

### 3.1.5 Heritage and cultural resources

The proponent should describe relevant **cultural heritage resources** in the study areas of the VCs, including historic and archaeological resources; paleontological resources; architectural resources; and burial, cultural, and heritage sites.

### 3.1.6 Communities

The proponent should describe relevant **community elements** in the study areas of the VCs. This would include a description of local communities, industries, and population demographics; health services and social programs; family life, recreation, and culture; education and training facilities and programs; fire and emergency services; and housing, accommodations, and property values.

### 3.1.7 Economy, employment, and business

The **relevant economy, employment and business elements** in the study areas of the VCs should be described, including the economy and employment in the region; availability of skilled and unskilled labour in the region and in the province; business capacity relative to goods and services; and employment equity and diversity including under-represented groups.

## 3.2 Baseline studies

**Baseline studies** provide information and data required to support the evaluation of environmental effects and/or to develop mitigation measures and follow up monitoring programs. Baseline studies may include, but may not limited to the following:

- atmospheric Environment - air quality, noise, vibration and light;
- aquatic environment - water resources and use;

- terrestrial environmental – flora, fauna, avifauna and associated habitat, including species at risk and species of conservation concern and relevant habitat; and
- land and resource use - traditional, cultural, recreational, Indigenous, industrial and other use.

### 3.2.1 Data Gaps

**Information/data gaps** from a lack of previous research or practice should be described, indicating baseline and other information that is not available or existing data that does not accurately represent environmental conditions in the study area over four seasons. If background data have been extrapolated or otherwise manipulated to depict environmental conditions in the study area, modeling methods and equations should be described and include calculations of margins of error and/or confidence limits.

### 3.3 Predicted Future Condition of the Environment without the Undertaking

Describe the **predicted future condition of the environment** within the expected life span of the project if the project were not to proceed. This will help to distinguish project-related effects from environmental change due to natural processes.

## 4.0 Environmental Effects

This section of the registration document should provide information on the environmental effects related to the project.

### 4.1 Predicted Environmental Effects of the Undertaking

Include a comprehensive analysis of the **predicted environmental effects** of the proposed project on the VCs. For further information on the assessment of predicted environmental effects, please consult with the Department.

Predicted environmental effects for all phases of the project should include, but not be limited to, a comprehensive analysis of the effects of the project on, for example, the following features:

- a) surface water bodies, wetlands and groundwater aquifers, including water quality and quantity, surface water flow, groundwater movement, aquifer recharge zones; protected public water supplies and wellhead areas; unprotected public drinking water sources and private drinking water sources; receiving environment for wastewater discharge and capacity of receiving environment to manage wastewater discharge; existing and potential commercial, recreational, and Indigenous fisheries; and aquaculture operations, marine navigation and biosecurity;
- b) fish habitat ( including sensitive, critical and rare habitat) and fish populations by species, including species of special concern, threatened and endangered species, and rare species;
- c) flora, fauna, avifauna and associated habitat, including species at risk and species of conservation concern, and potential interactions with wind turbines, emissions, discharges and releases of substances, land disturbance, noise, vibrations and light;
- d) land use and tenure, including but not limited to Crown land tenure, private land ownership, municipal zoning, land tenure under the **Petroleum and Natural Gas Act, Mineral Act**, and the **Quarry Materials Act**;
- e) above ground or underground storage of hydrogen/ammonia and/or carbon dioxide, if applicable, and interactions with tourism operations, aquaculture facilities and Indigenous other land use;
- f) electrical infrastructure and potential implications for the overall provincial and regionally interconnected transmission system, including cost and access to electricity for residents, the reliability and operating effects of the project on the existing electrical system, the timing of access requirements to transmission resources, including any curtailment considerations and the effect on other customers, both during the period before the wind farm is operational and over

the longer term, and renewable energy resource may be available to supply the energy grid when not used for production of hydrogen;

- g) greenhouse gas emissions, including effects on provincial GHG emissions totals and the application of carbon pricing regulations;
- h) human health and quality of life, including effects of vibrations, noise, light, dust, ice throw, weather radar, domestic wood harvesting, viewscales, and traditional, cultural, recreational, Indigenous, industrial and other activities; and
- i) boomtown effects on community health and services, including food security, employment equity and diversity, business capacity, goods and services, housing accommodations and values, health care, mental health and addiction services, social programs, fire and emergency services, education and training services, municipal infrastructure and services, and green spaces.

#### 4.2 Accidents and Malfunctions

The proponent should identify and describe the potential **accidents and malfunctions** related to the project, including an explanation of how those events were identified and potential consequences (including the potential environmental effects). The proponent should assess the likelihood of occurrence and consequence severity of the accidents and malfunctions. Potential accidents and malfunctions may include, but not be limited to the following occurrences:

- a) accidental spills and/or releases of hydrogen, ammonia, chemicals, pesticides or any potentially hazardous substance on land or in air or water;
- b) traffic accidents;
- c) fires and explosions;
- d) dislodging of a wind tower or turbine blade;
- e) occupational hazards and human injuries;
- f) failure of industrial water supply;
- g) flaring/venting of hydrogen, ammonia, other gases in the event of malfunction; and

- h) wildlife emergencies/incidents (e.g. bird mortalities of 10 or more birds or an individual species at risk during a single event due to collisions with wind energy infrastructure).

#### 4.3 Effects of the Environment on the Project

The **effects of the environment on the project** (e.g. storm surge, flooding, algal blooms, severe precipitation events, ice storms, hurricanes, forest fires) should be described in the registration document, taking into account local knowledge and the potential influence of climate change scenarios (e.g. sea level rise, increased frequency of extreme weather events and other natural disasters).

#### 4.4 Mitigations

The registration document should propose **mitigations** that will be undertaken to address adverse effects and enhance beneficial effects during construction, operation and maintenance, and decommissioning and rehabilitation phases of the project. The rationale for and effectiveness of the proposed mitigation and enhancement measures should be discussed and evaluated. The proponent, where possible, should refer to similar situations where the proposed mitigation has proven to be successful. Mitigation failure should be discussed with respect to risk and severity of consequence.

The registration document should identify roles, responsibilities, and accountability for implementing mitigation measures during construction, operation and maintenance, and decommissioning and rehabilitation phases, including the obligations of contractors and subcontractors. The proponent should describe measures that will be undertaken to mitigate the effects of the project on:

- a) surface water bodies, wetlands and groundwater aquifers;
- b) fish and fish habitat;
- c) flora and fauna (including avifauna, species at risk and species of conservation concern ) and their habitat, and protected areas;



- d) existing land use and tenure;
- e) existing electrical infrastructure;
- f) greenhouse gas emissions;
- g) human health and quality of life; and
- h) boomtown effects on community health and services.

Other mitigation measures that were considered may be identified, and the rationale for rejecting these measures explained. The best available technology and best management practices should be considered. Avoidance of environmental effects through implementation of scheduling and siting constraints and pollution prevention opportunities should also be considered. Trade-offs between costs and predicted effectiveness of the mitigation measures should be justified.

#### 4.5 Plans

The registration document should consider including various **relevant plans**, which should be developed in consultation with the Environmental Assessment Division and appropriate government departments as identified by that division. Relevant plans may include, but may not be limited to the following:

- **Emergency Response/Contingency Plan** - including a Wildlife Emergency Response Plan, describes measures that will be undertaken to reduce the effects and/ or consequences of each type of accident or malfunction, should it occur. The Emergency Response/Contingency Plan establishes an emergency communication strategy with those potentially affected, and should outline procedures to respond to accidents, malfunctions and emergencies. The Emergency Response/ Contingency Plan should describe the capacity of the proponent/nearby communities to respond each type of accident, malfunction or emergency, including the availability of required equipment and training.

- **Waste Management Plan** - describes the handling, storage and final disposal of all liquid and solid wastes expected to be generated by the project during transportation, construction, operation and maintenance, and decommissioning and rehabilitation of the project. .
- **Hazardous Materials Response and Training Plan** - describes how fire fighters and first responders in local areas and along transportation routes will be trained to the appropriate National Fire Protection Association (NFPA) Codes and Standards (e.g. NFPA 1072 Hazardous Materials Technician) and any other related codes necessary to execute a hazardous materials response related to the project. Vehicles and hazardous materials equipment needed to execute an effective hazardous materials response should be identified in the plan. In accordance with the requirements of the **Fire Protection Services Act**, training should meet the approval of the Fire Commissioner. Review by the Fire Services Division of curriculum being offered and developed would be applicable.
- **Transportation Impact Study and Traffic Management Plan** - assesses and reports on the potential effects of transporting oversized and overweight project materials and equipment over existing roadways, during construction, operation, maintenance, modification, decommissioning and rehabilitation phases of the project.
- **Public Participation Plan** - describes how the public would meaningfully participate in the planning of all phases of project (construction, operation and maintenance, decommissioning and rehabilitation) and how they would continue to be consulted throughout the life of the project, including in the monitoring of environmental effects.
- **Workforce and Employment Plan** – describes recruitment and positions for the construction, operation and maintenance, decommissioning and rehabilitation phases of the project would be developed in consultation with the Department of Immigration, Population Growth and Skills and with the Office of Women and Gender Equality.

- **Domestic Wood Cutting Consultation Plan** – if applicable, identifies domestic harvesters, addresses concerns with the project and proposes appropriate mitigations. The mitigations should be developed in consultation with the Department of Fisheries, Forestry and Agriculture.
- **Environmental effects follow up and monitoring programs (EEMPs)** that would be incorporated into the construction, operation and maintenance, decommissioning and rehabilitation phases of the project. The purpose of the EEMPs is to verify the accuracy of the predictions made in the assessment of the effects as well as the effectiveness of the mitigation measures. The duration of the EEMPs should be as long as is needed to evaluate the effectiveness of the mitigation measures. If an EEMP identifies unforeseen adverse environmental effects, the proponent should commit to adjusting existing mitigation measures, or, if necessary, develop new mitigation measures.

## 5.0 Residual Effects

**Residual effects** are those adverse environmental effects which cannot be avoided or mitigated, or that remain after the application of environmental control technologies and best management practices. The registration document should list and contain a detailed discussion and evaluation of residual effects, and for ease of review, should include a matrix of the environmental effects, proposed mitigations, and residual adverse effects. The registration document should contain a concise statement and rationale for the overall conclusion relating to the significance of the residual adverse environmental effects.

## 6.0 Cumulative Effects

The proponent should identify and assess the project's **cumulative environmental effects**. Cumulative effects are defined as changes to the environment and resident

species in the area due to the project and combined with the effects of past, present, and planned projects and/or activities. The proponent should also:

- identify and justify the environmental components that will constitute the focus of the cumulative effects assessment, with emphasis on the main VCs and endangered flora and fauna that could potentially be most affected;
- justify geographic and temporal boundaries, choice of projects, and selected activities for the cumulative effects assessment; and
- describe mitigation measures and determine significance of the residual cumulative effects.

## 7.0 Assessment Summary and Conclusions

The registration document should summarize the overall findings, with emphasis on the key environmental issues identified, and present an **assessment summary and conclusions**.

## 8.0 Public and Indigenous Consultation

The Department strongly recommends that **public and Indigenous consultation** is undertaken to address any concerns prior to registering the undertaking for EA. The proponent should consider identifying and contacting local community representatives, government representatives (municipal, provincial and federal), First Nations, and other stakeholders who may have an interest in the proposed undertaking.

The registration document should describe:

- a) methods used to notify the public and Indigenous groups, the number of people contacted and the number of people who responded;
- b) copies of information and materials distributed to the public and Indigenous groups;
- c) opportunities that were/will be provided to the public and Indigenous groups to express their concerns and receive information on the various phases of project

- development, including planning, design, EA review, construction, operation and maintenance, decommissioning and rehabilitation;
- d) all comments brought to the attention of the proponent, both written and verbal, during the public and Indigenous consultations; and
  - e) how public and Indigenous comments were addressed during consultations, including any commitments made by the proponent.

## **9.0 Environmental Protection Plan**

A proposed table of contents and an annotated outline for the EPPs should be presented in the registration document, addressing the major construction and operational activities, permit requirements, mitigation measures and contingency planning.

## **10.0 References**

The proponent should include a complete and detailed **reference** of all studies used to prepare the registration document. Supporting documentation can be referenced in the registration document and submitted in separate volumes or attached as appendices.

## **11.0 Personnel**

The names and qualifications of all key professionals responsible for preparing the registration and supporting documentation should be included. A description of the qualifications of scientists conducting surveys and scientific studies associated with the undertaking should also be provided.

## **12.0 Commitments Made in the Registration Document**

The registration document should provide a list of all commitments made regarding environmental effects mitigation, monitoring and follow-up. Each commitment should be cross-referenced to the section of the registration document where it has been made.

### **13.0 Copies of Reports**

The proponent should submit printed and electronic copies of the registration document to the Department as specified below:

- 1 electronic copy (USB drive)
- 1 paper copy

The Minister reserves the right to request additional digital and paper copies, if required.

Stand-alone studies associated with the registration document, including baseline studies and all plans may be included in the body of the registration document or attached as appendices.

The proponent should make printed copies of the registration document available at public libraries or viewing centers in the project vicinity, if requested by the Minister, with locations to be approved by the Minister.

## APPENDIX A

### Department of Environment and Climate Change GUIDANCE FOR PUBLIC MEETINGS/INFORMATION SESSIONS

**Purpose:** To provide guidance for proponents, Indigenous groups and the public regarding the format, scheduling, number, notification, etc., for consultations in relation to wind energy generation and hydrogen production undertakings registered for environmental assessment under the **Environmental Protection Act**, SNL 2002 cE-14.2.

1. The proponent is encouraged to conduct public and Indigenous consultation sessions in local population centres within the project area.
2. The objectives of the public and Indigenous consultation sessions are to:
  - a. provide information concerning the proposed undertaking to those who may be affected;
  - b. record the concerns of local and Indigenous communities regarding the undertaking; and
  - c. demonstrate in the registration document how the public and Indigenous concerns are being addressed.
3. The format of the public and Indigenous consultation sessions may be proposed by the proponent, for approval by the Department.
4. The proponent is encouraged to advertise each consultation session to ensure the public and Indigenous groups are sufficiently notified of consultation opportunities, and the methods and timing of notification are to be described in the registration document.

## APPENDIX B

### List of Maps/Aerial Imagery

#### Section 2.1 - Study Area

- location of entire project on a provincial and regional map (aerial imagery, polygons);
- conceptual/aerial images of proposed sites (polygons) for principle structures and appurtenant works (e.g. wind turbine sites, access roads, transmission lines and infrastructure, hydrogen/ammonia facilities, water sources, and any auxiliary power sources);
- adjacent land use, identifying features such as waterbodies and wetlands, communities and settled areas, industrial and commercial use, tourism and recreational use; and
- above maps should be provided for all phases of the project.

#### Section 2.3 - Project Area

- graphic description (aerial images, maps, site plans, drawings, etc.) of the physical features of the undertaking, as outlined in section 2.3, and the proximity to nearest VCs.