

Bruce C Project

INITIAL PROJECT
DESCRIPTION
PLAIN LANGUAGE
SUMMARY: ENGLISH

August 2024

BRUCE POWER – INITIAL PROJECT DESCRIPTION PLAIN LANGUAGE SUMMARY

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ABBREVIATIONS

Abbreviation	Definition
ABWR	Advanced Boiling Water Reactor
APO	Annual Planning Outlook
BATEA	Best Available Technologies Economically Achievable
BHWP	Bruce Heavy Water Plant
CANDU	Canada Deuterium Uranium
CEAA	Canadian Environmental Assessment Agency
CGLR	Council of the Great Lakes Region
CH ₄	Methane
CMF	Central Maintenance Facility
CNL	Canadian Nuclear Laboratories
CNSC	Canadian Nuclear Safety Commission
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
COPC	Contaminants of Potential Concern
CRI	Climate Risk Institute
CSA	Canadian Standards Association
CSF	Central Storage Facility
CWMP	Coastal Waters Monitoring Program
dB	Decibel
DFO	Fisheries and Oceans Canada
DGR	Deep Geologic Repository

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Abbreviation	Definition
DNNP	Darlington New Nuclear Project
EA	Environmental Assessment
ECA	Environmental Compliance Approvals
ECCC	Environment and Climate Change Canada
ECE	Early Childhood Education
EIS	Environmental Impact Statement
ELC	Ecological Land Classification
EMS	Emergency Medical Services
EO	Environmental Office
EPR	European Pressurized Water Reactor
EPRI	Electric Power Research Institute
ERA	Environmental Risk Assessment
GBA+	Gender-Based Analysis Plus
GHG	Greenhouse Gas
GLC	Great Lakes Commission
GLFC	Great Lakes Fisheries Commission
HSM	Historic Saugeen Métis
I&E	Impingement and Entrainment
IA	Impact Assessment
IAA	Impact Assessment Act
IAAC	Impact Assessment Agency of Canada
IESO	Independent Electricity System Operator

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Abbreviation	Definition
IJC	International Joint Commission
IMPACT	Integrated Model for the Probabilistic Assessment of Contamination Transport
IPCC	Invasive Phragmites Control Centre
IPCC	Intergovernmental Panel on Climate Change
IPD	Initial Project Description
kWh	Kilowatt Hour
MCR	Major Component Replacement
MECP	Ministry of the Environment, Conservation and Parks
MNRF	Ministry of Natural Resources and Forestry
MOE	Ministry of the Environment
MOU	Memorandum of Understanding
MW	Megawatt
MWe	Megawatts Electric
MWth	Megawatts Thermal
NII	Nuclear Innovation Institute
NO _x	Oxides of Nitrogen
NWMO	Nuclear Waste Management Organization
OPG	Ontario Power Generation
PAHs	Polycyclic Aromatic Hydrocarbons
PM	Particulate Matter
PPE	Plant Parameter Envelope
PQRA	Preliminary Quantitative Risk Assessment

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Abbreviation	Definition
PROL	Power Reactor Operating License
PSW	Provincially Significant Wetland
REM	Radiological Environmental Monitoring
SACC	Strategic Assessment of Climate Change
SAR	Species at Risk
SMR	Small Modular Reactor
SO ₂	Sulphur Dioxide
SON	Saugeen Ojibway Nation
SSC	Structure, System and Components
SW	Surface Water
TSS	Total Suspended Solids
UN	United Nations
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
VC	Valued Component
VOCs	Volatile Organic Compounds
WWMF	Western Waste Management Facility

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INTRODUCTION

This Plain-Language Summary has been prepared to summarize the Initial Project Description (IPD) that has been prepared for the Bruce C Project (Project) and provided separately to the Impact Assessment Agency of Canada (IAAC). The IPD and this Plain Language Summary have been prepared in accordance with the *Impact Assessment Act*, (SC 2019, c 28, s 1 (IAA), [R-1]) and the *Information and Management of Time Limits Regulations* (SOR/2019-283, [R-2]).

Bruce Power is the operator of the largest electric generating facility in Canada. Bruce Power currently produces 30 per cent of Ontario's electricity on a site that has been safely generating nuclear power for over 50 years. Zero-emissions nuclear power is the backbone of Ontario's clean electricity system and is a crucial part of Ontario's clean energy future.

Through the Impact Assessment (IA), Bruce Power is evaluating the feasibility of expanding its nuclear fleet, to create an option for future electricity planning. The Project, referred to as "Bruce C", will evaluate the impact of adding up to 4,800 megawatts electric (MWe) of nuclear capacity on the existing Bruce Power site. As proposed, the Project considers several reactor technologies

Bruce Power recognizes that the Bruce Power site is located within the Saugeen Ojibway Nation Territory, the shared treaty and traditional Territory of the Chippewas of Saugeen First Nation and Chippewas of Nawash Unceded First Nation (Neyaashiinigmiing). Bruce Power is dedicated to honouring Indigenous history and culture and is committed to moving forward in the spirit of reconciliation and respect with the Indigenous Nations and Communities we work with. We are committed to strong and respectful relationships with the Saugeen Ojibway Nation (SON), the Métis Nation of Ontario Region 7 (MNO) and Historic Saugeen Métis (HSM).

PART A: GENERAL INFORMATION

1.0 THE PROJECT'S NAME, TYPE OR SECTOR AND PROPOSED LOCATION

Project Name: Bruce C Project (Project)

Sector: Nuclear

Location: The Project will be sited within the existing fenced and secured 932-hectare Bruce Power site, along with new intake and discharge structures in Lake Huron. The Bruce Power site is located 177 Tie Road, RR2 Tiverton in the Municipality of Kincardine on the eastern shore of Lake Huron, approximately 18 kilometres (km) north of the town of Kincardine in Bruce County, Ontario, and within the territory of the SON. Bruce County is in the northern part of southwestern Ontario (see Figure 1). The Bruce Power site currently hosts several licensed nuclear facilities, which include Bruce Nuclear Generating Station A (Bruce A) and Bruce Nuclear Generating Station B (Bruce B), each comprised of four CANDU reactors, as well as ancillary facilities. Several support facilities are also located on the Bruce Power site

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and are operated and maintained by Bruce Power. Bruce Power leases these portions of the Bruce Power site, including Bruce A and Bruce B, from OPG under a long-term lease agreement. The Bruce Power site also encompasses lands currently occupied by OPG, CNL, and Hydro One. A site map of the Bruce Power site is shown in Figure 2.

During the Pre-Planning Phase of the Project, Bruce Power commenced a siting process to understand potential constraints and opportunities at the Bruce Power site. The siting process was completed to support conceptual layout development and evaluate suitable areas for potential development. The process included reviewing opportunities, constraints and exclusion areas present at the Bruce Power site. The siting process allowed for an objective, transparent and rigorous understanding of the Bruce Power site relating to land footprint suitability and will provide foundational information that will assist with future engagement with Indigenous Nations and Communities and local communities regarding siting. Additional Information on the Project's proposed location and Project components are provided in Section 13.0.

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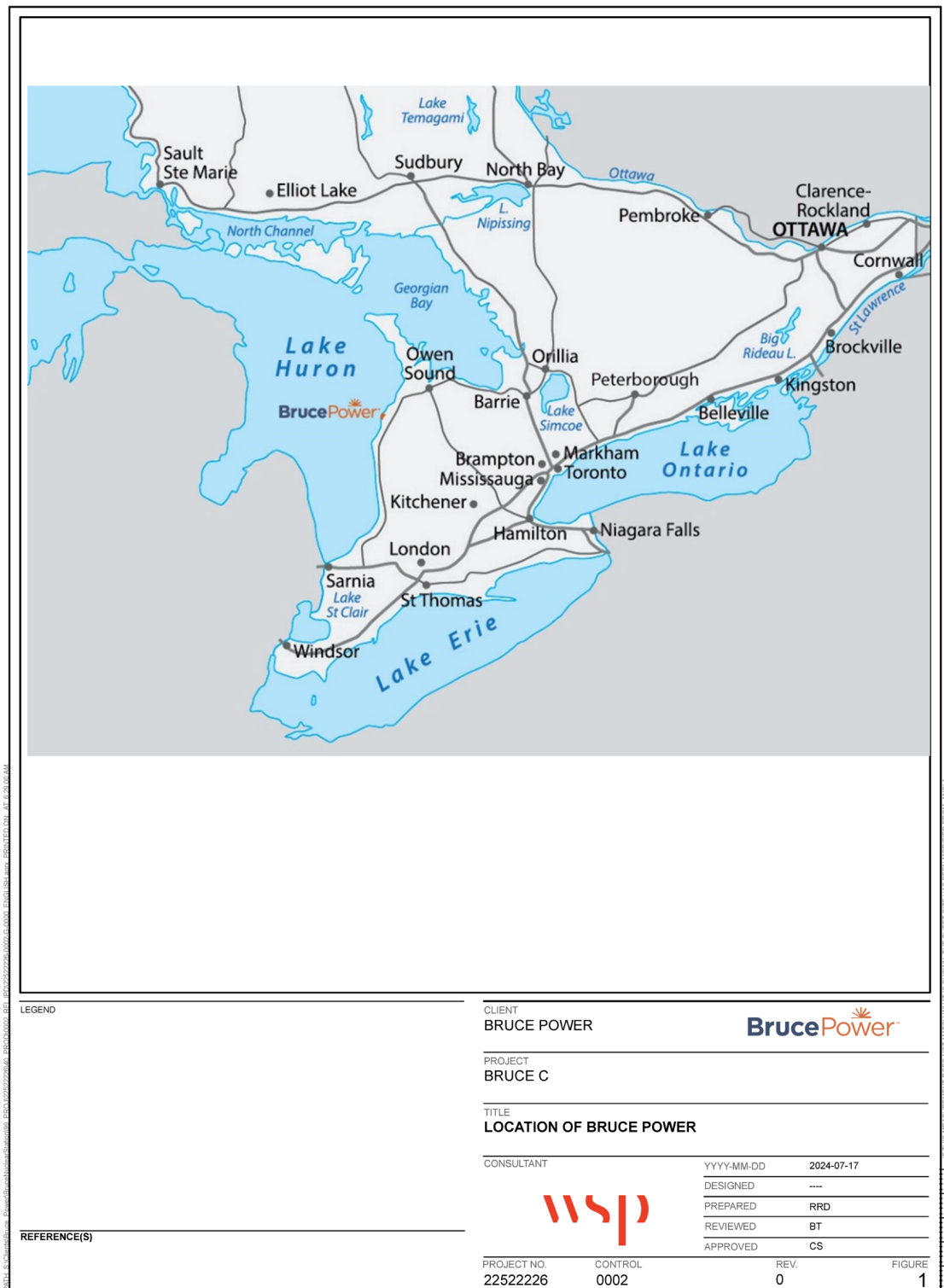


Figure 1: Location of Bruce Power

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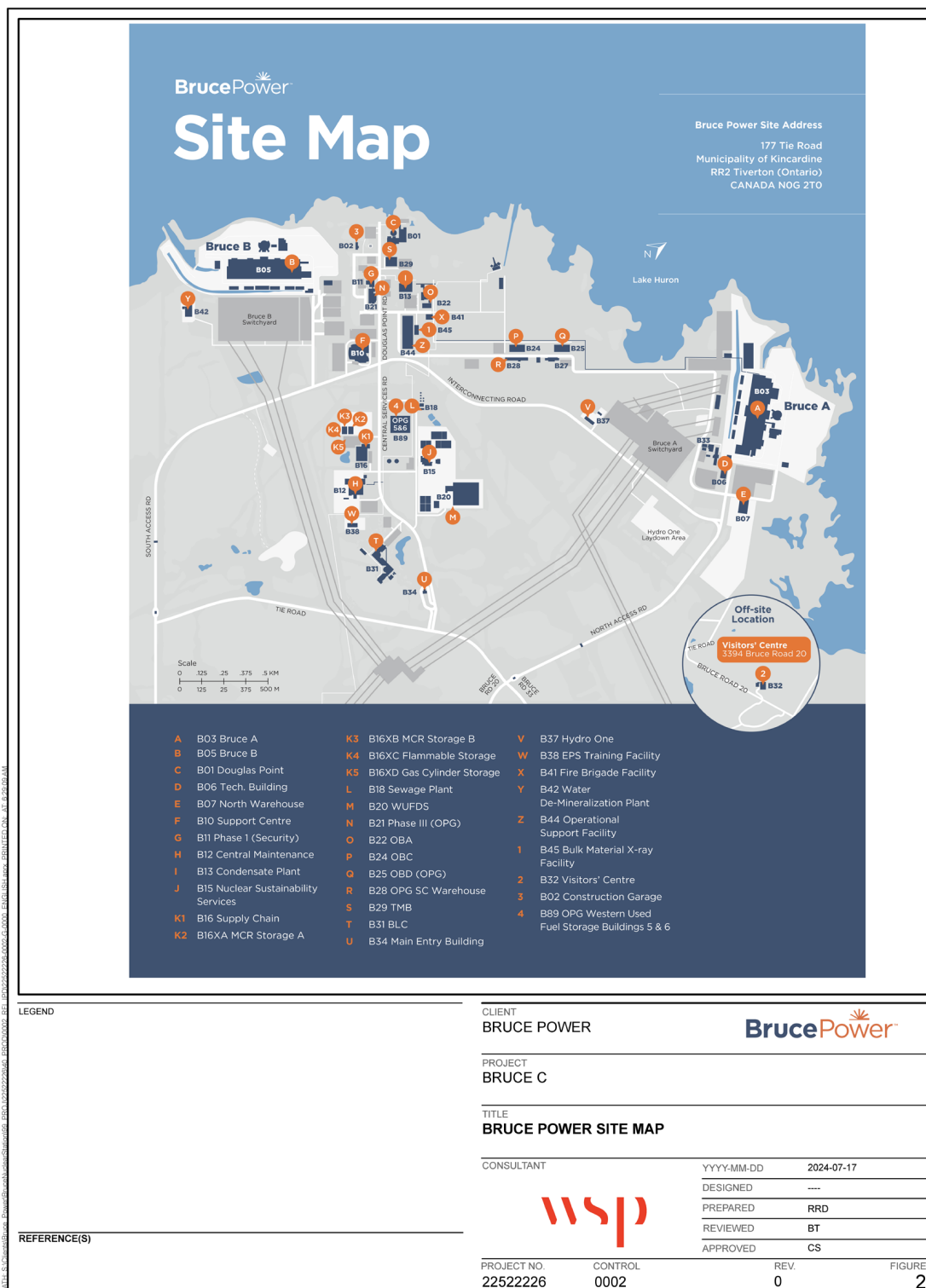


Figure 2: Bruce Power Site Map

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2.0 PROPONENT CONTACT INFORMATION

Proponent's name: Bruce Power Inc.

Bruce Power is the proponent for the Project.

Primary Representatives of the Project & Contact information:

Bruce Power Executive Contact:

Jennifer Edey

Senior Vice President, Operational Services and Business Development

Bruce Power Primary Contact:

Weina Chong

Director, Business Development – NextGen, Business Development & Energy Innovation

<personal information removed>, <email address removed>

3.0 SUMMARY OF EARLY ENGAGEMENT WITH JURISDICTIONS OR OTHER PARTY

Bruce Power owes much of its success to the support and commitment from surrounding communities. Bruce Power does not take this support for granted and is committed to earning the support of the community each and every day through continuous improvement and an ongoing focus on openness, transparency and strengthening the community.

Bruce Power is committed to proactive, open, and transparent engagement and will provide multiple opportunities for input, both in-person and virtually. Bruce Power will keep the public informed and engaged throughout the IA process and will provide regular updates about the proposed Project through its website, news releases, newsletters, social media, and videos.

The following summarizes engagement activities undertaken to date for the Project. A summary of engagement undertaken with Indigenous Nations and Communities is provided in Section 4.0.

On July 5, 2023, interested parties from local municipalities, Indigenous Nations and Communities, unions, suppliers, industry organizations and media were invited to attend a press conference on the Bruce Power site [R-3]. Ontario's Minister of Energy held a press conference to publicly announce Bruce Power's intent to advance the long-term planning and consultation work required to explore nuclear expansion on the Bruce Power site.

To date, Bruce Power has completed a number of public engagement activities for the Project. These engagement activities are summarized below:

- Bruce C Project website to provide Project updates and information. Project website also provides an opportunity for interested parties to subscribe to receive Project updates (<https://www.brucepower.com/future-of-the-bruce-site/>);

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- News releases and social media providing updates on the Project;
- Bruce C Port Elgin Project Office Grand Opening (November 15, 2023);
- Bruce C Project booklet published (November 2023);
- Bruce C Community Information Sessions, which also included an overview of current operations at Bruce Power's Visitor Centre and site tours advertised with local media and social media (November 19, 2023, and December 10, 2023);
- Presentation at Clean Energy Frontier Summit (January 19, 2024);
- Community Leaders Breakfast which included an update on the Bruce C Project and results of polling conducted (April 12, 2024);
- Bruce Power Community Update mailed to area residents (Fall 2023 and June 2024);
- Bruce Power and Bruce C Project E-Newsletters to subscribed email addresses (June 2024);
- Bruce C introductory video launched (June 2024);
- Delegations to local municipal councils (Municipality of Kincardine, Town of Saugeen Shores, Bruce County, Grey County, Huron County, Municipality of South Bruce);
- Presentations to local municipal staff (Municipality of Kincardine, Town of Saugeen Shores, Bruce County, Grey County, Huron County);
- Shared draft of Initial Project Description with local municipal staff (Municipality of Kincardine, Town of Saugeen Shores, Bruce County, Grey County, Huron County);
- An early engagement survey, accessible at the Community information sessions, linked in the community updates, posted on Bruce Power's website or obtainable at the Visitor Centre, sought to understand the community's preferred methods of learning about the proposed Project, the topics they are most interested in, and their favored channels for providing feedback;
- Reviewed public participation activities and feedback from previous nuclear expansion proposals;
- Table/booth at industry and municipal conferences (Clean Energy Frontier Summit, Rural Ontario Municipalities Association, Canadian Nuclear Association); and
- Table/booth at community events.

To ensure that engagement is focused and relevant, Bruce Power is creating a list of interested parties, populations, or individuals that will be engaged with as part of public engagement. This includes those who could be directly or indirectly affected by the Project such as local municipalities, residents in close proximity to the Bruce Power site, businesses

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and business groups, nuclear sector organizations, community groups, interest groups, and others.

Key interests and issues raised during the Pre-Planning Phase of the Project include:

- **Project details:** questions about the purpose and need of the Project, technology evaluation process and the use of the Plant Parameter Envelope (PPE), waste considerations and timeline of the Project;
- **Potential cumulative effects:** considerations of the effect of the Project and activities combined with the effect of other past, current or reasonably foreseeable projects and activities;
- **Local municipal government and public engagement:** considerations of the way groups wish to participate in the IA process;
- **Environment:** interests and issues raised about climate change, and natural heritage;
- **Human health and community wellbeing:** interests and issues raised including quality of life, recreation, safety, security and emergency management, and traffic; and
- **Socio-economic conditions:** including interests and issues related to local labour force, income, employment, education and childcare, health care, housing, population growth and development, training and business opportunities.

A comprehensive table summarizing the key interests and concerns heard during public engagement is included in the IPD for the Project.

To support further engagement on the Project, plans for public engagement activities include:

- Update the Bruce C Project website with project content and engagement opportunities;
- Advertise public engagement opportunities with local media and social media;
- News releases and social media;
- Site tours;
- Emails/Letters;
- Deliver Bruce Power Community Update and Bruce C Project Update newsletters to area residents;
- Bruce Power and Bruce C Project E-Newsletters to subscribed email addresses;
- Bruce C Project general inquiry email address;
- Utilize digital engagement tools;

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- Develop communications tools such as infographics, plain language summaries, factsheets and videos;
- Schedule open houses to share information about the Project;
- Schedule focused workshops to engage with organizations on topics such as socio-economic conditions, human health and well-being, and the environment;
- Offer Bruce C Project coffee chats;
- Delegations to local municipal councils;
- Presentations and meetings with community groups;
- Table/booth at industry and municipal conferences;
- Table/booth at community events; and
- Regional polling (Fall 2024).

4.0 SUMMARY OF EARLY ENGAGEMENT WITH INDIGENOUS NATIONS AND COMMUNITIES

Bruce Power is committed to early, frequent, community driven engagement to support collaboration and informed decision making with Indigenous Nations and Communities. As part of engagement and relationship development, Bruce Power's approach to engagement aims to facilitate:

- Understanding of the Project details, regulatory process and requirements;
- Greater organizational awareness and understanding of each Indigenous Nation and Community's interests, concerns, and priorities with respect to engagement on Project development and regulatory processes;
- Collaborative development of engagement processes, including approaches to the assessment of cumulative effects, potential impacts to rights, environment, and social, economic and health conditions, and mitigation/management measures;
- Support for Indigenous-led community engagement and study of the Project;
- A clear demonstration of how participation of Indigenous Nations and Communities is reflected in processes and regulatory submissions; and
- Potential benefits for Indigenous Nations and Communities from the Project such as training, jobs, and procurement opportunities.

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Bruce Power recognizes that the Bruce Power site is located within the SON Territory (Figure 3), the shared treaty and traditional Territory of the Chippewas of Saugeen First Nation and Chippewas of Nawash Unceded First Nation (Neyaashiinigmiing). Bruce Power is dedicated to honouring Indigenous history and culture and is committed to moving forward in the spirit of reconciliation and respect with the Indigenous Nations and Communities we work with. We are committed to strong and respectful relationships with the SON, MNO, and HSM (Figure 4).

Bruce Power has a history of engagement with SON, HSM, and MNO related to the Bruce Power site and will continue to engage with these Indigenous Nations and Communities for the Project. Bruce Power is progressing with the IA process in a transparent manner. Should additional Indigenous Nations and Communities be included in IAAC's Indigenous Engagement and Partnership Plan, Bruce Power will engage consistent with the approach described above.

Bruce Power has engaged SON, MNO, and HSM with respect to its operations, licensing and permitting for many years and has established protocol/relationship agreements that facilitate ongoing engagement and the advancement of shared priorities by:

- Supporting the framework for information-sharing, engagement, and collaboration;
- Providing annual capacity funding to support engagement activities and other agreed-upon work, as well as providing additional capacity funding to support engagement in regulatory processes; and
- Setting out a process to collaborate in several areas including environment, training, employment, and business development.

Bruce Power's relationships with local Indigenous Nations and Communities are of the utmost importance and as such, Bruce Power remains committed to meaningful engagement and collaboration in shaping the future of the Bruce Power site and ensuring participation in and benefit from any future development.

Bruce Power acknowledges that Indigenous Knowledge related to the Project is an important component of the IA. Bruce Power looks forward to continuing to discuss and collaborate on Project specific engagement plans with each Indigenous Nation and Community and will utilize the IAAC's Indigenous Engagement and Partnership Plan to aid in the development of engagement strategies.

The following sections provide a summary of early engagement with Indigenous Nations and Communities, including a summary of key issues raised. A description of planned future engagement is also summarized below. At the request of MNO, details of engagement related to the Project with the MNO are not included in this IPD. Bruce Power has and will continue to engage with MNO about the Project on a regular basis.

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It is Bruce Power's intent to continue to work collaboratively with each of SON and HSM throughout the IA process. The company seeks to collaboratively develop engagement plans, provide capacity funding to support meaningful engagement with Bruce Power and also to support the engagement that each of SON and HSM will complete with their members. A detailed description of known interests and concerns is provided in Section 21.0.

SON and HSM are already familiar with Bruce Power and its operations through our ongoing engagement, and we will continue to strive to strengthen our relationships, engagement, collaboration. We plan to meet regularly, provide information and opportunities to learn, provide feedback/input and collaborate to address interest and concerns about the potential challenges and opportunities related to the Project.

We are still working with each of SON and HSM to develop specific engagement plans to inform the types of community engagement Bruce Power will do directly and which types of community engagement and communications will be Indigenous-led on the Project. It is important to note the public engagement plans and resources in Section 3.0 will also be available to Indigenous Nations and Communities, in addition to tailored resources and approaches to engagement developed collaboratively.

4.1 Summary of Project Specific Engagement with Saugeen Ojibway Nation

The following section provides a summary of Project specific engagement with the SON. A summary of key interests and issues raised by SON, and a summary of future planned project specific engagement is also included.

On September 18, 2023, after Bruce Power provided the early draft IPD, Bruce Power met with SON Environment Office (SON EO) representatives for a routine quarterly meeting. During this meeting, Bruce Power provided an overview of the IA process. The SON EO indicated, in the meeting, the need for the IPD to be discussed with the SON Joint Council before further engagement. Bruce Power was informed that SON required more time to determine the process for engagement between SON and Bruce Power on the IPD and the IA more broadly and Bruce Power delayed the submission of the IPD to provide additional time.

Beginning in December 2023, SON and Bruce Power have been meeting regularly to develop a path forward for meaningful engagement on the IA. SON and Bruce Power have been meeting on a minimum-monthly basis at a leadership level to develop a framework for a renewed relationship, which includes engagement on the IA. The intent of the renewed framework is to ensure that SON's well-documented and ongoing concerns related to the environmental and potential rights impacts of the Bruce Power site are addressed where possible, and that other interests and benefits such as economic participation, training, employment and business opportunities can progress. This renewed framework will include a collaboratively developed process for engagement on the IA. We are working with SON to ensure that Bruce Power provides the necessary capacity funding to support SON and Bruce Power's engagement, SON's own process to assess potential new nuclear in SON Territory and SON's engagement with SON Membership on the potential Project. We are also discussing approaches for both collaborative and SON-led environmental research related to ongoing operations and the potential Project.

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Through our engagement, we understand that key areas of interest and concern include, environmental impact and cumulative effects, impacts to rights, nuclear waste, economic participation, training, employment and business opportunities.

SON has also expressed challenges they are facing related to capacity resources and competing engagement on the high volume of development in SON Territory, including other large nuclear and energy projects such as the Nuclear Waste Management Organization (NWMO) Deep Geologic Repository and TC Energy's proposed pumped storage project. SON had expressed that it is a challenge to assess the potential for new nuclear development given the lack of resolution of legacy issues related to long-term nuclear operations and waste storage in SON Territory.

An updated version of the IPD was shared with SON on March 21, 2024, following a March 20, 2024, monthly meeting with SON leadership to discuss the IPD and IA process. SON has not provided any specific feedback on the content of the IPD beyond the general concerns that have been raised with respect to the potential Project, as set out above. Bruce Power has advised SON that the IPD will be submitted in summer 2024, and we plan for continued and regular engagement on the IA.

4.1.1 Planned Project Specific Engagement with Saugeen Ojibway Nation

SON and Bruce Power will continue to work together to develop the plan for Project-specific engagement. We plan to actively engage with SON leadership and SON EO on a regular basis on areas of interest including siting, PPE, reactor technologies, environmental impact, cumulative effects, mitigation measures, Best Available Technology Economically Achievable (BATEA), social, economic and health, economic participation, training, employment and business opportunities. We are working together to develop SON-Bruce Power working groups so that we can engage in these items more effectively and with higher frequency. SON has expressed interest in developing a SON-led process to engage with SON Membership on the Project, and we will respect SON's decisions on how Bruce Power engages on the Project with the SON Membership directly. We will also collaboratively develop plans to investigate and better understand environmental and cumulative effects from a Two-Eyed Seeing Approach. This approach will ensure SON's Knowledge Systems are represented in a way that SON supports. We will take SON's lead on areas that they will work on independently and provide capacity support to facilitate their work.

Engagement and collaboration with SON is important in the development of the IA and the potential Project to ensure we proceed in a way that avoids, minimizes and mitigates impacts to the environment, SON rights and interests, and provides opportunities for SON benefit.

4.2 Summary of Project Specific Engagement with Historic Saugeen Métis

The following section provides a summary of project specific engagement with HSM. A summary of key interests and issues raised by HSM, and a summary of future planned project specific engagement is also included.

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Following the receipt of the early draft IPD, Bruce Power and HSM met on September 20, 2023 for a quarterly meeting. During this meeting, Bruce Power provided an overview of the IA process and requested more frequent meetings to discuss items related to the IA. It was agreed by HSM that more frequent touch points would occur on approximately a bi-weekly basis.

On October 10, 2023, Bruce Power received initial feedback on the IPD from HSM in the morning and met with HSM that afternoon to go through the feedback provided. Bruce Power took the initial feedback and incorporated it into the IPD. On April 9, 2024 Bruce Power provided a revised IPD to HSM and included a response to how their initial comments were addressed. Additional feedback from HSM was provided to Bruce Power on May 9, 2024 which expressed on-going concerns with the current thresholds for effluent temperature, fish impingement and entrainment, the lack of monitoring for aquatic invertebrates, and the long-term reduction and safe storage of waste. HSM expressed the need for further clarity and engagement on the development of the PPE approach and an interest in learning more about the “bounding plant parameter envelope” approach, the “available set of reactor designs”, and the potential impacts of what existing structures may be leveraged to support the Project. As a result of this comment from HSM, Bruce Power provided an initial presentation to HSM on June 27, 2024. Bruce Power will continue to discuss these issues with HSM through its continued engagement for the Project.

4.2.1 Planned Project Specific Engagement with Historic Saugeen Métis

Bruce Power and HSM plan to continue to meet at their established frequency and will conduct ad-hoc meetings when requested by HSM to further discuss areas of concern and interest.

4.3 Summary of Project Specific Engagement with Métis Nation of Ontario.

Bruce Power and MNO have had frequent engagement on the IPD since initial receipt in September of 2023. At the request of MNO, a summary of engagement is not included in the IPD. Bruce Power will continue to engage routinely with MNO throughout the duration of the process.

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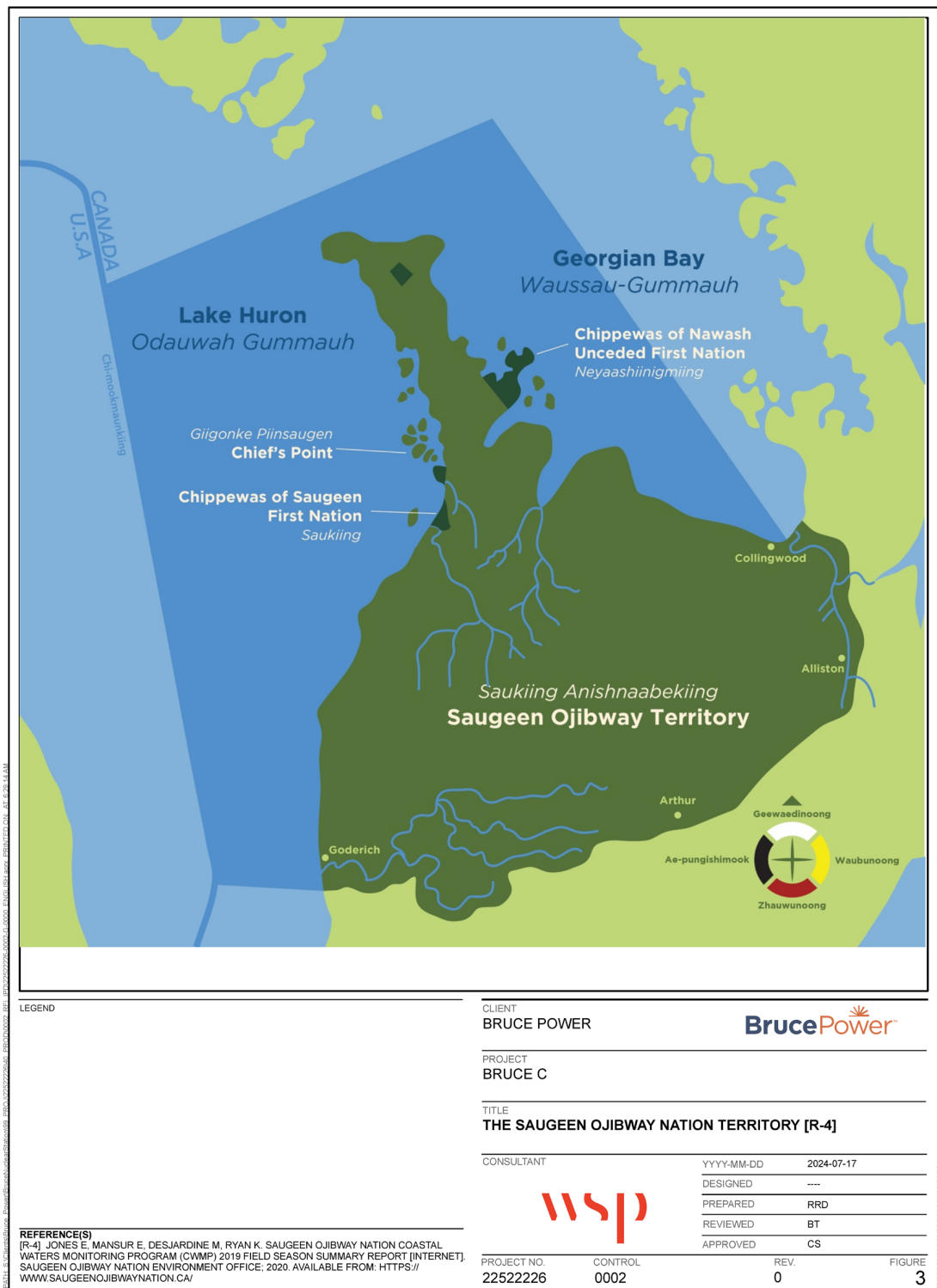


Figure 3: The Saugeen Ojibway Nation Territory [R-4]

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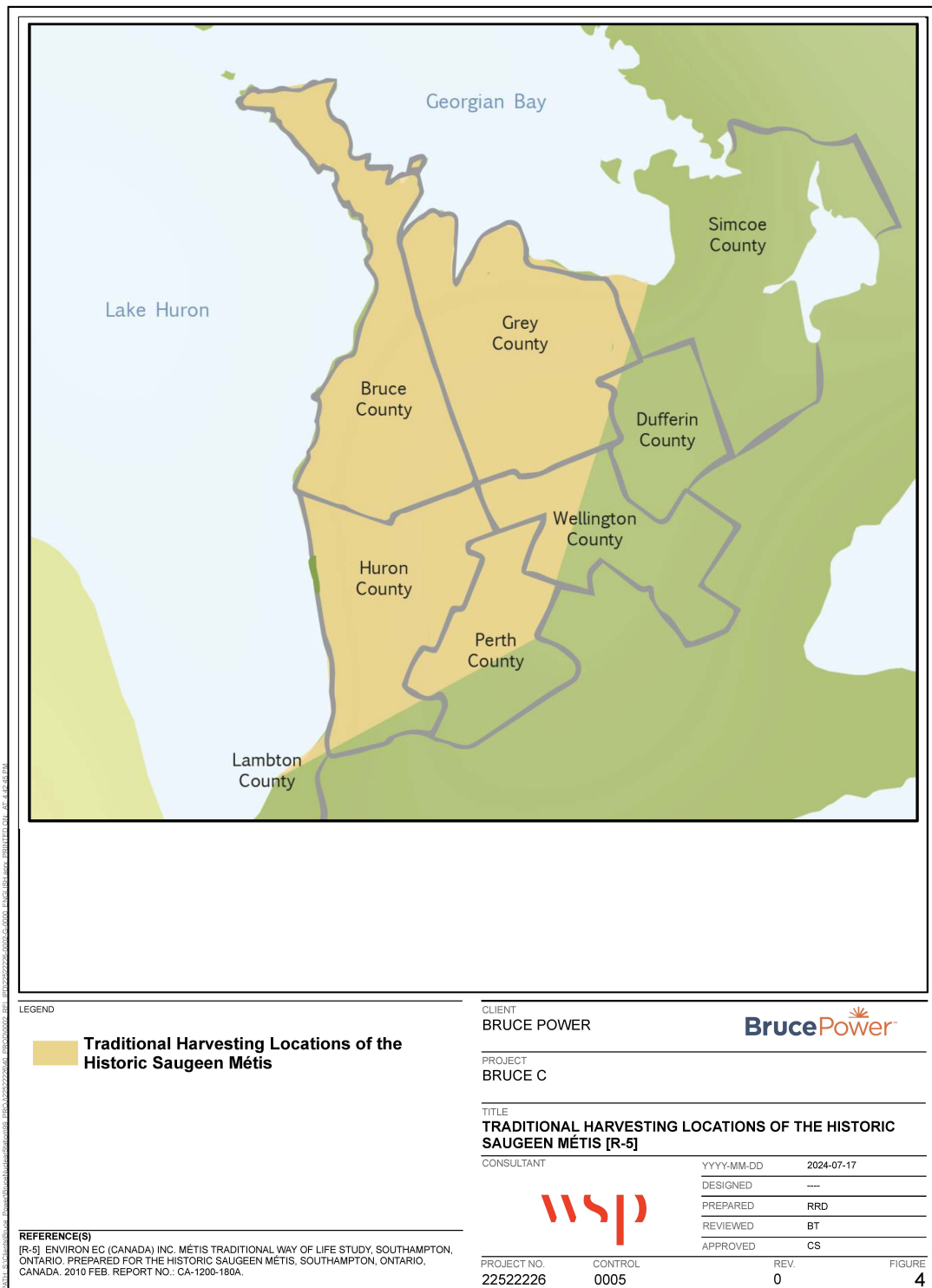


Figure 4: Traditional Harvesting Locations of the Historic Saugeen Métis [R-5]

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5.0 STUDIES OR PLANS RELEVANT TO THE PROJECT

The Bruce Power site has been highly studied and characterized and has demonstrated over 50 years of safe nuclear power generation. Bruce Power's environmental monitoring program conducts extensive year-round sampling to verify the protection of the local environment. This includes water temperature and surface water quality sampling on site and in Lake Huron, and routine monitoring of soil, sediment, groundwater, vegetation, agricultural products, and wildlife. Environmental monitoring (measurement, sampling, and analysis) ensures that the health of the environment and people are protected and verifies that emissions and effluents from operations result in negligible environmental risks [R-6].

Since Bruce Power took over operations of the Bruce Power site in 2001, Environmental Assessments and ongoing environmental protection programs (e.g., Environmental Risk Assessment [R-6]) have been conducted at key licensing and operational milestones. With the completion of each of the Environmental Assessments, progressively more environmental data has been collected for the Bruce Power site. Follow-up monitoring has confirmed that effects were as predicted in the Environmental Assessments. The collection of this wealth of information has enabled Bruce Power to inform and refine the Environmental Risk Assessment. Bruce Power anticipates that such information will have a similar beneficial impact on its IA efforts.

The Environmental Risk Assessment at the Bruce Power site is updated every five years and includes both a retrospective examination of environmental risk over the last five years and a prospective look at the potential environmental effects of proposed activities on site in the next five years. The 2022 Environmental Risk Assessment [R-6] was found to be compliant with the requirements of Canadian Standards Association N288.6-12 Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills [R-7] and was accepted by the Canadian Nuclear Safety Commission (CNSC) in 2023. The results of the 2022 Environmental Risk Assessment were shared and reviewed with the SON, the MNO, and the HSM prior to the submission to the CNSC.

Bruce Power confirmed with IAAC that there are no regional assessments carried out under Section 92 or Section 93 of the IAA or on behalf of an Indigenous governing body that would be applicable to the Project.

5.1 Indigenous-Led Assessments

The SON Coastal Waters Monitoring Program (CWMP) is implemented by SON members through the SON EO; the results are shared annually with Bruce Power and are incorporated into the Environmental Risk Assessment, as well as other Environmental Monitoring Processes, and is a complementary measure in Bruce Power's *Fisheries Act* Authorization. The continuation of this program will improve baseline understanding of Lake Huron and Georgian Bay, including knowledge of the existing fish community, water temperature, water quality, wetland habitat and SON Ecological Knowledge. More information on the SON CWMP is provided in Section 14.16.

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SON Fisheries Programs have also undertaken large-scale Lake Huron research programs, including acoustic telemetry and use, occupancy, and knowledge mapping with SON Fishers. Though this work is not specific to or directly related to Bruce Power or its operations, this body of SON Knowledge will support our engagement on environmental items of interest and concern to SON, such as potential impacts to fish and fish habitat [R-8].

As we work through the IA process, Bruce Power will continue to engage with the Indigenous Nations and Communities outlined in Section 4.0 to determine interest in carrying out Indigenous Led studies, the inclusion of Indigenous Knowledge throughout the IA, and land-use or other environmental studies that would support addressing concerns and interests related to the Project.

5.2 Regional Studies and Plans

There are numerous studies in the region that are relevant to the Project including, but not limited to, those conducted by Environment and Climate Change Canada, which include the 2021 Lake Huron Canadian Nearshore Assessment [R-9], The Council of the Great Lakes Region (CGLR) research and Regional Assessment [R-10][R-11], Ontario's Ministry of the Environment, Conservation and Parks (MECP) Great Lakes Strategy [R-12], and the International Joint Commission (IJC) Science Advisory Board Work Group on Great Lakes Ecosystem Valuation [R-13]. This collection of studies and plans examine many aspects of the current state of Lake Huron as well as considering future conditions that are relevant to the Project such as sustainable use strategies, shoreline condition, climate change, invasive species, as well as conservation strategies. Bruce Power will continue to review and leverage the information relevant to the Project throughout the IA.

The Nuclear Innovation Institute (NII) recently launched The Climate Project, which is a “living, trusted and accessible digital hub created by the NII—but with scientific research findings from qualified sources in academia, municipal, provincial and federal governments, conservation authorities, NGOs, industry partners, and sources of local Indigenous knowledge” [R-14]. The purpose of The Climate Project is to “share a body of localized research and scientific knowledge on climate change pertaining to people in this region - those in Bruce, Grey, and Huron counties and local Indigenous communities - all located within the Saugeen Ojibway Nation Territory”.

Bruce County is the land use planning authority and delivers planning services to each of the local municipalities in Bruce County. The County acts as the approval authority for plans of subdivisions and condominiums, severance applications, as well as local Official Plan Amendments.

6.0 STRATEGIC ASSESSMENT, RELEVANT TO THE PROJECT

One factor to be considered in a designated project's IA process is the Project's impact on reaching the Government of Canada's climate change goals. The Strategic Assessment of Climate Change (SACC) developed by Environment and Climate Change Canada (ECCC) was published in 2019 [R-15] and enables consistent, predictable, efficient and transparent consideration of climate change throughout federal IAs.

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IAAC informed Bruce Power that they are not aware of any other relevant strategic assessments that have been conducted under section 95 of the IAA.

PART B: PROJECT INFORMATION

7.0 A STATEMENT OF THE PURPOSE OF AND NEED FOR THE PROJECT

The Project will provide an option to the province of Ontario for nuclear expansion on the Bruce Power site for up to 4,800 MWe of electricity. This will support Ontario's growing energy needs, while advancing federal and provincial carbon emissions goals. Such need for additional electricity has been forecasted by both Ontario's Independent Electricity System Operator (IESO) and the Government of Canada.

The IESO identified the need for new nuclear in its Pathways to Decarbonization Report [R-16] (Figure 5). The Pathways to Decarbonization Report was issued in December 2022, and forecasts the need for an additional 69,000 MWe of non-emitting supply to meet growing electricity demand and fully decarbonize by 2050, including 17,800 MWe of additional nuclear capacity. The report called for "no regret actions" including "beginning the planning, siting, and environmental assessment work needed for new nuclear".

In July 2023, the Government of Ontario responded to the IESO's Pathways to Decarbonization Report by releasing Powering Ontario's Growth [R-17]. The plan outlines Ontario's electricity policy for the coming decade, a key element of which is "starting the development of long-lead generation and storage assets like nuclear and pumped hydroelectric so the government has a range of options to choose from to contribute to our diverse energy system". Bruce Power completing an IA was cited as an important option for the province, complemented by a provincial request for the IESO to work with Bruce Power on a cost-recovery framework for completing pre-development work. On April 4th, 2024 the Minister of Energy directed the IESO to enter into a funding agreement with Bruce Power to recover costs incurred for undertaking the IA process. An agreement was formally executed between the IESO and Bruce Power in April 2024. Together, these actions signal a clear need for the Project from a provincial electricity system planning perspective.

In the 2024 Annual Planning Outlook (APO) [R-18], IESO projects quicker demand growth in the near term than its previous APO and the Pathways to Decarbonization Report. A "high-nuclear" case is considered by IESO, which assumes that capacity from Bruce C is available in the 2040s. This scenario shows that new baseload nuclear from Bruce C would contribute significantly to addressing Ontario's electricity supply needs and demonstrates the necessity for exploring this option [R-18].

The federal government has also identified a need for new electricity infrastructure to meet growing demand. In its 2023 budget, the Government of Canada forecasted that demand for electricity will double between now and 2050, and "to meet this increased demand with a sustainable, secure, and affordable grid, our electricity capacity must increase by 2.2 to 3.4 times compared to current levels [R-19]". The Government of Canada has also announced measures to "help get nuclear projects built in a timely, predictable, and responsible fashion". This includes a 3-year target for nuclear project reviews and progress on implementing

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Investment Tax Credits that include new nuclear projects, as announced in Budget 2024 [R-20].

Beyond electricity supply and net zero targets, the Project will create and sustain high-quality jobs in Bruce, Grey, and Huron Counties and beyond by supporting a highly technical and robust supply chain, as well as meaningful economic benefits to Indigenous Nations and Communities.

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8.0 THE PROVISIONS IN THE SCHEDULE TO THE PHYSICAL ACTIVITIES REGULATIONS

The Project has a proposed capacity of up to 4,800 MWe or 13,600 megawatts thermal (MWth) and will be located on the Bruce Power site. As such, the Project is a “designated project” as described in subsection 27(a) of the Physical Activities Regulations: [R-21]

“27 The site preparation for, and the construction, operation and decommissioning of, one or more new nuclear fission or fusion reactors if

(a) that activity is located within the licensed boundaries of an existing Class IA nuclear facility and the new reactors have a combined thermal capacity of more than 900 MWth”

9.0 PROJECT ACTIVITIES

Table 1 summarizes all known activities, infrastructure, permanent or temporary structures and physical works to be included in and associated with the site preparation, construction, operation (active and safe storage operations), decommissioning, and abandonment of the Project, as understood at this stage in the Project planning. The Project activities will continue to be refined as the Project progresses.

The Project is located at the existing Bruce Power site and, as such, the Project may leverage existing structures to support the Project. These structures may include existing roads, parking lots, docks, warehouses, laydown areas, office buildings, labs, training facilities, domestic water supply and wastewater treatment plant. Considerations for the potential use of existing structures will be further assessed as part of the Impact Statement.

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Table 1: Site Preparation, Construction, Operation, Decommissioning and Abandonment Activities

Project Phase	List of Activities, Infrastructure, Permanent or Temporary Structures and Physical Works
Site Preparation	Site preparation activities may include: • Preparation of temporary construction areas; • Land clearance; • Surface clearing and grubbing, including demolition of existing structures; • Relocation or removal of existing below-grade utilities; • Installation of services and utilities; • Grading; • Construction of flood protection and erosion control measures¹; • Construction of stormwater management facilities; • Preparation of temporary or permanent new roads, road upgrades, and parking lots; • Installation of dock for delivery of components¹; • Materials laydown; • Installation of temporary construction facilities for equipment assembly, administration and personnel amenities; • Blasting to prepare foundations of reactor buildings and water intake and discharge structures¹; • Dewatering for site-preparation activities; • Procurement of components and equipment; • Delivery of components by road and tug-towed barge¹; • Construction of concrete batch and crushing plant; and • Management of soils and waste generated by site preparation activities.
Construction	Construction activities may include: • Continuation of construction of stormwater management facilities; • Construction of water intake and discharge structures; • Construction of switchyard; • Dewatering of construction area; • Continuation of blasting to prepare foundations of reactor buildings and water intake and discharge structures; • Use of waste rock as infill for power block area, road base and building foundations; • Management of waste generated by construction activities;

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Table 1: Site Preparation, Construction, Operation, Decommissioning and Abandonment Activities

Project Phase	List of Activities, Infrastructure, Permanent or Temporary Structures and Physical Works
	• Installation of any additional temporary construction facilities for equipment assembly, administration and personnel amenities; • Continuation of procurement of components and equipment; • Materials laydown; • Construction of all plant buildings and structures; • Delivery of components by road and tug-towed barge; • Assembly of modules on-site; • Lifting of modules via heavy lifting cranes; and • Installation of equipment.
Active and Safe Storage Operations & Maintenance	Active operations and maintenance activities may include: • Operations and maintenance activities during commissioning may include: ○ Structure, System and Components (SSC) construction completion activities; ○ SSC turnover activities; ○ Commissioning- SSC testing and qualification activities; ○ Fuel loading; ○ Stormwater management; ○ Final commissioning activities; and ○ Training of commissioning and operations staff. • Operations and maintenance activities during power operations and outages may include: ○ Nuclear Steam Supply System; ○ Nuclear Safety Systems; ○ Turbine Generator and Feedwater System; ○ Electrical Power Systems; ○ Service Water and Cooling Water Systems; ○ Material Handling Systems; ○ Radioactive Waste Management Systems; ○ Non-Radioactive Waste Management Systems; ○ Operational and Maintenance Programs;

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Table 1: Site Preparation, Construction, Operation, Decommissioning and Abandonment Activities

Project Phase	List of Activities, Infrastructure, Permanent or Temporary Structures and Physical Works
	○ Refurbishment and Major Maintenance; ○ Site Support Systems; and ○ Workers, Payroll and Purchasing. Safe storage operations activities may include: • De-fueling of the reactors; and • Activities required to maintain support systems and infrastructure (e.g., electrical power systems, lighting, etc.).
Decommissioning	Decommissioning activities may include: • Support system shutdown; • Stormwater management; • Safe storage of radioactive waste, including used fuel; • Final disposal of used fuel; and • Dismantlement and removal of reactors, and support infrastructure/systems.
Abandonment	Restoration of the site.

Note: ¹ indicates site preparation activities where there is a potential for in-water works

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10.0 ESTIMATE OF THE MAXIMUM PRODUCTION CAPACITY, DESCRIPTION OF THE PRODUCTION PROCESSES

To provide options to the province in long-term electricity system planning, the Project will be technology-neutral, using a PPE. This means that the IA will evaluate the potential impacts of the Project by considering multiple reactor technologies. A PPE is a set of values that define the characteristics of a reactor that might later be built at a site. The PPE is considered bounding as none of the individual reactor designs would have a greater impact on the environment, socio-economic conditions or human health than what is defined in the PPE. More than 300 parameters are defined by all technologies under consideration, therefore acting as a conservative surrogate for the final reactor design and is bounding for all technologies. The bounding parameters of the PPE will inform the pathways of effect on health, social, cultural and economic conditions, as well as impacts on Indigenous Nations and Communities. A technology-neutral approach has been used previously in regulatory decision-making processes for new nuclear power projects in both Canada and in the United States.

Currently, a technology “assessment evaluation” in collaboration with reactor technology providers is ongoing to further validate the list of reactor designs. Bruce Power also plans to use the information collected in the technology evaluation process to inform the PPE. Bruce Power anticipates that the technology selection process will be completed prior to the Licence to Construct application being submitted to the CNSC. In 2024, OPG, Bruce Power, and IESO will complete a feasibility study, which will assess the timing of additional new build in the province. This information will be used to further inform the timeline for technology selection.

The bounding envelope currently includes the available information of the following designs for reactor models. Schematics of the reactor designs are shown in Figure 6 for illustrative purposes only.

- Atkins Réalis – MONARK;
- Électricité de France – European Pressurized Water Reactor (EPR);
- Hitachi-GE Nuclear Energy – Advanced Boiling Water Reactor (ABWR);
- GE Hitachi Nuclear Energy – BWRX-300; and
- Westinghouse – AP1000 Pressurized Water Reactor

The above list of technologies currently considered in the PPE are non-exhaustive and subject to change based on the ongoing technology evaluation process, continued internal development and engagement with Indigenous Nations and Communities. Bruce Power will provide a revision to the project description as part of the Impact Statement and PPE, should the current PPE require an update based on the outcome of the technology evaluation for the next stages of Project development.

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Figure 6: Reactor Designs Considered in the Plant Parameter Envelope

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11.0 ANTICIPATED PROJECT SCHEDULE

Table 2 summarizes the anticipated schedule for the Project. The timeline for the actual sequence of the Project schedule is dependent on several considerations, and therefore is subject to potential changes. Environmental monitoring in accordance with the Environmental Follow-up Monitoring Program that will be prepared for the Project, will occur during each of the Project phases. Bruce Power will continue to engage with SON, HSM and MNO throughout the IA process. Bruce Power is committed to working together to address SON's concerns related to the IA timelines and to taking the time reasonably required to support SON's engagement on the IA.

Table 2: Anticipated Project Schedule

Project Phase	Anticipated Schedule (Start – Finish)	Notes
Impact Assessment	Approximately 3 - 4 years (2024 – 2027/2028)	In the 2024 Federal Budget, the government set a three-year target for nuclear project reviews. [R-20] However, based on necessary engagement activities with Indigenous Nations and Communities, local municipalities and the public, Bruce Power believes that the IA process may take up to four years. For ease of reference, a four-year IA process has been assumed for calculating the timelines under the Anticipated Schedule column. The integrated IA will also consider an application for a CNSC Licence to Prepare Site.
Site Preparation	Approximately 3 years (2028 – 2031)	Requires integrated approval for IA and Licence to Prepare Site
Construction & Commissioning	Approximately 14 years (2031 –2045)	Requires CNSC Licence to Construct. Assumes one year between subsequent unit deployments.
Active Operation	Approximately 60 - 100 years	Requires CNSC Licence to Operate. Assumes 60 - 100 year operational lifespan dependent on the technology selected.
Safe Storage Operation	Approximately 30 years	Application under CNSC Licence to Operate.

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Project Phase	Anticipated Schedule (Start – Finish)	Notes
Decommissioning	Approximately 10 years	Requires a Licence to Decommission. Requires Detailed Decommissioning Plan.
Abandonment	Thereafter	Requires a Licence to Abandon.

12.0 A LIST OF POTENTIAL ALTERNATIVE MEANS AND POTENTIAL ALTERNATIVES TO THE PROJECT

12.1 Alternative Means

Alternative means being considered for the Project are provided below. Alternative means will continue to be refined based on engagement with Indigenous Nations and Communities, and the result engineering, feasibility and environmental studies that will be completed to determine economic and technical feasibility.

- Development of the bounding PPE strategy, considering multiple potentially available reactor technologies as discussed in Section 10.0.
- Alternative locations on the Bruce Power site, as discussed in Section 1.0 and 7.0, 8.0, and 9.0.
- Alternative condenser cooling strategies (once-through cooling, cooling towers and air cooling).
- Switchyard designs in consultation with Hydro One (air-insulated and gas-insulated).
- Radioactive waste management strategies at licenced facilities (interim dry storage facility and low and intermediate-level waste facility):
 - The NWMO is implementing Canada's plan for the safe, long-term management of used nuclear fuel [R-22]. The transportation of used nuclear fuel in Canada is jointly regulated by the CNSC and Transport Canada. Transportation of nuclear waste is considered outside of the Project scope.

12.2 Alternatives to the Project

Bruce Power is a private nuclear power operator and is proposing the Project in response to Ontario's electricity needs and as a contribution to provincial and federal climate change objectives by providing clean, reliable, and affordable power. Exploring new nuclear generation at the Bruce Power site is a key element in the provincial government's Powering Ontario's Growth plan [R-17]. Bruce Power's focus is on nuclear power generation. This Project would represent a partial implementation of the Province of Ontario's energy plan which is also considering many other clean energy developments. Therefore, this Project is not an alternative to other clean energy projects but would be implemented together with other clean energy projects by other proponents on behalf of the Province of Ontario.

PART C: LOCATION INFORMATION

13.0 A DESCRIPTION OF THE PROJECT’S PROPOSED LOCATION

Table 3: Location Information

Section Reference Numbers per Information and Management of Time Limits Regulations Schedule 1	Description
Section 13 (a) Proposed geographic coordinates	The lands to be assessed for the Project are shown in the site maps (see Figure 7, Figure 8, and Figure 9). The centre of the Bruce Power site is located at approximately 44°19'37.4"N 81°35'20.9"W.
Section 13 (b) Site Map	Figure 7, Figure 8, and Figure 9 provide site maps of the proposed site layout scenarios. In each scenario the potential fenced facility is identified, as well as the area being assessed for supporting infrastructure. The general area to be further assessed for new intake and discharge structures is also shown in each of the site layout scenarios. Bruce Power is currently completing engineering and feasibility studies to determine locations of Project components, which will inform the Impact Statement. Bruce Power will also be engaging with the Indigenous Nations and Communities on the proposed Project component locations. The fenced facility will include the following infrastructure: • Power block; • Switchyard; • Forebay; • Unit and essential services pump house; • Radiological waste storage building; • Dry used fuel storage facility; • Water treatment plant; • Parking; • Security building and guard house; • Diesel storage tanks; • Demineralized water storage; and • Administration building. The areas identified for supporting infrastructure may include the following: • Temporary sewage treatment plant; • Construction and spool yard laydown; • Temporary steam plant; • Temporary water supply; • Shops and assembly areas; • Administration buildings; • Storage and shops; • Parking; • Concrete batch and crushing plant; • Temporary rock and sand stockpile area; • Stormwater management; • Utilities; • Roads and docks; and • Instrumentation, testing and training facilities, including simulator facility.

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Table 3: Location Information

Section Reference Numbers per Information and Management of Time Limits Regulations Schedule 1	Description
Section 13 (c) The legal description of land to be used for the project, including, if the land has already been acquired, the title, deed or document and any authorization relating to a water lot	As part of its planning process over the next few years, Bruce Power will pursue the opportunity for continuing the lease and operating the new nuclear power station for the lifetime of the reactors. Bruce Power will also demonstrate that it has authority to carry out future licensing activities related to the Project. The legal description of the land to be used for the Project is included in Appendix A.
Section 13 (d) The project's proximity to any permanent, seasonal or temporary residences and to the nearest affected communities	The Municipality of Kincardine contains two urban centres and several small communities within 25 km of the Bruce Power site. The urban areas are the Town of Kincardine and Village of Tiverton. Other communities in the Municipality of Kincardine include Inverhuron, Glammis, Bervie, Underwood, Millarton, Armow, and Scott Point. Immediately north of the Municipality of Kincardine is the Town of Saugeen Shores. The Town of Saugeen Shores contains the communities of Southampton and Port Elgin. These two population centres are located within 30 km of the Bruce Power site [R-6]. Recreational land use includes Inverhuron Park which abuts the southern fence of the Bruce Power site and Baie du Doré/Scott Point area which abuts the northern fence of the Bruce Power site. The fenced perimeter of the existing Bruce Power site is approximately 240 metres (m) south, 750 m north and 1,065 m east to the closest seasonal or temporary residents.
Section 13 (e) The project's proximity to land used for traditional purposes by Indigenous peoples of Canada, land in a reserve as defined in subsection 2(1) of the Indian Act , First Nation land as defined in subsection 2(1) of the First Nations Land Management Act , land that is subject to a comprehensive land claim agreement or a self-government agreement and any other land set aside for the use and benefit of Indigenous peoples of Canada	The SON includes the Chippewas of Saugeen First Nation and the Chippewas of Nawash Unceded First Nation (Neyaashiinigmiing). The Saugeen First Nation is centered at Saugeen First Nation Reserve No. 29 adjacent to the community of Southampton, but also includes Chiefs Point Reserve No.28 located adjacent to Sauble Falls, approximately 35km and 60km respectively from the Bruce Power site. The Chippewas of Nawash Unceded First Nation is centered at Neyaashiinigmiing, which is located approximately 85 km from the Bruce Power site on the east shore of Georgian Bay north of the town of Wiarton (Figure 3). The SON Territory includes all of Bruce and Grey Counties and extends into Huron, Perth, Wellington and Dufferin Counties to include the Maitland and Nottawasaga River watersheds [R-4]. It also includes portions of Lake Huron, extending to the US border in the Main Basin, and extending to the approximate mid-point of Georgian Bay. SON have asserted Aboriginal title to the lakebed of Lake Huron and Georgian Bay, a claim which was dismissed by the Ontario Superior Court of Justice. The Court of Appeal allowed the SON's appeal but only to the extent of remitting the matter back to the trial judge to determine whether Aboriginal title can be established to a more limited and defined area. The SON are party to numerous treaties including Treaty 45 ½ which includes the Project lands. The HSM is a self-governing Métis community in Southampton, which is approximately 30km north of the Bruce Power site. The community has been settled along the Lake Huron shoreline since circa 1818 and their asserted traditional harvesting locations includes the area surrounding the Bruce Power Site (Figure 4). The MNO was established in 1993 as a representative organization of the Métis in Ontario. MNO has 29 community councils across Ontario. Four of these councils (Moon River Métis Council, Georgian Bay Métis Council, Barrie South Simcoe Community Council and the Great Lakes Métis Council) comprise MNO – Region 7. These councils are distinct from the HSM which is no longer part of the MNO. The Métis are integrated into the population of the local surrounding municipalities. Bruce Power recognizes that local lakes and rivers, including Lake Huron, are important to and used for traditional purposes.
Section 13 (f) The project's proximity to any federal lands.	The following provides approximate distances from the Bruce Power site to federal lands: • Point Clark Lighthouse National Historic Site is approximately 44 km; • Owen Sound Harbour is approximately 80 km; • Meaford Range and Training Area, a military base, is approximately 110 km; • Bruce Peninsula National Park is approximately 122 km; and • Fathom Five National Marine Park is approximately 143 km.

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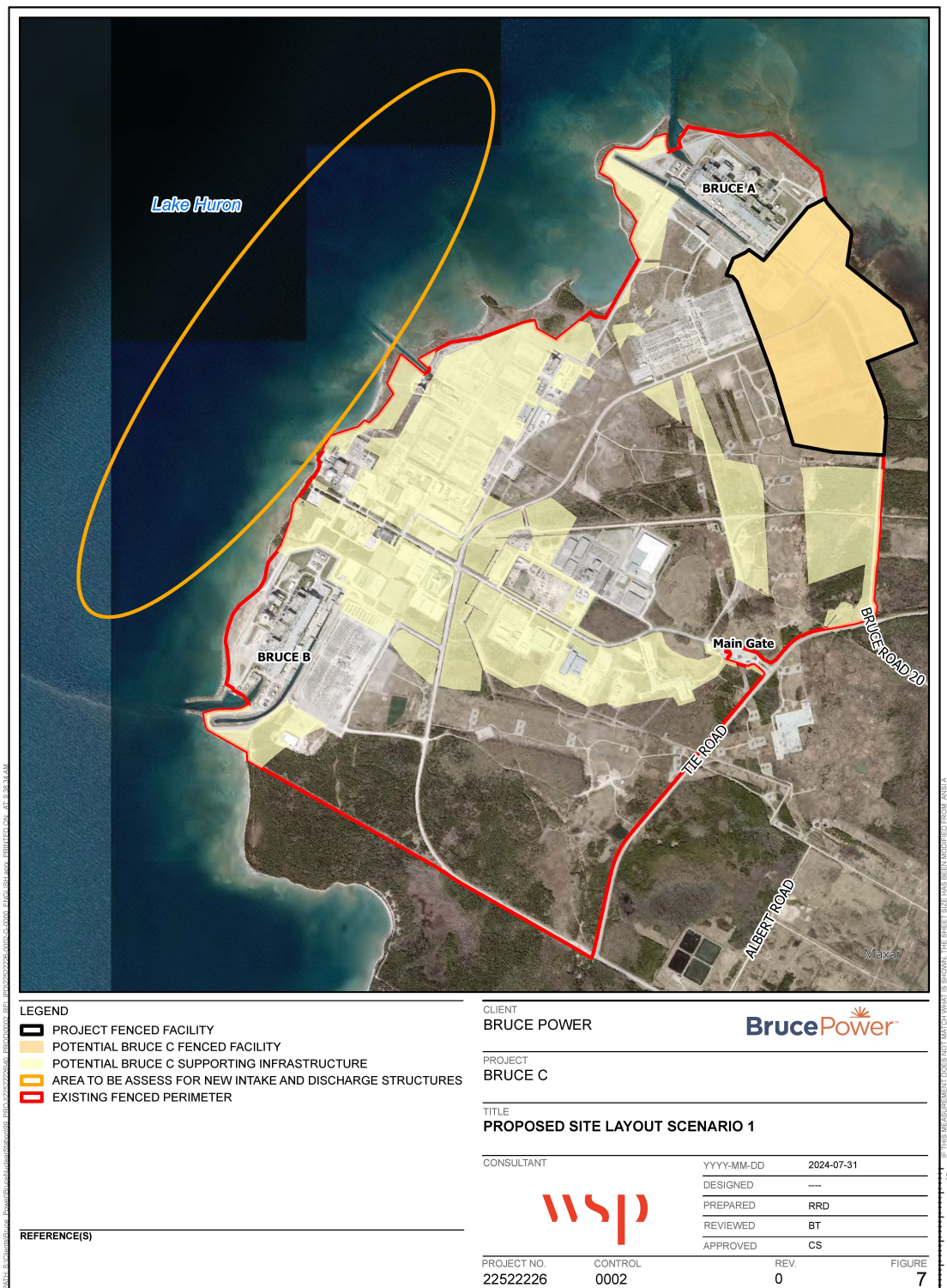


Figure 7: Proposed Site Layout Scenario 1

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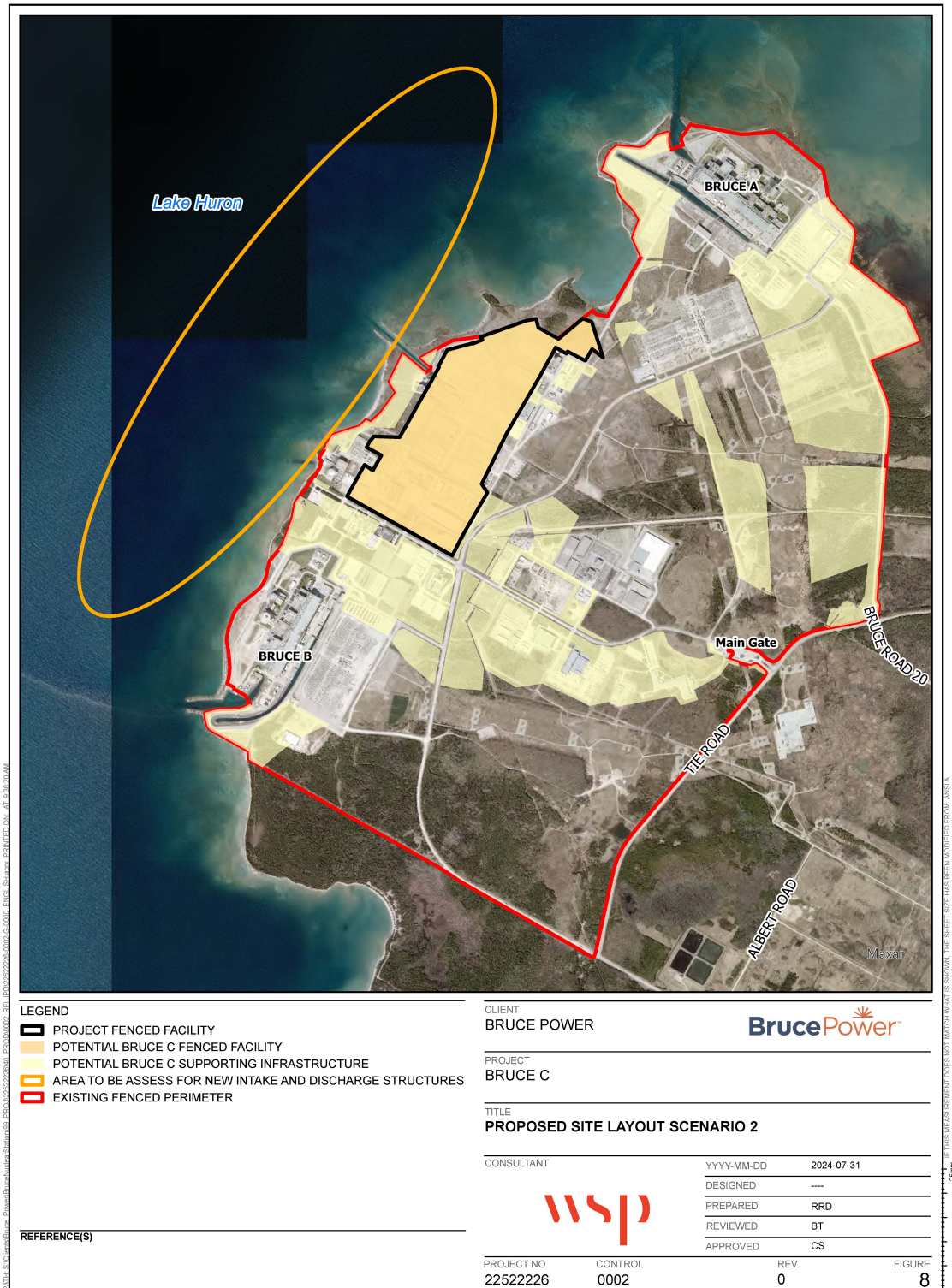


Figure 8: Proposed Site Layout Scenario 2

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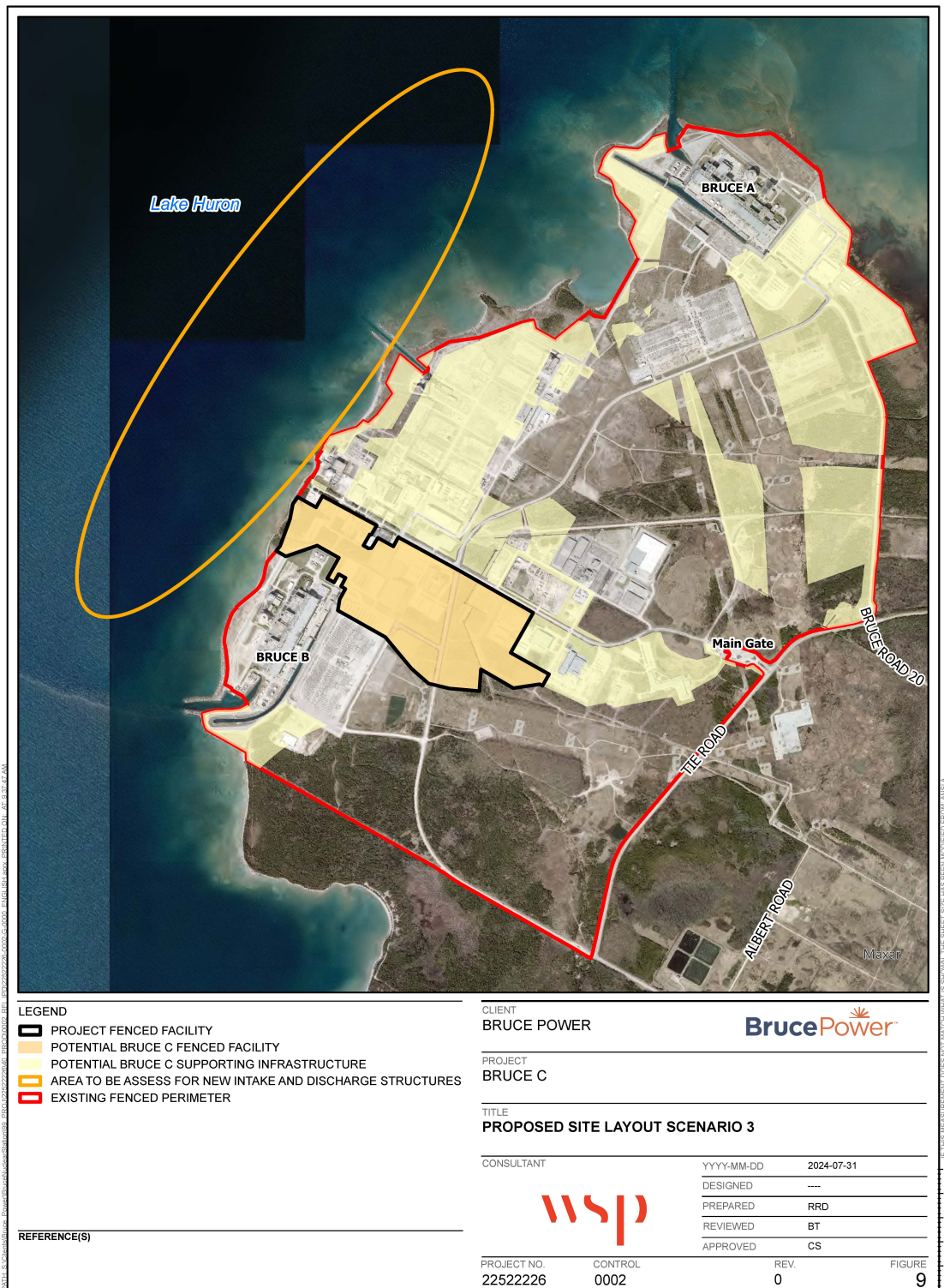


Figure 9: Proposed Site Layout Scenario 3

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14.0 A BRIEF DESCRIPTION OF THE PHYSICAL AND BIOLOGICAL ENVIRONMENT OF THE PROJECT'S LOCATION, BASED ON INFORMATION THAT IS AVAILABLE TO THE PUBLIC.

The Bruce Power site has been the subject of numerous environmental assessments and is a highly characterized site. It is home to diverse natural environment that contains hundreds of species of plants and wildlife. Surrounding the Bruce Power site are areas of natural, physical, and cultural significance, such as the Lake Huron shoreline, commercial, recreational, and subsistence fisheries, and the Baie du Doré Provincially Significant Wetland (PSW). The Bruce Power site is also in close proximity to two provincial parks (Inverhuron and MacGregor Point) and three conservation areas (Brucedale, Saugeen Bluffs, and Stoney Island). The following sections provides a summary of the physical and biological environment.

14.1 Meteorology

- The historic annual average (1971-2000) daily temperature, total precipitation, and average wind speed and direction at Wiarton Airport were 6.1 degree Celsius (°C), 1,041.3 millimetre (mm), and 13.5 km/hour predominantly from the south, respectively [R-6].
- The 2011-2016 meteorological data for the Bruce Power site was processed and air temperature data is collected from the on-site meteorological tower at the 10 m elevation with hourly average monthly temperatures. Values averaged over the ten-year period between 2007 and 2016, show a range of monthly temperature mean between -5.0°C and 20.4°C.

14.2 Regional Overburden and Bedrock Geology

- The soil and subsoil above the bedrock (overburden) at the Bruce Power site consists of Elma Till, which has a sandy silt to silt matrix, with clayey silt at the southern area. Other areas of the Bruce Power site (to the east) have exposed bedrock at select locations [R-23].
- The ground surface within the Bruce Power site is generally flat, due to construction grading activities within the site. The overburden increases in thickness from less than 3 metres (m) near the shoreline to approximately 27 m in depth at the eastern property boundary. Several stratigraphic units are present within the subsurface; they vary in thickness and are laterally discontinuous [R-23].
- The bedrock at the Bruce Power site is composed of Paleozoic limestone, dolostone, and shale of the Detroit River Group, or Onondaga Formation. The bedrock is exposed at ground surface at certain locations or is covered by a thin layer of overburden at others [R-23].

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- The bedrock rises from beneath Lake Huron to an elevation over 184 m above sea level, approximately 500 to 800 m from the shore. This area is a local high point of bedrock elevation [R-23].

14.3 Site Overburden Geology

- The overburden at the Bruce Power site comprises variable thicknesses of sand and gravel (0 to 10 m) overlying a silt till sequence which has been divided into a “weathered till unit” and an underlying “un-weathered till unit” [R-24].
- Near the Lake Huron shoreline, there is less than 3 m of overburden in the vicinity of the Bruce B generating station, former Bruce Heavy Water Plant, and parts of the Bruce A generating station prior to their construction [R-24]. These areas were graded with engineered fill for construction.
- The overburden is layered in the following sequence: surficial sand and gravel; upper weathered silt till; upper unweathered silt till; middle sand/layered till (in area near the Western Waste Management Facility); and lower unweathered silt till.
- Wave scouring near the shoreline has removed much of the overburden leaving boulders [R-24].

14.4 Site Bedrock Geology

- Bedrock on the Bruce Power site consists of Middle Devonian age, buff dolostone with dark grey bituminous limestone of the Amherstburg Formation [R-24].
- Bedrock dips northeastward at approximately one percent (due to glacial erosion) [R-24].
- The bedding structure of the bedrock sequence (Amherstburg – Bois Blanc Formation contact) dips gently westward to southwestward at approximately one percent [R-24].

14.5 Hydrogeology

- Overburden groundwater flow is toward Lake Huron (except immediately surrounding Bruce A and Bruce B generating stations (due to foundation drains)).
- Due to a Middle Sand Aquifer, there is an overburden groundwater divide between the former Bruce Heavy Water Plant and the Western Waste Management Facility (WWMF) as well as within the WWMF area. Northwest of this divide, shallow groundwater flows towards Lake Huron; southeast of the divide, shallow groundwater flows towards the WWMF area (within the WWMF area groundwater flow is divided between north and south).
- Vertical migration of infiltrating groundwater in the vicinity of the WWMF is due presence of Middle Sand Aquifer.

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- Shallow bedrock groundwater flow appeared to be similar to that observed for the overburden.

14.6 Hydrology and Water Quality

- Nearshore currents are predominantly bi-directional and parallel to shore [R-6].
- Rapid changes in water temperature and nutrient composition (upwelling or downwelling) occur (usually around 10°C changes) nearshore [R-6].
- Numerous smaller tributary streams that flow into Lake Huron surrounding the Bruce Power site [R-6].
- The shoreline of the Bruce Power site is dominated by a flat to gently sloped rocky platform that extends offshore to a distance of approximately 300 m [R-6].
- Within 1 km from shore, the lake depth reaches 18 m immediately in front of the Bruce Power site [R-6].

14.7 Wildlife and Plant Communities

- A review of wildlife and plant communities and the resulting ecological risk assessment is included in the 2022 Environmental Risk Assessment [R-6]. Monitoring is ongoing and results of annual surveys are reported in the Environmental Protection Report which is posted to the Bruce Power external website on May 1st each year [R-25][R-26].

The following subsections summarize the findings from those assessments. We anticipate conducting further wildlife and plant studies to support the IA and will discuss the scope of those studies during that stage of the Project.

14.7.1 Plant Communities

- A total of 72 separate ecological land classification (ELC) communities and 195 plant communities were identified within the Bruce Power site. These represent a total of 15 broad categories of plant communities including agriculture, alvar, beach, cultural barren, cultural grassland, cultural meadow, cultural thicket, cultural woodland, forest, industrial barren, industrial lands (active use), marsh, open water, submergent aquatics and swamp.
- Areas with a long-standing history of anthropogenic use and modification, occupy the largest proportion of the Bruce Power site, and industrial lands occupy the largest area of that category.

14.7.2 Plant Species

- A total of 437 vascular plant species have been recorded within and surrounding the Bruce Power site to date [R-27].

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- One hundred species or 24% of the total flora are identified as introduced or non-native to Ontario [R-27].
- One tree species, designated as endangered (butternut) is observed on site (on OPG retained lands, which is not available for further development by the Project).
- 97 locally significant plant species, 40 of which have been identified as rare or uncommon (many of which are found in swamp and fen communities) [R-27] [R-28].

14.7.3 Culturally Significant Plant Species and Wildlife Species and Habitats

- Over the past decade community-specific plant use information has been shared with Bruce Power by both SON and HSM and additional diet surveys were conducted in 2019-2021 [R-6].
- SON have identified the importance of fish, fish habitat and the fishery in SON Territory, preserving black bear and reptile habitat and movement corridors, upland deciduous forests, riparian areas, wetlands, alvars and cliffs, coniferous and mixed forests and meadows, along with sites that support plants used for medicine, food or products of traditional, cultural or economic importance [R-29].
- The HSM and MNO have indicated that they historically harvested vegetation and medicinal plants from the area near the Bruce Power site [R-30] [R-31].

14.8 Wildlife Habitat and Communities

- Wildlife habitat and communities were formally updated in 2016 [R-27] and additional monitoring and SAR assessments were completed between 2016 and 2022 [R-25] [R-26] [R-32]–[R-35].
- Most of the wildlife habitat on the Bruce Power site occurs around the periphery of the Bruce Power site, in Inverhuron Provincial Park, in the Baie du Doré Wetland Complex and in the conifer forest communities near or along the perimeter fence due to absent or infrequent disturbance of this “core” natural habitat.

Most of the wildlife habitat on the Bruce Power site occurs around the periphery of the Bruce Power site, in Inverhuron Provincial Park, in the Baie du Doré Wetland Complex and in the conifer forest communities near or along the perimeter fence. As well, these areas provide access to a variety of different habitat types, such as the lake shore, dug ponds and the local watercourses, providing a range of foraging opportunities for locally resident wildlife, while acting as “core” natural habitat within which disturbance is absent or infrequent [R-27].

14.9 Mammals

- In 2016, there were 164 mammals, 145 bird and 91 reptile observations by camera traps.
- In 2017, there were 111 mammals, 123 bird and 5 frog observations at new camera trap locations.

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- 26 mammal species and 8 bat species have been reported on and around Bruce Power site (such as the masked shrew, white-tailed deer, and little brown bat).

14.10 Birds

- 82 bird species were observed using breeding bird point count surveys and 12 additional were observed incidentally during the breeding season species [R-27].
- Most common species are the Red-eyed Vireo and American Robin.
- A number of birds with special conservation status have been observed on the Bruce Power site [R-35] [R-36].

14.11 Bald Eagle and Winter Raptor Surveys

- Counts of Bald Eagles have increased over last four years (during overwintering period).
- Sparse observations of other raptors on or near Bruce Power Site due to low habitat availability, however one Red-tailed Hawk was observed in 2018 - 2019, and one Snowy Owl and one Northern Harrier were recorded in 2019 – 2020 and in 2021, a Cooper's Hawk, Northern Harrier and Snowy Owl were observed.

14.12 Waterfowl and Shoreline Bird Surveys

- 3584 bird observations (32 species) in 2022 with Canada Goose being most abundant.
- 3138 bird observations (35 species) in 2021.
- Diverse populations of local and migrant waterfowl and shorebirds inhabiting the lands nearby Bruce Power, with the highest density in Baie du Doré (2021-2022 surveys).

14.13 Breeding Bird Surveys

- During breeding bird monitoring surveys in 2022, 60 bird species were documented, and the most commonly observed species were the Red-Eyed Vireo and American Crow, with Blue Jay, Red-winged Blackbird, American Goldfinch, Common Yellowthroat, American Robin and Song Sparrow.
- During these surveys the following four SAR bird species were observed: Eastern Wood Pewee, Wood Thrush, Eastern Meadowlark, and Canada Warbler.
- In previous surveys the threatened Bobolink was observed as well as the locally uncommon Sedge Wren.

14.14 Reptiles

- Snake monitoring has been ongoing on the Bruce Power site since 2017 and consistent observations have been made from year to year.

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- Focused snake board studies following the Ministry of Northern Development, Mines, Natural Resources and Forestry (MNR) survey protocol were initiated (in collaboration with OPG) in 2020 at key habitat locations on-site and seven different snake species were observed (Eastern Garter Snake, Dekay's Brown Snake, Red-bellied Snake, Smooth Green Snake, Northern Ring-necked Snake, Northern Watersnake and Eastern Milksnake).
- The Eastern Ribbonsnake is a listed SAR and has been seen in past years.
- Incidental observations were made of Snapping Turtle, Midland Painted Turtle, and an additional turtle species from 2017 to 2022 (details on additional turtle species will not be disclosed due to SAR status). The SON-led CWMP also observed Painted Turtles in Baie du Doré in 2019 and 2020 [R-37] [R-38].

14.15 Amphibians

- Targeted nocturnal amphibian vocalization surveys were conducted in 2017 to 2022 following the Bird Studies Canada/Environment Canada Marsh Monitoring Protocol as well as incidental observations.
- Five different frog species were typically identified during these surveys with the American Toad occasionally being heard.
- A survey for salamanders and newts was performed in 2022 with observations of Yellow-spotted salamanders (and their egg masses), Eastern Red-Spotted newts, incidental observations noted presence of Spotted Salamanders in 2019, 2020 and 2022 and Eastern Red Spotted Newts in 2019 and 2022.

14.16 Aquatic Environment

- Areas providing aquatic habitat on and around the Bruce Power site were identified as those that meet the definition of a water body under the *Environmental Protection Act* [R-39].
- Aquatic habitat in the offshore and nearshore areas of Lake Huron in the immediate vicinity of the Bruce Power site were considered in the recent 2022 Environmental Risk Assessment [R-6].
- Nearshore and on-site areas include the Bruce A and Bruce B discharge channels, Lake Huron shoreline immediately next to the site as well as extending north and south of site including several small bays (Inverhuron Bay, Holmes Bay, MacPherson Bay as well as Baie du Doré, PSW) and on-site Stream C.
- In general, aquatic communities in these areas include aquatic vegetation (macrophytes), phytoplankton, zooplankton, benthic invertebrates, and fish.

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- Macrophytes grow in sheltered areas along the Lake Huron shoreline including in the Bruce A and Bruce B discharge channels. The species in the discharge channels are those with known tolerances to temperature and flow velocities [R-6].
- Previous studies have shown that the density and diversity of phytoplankton in Lake Huron in the vicinity of Bruce Power has been low as a result of the low nutrient concentrations [R-6]. These zooplankton are unlikely to be impacted by the thermal discharge due to the limited periods of time that the Bruce A and Bruce B discharge channels exceeded temperatures that are associated with increased growth rates or lower egg production.
- Benthic invertebrates (those living on the bottom of waterbodies) in the vicinity of the Bruce Power site have been studied in 2012 and a current study is planned in 2024. In 2012 a low diversity and abundance of benthic invertebrates was observed except for the Bruce A discharge and Baie du Doré where a greater abundance was noted [R-40].
- The nearshore fish community of Lake Huron is comprised of those species that prefer shallow, warmer water such as the Smallmouth Bass, Yellow Perch, Rock Bass and Mimic Shiner.
- Smallmouth Bass nesting surveys to monitor local bass populations have occurred annually from 2009 (Bruce A and Bruce B discharge channels) and 2010 (Baie du Doré) to 2020.
- Offshore fish community (such as Round Whitefish, Lake Whitefish, Lake Trout, and Rainbow Smelt) use open or deep-water habitats for most of their life cycles they occupy nearshore areas for spawning, nursery habitat and possible feeding and prefer cool, deep, offshore waters, particularly during the warmer summer months.
- The abundance of both fish communities is assessed at different life stages by nearshore fish monitoring programs conducted by Bruce Power and collaborating groups.
- Each of SON and HSM have expressed a strong connection to Lake Huron and the Lake Huron fishery which include harvesting fish for food (subsistence), social and ceremonial uses and, in the SON's case, commercial purposes.
- SON's fishing rights include the right to harvest all species of fish [R-41] from Point Clark on the Lake Huron side to Craighleith on the Georgian Bay side. [R-42].
- The SON-led CWMP began annual sampling activities across SON Territory in 2019, sampling between 40 and 70 nearshore sites from Inverhuron to the Nottawasaga River (including Baie du Dore). Bruce Power provides funding support for the program, and CWMP shares nearshore sampling data (fish community, water quality, and temperature) with Bruce Power on an annual basis.
- The Baie du Doré wetland is also being monitored as part of a partnership between Bruce Power and the Invasive Phragmites Control Centre (IPCC) to understand the impact of Phragmites australis on fish communities and to understand the impact of control activities on recovery of native plants and fish habitat.

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- Existing Bruce A and Bruce B use deep, offshore water intakes to pump water through the non-radiological side of each generating station to indirectly condense/cool steam that causes warming of the intake water prior to it being returned to the lake.
- Limits on the discharge water temperature and difference between intake and discharge water temperature are set by Ontario's Ministry of the Environment, Conservation and Parks (MECP) in Environmental Compliance Approvals (ECAs).
- Federal guidance for the assessment of thermal discharge is provided by ECCC in Guidance Document: Environmental Effects Assessment of Freshwater Thermal Discharges.
- Bruce Power uses modelling of the thermal effluent from the Bruce Power site using a lake-wide model.
- Historically, the Bruce Power thermal plume under warm water conditions extends approximately 23 km northeast alongshore from Bruce A, 15 km southwest from Bruce B and up to 3 km offshore [R-28].
- Historically, under cold water conditions the Bruce Power thermal plume extends approximately 10 km northeast and up to 8 km offshore [R-28].
- Overlap of the Bruce A and Bruce B lake surface plumes is estimated to occur less than 8% of the time [R-28].

14.17 Radiological Environment

- The contribution of overall radiation dose to members of the public as a consequence of the radiological releases from normal operations on the Bruce Power site is determined by the radiological environmental monitoring (REM) program.
- The REM program involves the annual collection and analysis of environmental samples at representative locations for radionuclides specific to nuclear power generation and is designed based on risk and is informed by a radionuclide and exposure pathways analysis.
- REM program sampling locations are grouped by proximity to the Bruce Power site and generally, radionuclide concentrations decrease with distance from the Bruce Power site.
- Yearly, Bruce Power gathers information to calculate the radiological dose to representative persons living near the Bruce Power site.
- Following the methodology outlined in CSA N288.1 Guidelines For Modelling Radionuclide Environmental Transport, Fate, And Exposure Associated With The Normal Operation Of Nuclear Facilities [R-43] and using an environmental transfer model (IMPACT 5.5.2), a radiation dose is calculated for each representative person at three age classes – adult, child and infant.

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- A representative person is determined using the lifestyle characteristics identified in the Site-Specific Survey and is defined as an individual who receives a dose that is representative of the most highly exposed individuals in the population.
- The highest calculated dose, is used as the annual dose to public and all dose calculation inputs and results are published annually in Bruce Power's Environmental Protection Report [R-25][R-26][R-32]–[R-34].
- For the 31st consecutive year, Bruce Power's contribution to the annual dose of a member of the public is less than the lower threshold for significance ($<10 \mu\text{Sv}/\text{year}$) and is considered *de minimus*. This maximum dose is a small fraction of a percent of the legal limit of $1,000 \mu\text{Sv}/\text{year}$.
- The radiation doses to members of the public residing in the area surrounding the Bruce Power site were less than 1% of the CNSC effective dose limit for a member of the public ($1 \text{ mSv}/\text{y}$).
- The radiation dose rates to non-human biota residing on or near the Bruce Power site are less than 1% of the applicable UNSCEAR benchmark value.
- Operation of the Bruce Nuclear Facility has not resulted in adverse effects on human health of nearby residents or visitors or non-human organisms due to exposure to radiological substances.

14.18 Air Quality

- Conventional (non-radiological) air emissions are compliant ECA for Air Number 7477-8PGMTZ.
- Air contaminants of concern are modelled for all non-negligible sources in worst-case scenarios and estimated emission rates are then analyzed to ensure regulatory limits at the Point of Impingement are met.
- Operational flexibility allows changes to that physical structures that release emissions only if Bruce Power can remain compliant with emission limits.
- Existing baseline air quality information will be utilized to inform the IA.

14.19 Noise

- Noise investigations were conducted annually between 2015 and 2020.
- Bruce Power is slightly audible during periods of low background noise and operates well below the MECP acceptable criteria of 40 decibels.
- Silencers have been installed at deaerator vents through 2019.

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- As part of the Project, Bruce Power has commenced the collection of noise monitoring to prepare a site-wide model to inform the IA.
- In 2015, modelled deaerator vents becoming completely inaudible.
- Noise Investigations were conducted in 2020 and sound levels as low as 22 to 24 dBA, which is well within the applicable MECP criterion of 40 dBA.

14.20 Land Use and Resources

- The Bruce Power site is located in the Municipality of Kincardine and zoned General Industrial (Special Zone M1-c [R-44]).
- Land use in the surrounding municipalities is dominated by controlled development agricultural lands and small urban communities.
- The transportation system includes County Road 23 (arterial road); Provincial Highway 21 (arterial road); Concession Roads 2, 6 (local collector roads) and Country Road 20; and a number of other local roads.

14.21 Cultural and Physical Heritage

- The Municipality of Kincardine has a total of 42 buildings designated as properties of cultural heritage value or interest under the Ontario Heritage Act (Part IV).
- Southampton and Port Elgin collectively have 14 properties of cultural heritage value or interest under the Ontario Heritage Act (Part IV).
- In 2006, the Douglas Point site was recognized by the Ontario Heritage Trust with a provincial plaque for its contribution to the development of commercial scale CANDU reactors.
- In 2009, a Stage 2 Archaeological Assessment was completed to support the proposed New Build Project and other proposed projects at that time [R-45]. The Assessment identified four culturally sensitive areas [R-45], which will be avoided as part of the Project. Bruce Power will work with Indigenous Nations and Communities on the methodology for both Marine and Terrestrial Archaeological Assessments that are proposed to be completed for the Project.

14.22 Cumulative Effects

As part of the IA, Bruce Power will be completing a cumulative effects assessment [R-46], considering any cumulative effects that are likely to result from the Project and activities in combination with other physical activities that have been or will be carried out (also sometime referred to as past, present or reasonably foreseeable projects). The form of cumulative effects assessment will vary by Valued Component (VC) (i.e., quantitative vs qualitative) [R-46].

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15.0 HEALTH, SOCIAL AND ECONOMIC CONTEXT

The Municipality of Kincardine has a population of 12,268 as reported in the 2021 Census [R-47]. Immediately north of the Municipality of Kincardine is the Town of Saugeen Shores. The Town of Saugeen Shores has a population of 15,905 as reported in the 2021 Census Bruce County, including Saugeen Shores and Kincardine. The area has traditionally relied on agriculture and small-scale manufacturing as economic mainstays. Lake Huron and other larger watercourses such as the Saugeen River are popular destinations for recreational activities including boating, canoeing, and angling. Bruce County is bordered by both Lake Huron and Georgian Bay which offers more than 850 km of coastlines and beaches. In 2019, the Economic Impact of Tourism Report was completed by the Bruce County Economic Development team which concluded that in 2019, over 2.5 million people visited Bruce County, over 95% would likely visit again the following year and 2019 have an economic impact of tourism of \$326.7 million dollars [R-48].

The Bruce Power site is located within the Grey Bruce Health Unit [R-49]. Social services are predominantly administered at the county level. Bruce County provides both paramedic services and community paramedic services. Paramedic services offer emergency and immediate health care services. Community paramedic services deliver in home health care supports and can liaise with other health care providers to coordinate care for patients. The closest hospital to the Bruce Power site is the Kincardine Site of the South Bruce Grey Health Centre.

The 2021 Census of Population recorded that the median total income of household in 2020 for Bruce County is \$87,000 [R-47]. According to the Grey Bruce Public Health, 60% of Grey Bruce residents rate their health as very good or excellent, and 97% of Grey Bruce residents feel satisfied or very satisfied with their lives. An estimated 20% of Grey and 18.4% of Bruce County children live in low-income households, although this varies greatly by local municipality. Through engagement on the IPD, it was noted that demand for emergency housing and homelessness support has increased substantially over the past several years.

Local communities rely on both water from Lake Huron and groundwater wells for their drinking water needs. Surface water from Lake Huron is treated through two water treatment plants including the Southampton Water Treatment Plant, and the Kincardine Water Treatment Plant. There is one drinking water well within the Bruce Power site located on the Hydro One property used for hand washing and toilet flushing only. The Municipality of Kincardine has two separate potable water supply systems for the town of Kincardine and the community of Tiverton. Through engagement on the IPD, it was also noted that there are several communal and private wells in close proximity to the Bruce Power site. The Municipality of Kincardine has two wastewater treatment plants, one for the town of Kincardine, and one for the Bruce Energy Centre.

The utilities industry employs the largest amount of Bruce County's workforce, followed by retail trade industry, and the health care and social assistance industry [R-50]. Today, Bruce Power is by far the largest employer in the county, employing more than 4,000 people. Ontario's Long-Term Energy Plan is counting on Bruce Power to provide a reliable and carbon-free source of affordable energy through 2064. Bruce Power is currently carrying out

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its Major Component Replacement (MCR) Project. The MCR Project began in January 2020 and focuses on the replacement of key reactor components in Units 3-8. The program will secure an estimated 22,000 jobs directly and indirectly from operations, and an additional 5,000 jobs annually throughout the investment program, injecting billions into Ontario's economy. Approximately 60 supplier partners have also opened offices or manufacturing facilities in Bruce, Grey and Huron counties since 2016 and the majority of these organizations play a role in the MCR Project. Bruce Power and the County of Bruce are working to transform the area into a clean energy-inspired economic hub and sustain the company as a world leader in the nuclear sector. Indigenous Nations and Communities and local municipalities had an opportunity to participate in the regulatory process for the MCR Project during the Bruce Power's 2018 License Renewal.

Bruce Power has a substantial impact on the municipalities of Kincardine and Saugeen Shores, the tri-county region, and the province. In terms of the economic impact, the NII found that in 2020, Bruce Power's contribution to the provincial GDP was \$4.03 billion from direct, indirect and induced effects [R-51]. In 2020, employment income induced by the local nuclear sector supported \$1.43 billion in household spending in Bruce, Grey and Huron counties combined. The breakdown of this spend includes \$70 million spent on clothes and accessories, \$56 million in restaurants, and \$16 million in pet expenses [R-51]. In addition to entrepreneurial and clean energy jobs, there has been assessment growth from residential, commercial and industrial builds. More than \$233 million was paid into municipal taxation because of the clean energy sector in 2020, with the vast majority in the Bruce, Grey, Huron region [R-51].

Bruce Power has completed a Municipal Socio-Economic Existing Conditions Report to support the Impact Statement by characterizing community social, economic, and human health conditions, in addition to non-traditional land and resource use, which could experience effects as a result of the Project. Interviews to gather information about existing socio-economic conditions were conducted virtually in December 2023, and in January and April 2024.

Bruce Power will engage with SON, HSM, and MNO, to develop scope characterizing health, social, economic conditions, and Indigenous Knowledge and/or other information to be defined by each Indigenous community.

PART D: FEDERAL, PROVINCIAL, TERRITORIAL, INDIGENOUS AND MUNICIPAL INVOLVEMENT

16.0 FINANCIAL SUPPORT THAT FEDERAL AUTHORITIES ARE, OR MAY BE, PROVIDING TO THE PROJECT

In February 2024, the Government of Canada (Natural Resources Canada) announced up to \$50 million of support to Bruce Power through its Electricity Predevelopment Program [R-52]. The funding is in support of Ontario's plan to maintain a clean energy grid while continuing to drive economic development and support Indigenous and community consultation.

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17.0 FEDERAL LANDS THAT MAY BE USED FOR THE PURPOSE OF CARRYING OUT THE PROJECT

The Project will not be utilizing any federal lands.

18.0 A LIST OF ANY JURISDICTIONS THAT HAVE POWERS, DUTIES OR FUNCTIONS IN RELATION TO AN ASSESSMENT OF THE PROJECT'S ENVIRONMENTAL EFFECTS

For projects regulated under the *Nuclear Safety and Control Act*, IAAC and the CNSC will collaborate in conducting an integrated impact assessment under the IAA. The following jurisdictions may also have powers, duties, or functions in relation to the assessment of the Project. The permit requirements will be confirmed through regulatory discussions. Bruce Power may initiate federal and provincial permit approval processes concurrently with the IA. A preliminary list of potential permits and approvals that may be required for the lifecycle of the Project is included in Appendix B of the IPD. The potential permits and approvals will continue to be refined as the Project progresses.

Federal:

- Fisheries and Oceans Canada;
- Environment and Climate Change Canada;
- Indigenous Services Canada;
- Federal Economic Development Agency for Southern Ontario;
- Women and Gender Equality Canada;
- Natural Resources Canada;
- Health Canada; and
- Transport Canada.

Provincial:

- Technical Standards and Safety Authority;
- Ontario Ministry of Environment, Conservation and Parks; and
- Ontario Ministry of Natural Resources and Forestry.

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PART E: POTENTIAL EFFECTS OF THE PROJECT**19.0 A LIST OF ANY CHANGES TO COMPONENTS OF THE ENVIRONMENT THAT ARE WITHIN THE LEGISLATIVE AUTHORITY OF PARLIAMENT**

As a result of carrying out of the Project, examples of expected changes to components of the environment that are within the legislative authority of Parliament (i.e., fish, fish habitat, aquatic species, SAR, and migratory birds) are summarized in Table 4, however environmental effects will continue to be identified through the IA process. Examples of standard mitigation have been included; however, mitigation will continue to be identified through the IA process, including engagement with Indigenous Nations and Communities.

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Table 4: Changes to the Environment under Federal Legislation – Potential Effects

Factor/Project Phase	Potential Environmental Effects	Standard Mitigation Examples
Fish, Aquatic Species and Aquatic Habitat, as defined in subsection 2(1) of the Fisheries Act [R-53] and aquatic SAR as defined in subsection 2(1) of the Species at Risk Act [R-54]		
Site-Preparation	Potential changes to water quality from run-off during removal of vegetation (during grubbing and clearing), potential demolition and excavation	Control run-off from work areas using storm water run-off management programs
	Potential changes to shoreline areas (protection strategies) and connected drainage ditches may result in local physical changes to aquatic habitat and aquatic biota	Conduct shoreline assessment to determine offsets, if necessary
	Facility site preparation activities may result in changes to aquatic biota due to changes in habitat, temporary sensory disturbance (underwater noise and vibration) and lake water quality (sediment)	Use of explosives within acceptable ranges (particle velocity and immediate pressure changes) to minimize effect to aquatic biota
	Cooling water intake tunnel and discharge channel activities may result in physical changes to aquatic habitat	Placement of intake tunnel and discharge channel in locations of least impact (as determined by BATEA assessment)
	Cooling water intake tunnel and discharge channel activities may affect aquatic biota due to changes in habitat, temporary sensory disturbance (underwater noise and vibration) and lake water quality (sediment).	Use of explosives within acceptable ranges (particle velocity and immediate pressure changes) to minimize effect to aquatic biota and schedule activities to minimize impact
	Aquatic SAR biota may be affected through the activities related to the cooling water tunnels, i.e., physical changes to habitat and sensory disturbance	Conduct most impactful construction activities during times when SAR populations are at seasonal minimum (i.e., blasting)
Construction and Commissioning	Facility construction activities may result in changes to aquatic habitat due to wastewater discharges affecting water quality	Minimize and manage discharges by appropriate controls and monitoring
	Facility construction activities may result in changes to aquatic biota due to changes in habitat, temporary sensory disturbance (underwater noise and vibration) and lake water quality (sediment)	Use of explosives within acceptable ranges (particle velocity and immediate pressure changes) to minimize effect to aquatic biota
	Construction activities of cooling water intake tunnel and discharge channel may result in physical changes to aquatic habitat.	Placement of intake tunnel and discharge channel in locations of least impact (as determined by BATEA assessment)
	Construction activities of cooling water intake tunnel and discharge channel may affect aquatic biota due to changes in habitat, temporary sensory disturbance (underwater noise and vibration) and lake water quality (sediment).	Use of explosives within acceptable ranges (particle velocity and immediate pressure changes) to minimize effect to aquatic biota and schedule activities to minimize impact
	Aquatic SAR biota may be affected through the construction of cooling water tunnels, i.e., physical changes to habitat and sensory disturbance	Conduct most impactful construction activities during times when SAR populations are at seasonal minimum (i.e., blasting)
Active Operations and Maintenance	Operation of cooling water tunnel and discharge channel may result in changes to aquatic habitat through sensory disturbances, changes to lake water circulation and lake water quality, and lake temperature. Impingement and entrainment of fish species at all life stages.	Inclusion of mitigation strategies as determined by BATEA assessment
	Increase in contaminant concentrations in lake during operation affecting aquatic habitat and biota.	Operate facility within emission limits
		inclusion of mitigation strategies as determined by BATEA assessment
	Aquatic SAR biota may be affected through the operation of cooling water intake (i.e., impingement and entrainment), and changes to lake water circulation and lake water quality, and temperature	Inclusion of mitigation strategies as determined by BATEA assessment
Safe Storage Operation	Reduction in local water temperature from cessation of operations will affect some aquatic habitat during Storage with Surveillance (SWS) phase	Gradual shut down of individual reactor units as per decommissioning plan
Decommissioning	Changes in quantity and quality of water run-off from the site during dismantling, demolition activities may impact aquatic habitats and biota	Control run-off from work areas using storm water runoff management programs
	Potential infilling of intake tunnel and discharge channel could affect some aquatic habitat and biota during site restoration phase	If these activities are required by decommissioning plan then mitigation and off-set commitments may be required under the <i>Fisheries Act</i> .
Abandonment	Changes in quantity and quality of water run-off from the site during site restoration may impact aquatic habitats and biota	Control run-off from work areas using storm water runoff management programs

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Table 4: Changes to the Environment under Federal Legislation – Potential Effects

Factor/Project Phase	Potential Environmental Effects	Standard Mitigation Examples
Migratory Birds, as defined in subsection 2(1) of the Migratory Birds Convention Act, 1994 [R-55] and avian SAR as defined in subsection 2(1) of the Species at Risk Act [R-54]		
Site-Preparation	Changes to vegetation communities (e.g., nesting habitat), wildlife communities, wildlife habitat, or natural heritage systems (e.g., removal of vegetation during grubbing and clearing, sensory disturbance, individual mortality).	Consideration of avian habitats during site selection process to minimize impact
	Avian SAR biota may be affected by site preparation activities which may result in changes to vegetation communities, wildlife communities, wildlife habitat, or natural heritage systems (e.g., removal of vegetation during grubbing and clearing).	Consideration of avian habitats during site selection process to minimize impact
	Changes to migration abilities and bird calls due to temporary increase in ambient noise and light	Maintain noise and light levels to acceptable limits
	Temporary changes in air quality (dust/fumes) from site-preparation activities that could affect avian health	Minimize dust and air emissions by standard site watering and emission monitoring activities
	Avian SAR may be affected during site preparation activities by changes noise, light and air quality	Minimize light, noise and air emissions through standard mitigations
Construction and Commissioning	Changes to migration abilities and bird calls due to temporary increase in ambient noise and light	Maintain noise and light levels to acceptable limits
	Temporary changes in air quality (dust/fumes) from construction that could affect avian health	Minimize dust and air emissions by standard site watering and emission monitoring activities
	Avian SAR may be affected during construction activities by changes noise, light and air quality	Minimize light, noise and air emissions through standard mitigations
Active Operations and Maintenance	Avian health may be affected by decreases in air quality due to chemical and radiological emissions	Ongoing emission reduction strategies and routine monitoring
	Artificial light at night may affect bird migration patterns and increase in collisions with infrastructure	Minimize exterior light to acceptable standards
	Increase in noise could affect some bird species by interrupting mating calls	Minimize noise emissions to acceptable standards
	Avian SAR biota may be affected by site operations due to light, noise and air quality	Minimize light, noise and air emissions to acceptable standards
Safe Storage Operation	Increase in migratory birds onsite due to a relative decrease in site activity (approximately 30 years)	Mitigation likely not required
	A reduction of feeding grounds and nesting locations that were artificially created from the warm water discharge	Gradual shut down of individual reactor units as per decommissioning plan
Decommissioning	Temporary effects on birds due to noise and dust from dismantling and demolition phase of decommissioning (at least a 10-year period per reactor unit)	Minimize work producing large amounts of noise and dust during bird migratory periods
	Decreases in air quality due to release of chemical or radiological contaminants during dismantling and demolition phase could affect avian health	Use of temporary containment structures and local filtered ventilation as per decommissioning plan
Abandonment	Changes in air quality (dust) from the site during site restoration may impact avian habitats and biota	Utilization of dust mitigation measures

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20.0 POTENTIAL CHANGES TO ENVIRONMENT ON LANDS OUTSIDE OF ONTARIO AND CANADA

The Project is located in Ontario and no changes to the environment in another province or outside Canada are anticipated. The Project is located on the eastern shore of Lake Huron. Lake Huron is a part of the Great Lakes-St. Lawrence water system which is transboundary basin shared between Canada and the United States. Potential effects and impacts will be further assessed in detail in the Impact Statement.

21.0 POTENTIAL IMPACTS TO INDIGENOUS PEOPLES: PHYSICAL AND CULTURAL HERITAGE, TRADITIONAL LAND USE, HISTORICAL, ARCHAEOLOGICAL AND PALEONTOLOGICAL AND ARCHITECTURAL RESOURCES

Bruce Power has been engaging with SON, HSM, and MNO for many years, with Protocol / Relationship agreements dating to 2011, 2009, and 2012 respectively. Bruce Power has an understanding of current issues and concerns from Indigenous Nations and Communities as it relates to the Bruce Power site; however, Bruce Power recognizes that additional issues and concerns can evolve over time and will arise through ongoing engagement on the Project.

We understand that the prospect of new nuclear power generation may be associated with concerns about environmental impacts and at the same time may offer new opportunities to work together to address environmental issues and concerns and to expand our engagement on environmental monitoring, environmental protection, and mitigation measures.

For Indigenous Peoples, potential impacts to the environment can be intricately linked to potential impacts to Aboriginal and treaty rights and way of life, specifically those environmental impacts that may alter the physical and cultural ways that Indigenous Nations and Communities interact with and relate to the environment. It is for these reasons that environmental topics and engagement on the ways that the Bruce Power site interacts with the environment, have always been the focus of engagement with SON, HSM, and MNO.

For example, each of SON and HSM have expressed that the Lake Huron ecosystem and in particular the fish that inhabit this ecosystem are significant and any potential impacts on fish or water are of concern. Because of the expressed importance of the Lake Huron ecosystem, fish and fishing, the potential impacts of impingement and entrainment of fish (I&E) and thermal effluent associated with operation of the condenser cooling water intake system have always been key focus areas of engagement.

Based on review of Bruce Power's past and current engagement discussions, as well as any input on the IPD, the potential impacts of the Project to Indigenous Peoples (excluding social, economic and health conditions) are:

- Impacts to fish and fish habitat from thermal impacts of cooling water or industrial water effluents;
- Impacts to fish from impingement & entrainment in water intakes and structures;
- Impacts to aquatic invertebrate, plant and nearshore wetland health related to thermal impacts from cooling water or industrial water effluents;

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- Impacts to terrestrial environments, species and habitat connectivity;
- Impacts related to accidental spills released to the terrestrial and aquatic environments;
- Impacts to ability of SON Members to access the SON Spirit Site / Burial Ground – Chiibegmegoong;
- Impacts related to the production, treatment, and storage of nuclear Waste (all levels);
- Cumulative impacts related to the combined past, present and future impacts of Bruce Power's operations and the operations of the Project (other operations at the Bruce Power site - OPG, CNL and Hydro One), climate change, and other local and regional environmental stressors;
- Radiological dose to public and general radiological safety; and
- Impacts of changing climate to environmental regulatory approvals and limits.

See Table 5 for preliminary assessment of Project activities and potential impact on Indigenous Peoples.

Bruce Power will continue to engage with SON, HSM and MNO to understand potential impacts resulting from the Project.

22.0 **POTENTIAL IMPACTS TO INDIGENOUS PEOPLES: SOCIAL, ECONOMIC AND HEALTH CONDITIONS**

The following section provides a description of any change that, as a result of the carrying out of the Project, may occur to the health, social or economic conditions of Indigenous Peoples.

We recognize that census data is not the most reliable source of information as it relates to First Nations and Métis. We will report more information about social, health and economic conditions of the Indigenous Nations and Communities through our engagement. Bruce Power has made contributions through the Indigenous Community Investment Fund that supports many social initiatives for Indigenous Nations and Communities [R-56]. We are working with SON to explore and implement actions that Bruce Power can take to have a positive impact on the SON Communities to support improving social, economic and health conditions.

Bruce Power has been engaging with SON, HSM, and MNO for many years, with Protocol / Relationship agreements dating to 2011, 2009, and 2012 respectively. Through longstanding engagement, Bruce Power has worked with SON, HSM, and MNO to support the areas of training, employment, and economic and business development, and provides annual funding support for Indigenous Nation or Community-based programs. The prospect of new nuclear power generation may be associated with concerns about socio-economic impacts as well as with the prospect of new opportunities to work together to address these issues and to create benefits related to socio-economic and health conditions.

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In order to identify potential impacts to social, economic and health conditions of Indigenous Peoples, Bruce Power reviewed prior assessments from previous regulatory reviews, and past and current engagement discussions, including any input provided on the IPD. Table 5 summarizes the preliminary assessment of Project activities and potential impact on Indigenous Peoples.

As outlined in Section 15.0, Bruce Power will, as part of the IA, engage SON, HSM, and MNO to discuss the criteria to be considered for the assessment of health, social, and economic conditions and how Indigenous Knowledge can further support these discussions and assessments.

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Table 5: Preliminary Assessment of Project Activities and Potential Impact on Indigenous Peoples

Project Phase (Based on Project Activities in Table 1)	Section 21.0 Potential impacts to Indigenous Peoples: Physical and cultural heritage, traditional land use, historical archaeological and paleontological and architectural resources	Section 22.0 Potential impacts to Indigenous Peoples: Social, Economic and Health Conditions
The potential environmental impacts listed below and in subsequent rows may impact the quantity and quality of aquatic and terrestrial habitats and species which could have the potential to impact cultural, ceremonial, subsistence, or commercial harvesting practices and activities and related social, health and economic conditions of Indigenous Peoples.		
Site-Preparation	Potential direct and indirect impacts to fish and fish habitat. Potential direct and indirect impacts to aquatic invertebrate, plant, and nearshore wetland health. Potential direct and indirect impacts related to accidental spills released to the terrestrial and aquatic environments. Potential direct and indirect impacts to terrestrial environments, species and habitat connectivity related to increased human presence and vehicular traffic both on and off site. Cumulative environmental impacts related to the combined past, present and future impacts of Bruce Power’s operations, the operations of the Project, other operations at the Bruce Power site (OPG, CNL and Hydro One), other local and regional projects and environmental stressors, and climate change.	Changes to perception of risk and feelings of personal security and wellbeing related to the presence of a nuclear facility in proximity to Indigenous Nations and Communities. Potential effects of influx of nuclear workers and suppliers on demand for services such as health care, emergency response, childcare, and to the availability and affordability of local housing. Potential for increased availability of training, employment, and procurement opportunities. Potential direct and indirect impacts to health and well-being related to economic conditions. Potential indirect impacts to food security driven by changes to availability and accessibility of off-site lands for harvesting. Potential indirect impacts to cultural knowledge transfer driven by changes to availability and accessibility of off-site lands. Cumulative impacts on social, economic and health conditions related to the combined past, present and future impacts of Bruce Power’s operations, operations of the Project, other operations at the Bruce Power site (OPG, CNL and Hydro One), and other local and regional projects.
Construction and Commissioning	Potential direct and indirect impacts to fish and fish habitat. Potential direct and indirect potential impacts to aquatic invertebrate, plant and nearshore wetland health. Potential direct and indirect impacts related to accidental spills released to the terrestrial and aquatic environments. Potential direct and indirect impacts to terrestrial environments, species and habitat connectivity related to new infrastructure and increased human presence and vehicular traffic both on and off the Bruce Power site. Cumulative environmental impacts related to the combined past, present and future impacts of Bruce Power’s operations, the operations of the Project, other operations at the Bruce Power site (OPG, CNL and Hydro One), other local and regional projects and environmental stressors, and climate change.,	Changes to perception of risk and feelings of personal security and wellbeing related to the presence of a nuclear facility in proximity to Indigenous Nations and Communities. Potential effects of influx of nuclear workers and suppliers on demand and cost of services such as health care, emergency response, childcare, and to the availability and affordability of local housing. Potential for increased availability of training, employment, and procurement opportunities. Potential direct and indirect impacts to health and well-being related to economic conditions. Potential indirect impacts to food security driven by changes to availability and accessibility of off-site lands for harvesting. Potential indirect impacts to cultural knowledge transfer driven by changes to availability and accessibility of off-site lands. Cumulative impacts on social, economic and health conditions related to the combined past, present and future impacts of Bruce Power’s operations, operations of the Project, other operations at the Bruce Power site (OPG, CNL and Hydro One), and other local and regional projects.

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Table 5: Preliminary Assessment of Project Activities and Potential Impact on Indigenous Peoples

Project Phase (Based on Project Activities in Table 1)	Section 21.0 Potential impacts to Indigenous Peoples: Physical and cultural heritage, traditional land use, historical archaeological and paleontological and architectural resources	Section 22.0 Potential impacts to Indigenous Peoples: Social, Economic and Health Conditions
Active and Safe Storage Operations & Maintenance	Potential direct and indirect impacts to fish and fish habitat from thermal effluent from cooling water or industrial water effluents. Potential direct and indirect impacts to fish from impingement & entrainment in water intakes and structures. Potential direct and indirect impacts to aquatic invertebrate, plant and nearshore wetland health related to thermal effluent from cooling water or industrial water effluents. Potential direct and indirect impacts to terrestrial environments, species and habitat connectivity related to new infrastructure and increased human presence and vehicular traffic both on and off the Bruce Power site. Potential direct and indirect impacts related to accidental spills released to the terrestrial and aquatic environments. Potential direct and indirect impacts related to the production, treatment, and storage of nuclear waste (all levels). Cumulative environmental impacts related to the combined past, present and future impacts of Bruce Power’s operations, the operations of the Project, other operations at the Bruce Power site (OPG, CNL and Hydro One), other local and regional projects and environmental stressors, and climate change. Potential direct and indirect impacts related to radiological releases to the environment.	Changes to perception of risk and feelings of personal security and wellbeing related to the presence of a nuclear facility in proximity to Indigenous Communities. Potential effects of influx of nuclear workers and suppliers on demand and cost of services such as health care, emergency response, childcare, and to the availability and affordability of local housing. Potential for increased availability of training, employment, and procurement opportunities. Potential direct and indirect impacts to health and well-being related to economic conditions. Potential for improved economic conditions related to economic participation in the Project. Potential for Increase in the production of medical isotopes may enhance economic benefit and availability and application of nuclear medicine locally or regionally. Potential indirect impacts to food security driven by changes to availability and accessibility of off-site lands for harvesting. Potential indirect impacts to cultural knowledge transfer driven by changes to availability and accessibility of off-site lands. Cumulative impacts on social, economic and health conditions related to the combined past, present and future impacts of Bruce Power’s operations, operations of the Project, other operations at the Bruce Power site (OPG, CNL and Hydro One), and other local and regional projects.
Decommissioning	Potential direct and indirect impacts to fish and fish habitat, aquatic invertebrate, plant and nearshore wetland health related to decommissioning activities; potential for positive impact related to restoration activities and cessation of impingement, entrainment and release of thermal effluent. Potential direct and indirect impacts to terrestrial habitats and species related to decommissioning activities; potential for positive impact related to restoration activities and cessation of high intensity of human activity on site. Potential direct and indirect impacts related to the treatment, and storage of nuclear waste (all levels). Cumulative environmental impacts related to the combined past, present and future impacts of Bruce Power’s operations, the operations of the Project, other operations at the Bruce Power site (OPG, CNL and Hydro One), other local and regional projects and environmental stressors, and climate change.	Changes to perception of risk and feelings of personal security and wellbeing related to the presence of a nuclear facility in proximity to Indigenous Communities. Potential effects of influx of nuclear workers and suppliers on demand and cost of services such as health care, emergency response, childcare, and to the availability and affordability of local housing. Changes in the availability of training, employment, and procurement opportunities. Changes to health and well-being related to economic conditions. Changes to economic conditions related to economic participation in the Project. Potential indirect impacts to food security driven by changes to availability and accessibility of off-site lands for harvesting. Potential indirect impacts to cultural knowledge transfer driven by changes to availability and accessibility of off-site lands. Cumulative impacts on social, economic and health conditions related to the combined past, present and future impacts of Bruce Power’s operations, operations of the Project, other operations at the Bruce Power site (OPG, CNL and Hydro One), and other local and regional projects.

Table 5: Preliminary Assessment of Project Activities and Potential Impact on Indigenous Peoples

Project Phase (Based on Project Activities in Table 1)	Section 21.0 Potential impacts to Indigenous Peoples: Physical and cultural heritage, traditional land use, historical archaeological and paleontological and architectural resources	Section 22.0 Potential impacts to Indigenous Peoples: Social, Economic and Health Conditions
Abandonment	Potential direct and indirect impacts to fish and fish habitat, aquatic invertebrate, plant and nearshore wetland health related to cessation of activities on site; potential for positive impact related to restoration activities and cessation of impingement, entrainment and release of thermal effluent. Potential direct and indirect impacts to terrestrial habitats and species related to cessation of activities on site; potential for positive impact related to restoration activities and cessation of high intensity of human activity on site. Potential direct and indirect impacts related to the treatment and storage of nuclear waste (all levels). Cumulative environmental impacts related to the combined past, present and future impacts of Bruce Power’s operations, the operations of the Project, other operations at the Bruce Power site (OPG, CNL and Hydro One), other local and regional projects and environmental stressors, and climate change.	Potential changes to perception of risk and feelings of personal security and wellbeing related to the presence of a nuclear facility in proximity to Indigenous Communities. Potential changes to the cost and demand for services such as health care, emergency response, childcare, and to the availability and affordability of local housing. Changes in the availability of training, employment, and procurement opportunities. Changes to health and well-being related to economic conditions. Changes to economic conditions related to economic participation in the Project. Potential indirect impacts to food security driven by changes to availability and accessibility of off-site lands for harvesting. Potential indirect impacts to cultural knowledge transfer driven by changes to availability and accessibility of off-site lands. Cumulative impacts on social, economic and health conditions related to the combined past, present and future impacts of Bruce Power’s operations, operations of the Project, other operations at the Bruce Power site (OPG, CNL and Hydro One), and other local and regional projects.

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23.0 AN ESTIMATE OF ANY GREENHOUSE GAS EMISSIONS ASSOCIATED WITH THE PROJECT

Nuclear power emits just a few grams of carbon dioxide (CO₂) equivalent per kilowatt hour (kWh) of electricity produced. Based on the United Nations (UN) Intergovernmental Panel on Climate Change (IPCC) study, this equates to 12g CO₂ equivalent/kWh for nuclear [R-57], as shown below in Figure 10.

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An estimate of the greenhouse gas emissions (GHG) associated with the Project is included within Table 6 and Table 7. The GHG emissions for the Project were estimated using methodology consistent with the Strategic Assessment of Climate Change (SACC) developed by ECCC [R-15]. Direct scope 1 and 2 emissions have been included in this assessment relating to the following project phases:

- Site preparation and construction; and
- Operation and maintenance.

No emissions have been estimated for the decommissioning or safe storage phases since emissions could not be estimated with the information available at this time. Emissions from these phases are expected to be minimal but will be considered later when the necessary information is available.

Due to the limited construction details and construction schedule at this time, site preparation, and construction/commissioning emission estimates during the 2008 Bruce New Nuclear Power Plant Project Environmental Assessment Methods, Project Description, and Existing Environment Environmental Impact Statement [R-58] have been used as a conservative approach. It has been assumed the reactors will have similar site preparation and construction activities, as well as use similar equipment. As such, the emissions associated with construction have been assumed to be the same on an annual basis. Estimated site preparation and construction emissions are provided in Table 6 below. Site preparation and construction phase emissions should be revisited and updated (if required) once more construction phase details are known (e.g., schedule, types and number of equipment, types of land to be cleared).

Table 6: Estimated GHG Emissions from Land Preparation and Construction Activities

Phase	Estimated GHG Emissions (kt CO ₂ e)	
	Annual Estimated Emissions	Total Estimated Emissions (Project Phase)
Site Preparation (3 Years)	79.75	239.25
Construction and Commissioning (14 years)	79.44	1,112.16

Note: Annual estimated GHG emissions from site preparation and construction phases have been taken from the Bruce New Nuclear Power Plant Project Environmental Assessment Methods, Project Description, and Existing Environment Environmental Impact Statement [R-58] as sufficient project information is not available to provide reasonable estimates. Annual source emissions have then been extrapolated based on project schedule.

CO₂ emissions from land-use change include the annual carbon sink loss and the one-time loss of carbon from land clearing activities. Due to the limited land use category data at this time (i.e., the type of land cover being disturbed by the project), emissions associated with land disturbance activities could not be estimated with the available project information at this time. However, emissions associated with land disturbance activities will be estimated once more accurate land category data is known. The land disturbance emissions will be calculated using the method described in 2006 IPCC Volume 4, Chapter 2 [R-59]. The calculation of the

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total carbon stored annually, and therefore lost with the removal of vegetation, will be calculated based on Equation 2.9 and Equation 2.10 (Tier 1) in Section 2.3.1.1.A of the 2006 IPCC Volume 4, Chapter 2 [R-59]. CH₄ from annual sink loss will be calculated using Equation 7.12 from Chapter 7 of the IPCC 2019 Refinement to the 2006 IPCC Guidelines for National GHG Inventories [R-60]. This calculation methodology is consistent with methodology provided in the IPCC 2019 Refinement to the 2006 IPCC Guidelines for National GHG Inventories [R-60] and the Draft Technical Guide Related to the Strategic Assessment of Climate Change (SACC) [R-61].

GHG emissions associated with the operations and maintenance phase have been estimated for the Project. Yearly operation emissions and total operation emissions over the minimum 60-year operational lifespan have been estimated in Table 7 below. Due to the lack of information relating to the operation and maintenance of the proposed reactors at this time, emissions have been estimated using the existing facility emission intensity value (MW / kt CO₂e). For the purpose of this assessment to support the IPD, it has been assumed that the operations and maintenance for the proposed reactors will perform at the same level or better than existing reactors based on newer technology. As a result, it has been assumed operation and maintenance emission intensity per megawatt (output capacity) will be similar.

Emission intensity of the existing operations has been calculated using the existing operation emissions from the Bruce Power Annual Greenhouse Gas Annual Inventory data. The operations emissions from 2022 year were used and have been selected as a base year for calculating existing facility emission intensity. An existing output capacity of 6,550 MWe was used for the estimation. Since existing facility buildings such as visitor centers, safety buildings, and tech buildings are not expected to be built as part of this proposed Project, emissions associated with these types of facilities were excluded from the estimation. In addition, carbon credits and emission subsidies purchased by Bruce Power have not been included in the below estimate.

Table 7: Estimated GHG Emissions from Operation and Maintenance

Source	Greenhouse Gas Emissions
Estimated Yearly Emissions	17.0 kt CO ₂ e/yr
Minimum Estimated Total Operation Emissions (over 60 years)	1020 kt CO ₂ e
Maximum Estimated Total Operation Emissions (over 100 years)	1700 kt CO ₂ e/yr

Note: Operation and maintenance annual emissions have been assumed to be the same over the operational life of the project.

Operation emissions estimated below should be updated once more detailed operation inputs and expected activities are known.

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In addition to commitments described above related to GHG emissions, Bruce Power is engaging with SON, MNO and HSM to support climate change research that is relevant to each community. In 2018, Bruce Power announced its intent to carry out a Climate Change study in partnership with the Council of the Great Lakes Region (CGLR) from 2019-2021.

24.0 TYPES OF WASTE AND EMISSIONS GENERATED BY PROJECT

The following section outlines potential waste and emissions that may occur as a result of the Project to the air, in or on water and in or on land, during any phase of the Project. Emissions and waste management options including handling, disposal and storage will be further assessed and evaluated in the IA.

Land:

Potential sources of waste in or on the land that may occur as a result of the Project may include:

- Hazardous waste (oils, chemicals, lighting lamps and ballasts – some of these are recycled);
- Recyclable waste (glass, plastic, metal, cardboard, paper, wood, batteries, and electronics);
- Organics and food wastes (compost);
- Radiological waste (low-, intermediate-, and high-level radiological waste); and
- Landfill waste (for those items that are neither hazardous, recyclable, compostable, nor radiological).

Air:

Site Preparation and Construction:

- Oxides of Nitrogen (NO_x), Sulphur Dioxide (SO₂), Carbon Monoxide (CO), Volatile Organic Compounds VOCs, Suspended Particulate Matter (PM) Polycyclic Aromatic Hydrocarbons (PAHs);
- PM and PAHs associated with construction vehicles exhaust emissions and material handling; and
- Particulates and metal fumes from welding activities.

Operations:

Contaminants of Potential Concern (COPC) that may be emitted during operations may include:

- Oxides of Nitrogen (NO_x);

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- Sulphur Dioxide (SO₂);
- Suspended Particulate Matter (PM);
- Polycyclic Aromatic Hydrocarbons (PAHs);
 - (PM and PAHs associated exhaust emissions from vehicle traffic and stationary emergency equipment);
- Carbon dioxide (CO₂);
- Hydrazine;
- Morpholine;
- Ammonia; and
- Radiological emissions (specific radionuclides/radionuclide groups dependent upon technology selection).

Decommissioning:

- Oxides of Nitrogen (NO_x), Sulphur Dioxide (SO₂), Carbon Monoxide (CO), VOCs, PM and PAHs associated with construction vehicles exhaust emissions and material handling; and
- Radiological emissions (specific radionuclides/radionuclide groups dependent upon technology selection).

Water:

Construction:

- Contaminants including Total suspended solids (TSS) and turbidity would be controlled and/or mitigated according to regulatory approvals;
- Contaminants (e.g., fuels or oils) released to the terrestrial or aquatic environments through accident or malfunction; and
- Atmospheric deposition of airborne COPCs during construction.

Operations:

- Heat, morpholine and hydrazine controlled and mitigated according to regulatory approvals;
- Contaminants (e.g., fuels or oils) released to the terrestrial or aquatic environments through accident or malfunction atmospheric deposition of airborne COPCs during operations;
- Use of water from Lake Huron in accordance with regulatory approvals;

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- Increase in treated wastewater entering the environment, subject to regulatory approvals; and
- Radiological effluents (specific radionuclides / radionuclide groups dependent upon technology selection).

Decommissioning:

- Contaminants including TSS controlled and/or mitigated according to regulatory approvals;
- Contaminants (e.g., fuels or oils) released to the terrestrial or aquatic environments through accident or malfunction; and
- Radiological effluents (specific radionuclides / radionuclide groups dependent upon technology selection).

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BRUCE C PROJECT – INITIAL PROJECT DESCRIPTION PLAIN LANGUAGE SUMMARY	

APPENDIX A: LEGAL LAND DESCRIPTION

BRUCE C PROJECT – INITIAL PROJECT DESCRIPTION PLAIN LANGUAGE SUMMARY

SCHEDULE 2.1 LEASED PREMISES

A. OPG-HURON A INC. LANDS

FIRSTLY

PIN 33285-0060 (LT)

Part of Lots 20, 21, 22, 23, 24, 25, 26, 27, 28, 29 and 30, Concession Lake Range or Concession A Bruce; part of the Original Road Allowance along the Shore of Lake Huron established by Municipal Survey 826, registered as Plan 475 (closed by By-Law 811 registered as Instrument No. R28696 and closed by By-Law 78-18 registered as Instrument No. R168541); and part of the Original Road Allowance between Lots 20 and 21 Concession Lake Range or Concession A Bruce, all designated as **Parts 31, 37 to 63 both inclusive, 73, 89, 91 to 95 both inclusive, and 121 to 127 both inclusive** on **Reference Plan 3R-7352**, Municipality of Kincardine, in the County of Bruce.

SECONDLY

PART OF PIN 33285-0165 (LT)

Part of the Bed of Lake Huron in front of Lots 24, 25, 26, 27, 28, 29 and 30, Concession Lake Range or Concession A Bruce; designated as **Parts 108 to 110**, both inclusive, on **Reference Plan 3R-7352**, Municipality of Kincardine, in the County of Bruce.

B. OPG-HURON B INC. LANDS

FIRSTLY

PART OF PIN 33285-0176 (LT)

Part of Lots 11, 12, 13, 14, 15, 16 and 17, Concession Lake Range or Concession A Bruce; Part of the Original Road Allowance along the Shore of Lake Huron established by Municipal Survey 826, Registered as Plan 475 (closed by By-Law 811 registered as Instrument No. 28696); Part of Lot 1 on the west side of Bruce Street, part of Lot 1 on the east side of Head Street, part of Lot 1 on the west side of Head Street, part of Lot 1 on the east side of Raglan Street, part of Lot 1 on the west side of Raglan Street, part of Lot 1 on the east side of Morin Street, part of Lot 1 on the west side of Morin Street, part of Lot 1 on the east side of Russell Street and part of Bruce Street and Head Street (closed by Bylaw No. 1752 registered as Instrument Nos. 34839/ 34840), part of Raglan Street and Morin Street (closed by Bylaw No. 810 registered as Instrument No. 27556) and part of McNabb Street (closed by Bylaw No. 7711 registered as Instrument No. 154872), all in the Townplot of Inverhuron (Crown Survey VI) designated as **Parts 4 to 9 both inclusive, 11, 12, 13, 15, 16 and 18 to 27 both inclusive**, on **Reference Plan 3R7351** and **Part 1 on Reference Plan 3R-7355**, Municipality of Kincardine, in the County of Bruce.

BRUCE C PROJECT – INITIAL PROJECT DESCRIPTION PLAIN LANGUAGE SUMMARY

SECONDLY [Part of Inverhuron Park]**PART OF PIN 33285-0176 (LT)**

Part of Lots 1, 2, 3, 4, 5 and 6 on the east side of Ontario Street, Lots 1, 2, 3, 4, 5, 6 and 7 on the west side of Ontario Street, Lots 1, 2, 3, 4, 5, 6, 7, 8 and 9 on the east side of Sir Colin Street, Lots 1, 2, 3, 4, 5, 6, 7, 8 and 9 on the west side of Sir Colin Street, Lots 1, 2, 3, 4, 5, 6, 7, 8 and 9 on the east side of William Street, Lots 1, 2, 3, 4, 5, 6, 7, 8 and 9 on the west side of William Street, part of Lake Street and Napier Street (closed by Bylaw No. 810 registered as Instrument No. 27556), part of McNabb Street (closed by Bylaw No. 7711 registered as Instrument No. 154872) and all of William Street, Sir Colin Street and Ontario Street (closed by Bylaw No. 810 registered as Instrument No. 27556), all in the Townplot of Inverhuron (Crown Survey No. VI) designated as Part 10 on Reference Plan 3R 7351, Municipality of Kincardine, in the County of Bruce.

THIRDLY**PIN 33285-0191 (LT)**

Parcel Water Lot 3, Section Location HY 152 being that part of the Bed of Lake Huron in front of Lots 11, 12, 13, 14, 15, 16 and 17, Concession A Bruce or Lake Range, designated as **Part 17 on Reference Plan 3R-7351**, Municipality of Kincardine, in the County of Bruce.

C. OPG-HURON COMMON FACILITIES INC. LANDS**FIRSTLY****PIN 33286-0210 (LT)**

Part of Lots 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 and 21, Concession Lake Range or Concession A Bruce; and part of the Original Road Allowance between Lots 20 and 21 (closed by By-Law 79-1 registered as Instrument No. R170321) Lake Range Kincardine designated as **Parts 2, 3 and 4 on Reference Plan 3R-7015**, Municipality of Kincardine, in the County of Bruce.

PIN 33286-0050(LT)

Part of Lots 21 and 22, Concession A or Lake Range Bruce designated as **Part 1 on Reference Plan 3R-7015**, Municipality of Kincardine, in the County of Bruce.

BRUCE C PROJECT – INITIAL PROJECT DESCRIPTION PLAIN LANGUAGE SUMMARY

SECONDLY**PART OF PIN 33285-0170 (LT)**

Part of Lots 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24, Concession Lake Range or Concession A Bruce, and part of the Original Road Allowance between Lots 20 and 21 (closed by By-Law 811), Concession Lake Range or Concession A Bruce, part of the Original Road Allowance along the Shore of Lake Huron established by Municipal Survey 826, Registered as Plan 475 (closed by By-Law 811 registered as R28696) and part of bed of Lake Huron in front of Lots 17, 18 and 19, Concession A Bruce being Water Lot Location HY-45, all designated as **Parts 1 to 5 both inclusive, 7 to 11 both inclusive, 13 to 20 both inclusive, 27, 28, 66, 67, 71, 79, 80, 84, 85, 87, 88, 90, 112 to 120 both inclusive**, on **Reference Plan 3R-7352** and **Parts 1 and 2 on Reference Plan 3R-8208**. Municipality of Kincardine, in the County of Bruce.

THIRDLY**PART OF PIN 33285-0166 (LT)**

Part of Parcel Water Lot-1, Section Location HY149, being composed of part of the Bed of Lake Huron in front of Lots 19, 20, 21, 22, 23 and 24, Concession A or in front of part of the Original Road Allowance between Lots 20 and 21, Concession A or Lake Range designated as **Parts 96, 98 and 106 on Reference Plan 3R-7352**. Municipality of Kincardine, in the County of Bruce.

LEASED PREMISES - COMMON FACILITIES**FOURTHLY****PIN 33286-0022 (LT)**

Part of Lots A, B, C, D and E, Concession 4, designated as **Parts 1, 2 and 3 on Reference Plan 3R-7019**, Municipality of Kincardine, in the County of Bruce.

INFORMATION CENTRE**PIN 33286-0019 (LT)**

Part of Lots C and D, Concession 5, Bruce, designated as Part 1 on Reference Plan 3R-7348 and **Part 4 on Reference Plan 3R-379**. Municipality of Kincardine, in the County of Bruce.