



MARINE RENEWABLE-ENERGY DEMONSTRATION PERMIT

**Province of Nova Scotia**  
***Marine Renewable-energy Act***

PERMIT HOLDER: Nova Innovation CAN Ltd.  
PERMIT NUMBER: 2019-70-0035  
EFFECTIVE DATE: December 4, 2019  
EXPIRY DATE: December 3, 2024  
LAST AMENDED ON: \_\_\_\_\_

**Pursuant to Section 36 of the *Marine Renewable-energy Act*, as amended from time to time, this Demonstration Permit granted to the Permit Holder is subject to the Terms and Conditions attached to and forming part of this Permit, for the following activities:**

Construction, installation, operation, and decommissioning of fifteen (15) in-stream tidal energy generators on a short-term demonstration basis with an aggregate nameplate capacity of one and a half (1.5) megawatts at Nova Innovation CAN Ltd. Permit Area located within and adjacent to the Petit Passage MREA.

For greater certainty, the activity authorized under this Demonstration Permit and its terms and conditions is subject to the *Marine Renewable-energy Act* and its regulations.

  
\_\_\_\_\_  
Derek Mombourquette  
Minister

December 4, 2019  
\_\_\_\_\_  
Date Signed

**MARINE RENEWABLE-ENERGY DEMONSTRATION PERMIT  
TERMS AND CONDITIONS**

**Province of Nova Scotia  
*Marine Renewable-energy Act***

PERMIT HOLDER: Nova Innovation CAN Ltd.  
PERMIT TYPE Demonstration Permit (Connected Generator)  
PERMIT NUMBER: 2019-70-0035  
EFFECTIVE DATE: December 4, 2019  
EXPIRY DATE: December 3, 2024  
LAST AMENDED ON: \_\_\_\_\_

**Terms and Conditions of License Approval**

This approval is subject to the following conditions and obtaining all other necessary approvals, permits or authorizations required by municipal, provincial and federal acts, regulations and by-laws before constructing, installing, operating and decommissioning any device in the Nova Innovation CAN Ltd. Permit Area.

**Permit**

The following schedules are attached to and form part of this Permit:

- Schedule A – Nova Innovation CAN Ltd. Technical Description;
- Schedule B – Survey of Nova Innovation CAN Ltd. Permit Area;
- Schedule C – Project Plan; and
- Schedule D – Insurance Requirements.

The terms and conditions of this Permit document shall prevail over the Schedules.

## Definitions:

Terms which are defined in either the *Marine Renewable-energy Act* or its regulations have the same meaning in these terms and conditions, unless otherwise provided.

### In this Permit:

“Aggregate Name Plate Capacity” means the maximum installed capacity permitted under the demonstration permit of the units forming the Generation Facility;

“Application Document” means the marine renewable-energy permit application submitted by the Permit Holder to the Nova Scotia Department of Energy and Mines and deemed complete on September 5, 2019;

“Commercial Operation” means the completion of the design, construction and commissioning of at least one (1) device of the Generating Facility, and the Permit Holder has provided written notice to NSPI that they are ready for Commercial Operation. Commercial Operation must be reached on or before the Final In-Service Date;

“Commercial Operation Date” means the first day of the calendar month following Commercial Operation;

“Decommissioning, Abandonment and Rehabilitation Plan” means the decommissioning, abandonment and rehabilitation plan required by subsection 44(2) of the *Marine Renewable-energy Act* and provided to the Minister in accordance with sections 19 and 20 of the *Marine Renewable-energy General Regulations*;

“Deployment” means the placement of a device or associated equipment in position ready for use;

“Effective Date” means the date that this Permit is effective, as noted at the head of this document;

“Fee Regulations” means the *Marine Renewable-energy Fees Regulations*;

“Final In-Service Date” shall be three (3) years from the Effective Date;

“Generation Facility” means one or more device(s) described in the Project Plan and Schedule A, together with all protective and other associated equipment and

improvements as may be modified from time to time pursuant to the terms of this Permit;

"Generator(s)" as defined in the *Marine Renewable-energy Act*;

"Incremental Energy Rate" means the rate in \$/MWh which is equal to NSPI's cost of generating or purchasing one more MWh of energy from sources other than the Generating Facility as calculated by NSPI averaged over the twelve (12) month period immediately preceding the relevant time and set out in the Power Purchase Agreement (PPA);

"Minister" means the Minister of Energy and Mines for the Province of Nova Scotia;

"MRE-Act" means the *Marine Renewable-energy Act*;

"Nova Innovation CAD Ltd. Permit Area" or "Permit Area" means the area of submerged land for which the specific location has been determined by survey by the Permit Holder as described in the Application document and as contained in Schedule B of this Permit;

"NSPI" means Nova Scotia Power Incorporated;

"Permit Holder" means Nova Innovation CAN Ltd.;

"Program Administrator" means a representative of the Nova Scotia Department of Energy and Mines who has been assigned to receive information on the Department's behalf with respect to this Permit;

"Project Plan" means the project plan attached as Schedule C;

"Regulations" means the *Marine Renewable-energy General Regulations*;

"Socio-economic Matters" include, but are not limited to, issues relating to employment, job-creation, and community relations;

"Technical Description" means the description of the technology contained in Schedule A of this Permit;

## **1.0 Scope of Approval**

- 1.1 *Project Details.* This Permit is limited to the project as described in the Schedules attached to and forming part of this Permit.
- 1.2 *Project Technology.* The Permit for the project is limited to the technology as described in the Schedules attached to and forming part of this Permit and limited to the aggregate nameplate capacity first stated above.
- 1.3 *Permit Area.* The Permit Area is (21.94 hectares) as set out in Schedule B. Generator(s) authorized under this Permit shall be constructed, installed and operated within the Permit Area.
- 1.4 *Development and Operation.* The Permit Holder shall develop and operate the project as described in the Project Plan attached to and forming part of this Permit as Schedule C.
- 1.5 *Precedence of legislation.* In the event of a conflict between the *MRE-Act* and its regulations and the terms and conditions of this Permit, the *MRE-Act* and its regulations shall prevail.

## **2.0 General Terms and Conditions**

- 2.1 This Permit is valid for a term of five (5) years from the Effective Date.
- 2.2 *Site Development.* All work related to construction of shoreline and on-shore infrastructure related to this Permit take place between October and March, each year work is required, to minimize impacts to birds during the migration season.
- 2.3 *Renewal eligibility.* This Permit expires on December 3, 2024. To be eligible to renew the term of the Permit, the Permit Holder must have fulfilled its obligations under this Permit, *MRE-Act* and its regulations and shall submit and receive written approval of a new project plan for the coming renewed term in accordance with the requirements and within the timelines of the *MRE Act* and its associated Regulations.
- 2.4 *Other Approvals, Permits and Authorizations.* This Permit is subject to the terms and conditions herein, as well as the Permit Holder obtaining and

maintaining all other necessary approvals, permits or authorizations under municipal, provincial and federal acts, regulations and by-laws.

- 2.5 In accordance with Section 42(1C) of the MRE Act, the maximum aggregate of terms for this permit is 18 years.

### **3.0 Project Plan/Term of Permit**

- 3.1 The Permit Holder shall, within three (3) years of the Effective Date, reach Commercial Operation on the project.
- 3.2 The full Generation Facility as described in the Technical Description (Schedule A) and Project Plan (Schedule C) shall be constructed and operational within three (3) years of the Effective Date of this Permit. This is also the Final In-Service Date. The Final In-Service date shall not be extended by the Minister.
- 3.3 Any proposal by the Permit Holder for changes to any aspect of the project from that described in an approved Project Plan shall be submitted to the Minister for review and approval.
- 3.4 This Permit is valid from the date of issuance, expiring on December 3, 2024.

### **4.0 Power Purchase Agreement**

- 4.1 Energy produced by the Permit Holder will be paid in accordance with the Power Purchase Agreement (PPA) between the Permit Holder and NSPI.
- 4.2 The term of the PPA shall end on the earlier of:
- a) the date on which the Demonstration Permit expires, or is revoked;
  - b) or 15 years after the Commercial Operation Date.
- 4.3 The Permit Holder shall be paid an energy rate of \$500 per megawatt hour (MWh) of energy generated up to an annual cap of [REDACTED] MWh, then the Incremental Energy Rate above this cap, in accordance with the PPA.

## **5.0 Rent Payments**

5.1 The Permit Holder shall pay the first annual rent payment of \$32.46 no later than sixty (60) days after the Effective Date, and \$438.80 on or before January 31 of each subsequent year during the term of the Permit. The rent payment is calculated on the basis of a calendar year and is equal to the greater of two thousand five hundred dollars (\$2,500) per megawatt (MW) of installed capacity under the Permit or twenty dollars (\$20.00) per hectare in the Permit Area.

5.2 Rent payments shall be made payable to the “Minister of Finance” and are non-refundable.

5.3 If rent is not paid on or before the deadline for payment, the Permit Holder shall pay an additional late fee in an amount equivalent to 10% of the full owed.

If rent remains in arrears for more than 120 days after the deadline the Minister may suspend the Permit until rent owing is paid in full.

5.4 The Permit Holder shall notify the Minister in writing no later than sixty (60) calendar days before the next rent payment is due if the megawatts of installed capacity authorized under the Permit or the hectares of the Permit Area change such that it may impact annual rental fees.

## **6.0 Environmental Monitoring Plan**

6.1 The Permit Holder shall not construct or install a generator, cable or other equipment or structure in the Permit Area until the Permit holder has submitted, and the Minister has approved, an Environmental Monitoring Plan. The Permit Holder shall implement and adhere to the Environmental Monitoring Plan following approval.

6.2 Unless otherwise approved, the Permit Holder shall submit an Environmental Monitoring Plan to the Program Administrator for review and approval at least thirty (30) days prior to constructing or installing a generator, cable or other equipment or structure in the Permit Area.

6.3 The Environmental Monitoring Plan (EMP) must be developed using relevant baseline data and identify appropriate environmental effects

indicators. The plan shall consider project effects on, but not limited to, the following:

- fish and lobster;
- marine birds;
- marine mammals;
- acoustics;
- physical oceanography;
- currents and waves; and
- benthic environment.

The EMP shall include contingencies to be implemented as alternative courses of action in the event mitigation and/or monitoring activities cannot be implemented, are not functioning as designed, or do not provide expected results.

- 6.4 The Permit Holder shall update and revise the EMP to reflect best available and economic practices, methods, and technologies respecting environmental monitoring; changes in the Project Plan and circumstances of the project; and changes in the knowledge of, or actual changes in the physical, ecological, and environmental circumstances and impacts of the project.
- 6.5 The Permit Holder shall submit an initial status report on environmental monitoring equipment functionality to the Program Administrator prior to turbine operation and shall notify the Program Administrator of any malfunction or non-functioning of the equipment within twenty-four (24) hours.
- 6.6 Environmental effects monitoring reports shall be submitted in writing to the Minister at a schedule to be determined by the Nova Scotia Department of Energy and Mines.
- 6.7 Upon knowledge of serious harm to marine mammals, fish, marine invertebrates, and marine birds, the Permit Holder shall, without unreasonable delay, notify the Program Administrator and the Department of Fisheries and Oceans Canada.



## **7.0 Engagement Requirements**

- 7.1 *Mi'kmaq Engagement Plan.* The Permit Holder shall not construct or install a generator, cable or other equipment or structure in the Permit Area until the Permit Holder has submitted, and the Minister has approved, a Mi'kmaq Engagement Plan. The plan shall outline ongoing and proposed engagement activities with the Mi'kmaq of Nova Scotia and shall include, as a minimum, a description and general schedule of activities under the authority of the Permit. The Permit Holder shall send a draft of this engagement plan to the KMKNO and allow adequate time for feedback to be incorporated prior to submitting to the Department for approval. The Permit Holder shall implement the plan following approval. The plan shall be updated and resubmitted annually to the Minister for approval on or before January 31<sup>st</sup> throughout the term of this Permit.
- 7.2 The Permit Holder shall support the Province of Nova Scotia in its future and ongoing consultation processes with the Mi'kmaq of Nova Scotia related to this project, share information the Minister considers necessary or advisable, with the Mi'kmaq of Nova Scotia, and consider implementing mitigation and accommodation measures to address any issues raised through consultation.
- 7.3 *Stakeholder Communication and Engagement Plan.* The Permit Holder shall not construct or install a generator, cable or other equipment or structure in the Permit Area before submitting a stakeholder communication and engagement plan to the Minister for approval. The plan shall outline ongoing and proposed engagement activities with stakeholders and shall include, as a minimum, a description and general schedule of activities under the authority of the Permit. The Permit Holder shall implement the plan following approval. The plan shall be updated and resubmitted annually to the Minister for approval on or before January 31, throughout the term of this Permit.

## **8.0 Reporting Requirements**

- 8.1 *Deployment Notice.* The Permit Holder shall notify the Program Administrator at a minimum, thirty (30) days prior to the Deployment or the testing of generator(s) or equipment under the authority of the Permit.
- 8.2 *Deadlines for Activity Reports.* The Permit Holder, throughout the term of the Permit, shall submit quarterly written reports ("Activity Reports") to the Minister detailing the activities carried on under the authority of the Permit:

- a. by January 31, for activities between October 1 and December 31;
- b. by April 30, for activities between January 1 and March 30;
- c. by July 31, for activities between April 1 and June 30; and
- d. by October 31, for activities between July 1 and September 31.

8.3 *Content of Activity Reports.* At a minimum, the Activity Reports shall include:

- a. Detailed and up-to-date project schedule;
- b. Status update on operational aspects of the project;
- c. Operational capacity factor for each generator and calculation methodology;
- d. Progress updates on the activities outlined in the project schedule;
- e. Detailed and up-to-date procurement schedule;
- f. Amended procurement deadlines;
- g. Summary of any entities procured for goods/services;
- h. Financial statements related to procurement, construction, operations, and monitoring activities, with audited financial statements included at least once per calendar year;
- i. Data relating to socio-economic matters;
- j. Lessons learned deemed beneficial to the sector; and
- k. Any changes to the corporate structure of the Permit Holder or its major shareholders, including but not limited to changes of domicile, management, and corporate governance.

8.4 *Event notification.* The Permit Holder shall notify the Program Administrator within ten (10) business days upon reaching the following milestone(s):

- a. Receipt of any federal, provincial, or municipal regulatory approvals;
- b. Approval of additional funding or grants;
- c. Completion of any NSPI grid interconnection activities;
- d. Connection to the transmission or distribution grid;
- e. Issuance of any manufacturing or fabrication contracts;
- f. Installation of a generator and any cable or other equipment or structure used or intended to be used with a generator;
- g. Reaching commercial operation under the power purchase agreement;
- h. Achieving [REDACTED] capacity factor;
- i. Achieving [REDACTED] capacity factor;
- j. Exceeding [REDACTED] capacity factor;
- k. Commencement of decommissioning activities; and

I. Completion of decommissioning and rehabilitation activities.

- 8.5 *Press release notification.* The Permit Holder shall notify the Program Administrator at least one (1) business day prior to any press release, social media post, or other public facing release, related to the activities authorized under the Permit.
- 8.6 *Officer's and Director's Certificates.* The Permit Holder, upon request from the Minister, shall provide an officer's or director's certificate attesting to the truth, accuracy and completeness of any report and submission required under this Permit, or attesting to matters of compliance with this Permit.

**9.0 Incident Reporting**

- 9.1 The Permit Holder shall provide the Program Administrator, within seventy-two (72) hours, a report of any significant adverse environmental effects, accident or near miss, generator malfunction or impact to human health or safety together with a description of the response.
- 9.2 The Permit Holder shall notify the Program Administrator at least one (1) business day in advance of any public release or press-conference related to an incident or near-miss.
- 9.3 The Permit Holder shall ensure that:
- a. Any incident or near-miss is investigated, its root cause and causal factors identified where possible and corrective action taken where applicable; and
  - b. Any incident or near-miss is investigated, its root cause, causal factors and corrective action taken must be submitted in writing to the Program Administrator no later than thirty (30) days after the day on which the incident or near-miss occurred.

**10.0 Risk Management Plan**

- 10.1 The Permit Holder shall not construct or install a generator, cable or other equipment or structure in the Permit Area, until the Permit holder has submitted, and the Minister has approved a Risk Management Plan. The

Permit Holder shall implement and adhere to the Risk Management Plan following approval.

- 10.2 Unless otherwise approved, the Permit Holder shall submit a Risk Management Plan to the Program Administrator for review and approval at least six (6) months prior to taking any action authorized by this Permit.
- 10.3 The Risk Management Plan must be developed using relevant project information and shall contain all the information listed in Section 18 of the Regulations.
- 10.4 The Risk Management Plan shall be updated and resubmitted annually by the Permit Holder to the Minister on or before January 31, throughout the term of the Permit.

#### **11.0 Decommissioning, Abandonment and Rehabilitation Plan**

- 11.1 Unless otherwise approved, in accordance with Section 19 of the Regulations, the Permit Holder shall not construct or install a generator, cable or other equipment or structure authorized by this Permit until the Permit Holder has submitted and the Minister has approved a Decommissioning, Abandonment and Rehabilitation Plan.
- 11.2 Unless otherwise approved, the Permit Holder shall submit a Decommissioning, Abandonment and Rehabilitation Plan to the Program Administrator for review and approval at least six (6) months prior to constructing or installing a generator, cable or other equipment or structure authorized by this Permit.
- 11.3 The Decommissioning, Abandonment and Rehabilitation Plan shall be developed using relevant project information and shall contain all decommissioning activities and all of the information listed in Section 20 of the Regulations.
- 11.4 The Permit Holder shall update and revise the Decommissioning, Abandonment and Rehabilitation Plan to reflect best available and economic practices, methods, and technology of decommissioning, abandonment and rehabilitation; changes in the Project Plan and circumstances of the project; and changes in the, or knowledge of the, physical, ecological, and environmental circumstances and impacts of the project.

- 11.5 Any proposal by the Permit Holder that proposes changes to any aspect described in an approved Decommissioning, Abandonment and Rehabilitation Plan(s) shall be submitted to the Minister for review and approval.

## **12.0 Financial Security and Insurance**

- 12.1 *Insurance.* The Permit Holder shall provide proof of liability insurance to the satisfaction of the Minister prior to taking any action authorized by this Permit.
- 12.2 *Coverage.* The Permit Holder shall maintain its insurance coverage in full force and effect for the term of the Permit and shall meet or exceed the terms and conditions as set out in Schedule D.
- 12.3 The Permit Holder shall provide financial security on terms and conditions acceptable to the Minister and at a minimum, sixty (60) days prior to the construction or installation of a generator or cable, or other equipment or structure authorized by this Permit. The Minister will provide written notice of the amount required, and any terms or conditions, prior to receiving financial security from the Permit Holder.
- 12.4 The Permit Holder shall ensure that any security provided is kept in effect throughout the Permit term. Unless otherwise required, the Permit Holder shall renew security on an annual basis and provide proof of financial security annually on or before January 31, throughout the term of the Permit.
- 12.5 The Minister may determine the form, and for greater certainty the terms and conditions, in which financial security is provided, including any of the following forms:
- a. Electronic transfer, cash deposit, or cheques made payable to the Minister of Finance, which the Province in its absolute discretion may cash at any time;
  - b. Government guaranteed bonds, debentures, term deposits, certificates of deposit, trust certificates or investment certificates assigned to the Minister of Finance; or
  - c. Irrevocable letters of credit, irrevocable letters of guarantee, performance bonds or surety bonds in a form acceptable to the Minister.

The Minister may impose additional terms and conditions for this financial security upon review and approval of the Decommissioning, Abandonment and Rehabilitation Plan.

### **13.0 Performance Requirements**

13.1 The Permit Holder shall provide final as-constructed drawings of the Generation Facility and all associated infrastructure to the Program Administrator no later than ninety (90) days upon reaching Commercial Operation.

13.2 The Permit Holder is subject to the following performance targets:

- a. Capability of deployed generators(s) to be operated and controlled with consistency following installation;
- b. Deployed generators operating and being controlled consistently;
- c. Capability of turbines, blades, and other spinning or moving components representing a risk to human or wildlife health of being stopped, halted and braked when and if required; and
- d. Maintenance of an annual average capacity factor of at least 12.45% for each generator under the authority of the Permit.

13.3 The Permit Holder shall provide performance reports to the Program Administrator no later than January 31 of each year through the term of this Permit. At a minimum, the report must include the following for each generator installed:

- a. Amount of energy generated;
- b. Date(s) energy was generated;
- c. Peak generation;
- d. Capacity factor achieved and calculation methodology;
- e. Number and date(s) of days deployed;
- f. Number and date(s) of operating days;
- g. Number and date(s) of maintenance days (planned and unscheduled);
- h. The type of maintenance required; and,
- i. A summary of operational issues impacting energy production or safe operation of the Generation Facility.

13.4 In the event any generator fails to meet the annual performance standard detailed in 11.2, the Permit Holder must submit a report to the Minister outlining a reasonable time-line and plan for restoration of the generator(s)

to either render it fully functional or provide details for removing the generator(s) from the Permit Area. The Permit Holder must implement the restoration as submitted; any change is subject to prior approval of the Minister. Unless otherwise approved, the Permit Holder cannot invoke this provision within three years of it being previously invoked, and not more than twice overall during the maximum term of this Permit.

#### **14.0 Notice to Minister and Program Administrator**

- 14.1 Notice, documents and other information required to be sent to the Minister of the Nova Scotia Department of Energy and Mines, shall be in writing and may be served by personal service, fax or electronically, addressed as follows:

Attention: Minister of Energy and Mines

Nova Scotia Department of Energy and Mines  
Joseph Howe Building  
1690 Hollis Street  
PO Box 2664  
Halifax, NS B3J 3J9

Phone: (902) 424-4575  
Fax: (902) 424-0528

Email: [energyminister@novascotia.ca](mailto:energyminister@novascotia.ca)

- 14.2 Notice and/or information required to be sent to the Program Administrator shall be in writing and sent via email to: [marinerenewables@novascotia.ca](mailto:marinerenewables@novascotia.ca)

#### **15.0 Notice to NSPI**

- 15.1 In the event this Permit expires, is suspended or revoked, the Minister will provide written notice of this to Nova Scotia Power Inc.

#### **16.0 Standards**

- 16.1 The Permit Holder must comply with industry standards for marine renewable energy conversion systems as they exist at the time of the issuance of this Permit and as amended, which may include, but may not

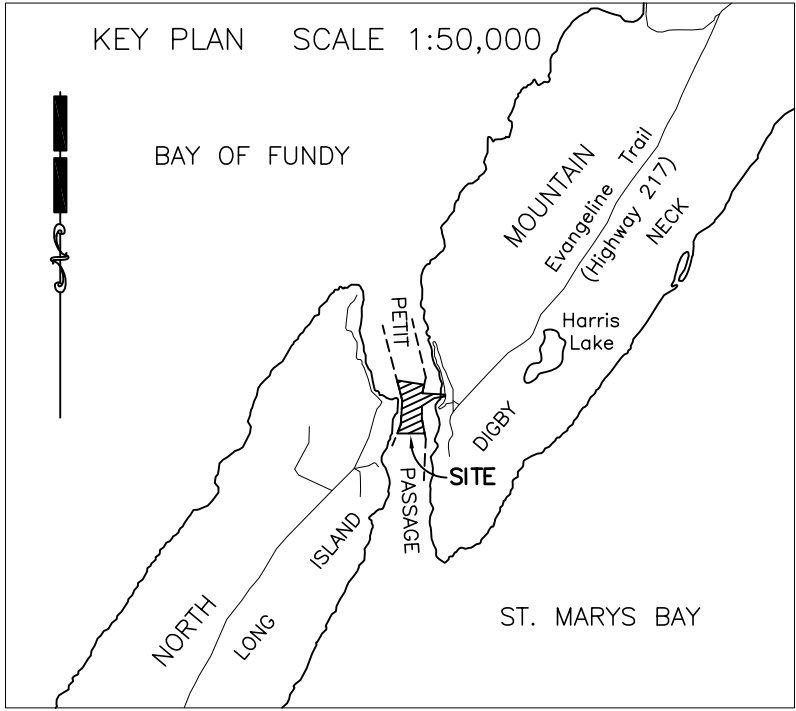
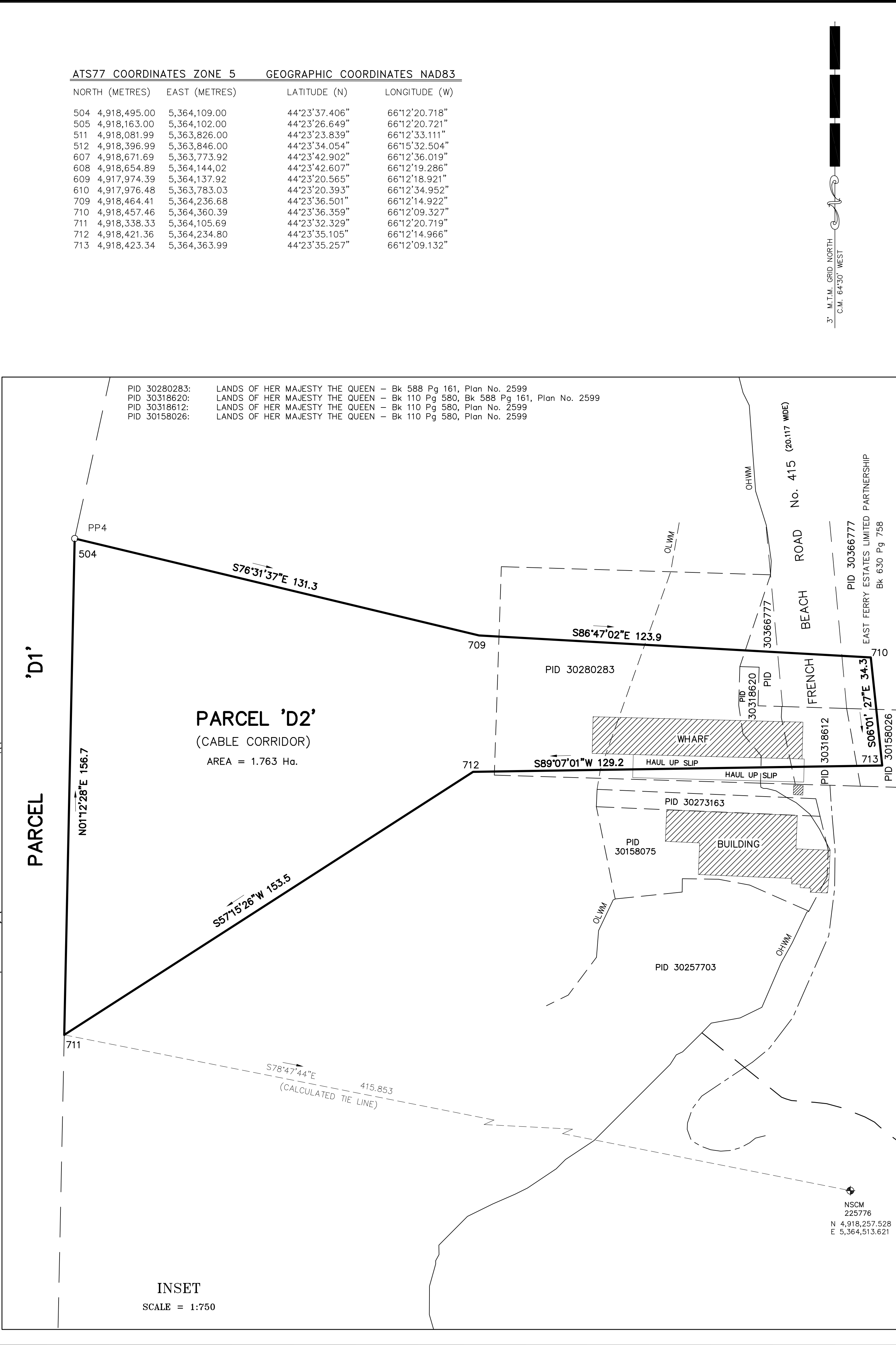
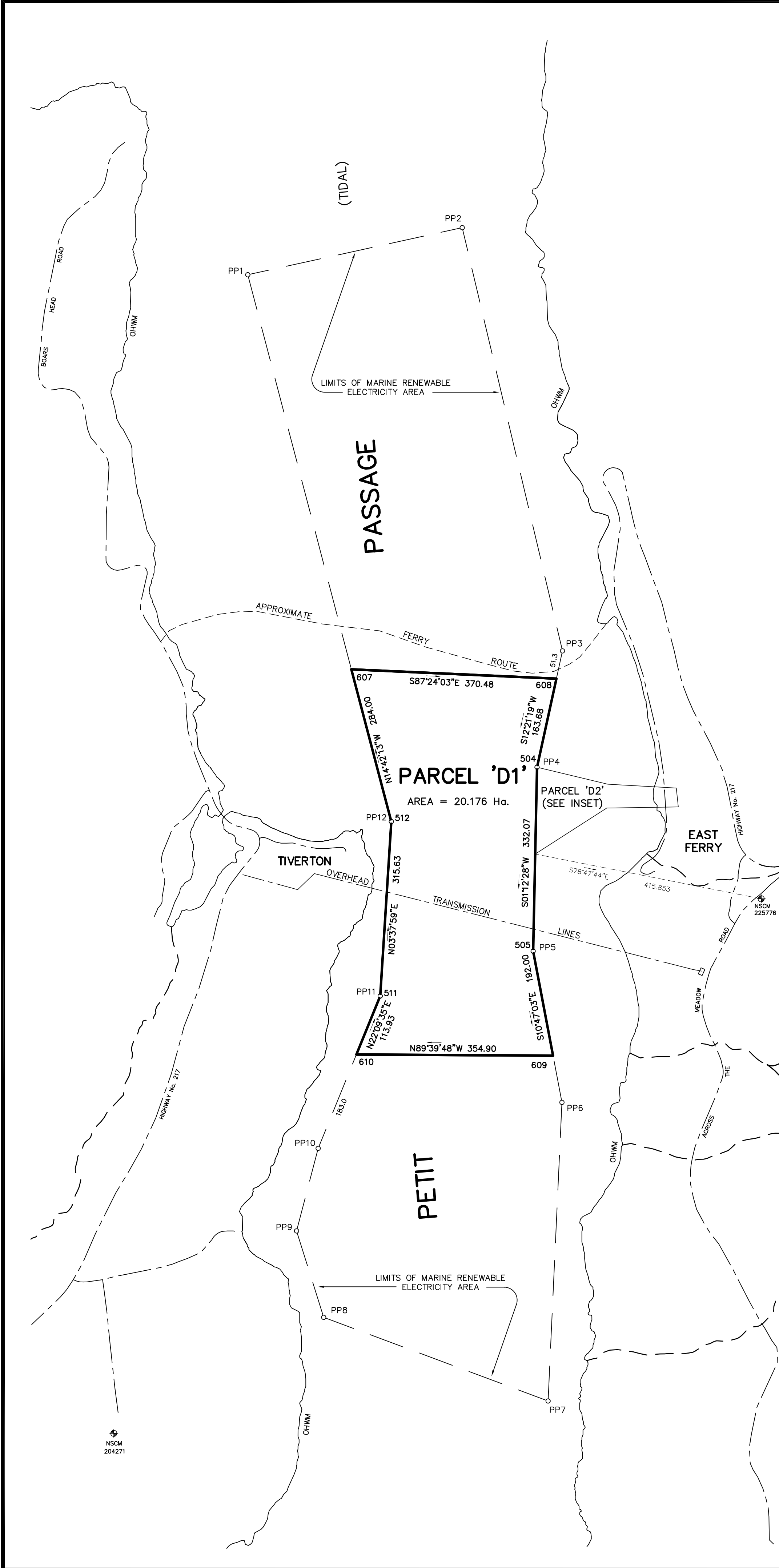
be limited to, the International Electrotechnical Commission (IEC) Technical Committee (TC) 114.

- 16.2 At a minimum, the Permit Holder shall conduct itself with prudence and due diligence and with appropriate regard for matters of health, safety, and environment.



## **Schedule A – Technical Description**

## **Schedule B – Survey of Permit Area**



**SYMBOL LEGEND:**

- BOUNDARIES DEALT WITH BY THIS PLAN
- OTHER BOUNDARIES
- PID PARCEL IDENTIFICATION NUMBER
- NSCM NOVA SCOTIA COORDINATE MONUMENT
- Ha HECTARES
- OHWM ORDINARY HIGH WATER MARK FROM PLANS AND TOPOGRAPHIC MAPPING.
- OLWM ORDINARY LOW WATER MARK FROM PLANS.
- PP1 - PP12 PRINCIPAL POINTS, MARINE RENEWABLE ENERGY AREA.
- 504 - 713 PRINCIPAL POINTS, PARCELS 'D1' and 'D2'.

**NOTES:**

BEARINGS ARE REFERRED FROM THE 3' MODIFIED TRANSVERSE MERCATOR GRID NORTH, CENTRAL MERIDIAN 64°30' WEST LONGITUDE, (ZONE 5), AND WERE GENERATED BY REFERENCE TO MARINE RENEWABLE ENERGY AREA DESCRIPTION, RECORDED SURVEY PLANS, AND PUBLISHED VALUES FOR NOVA SCOTIA COORDINATE MONUMENT NUMBERS 225776, 225775, and 225774 (ATS77, 1992 VALUES).

NO FIELD SURVEYS WERE CARRIED OUT.

DISTANCES SHOWN ARE CALCULATED, IN METRES. TO CONVERT TO FEET DIVIDE BY 0.3048.

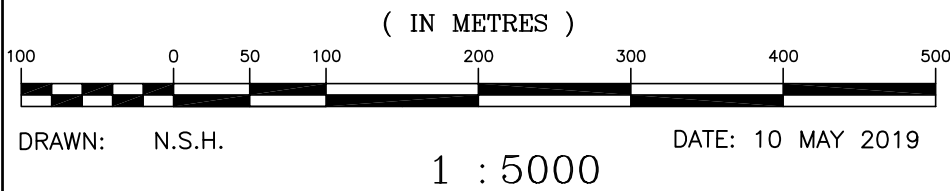
TOPOGRAPHIC FEATURES ARE FROM 1:10,000 MAPPING.



NORVAL S. HIGGINS, N.S.L.S., GREENWICH, NOVA SCOTIA

PLAN OF  
**TIDAL ARRAY SITE**  
PROPOSED BY NOVA INNOVATION  
PARCEL 'D1'  
**SUBMERGED CROWN LANDS**  
and PARCEL 'D2'  
**SUBMERGED and**  
**RIPARIAN CROWN LANDS**  
AT PETIT PASSAGE  
DIGBY, NOVA SCOTIA

**GRAPHIC SCALE**



PLAN No.  
**793-19-1**

## **Schedule C – Project Plan**

### About Nova Innovation

Nova Innovation ([www.novainnovation.com](http://www.novainnovation.com)) is a world-leading tidal energy company. We design, build, and operate tidal energy devices, and develop tidal energy sites in harmony with the environment.

In 2016, we installed the world's first offshore tidal energy array in the Bluemull Sound, Shetland, Scotland. Our strategy of focusing on small-scale devices enabled us to reach this world-leading milestone just six years after the company was founded.

In 2018, we integrated energy storage into our array, in collaboration with Tesla. Over the last year, we have been providing baseload tidal energy to the Shetland grid.

Our technology is based on four guiding design principles: safety, reliability, sustainability and minimum lifetime cost of energy. The 100 kW Nova M100 device (Figure 1) is robust, scalable and suitable for deployment in a wide range of locations, including deep water, shallow water, estuarine and river environments. The relatively small-scale device sits securely on the seabed, generating clean, reliable and predictable power – with no visual impact.



*Figure 1 The Nova M100 Tidal Turbine sitting dockside before deployment in Shetland, UK*

### Our Project: The Nova Tidal Array

Nova Innovation has applied for a Demonstration Permit to construct a 1.5 MW tidal energy array in Petit Passage: The Nova Tidal Array.

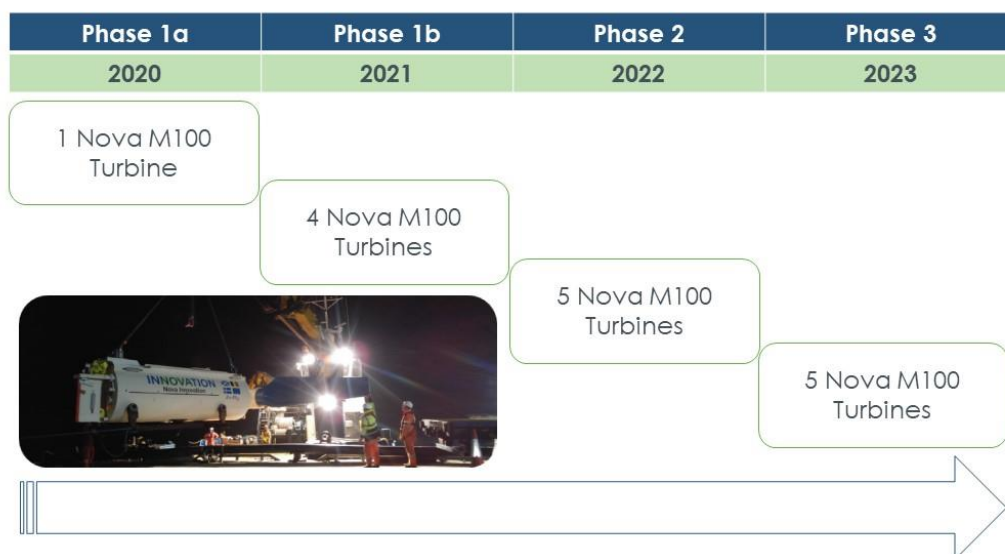
The proposed location of the Nova Tidal Array is in the Petit Passage Marine Renewable Energy Area. The location of the site search area and indicative layout of the first phase of the array can be seen in the project map presented in Figure 4 at the end of this document.

## Phased Deployment

The array would be developed in three 0.5 MW phases. Turbines will be deployed gradually within each phase, so that environmental effects can be carefully monitored.

The first 0.5 MW will be further split into two phases to enable deployment and environmental monitoring of a single turbine first (Phase 1a), before the next four turbines are added to the array (Phase 1b).

Each phase of the project will be monitored to build an understanding of any environmental effects of the turbines before the next phase proceeds.



*Figure 2 Nova Tidal Array Phased Deployment*

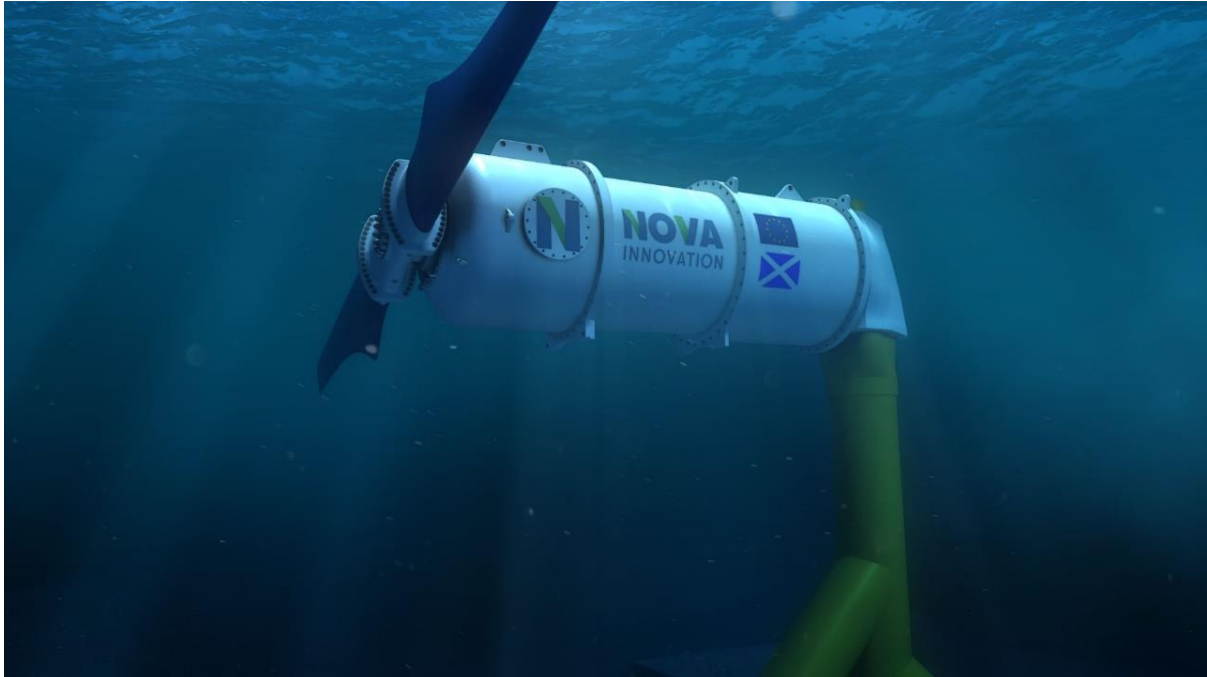
Nova has used this carefully managed, phased approach for our project in Shetland, Scotland. It has helped to demonstrate the reliability and performance of our turbines and build confidence in tidal energy.

Nova is currently discussing the best approach to phasing with the Nova Scotia and Federal Government, First Nation Communities, the fishing community and local residents. Significant work will be carried out to gather information on the marine environment in Petit Passage before Nova deploys the first turbine.

## The Nova M100-D tidal turbine

The array will use the Nova M100-D (100 kW) turbine (Figure 3). This consists of a two-bladed rotor, with a watertight steel cover enclosing the drivetrain, supported securely on a steel gravity base frame. The Nova M100-D sits on the seabed and provides ample draft clearance for marine traffic. Use of a gravity base frame means no seabed drilling or additional site works are required and decommissioning is straightforward.

Nova's technology is designed to minimize any impact on the environment. In over three years of operation of the Shetland Tidal Array, no negative environmental impacts have been observed. Nova Innovation will build upon this experience in developing the Nova Tidal Array, ensuring any potential environmental effects are carefully monitored and assessed, working with governments and wider stakeholders to build public confidence in the sector.



*Figure 3 Image of the Nova M100-D Turbine*

### **The Nova Tidal Array – Project Benefits**

In developing the Nova Tidal Array, Nova Innovation will:

- Successfully deliver a world-leading tidal energy array in the Petit Passage
- Work in partnership with local stakeholders to boost local economic development and regeneration
- Set up a North American manufacturing hub
- Carefully monitor and manage the environmental effects of the project to ensure it doesn't harm marine wildlife in the Petit Passage
- Create skilled local jobs
- Reduce greenhouse gas emissions by providing clean, reliable, tidal energy to the Nova Scotia grid
- Deliver technology innovation in collaboration with leading Nova Scotia organizations
- Support the creation of a global centre of excellence for tidal energy technology in Nova Scotia.



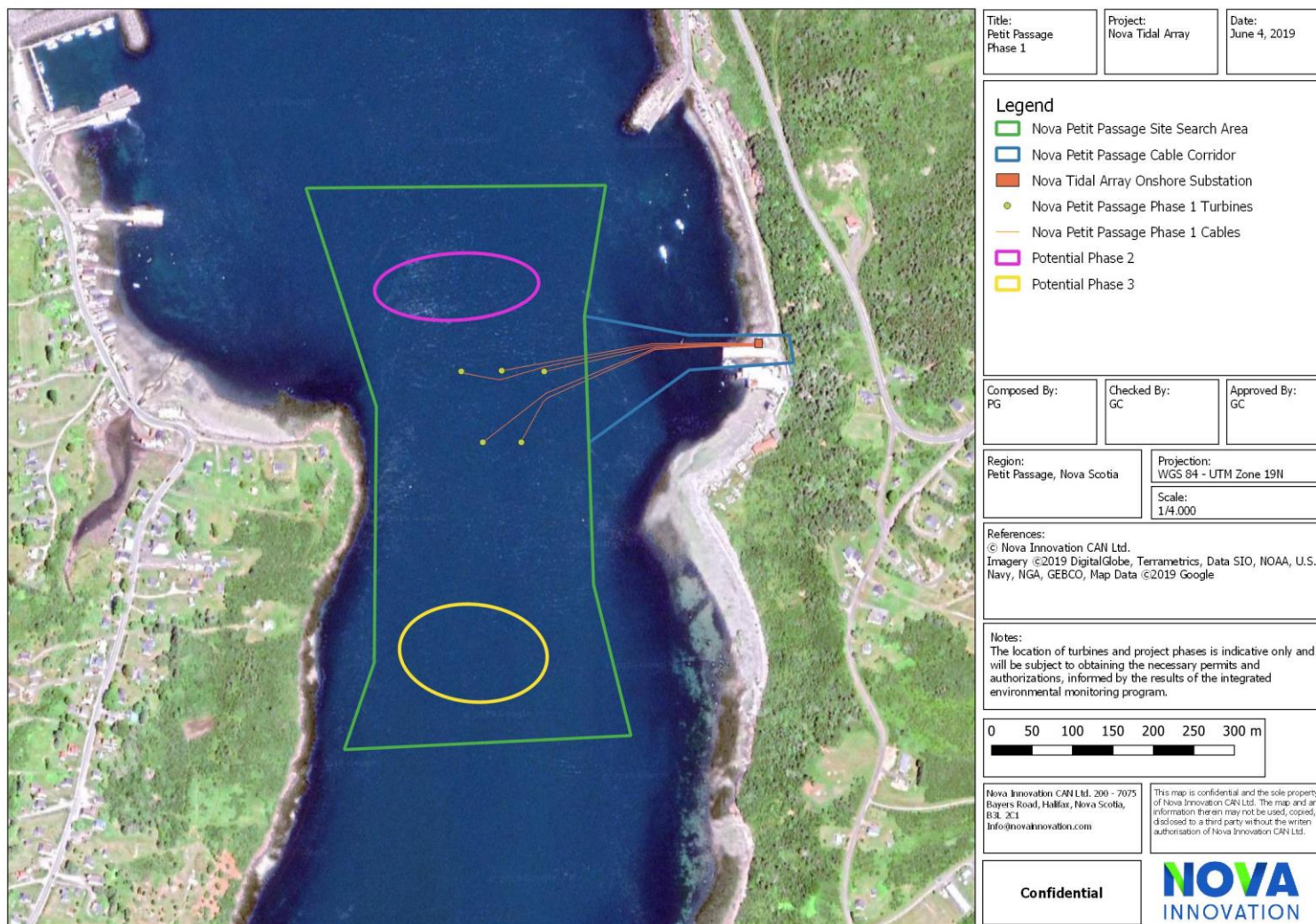


Figure 4 Nova Tidal Array Phase 1 Project Layout. The circles show the potential location of Phase 2 and Phase 3.