CI C0080101

539N-210 Big Island Subsea Cable Replacement

NON-CONFIDENTIAL

April 9, 2026

Nova Scotia POWER
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NSEB APPROVAL SHEET

Project Title: 539N-201 Big Island Subsea Cable Replacement

CI Number: C0080101 **Date:** April 9, 2026

Expenditure Profile		
Year	Budget Amount	Project Estimate
2025	1,130,497	
2026	2,408,570	1,213,712
2027		3,174,967
Total	$3,539,067	$4,388,679

Type of Filing

- [ ] Capital Project Authorization
  - [ ] Unforeseen and Unbudgeted (U&U)
  - [ ] Planned & Advanced (P&A)
  - [X] Subsequent Approval Item
- [ ] Authorization to Overspend (ATO)
- [ ] Scope Change
- [ ] Final Cost (FIN)

COMMENTS

Submitted on behalf of NOVA SCOTIA POWER INCORPORATED

Authorized Signatory
Dave Pickles
Chief Operating Officer

DATE
April 8, 2026

Approved on behalf of NOVA SCOTIA ENERGY BOARD

DATE

CI Number: C0080101

Title: 539N-201 Big Island Subsea Cable Replacement

Start Date: 2026/01
In-Service Date: 2027/06
Final Cost Date: 2028/06
Function: Distribution
Forecast Amount: $4,388,679

DESCRIPTION:

This project includes the installation and protection of a replacement submarine cable from Brownsville to Big Island, Pictou County. The existing single-phase primary submarine power cable is approximately 1,400m long. It has reached the end of its expected service life and requires replacement to ensure reliable service to customers.

Summary of Related CIs +/- 2 years:
Pursuant to Section 11.2 of the CEJC, related CIs for Distribution projects include "work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- No other projects in 2024, 2025, 2026, 2027, or 2028

Depreciation Class: Distribution Plant – Underground Conductors and Devices
Distribution Plant – Poles, Towers and Fixtures

Estimated Life of the Asset: 40 years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 0.11%

JUSTIFICATION:

Justification Criteria: Distribution System

Sub Criteria: Requirement to Serve

Why do this project?

The existing submarine power cable was installed in 1977, and is the only source of power for customers on Big Island. The cable has reached the end of its design life and an unplanned failure of the cable, and the subsequent reactive repairs would result in an extended outage to all customers served by the cable. While temporary measures could be established, a permanent refurbishment or replacement resulting from cable fault could take months, depending on time of year. Installing a new cable while the existing cable is still in service will improve the reliability and availability of service supplied to Big Island customers.

Why do this project now?

The Big Island submarine cable has now reached a point where replacement is required to maintain reliable service. The original 1977 cable experienced a fault and was replaced in the late 1990s; however, the 1999-vintage replacement cable subsequently failed during a major storm event. To restore service, NS Power re-energized the original 1977 cable, which has remained in service since that time. Given the age of this asset, its previous fault history, and the absence of any redundant supply to Big Island, continued reliance on the 1977 cable presents an elevated risk of an extended outage should a failure occur.

The existing cable has exceeded the typical 40-year service life for submarine distribution cables and is surface-laid on the harbour bottom, leaving it exposed to third-party contact and environmental impacts. Delaying replacement increases the likelihood of an unplanned failure, which could result in prolonged customer outages due to the time required for marine mobilization, environmental permitting, and favourable weather windows for refurbishment.

Replacing the cable now, while it remains operational, ensures continuity of supply and mitigates substantial reliability and operational risks.

This project is deemed in service when upgrades to the overhead distribution at cable landing sites are completed to accept the new installation (forecast to be June 2027); therefore, the Final Cost Date for the project (June 2028),is listed as six months after the final construction as-builts have been completed (forecast to be December 2027).

Why do this project this way?

A subsea replacement was selected after evaluating and ruling out two land-based alternatives—an overhead line along the Big Island causeway and a trenched underground cable in the same corridor. While an overhead line or trenched cable along the Big Island causeway were evaluated, the site does not support a resilient land-based solution.

The Big Island causeway differs from many other coastal Nova Scotia corridors where overhead lines are located on higher ground with natural protection. On the Big Island causeway, the exposure to open-water conditions and climate-driven increases in storm severity create a persistently high failure risk for any land-based alternative. A subsea cable routed through the more sheltered harbour provides substantially lower lifecycle risk, higher reliability, and reduced exposure to environmental forces, making it the most appropriate long-term solution.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expert (professional engineers, operations personnel) judgment, previous experience in similar distribution projects and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a Class 3 estimate with a contingency of 15 percent. Risks intended to be covered by the contingency include, but are not limited to, weather contingency, cable repair during installation phase, archaeological findings during execution, cable route survey information, potential for requirement for external consultants to review/validate findings, and marine mobilization days.

Reason for Variance

The increase of $849,612 from the 2026 ACE Plan subsequent submittal estimate of $3,539,067 is due to further evaluation of detailed engineering requirements to capture external risks to the subsea cable. Specifically, the increased estimate covers the inclusion of a marine geo-technical survey required for burial assessment and cable protection, landfall civil execution for cable pull in and backfill and marine cable protection.

Capital Project Detailed Estimate

Location: Distribution
CI# : C0080101
Title: 539N-201 Big Island Subsea Cable Replacement
Execution Year: 2026/2027

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
Engineering	PD	318	$ 452	$ 143,881		
			Sub-Total	$ 143,881		
Materials						
Submarine Cables	Lot	1	$ 161,624	$ 161,624		
Cable Joint/Sealing Materials	Lot	1	$ 30,000	$ 30,000		
Transportation Reel Deposits	Lot	1	$ 17,048	$ 17,048		
Single-Phase Recloser with Controls	Lot	1	$ 11,722	$ 11,722		
Misc. Hardware (poles, connectors, etc.)	Lot	1	$ 24,056	$ 24,056		
				$ -		
			Sub-Total	$ 244,450		
Contracts						
Geophysical and benthic surveying	Lot	1	$ 98,400	$ 98,400		
Geotechnical survey	Lot	1	$ 89,510	$ 89,510		
Landfall survey	Lot	1	$ 19,500	$ 19,500		
Marine penetrating LIDAR	Lot	1	$ 62,200	$ 62,200		
Cable Installation	Lot	1	$ 720,000	$ 720,000		
Cable Protection	Lot	1	$ 1,112,039	$ 1,112,039		
Tree trimming and vegetation removal	Lot	1	$ 8,400	$ 8,400		
Access road construction	Lot	1	$ 6,000	$ 6,000		
Traffic Control	Lot	1	$ 3,000	$ 3,000		
Scrap and waste disposal	Lot	1	$ 3,000	$ 3,000		
Cable unloading	Lot	1	$ 3,000	$ 3,000		
Site supervision	Lot	1	$ 32,400	$ 32,400		
Access mats	Lot	1	$ 24,000	$ 24,000		
Landfall and inter-tidal protection	Lot	1	$ 348,737	$ 348,737		
Civil upgrades on island landing site	Lot	1	$ 52,161	$ 52,161		
				$ -		
			Sub-Total	$ 2,582,346		
Consulting						
Cable engineering design and routing	Lot	1	$ 60,000	$ 60,000		
MetOcean Data	Lot	1	$ 30,000	$ 30,000		
Marine Traffic	Lot	1	$ 20,000	$ 20,000		
Fisheries Studies	Lot	1	$ 60,000	$ 60,000		
Cable burial risk assessment	Lot	1	$ 40,000	$ 40,000		
Underwater benthic habitat testing	Lot	1	$ 11,000	$ 11,000		
Archaeology Resource Impact Assessment	Lot	1	$ 25,000	$ 25,000		
Wetlands, watercourses and SOCI	Lot	1	$ 25,000	$ 25,000		
			Sub-Total	$ 271,000		
Freight Postage Delivery						
Materials Transportation	Lot	1	$ 50,000	$ 50,000		
			Sub-Total	$ 50,000		
Easements and Appraisals						
Appraisals, Purchases & Easements	Lot	1	$ 95,640	$ 95,640		
Land Agent Services	Lot	1	$ 6,000	$ 6,000		
Crown Land Easement	Lot	1	$ 6,000	$ 6,000		
			Sub-Total	$ 107,640		
Other Goods & Services						
Contingency	%	15%	$ 3,399,318	$ 509,898		
				$ -		
			Sub-Total	$ 509,898		
Vehicle Overhead						
Vehicle Labour AO				$ 46,340		
			Sub-Total	$ 46,340		
Interest Capitalized						
AFUDC				$ 85,516		
			Sub-Total	$ 85,516		
Administrative Overhead						
Labour AO				$ 77,676		
Contractor AO				$ 269,933		
			Sub-Total	$ 347,609		
			SUB-TOTAL (no AO, AFUDC)	$ 3,909,215		
			TOTAL (AO, AFUDC included)	$ 4,388,679		
Original Cost				$ 843,222		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B. Columns C through G will auto-populate.

Document No: XXX-XX-XXXX-XXXX

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name: 539N-201 Big Island Subsea Cable Replacement	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete					
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
Site Infrastructure (Access, Construction Power, Camp, etc.)	Defined (D)	NR	P	D	D	D
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Preliminary (P)	NR	NR	P	P	
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Preliminary (P)	P	P			
Contracting/Sourcing	Preliminary (P)	NR	P			
Escalation	Not Applicable (NA)	NR				
G. Planning						
System/Grid Planning (including substation and interconnect locations)	Defined (D)	P	P	D	D	D
Logistics Plan	Preliminary (P)	P	P	P		
Integrated Project Plan	Defined (D)	NR	P	D	D	D
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Preliminary (P)	NR	P			
Regulatory Approval & Permitting	Preliminary (P)	NR	P			
Risk Register	Defined (D)	NR	P	D	D	D
Stakeholder Consultation/Engagement/Management Plan	Preliminary (P)	NR	P			
Work Breakdown Structure (WBS)	Preliminary (P)	NR	P			
Start-up & Commissioning Plan	Preliminary (P)	NR	P	P/D		
H. Studies						
Routing Options	Preliminary (P)	P	P			
Topography & Bathymetry	Preliminary (P)	P	P	P/D		
Environmental Impact/Sustainability Assessment	Preliminary (P)	NR	P			
Environment/Existing Conditions	Preliminary (P)	NR	P			
Meteorology and/or Oceanographic/Subsea	Preliminary (P)	NR	P			
Soils & Hydrology	Preliminary (P)	NR	P			
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Preliminary (P)	S	P			
Foundation/Structure (Tower) Design	Not Applicable (NA)					
Route Mapping/Survey	Preliminary (P)	S/P	P/C			
Design Specifications	Preliminary (P)	NR	S/P			
Instrument List	Not Applicable (NA)	NR				
Construction Permits	Preliminary (P)	NR	S/P	P/C		
Geometric Layout, Alignment, Profile, Cross Section	Not Applicable (NA)	NR				
Land/ROW Title Negotiation	Preliminary (P)	NR	S/P	P/C		
Civil/ Site/Structural/Architectural Discipline Drawings	Preliminary (P)	NR	S/P	P		
Crossings and Borings Designs and Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Not Applicable (NA)	NR				
Foundation/Structure (Tower) Discipline Drawings	Not Applicable (NA)	NR				
Tower/Structure Location/Spotting	Not Applicable (NA)	NR				
Instrument Datasheets	Not Applicable (NA)	NR	NR/S			
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Instrumentation/Control System Discipline Drawings	Not Applicable (NA)	NR	NR			
	Total # Deliverables for this Project	9	28	15	9	8
	% Defined/Complete towards Class Estimate	100%	100%	52%	31%	28%

Comments:

This project is being filed as a Class 3 estimate. The define deliverables for this project indicate that 52% of Class 3 deliverables have been completed. A contingency value of 15% was selected to account for specific risks such as weather contingency, cable repair during installation phase, archaeological findings during execution, cable route survey information, external consultants, and marine mobilization days.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- **Not Required (NR):** May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- **Preliminary (P):** Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- **Defined (D):** Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- **Not Required (NR):** Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- **Started (S):** Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- **Preliminary (P):** Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- **Complete (C):** The deliverable has been reviewed and approved as appropriate.

Inclusions:

For the purposes of this document, the term *power transmission line infrastructure industries* is assumed to include greenfield or brownfield sites for overhead, buried and submarine transmission of electrical power in the infrastructure industries. High voltage is typically >100kV but may be less (e.g., 33 or 66kv) if long distance with light electrical loads. This excludes power supply and distribution scope within a process plant, mining facility, building complex or other facility site. It also excludes power generation facilities and substations. The defining deliverables of those excluded project scopes are covered in other RPs (e.g., 18R-97 for process plants [2]).

Power transmission is considered an element of the infrastructure industry. The Construction Industry Institute has provided a good definition of infrastructure in its Project Definition Rating Index for Infrastructure Projects as follows [3]:

"A capital project that provides transportation, transmission, distribution, collection or other capabilities supporting commerce or interaction of goods, services, or people. Infrastructure projects generally impact multiple jurisdictions, stakeholder groups and/or a wide area. They are characterized as projects with a primary purpose that is integral to the effective operation of a system. These collective capabilities provide a service that is made up of nodes and vectors into a grid or system."

Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route, the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and revamp projects add their own concerns for interface with existing elements, crowded working conditions, etc. For each scope definition decision, stakeholder requirements need to be considered.

Power substation projects are usually associated with transmission projects. However, substations being equipment-centric and located on a facility site have physical and defining characteristics similar to process plant projects (e.g., reliance on one-line diagrams, plot plans, etc.).