CI C0080102

92H-331 Double Circuit Peggy's Cove Rd.

REDACTED

March 13, 2026

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NSEB APPROVAL SHEET

Project Title: 92H-331 Double Circuit Peggy's Cove Rd

CI Number: C0080102

Date: March 13, 2026

Expenditure Profile		
Year	Budget Amount	Project Estimate
2026	1,704,973	3,798,558
2027	177,600	504,652
Total	$1,882,573	$4,303,210

Type of Filing

- [X] 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		Approved on behalf of NOVA SCOTIA ENERGY BOARD
Authorized Signatory Dave Pickles Chief Operating Officer	DATE March 13, 2026	DATE

CI Number: C0080102

Title: 92H-331 Double Circuit Peggy's Cove Rd.

Start Date:	2026/02
In-Service Date:	2026/07
Final Cost Date:	2027/06
Function:	Distribution
Forecast Amount:	$4,303,210

DESCRIPTION:

This project involves the construction of an 8.5 kilometer new three-phase feeder from the 92H Tidewater Substation to offload and double circuit the existing feeder 92H-331 along Peggy's Cove Road. The new feeder construction will be aligned with a separate project, CI C0071888 – 92H-T61 Transformer Replacement upgrading 92H-T61 with a larger 25 MVA transformer to alleviate the overload on both the substation transformer and feeder 92H-331 during winter peak-loading periods in subsequent years.

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 for 2024, 2025, 2026, 2027, or 2028

Depreciation Class: Distribution Plant – Poles, Towers and Fixtures
Distribution Plant – Overhead Conductors and Devices
Distribution Plant – Line Transformers
Distribution Plant – Services

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: 0.06%

JUSTIFICATION:

Justification Criteria: Distribution System

Sub Criteria: Overloaded Equipment

Why do this project?

The 92H-331 feeder at Tidewater substation is overloaded during periods of high load. The construction of the new three phase feeder section along Peggys Cove Road from 92H substation will allow for the offload of 92H-331 and will improve the reliability for the customers and help to alleviate strain/overload to parts of the distribution system in combination with the transformer replacement project, CI C0071888.

The 92H Tidewater substation supplies customers in Hubley, Peggys Cove, and Boutiliers Point areas. There are three 12 kV feeders that are supplied via transformer 92H-T61, including a tie point with feeder 87W-311. The 92H distribution is a 12 kV zone and has limited ability to offload feeder 92H-334 (Boutiliers Point) to an adjacent substation - 87W Hubbards (via 87W-311). The other two feeders, 92H-331 (Hubley) and 92H-332 (Peggys Cove), have no tie points to other 12 kV sources.

Planning study M-AREA-2025-002 "Tidewater and Hammonds Plains Area Review" (please refer to Partially Confidential Attachment 1) outlines the challenges regarding the capacity and reliability of 92H Feeders. The planning study proposes an immediate solution to address increasing capacity and improving reliability for the multiple feeders throughout 92H and surrounding areas as well as identify long term solution by proposing construction of a new substation.

Why do this project now?

Feeder 92H-331 has a winter peak load beyond the 325 Amp, NS Power Capital Expenditure Justification Criteria (CEJC) and has experienced cold load pickup issues, as observed during the February 4, 2024 extreme cold event. The design criterion of an NS Power distribution feeder is lower than the thermal capacity of the feeder circuit conductors or 325 Amp (7 MVA at 12 kV). Feeder 92H-331 also peaked above 450 Amps in the winter of 2025 and has a forecasted load growth rate of approximately 4% per year, driven by residential growth and electrification.

Feeder 92H-331 has no significant transfer capability with adjacent feeders, significantly limiting operational flexibility due to its 12 kV source. Adjacent 25 kV distribution feeders are currently operating above their designed capacity during winter peak load cold as a result of substantial load growth experienced over the past five years which limits an alternative source via stepdown transformers as substations and associated feeders are already at, or over, design limits. Reference M-AREA-2025-002 "Tidewater and Hammonds Plains Area Review - Sec 6 Alternative Analysis. Additionally, feeder 92H-331 is experiencing low voltage during peak loading. Offloading the feeder through the construction of a new feeder will reduce loading, improve voltage levels, and enhance overall system reliability.

This project is deemed in-service once poles and/or anchoring have been upgraded on either 92H-331 or 92H-332 Feeders to accommodate the new double circuit pole line to accommodate the new feeder (forecast in July 2026). The Final Cost Date (June 2027) is listed as six months after the new double circuit pole line construction is forecast to be completed (December 2026), which allows for landscaping or concrete work to be completed in months with the most suitable weather for those activities.

Why do this project this way?

The proposed construction of a new three-phase feeder along Peggy's Cove Road provides the most effective near-term solution in conjunction with CI C0071888 upgrading 92H-T61 with a larger 25 MVA transformer to address the loading and voltage constraints on feeder 92H-331 while supporting the longer-term distribution strategy for the Tidewater and surrounding areas.

This solution is consistent with the staged approach identified in Partially Confidential Attachment 1, recognizing that immediate feeder offloading is required in advance of broader system reinforcements, including future substation development and voltage conversion of the Hubley area to 25 kV in potential future projects not currently defined.

There are no viable alternative routes to construct a new feeder to serve the Peggy's Cove area.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expert (professional engineers, capital planner and Power Line Technicians) previous experience and site-specific knowledge for new feeder and double circuit construction 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 value of 15%. Risks intended to be covered by contingency include the replacement of additional distribution equipment/materials, additional contract work (rock breaking, tree trimming, traffic control), additional environmental mitigation measures when working close to water, and additional PLT resources to meet construction schedule and/or unidentified switching and overtime requirements.

Reason for Variance

The increase of $2,420,637 from the 2026 ACE Plan subsequent submittal estimate of $1,882,573 is primarily due to the increase in construction length from 5.5km to 8.5km and the requirement to complete this work under live operating conditions, which increased the time required to complete each kilometer.

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Capital Project Detailed Estimate

Location: **Distrubution**
CI# : C0080102
Title: 92H-331 Double Circuit Peggy's Cove Rd
Execution Year: 2026-2027

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
Project Management	PD	382	$ 452	$ 172,730		
Engineering	PD	31	$ 452	$ 13,941		
Planner/Scoping	PD	66	$ 398	$ 26,410		
			Sub-Total	$ 213,081		
Materials						
Environmental - Bird Guards	Lot	1	$ 192	$ 192		
Wood Poles	Lot	1	$ 629,073	$ 629,073		
O/H Conductor	Lot	1	$ 82,462	$ 82,462		
O/H Conductor Devices	Lot	1	$ 3,751	$ 3,751		
O/H Line Transfer	Lot	1	$ 42,973	$ 42,973		
			Sub-Total	$ 758,451		
Contracts						
Environmental - Bird Guards	Lot	1	$ 615	$ 615		
Wood Poles	Lot	1	$ 456,868	$ 456,868		
O/H Conductor	Lot	1	$ 660,905	$ 660,905		
O/H Conductor Devices	Lot	1	$ 6,108	$ 6,108		
O/H Line Transfer	Lot	1	$ 48,943	$ 48,943		
Street Lights	Lot	1	$ 5,886	$ 5,886		
Transfer Services	Lot	1	$ 40,764	$ 40,764		
Misc.Equipment	Lot	1	$ 7,194	$ 7,194		
Flagging	Lot	1	$ 610,399	$ 610,399		
Backhoe	Lot	1	$ 159,239	$ 159,239		
Rockbreaking/HydroVac	Lot	1	$ 148,000	$ 148,000		
Vegatation Management	Lot	1	$ 104,868	$ 104,868		
DNNR Permit - Silt Boom Supply	Lot	1	$ 5,000	$ 5,000		
Ductbank Construction	m	55	$ 1,600	$ 88,000		
			Sub-Total	$ 2,342,788		
Royalty, Easement and Appraisal						
Easement	Each	20	$ 2,500	$ 50,000		
			Sub-Total	$ 50,000		
Other Goods & Services						
Contingency	%	15%	$ 3,364,320	$ 504,648		
			Sub-Total	$ 504,648		
Vehicle Overhead						
Vehicle Labour AO				$ 68,565		
			Sub-Total	$ 68,565		
Interest Capitalized						
AFUDC				$ 5,760		
			Sub-Total	$ 5,760		
Administrative Overhead						
Labour AO				$ 115,025		
Contractor AO				$ 244,891		
			Sub-Total	$ 359,917		
			SUB-TOTAL (no AO, AFUDC)	$ 3,868,968		
			TOTAL (AO, AFUDC included)	$ 4,303,210		
Original Cost				$ 992,564		

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: 92H-331 Double Circuit Peggy's Cove Rd.	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.)	Not Applicable (NA)	NR				
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable	Defined (D)					
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	Not Applicable (NA)					
F. Strategy						
Right-of-Way (ROW)	Defined (D)	P	P	D	D	D
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	Not Applicable (NA)					
Integrated Project Plan	Defined (D)	NR	P	D	D	D
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Defined (D)	NR	P	D	D	D
Regulatory Approval & Permitting	Preliminary (P)	NR	P			
Risk Register	Not Applicable (NA)	NR				
Stakeholder Consultation/Engagement/Management Plan	Not Applicable (NA)	NR				
Work Breakdown Structure (WBS)	Not Applicable (NA)	NR				
Start-up & Commissioning Plan	Not Applicable (NA)	NR				
H. Studies						
Routing Options	Not Applicable (NA)					
Topography & Bathymetry	Not Applicable (NA)					
Environmental Impact/Sustainability Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Defined (D)	NR	P	D	D	D
Meteorology and/or Oceanographic/Subsea	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Complete (C)	S	P	C	C	C
Foundation/Structure (Tower) Design	Not Applicable (NA)					
Route Mapping/Survey	Not Applicable (NA)					
Design Specifications	Not Applicable (NA)	NR				
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	Not Applicable (NA)	NR				
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	5	14	13	11	10
	% Defined/Complete towards Class Estimate	100%	100%	87%	73%	67%

Comments:

This project is being filed as a Class 3 estimate. The defined deliverables for this project indicate that 87% of Class 3 deliverables are completed. A 15% Contingency Value has been applied to this project. Risks intended to be covered by the contingency include replacement of additional distribution equipment/materials, additional contract work (rock breaking, tree trimming, traffic control), additional environmental mitigation measures when working close to water, and additional PLT resources to meet construction schedule and/or unidentified switching and overtime requirements.

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.).

Planning Study
M-AREA-2025-002

Tidewater and Hammonds Plains Area Review

Revision		Date	Drafted By	Reviewed by	Approved By
0	Issued for Review	July 17, 2025	MA		
1	Revision Draft	February 24, 2026	BH		
2	Issued for Release	March 9, 2026	BH	JH	BH
3	Minor Revisions	March 13, 2026	BH	JC	BH

EXECUTIVE SUMMARY

This study evaluates capacity constraints affecting the 92H-Tidewater and 137H-Hammonds Plains substations and identifies capital investments required to maintain compliance with NS Power planning criteria and accommodate forecast load growth through 2035.

At 92H-Tidewater, winter peak load significantly exceeds the transformer rating when hydro is unavailable, and feeder 92H-331 exceeds the 325 A planning criterion with no available load transfer options. Replacement of transformer 92H-T61 with a 15/20/25 MVA unit, along with construction of a new feeder on Peggy's Cove Road, is required to restore compliance with planning criteria and provide capacity for near-term load growth.

Feeder 92H-332 in Hubley is forecast to exceed the 325 A planning criterion in 2029, and total station loading at 92H-Tidewater is forecast to exceed contingency capacity by 2030. It is recommended that the 12 kV distribution supplied from 92H-Tidewater be limited to coastal areas rather than expanding capacity at the substation. Following construction of the Stillwater Lake substation, the Hubley distribution system will be converted from 12 kV to 25 kV and transferred to the new source. This conversion will reduce loading on the Tidewater substation, address forecast planning violations, and improve reliability through new feeder interconnections with the 103H-Lakeside distribution system.

At 137H-Hammonds Plains, the 2025 winter peak exceeded the station's contingency capacity, and three feeders exceed the 325 A design criterion. The study evaluated construction of a new substation, expansion of the existing 137H substation, and new feeders from the 131H-Lucasville substation. Construction of a new Stillwater Lake substation is recommended to restore contingency capacity and relieve feeder overloads. As major developments such as Sandy Lake advance, expansion of the 137H substation will provide additional capacity.

The recommended capital program is summarized below:

2026: Replace transformer 92H-T61 and construct new feeder 92H-335.

2027: Construct Stillwater Lake substation with two feeders.

2028: Construct a third Stillwater Lake feeder and convert Hubley distribution from 12 kV to 25 kV.

2033: Rebuild Tidewater substation structures.

2037: Install a second transformer at 137H-Hammonds Plains.

Implementation of these projects will restore compliance with planning criteria, improve system reliability, and accommodate forecast load growth in the Tidewater and Hammonds Plains areas through the study horizon.

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1.0 SCOPE

This study was initiated to address transformer and feeder overloads at the 92H-Tidewater and 137H-Hammonds Plains substations. Both substations have experienced sustained loading above planning criteria during recent winter peak conditions and are expected to continue experiencing load growth driven by residential development and electrification.

The scope of this study is limited to evaluating alternatives to address capacity constraints at 92H and 137H under winter peak loading conditions. Planning criteria of 133% of top nameplate rating for substation transformers under winter peak conditions and 325 A for distribution feeders are used to assess normal operating limits.

In addition to normal operating limits, this study evaluates contingency capacity, defined as the ability to supply load following the loss of a single substation transformer. Contingency capacity may be provided through a combination of loading remaining transformers to 133% of top nameplate rating, installation of a 25 MVA mobile transformer, and transfer of load to adjacent substations via the distribution feeders loaded to a maximum of 400 A. Solutions are evaluated over a 15-year study window.

This study will identify and recommend capital investments required to address existing overloads, restore acceptable contingency capacity, and accommodate forecasted load growth in the Tidewater and Hammonds Plains areas over a 15-year study window.

2.0 EXISTING SYSTEM

2.1 Transmission

The Tidewater and Hammonds Plains substations are supplied from the 138 kV system in the Halifax area. The transmission network in this area is well interconnected and no transmission thermal or voltage limitations were identified that would constrain the distribution alternatives evaluated in this study. Transmission constraints are therefore not a limiting factor in addressing the identified distribution capacity issues.

A one-line diagram of the transmission system supplying the substations within the scope of this study is shown in Figure 1.

[redacted]

Figure 1: Tidewater and Hammonds Plains Area Transmission System

Table 1: Tidewater and Hammonds Plains Area Line Ratings

Line Number	Location	Length (km)	Conductor	Summer (MVA)	Winter (MVA)
L-6002a	90H-Sackville to 87W-Hubbards	49.9	ACSR 556.5 Dove	173	173
L-6016a	120H-Brushy Hill to 137H-Hammonds Plains	21	ACSR 795 Drake/ACSR 1113 Beaumont	214	287
L-6016b	137H-Hammonds Plains to 103H-Lakeside	11.1	ACSR 1113 Beaumont	231	231
L-6004	90H Sackville to 101V MacDonald Pond	46.9	ACSR 556.5 Dove	183	231

2.2 Distribution

The distribution systems under study are 92H-Tidewater and 137H-Hammonds Plains. Appendix A contains copies of the 92H & 137H substation one-line diagrams. **Table 2** provides winter peak loading for the 92H & 137H substation transformers, **Table 3** provides individual feeder winter peak loading, and **Table 4** provides the substation transformer specifications.

Table 2: Tidewater and Hammonds Plains Area Substation Loading

Substation	Transformer	Feeders	Winter Peak
92H-Tidewater	92H-T61	331, 332, 334	20.5 MVA
137H-T61-Hammonds Plains	137H-T61	411, 412, 413, 414	50.6 MVA

Table 3: Tidewater and Hammonds Plains Area Feeder loading

Transformer	Feeder	Typical Winter Peak	
		Amps	MVA
92H-T61	331	432	10.0
	332	297	6.5
	334	252	5.5
137H-T61	411	347	15.1
	412	364	15.8
	413	376	15.9
	414	79	3.4

Table 4: Tidewater and Hammonds Plains Area Substation Transformer Specs

Substation	Transformer	Transformer Data				
		Manufacturer	kV	Rating (MVA)	Impedance (%)	Age
92H-Tidewater	92H-T61	Moloney	138-13.2	7.5/10/12.5	6.43	1985
137H-Hammonds Plains	137H-T61	A.B.B	138-26.4	25/33/42	6.96	2008

2.2.1 92H-Tidewater

The 92H-Tidewater substation is supplied by a single 138–13.2 kV transformer, 92H-T61, rated 7.5/10/12.5 MVA. The transformer supplies three 12.47 kV distribution feeders serving areas surrounding Hubley, Peggy's Cove and Boutilier's Point.

In addition to customer load, there are three hydroelectric generating facilities embedded on the low-voltage bus of 92H-T61: Tidewater, Sandy Lake, and Mill Lake, with a combined nameplate capacity of approximately 9 MVA. These units reduce the net power flow through the transformer during periods of generation but cannot be relied upon to be available during winter peak conditions.

During the 2025 winter peak, the total load supplied from the 92H low-voltage bus significantly exceeded the top nameplate rating of 92H-T61. Operational actions, including hydro generation output, reduced transformer loading; however, the station remains capacity constrained and does not meet planning criteria.

Feeder 92H-331 significantly exceeded the 325 A design criterion during the winter peak, reaching an average phase current of 432 A. This feeder has no available tie points to adjacent feeders, and there are no options to transfer load.

Figure 2: 92H-Tidewater Distribution

Table 5: Tidewater Area Feeders

Feeders	Description
92H-331	Supplies customers along Peggy's Cove Road to East Dover. The single-phase extent of this feeder abuts single-phase 25 kV distribution from 103H-Lakeside.
92H-332	Supplies customers along St. Margarets Bay Road East of the substation into Hubley. The three-phase extent of this feeder abuts three-phase 25 kV distribution from 103H-Lakeside, which has been used to convert sections of 92H-332.
92H-334	Supplies customers along St. Margarets Bay Road West of the substation to Ingramport, where there is a feeder tie with the 87W-Hubbards substation.

2.2.2 137H-Hammonds Plains Distribution System

The 137H–Hammonds Plains substation is supplied by a single 138-25 kV transformer, 137H-T61, rated 25/33/42 MVA. The transformer supplies four 25 kV distribution feeders serving Hammonds Plains and surrounding areas.

The winter peak load on the 137H substation exceeds the contingency capacity to supply load in the event of a single transformer failure. The 2025 winter peak for station 137H was 50.6 MVA and the approximate contingency capacity is 39 MVA, assuming a 25 MVA mobile transformer is installed and 14 MVA is transferred to 101H-Cobequid and 129H-Kearney Lake via feeder ties.

Three of the four feeders supplied by 137H exceed the 325 A planning criterion during winter peak conditions. Forecasted load growth driven by residential development and electrification is expected to further increase demand on these feeders.

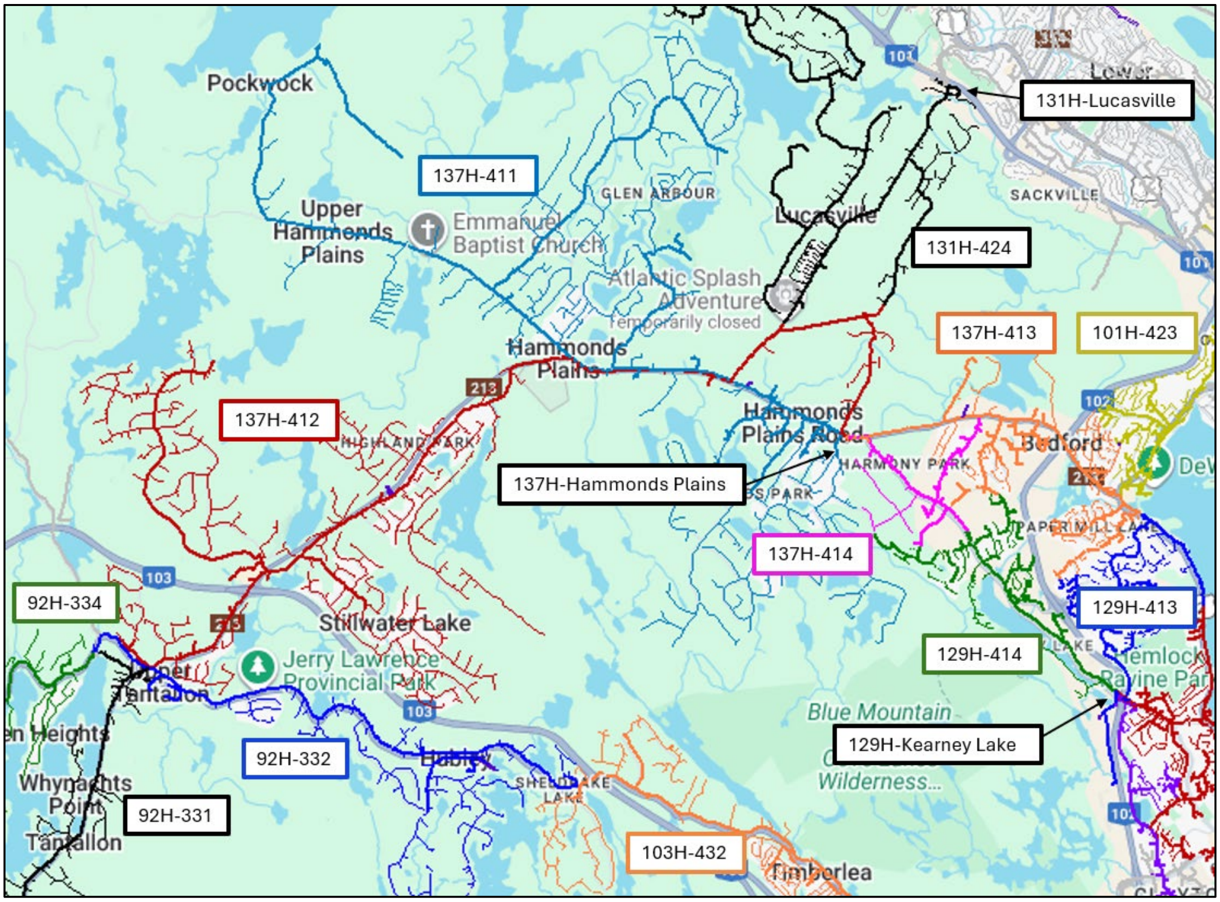


Figure 3: 137H-Hammonds Plains Distribution

Table 6: Hammonds Plains Area Feeders

Feeders	Description
137H-411	Supplies customers in Kingswood, Glen Arbour, and Pockwock Rd. into Upper Hammonds Plains. Ties with 137H-412 at the midpoint of feeder near downline recloser.
137H-412	Supplies customers in Highland Park, Stillwater Lake and Upper Tantallon North of Hwy 103. There are no available feeder ties that could segment this load.
137H-413	Supplies customers East of 137H substation along Hammonds Plains Rd. into Bedford. Feeder ties with 137H-414, 127H-413, 127H-414 and 101H-421.
137H-414	Supplies customers East of 137H substation along Larry Uteck Bldv. Feeder ties with 137H-413 and 127H-414.

3.0 LOAD HISTORY AND FORECAST

This section summarizes historical winter peak loading and the corresponding load forecasts for the Tidewater (92H) and Hammonds Plains (137H) substations. Forecasts are based on monthly load check data, PI data where available, and linear regression of historical winter peaks. As winter loading drives capacity constraints in both areas, only winter peak values are used in this analysis.

NSPI planning criteria allow:

- 110% transformer loading in summer and 133% in winter, unless otherwise limited.
- Feeder loading up to 325 A (approximately 14 MVA at 25 kV or 7 MVA at 12 kV), or the thermal limit of the conductor, whichever is lower.

Contingency capacity for each station reflects the maximum load that can be supplied following the loss of a transformer, using remaining station capacity, applicable mobile transformer capacity, and available feeder offload capability to adjacent substations.

Significant load growth is expected in the 137H area due to planned residential developments (Bedford West 1 & 12 and Sandy Lake), which could add approximately 21 MW of additional peak demand within the study window. No major new developments were identified in the 92H area; however, steady load growth has been observed.

3.1 Feeders

Historical feeder loading was derived from peak load analyses based on AMI measurements from 2022 onward. Limited SCADA/PI data is available, and data prior to 2022 could not be validated. The load forecast is developed using a linear regression trend of historical peaks (2022–2025) calculated with the Excel FORECAST function. Year-to-year variability is captured by determining the historical percentage deviation from the trend line and applying the 90th-percentile deviation as an adjustment factor. This produces a conservative planning forecast that reflects both long-term trends and upper-range variability. Forward-looking annual growth rate values are calculated from the 90th-percentile planning forecast to represent growth under a reasonable high-load scenario.

Table 7: Feeder Customer Counts, Peak Load and Annual Growth Rates

Transformer	Feeder	Customer Counts				Feeder Peaks (A)				
		2022	2023	2024	2025	2022	2023	2024	2025	Growth (%)
92H-T61	92H-331	2,451	2,521	2,557	2,515	372	369	413	432	4.3%
	92H-332	1,141	1,166	1,177	1,175	255	230	271	280	3.4%
	92H-334	1,191	1,210	1,218	1,203	216	188	215	239	3.6%
137H-T61	137H-411	3,173	3,361	3,597	3,623	292	302	357	337	4.4%
	137H-412	3,031	3,108	3,157	3,133	341	320	330	385	3.3%
	137H-413	4,551	4,678	4,856	4,871	345	333	365	358	1.9%
	137H-414	N/A	266	441	439	N/A	65	77	94	N/A

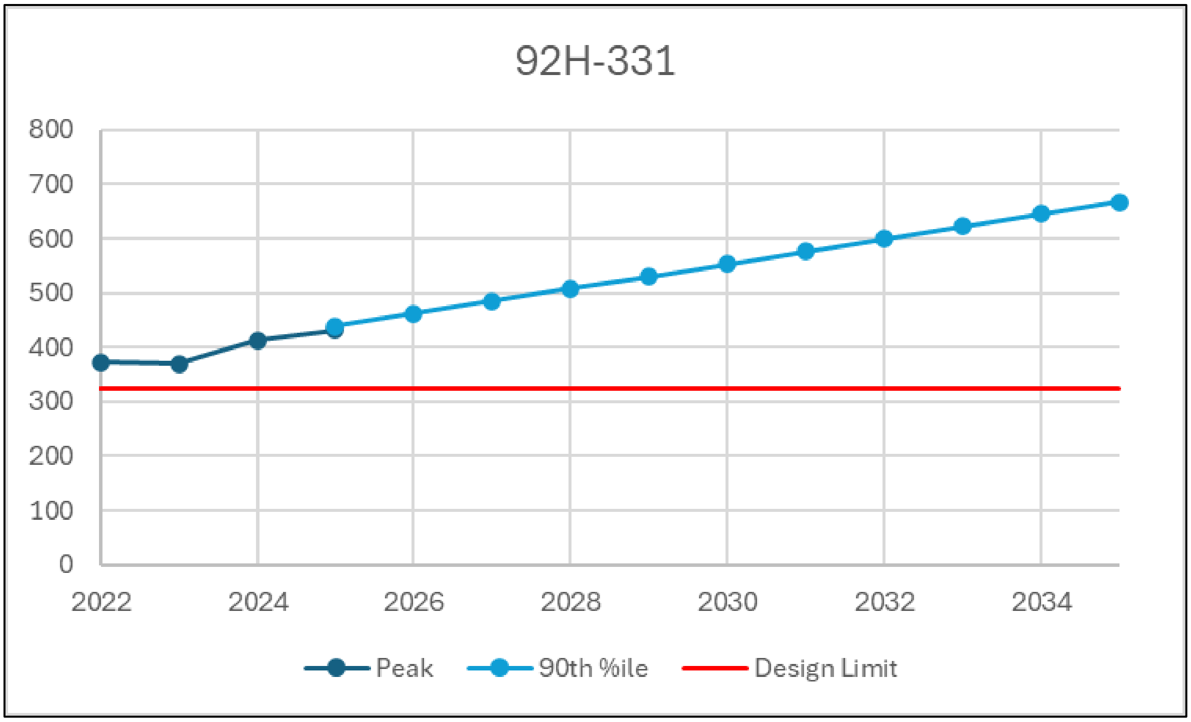


Figure 4: 92H-331 Load Forecast

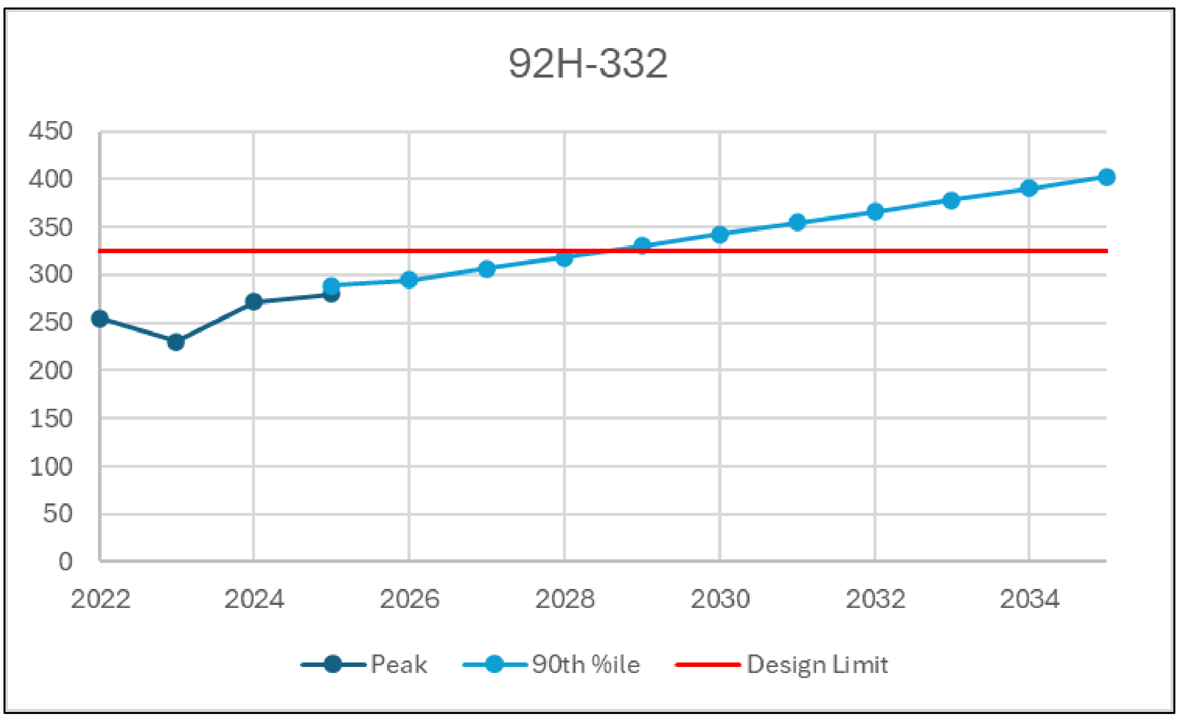


Figure 5: 92H-332 Load Forecast

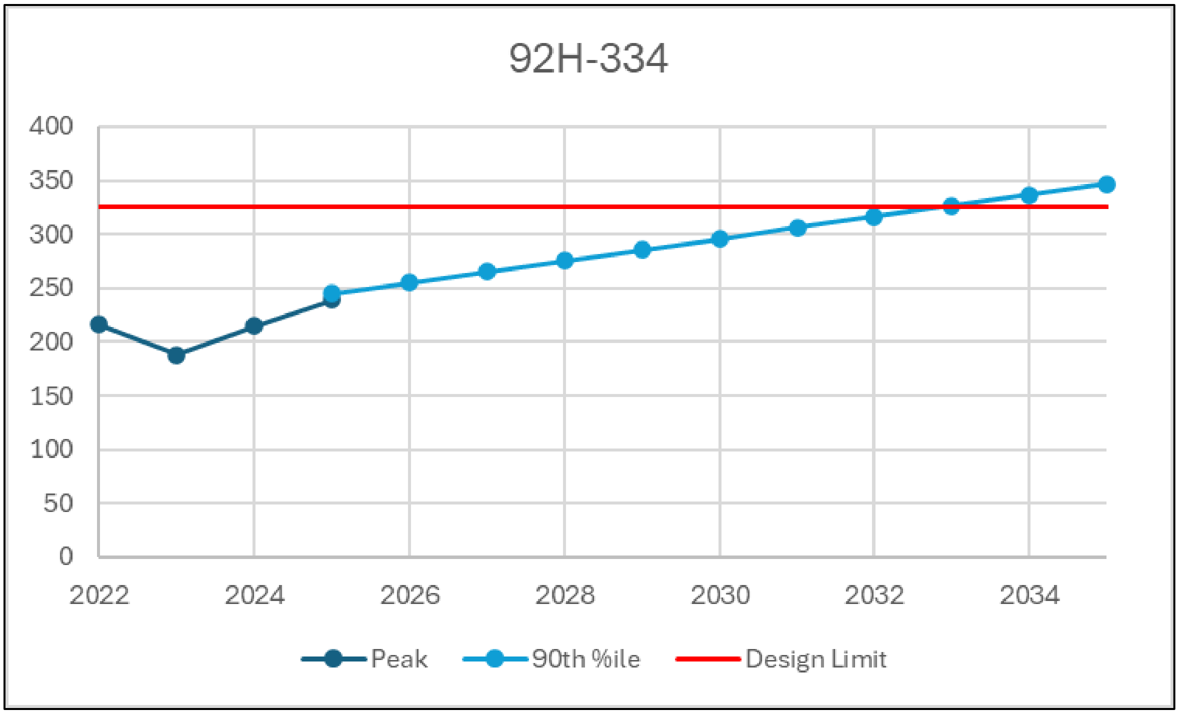


Figure 6: 92H-334 Load Forecast

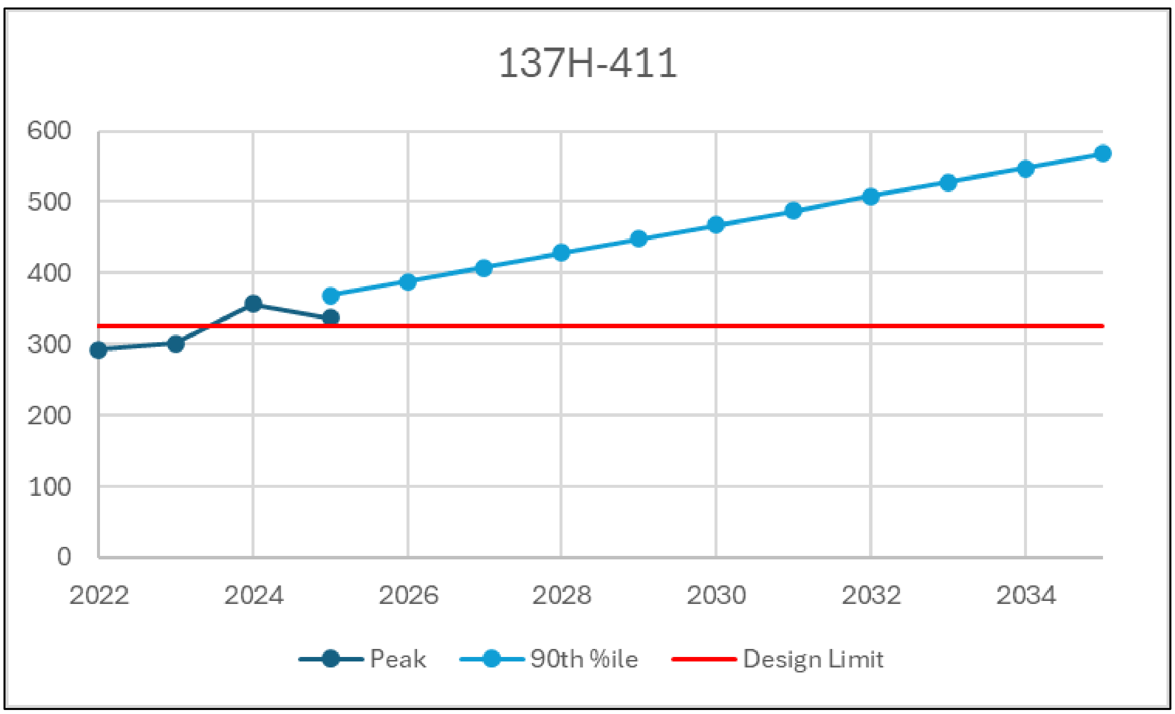


Figure 7: 137H-411 Load Forecast

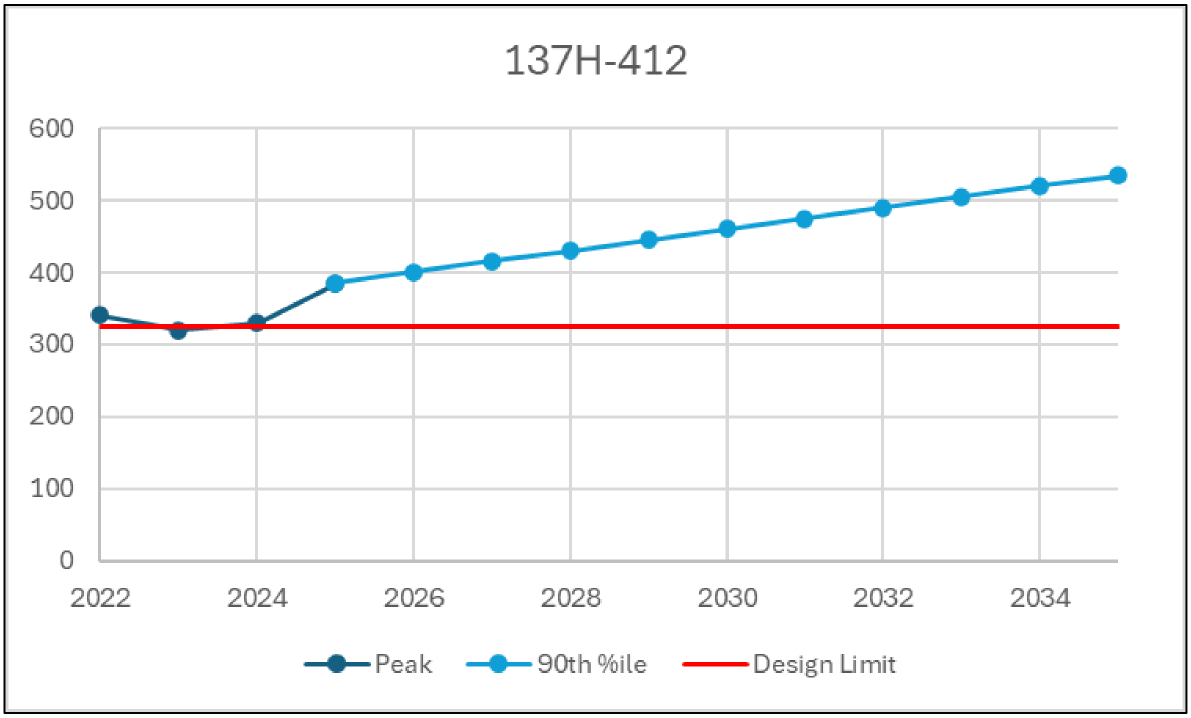


Figure 8: 137H-412 Load Forecast

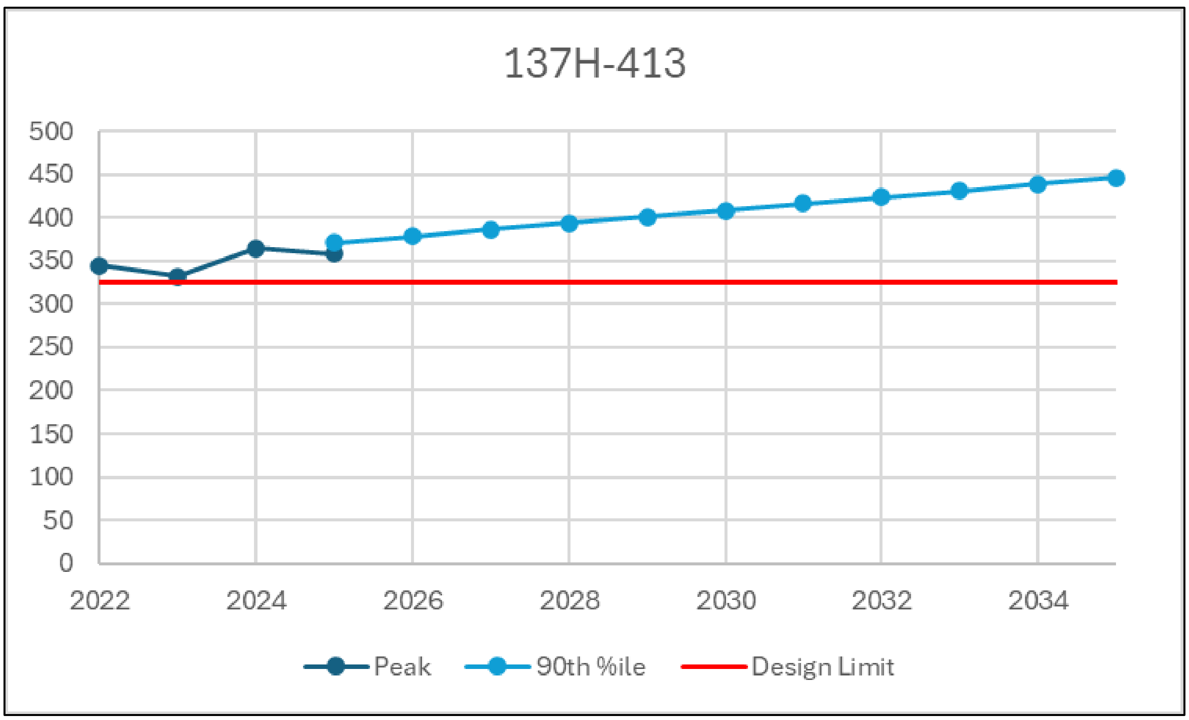


Figure 9: 137H-413 Load Forecast

3.2 Transformers

Historical transformer loading was derived from peak load analyses based on AMI measurements from 2022 onward. There was limited historical data available, and data prior to 2021 (for 137H) and prior to 2022 (for 92H) could not be validated. The load forecast is developed using a linear regression trend of historical peaks calculated with the Excel FORECAST function. Year-to-year variability is captured by determining the historical percentage deviation from the trend line and applying the 90th-percentile deviation as an adjustment factor. This produces a conservative planning forecast that reflects both long-term trends and upper-range variability. Forward-looking annual growth rate values are calculated from the 90th-percentile planning forecast to represent growth under a reasonable high-load scenario.

Table 8: Transformer Peak Loading and Growth Rates

Transformer	Rating (MVA)	Peak Load PI (MVA)					Growth (%)
		2021	2022	2023	2024	2025	
92H-T61	12.50	N/A	18.2	17.0	19.4	20.5	3.9%
137H-T61	42.00	37.4	50.6	44.0	48.7	50.6	4.1%

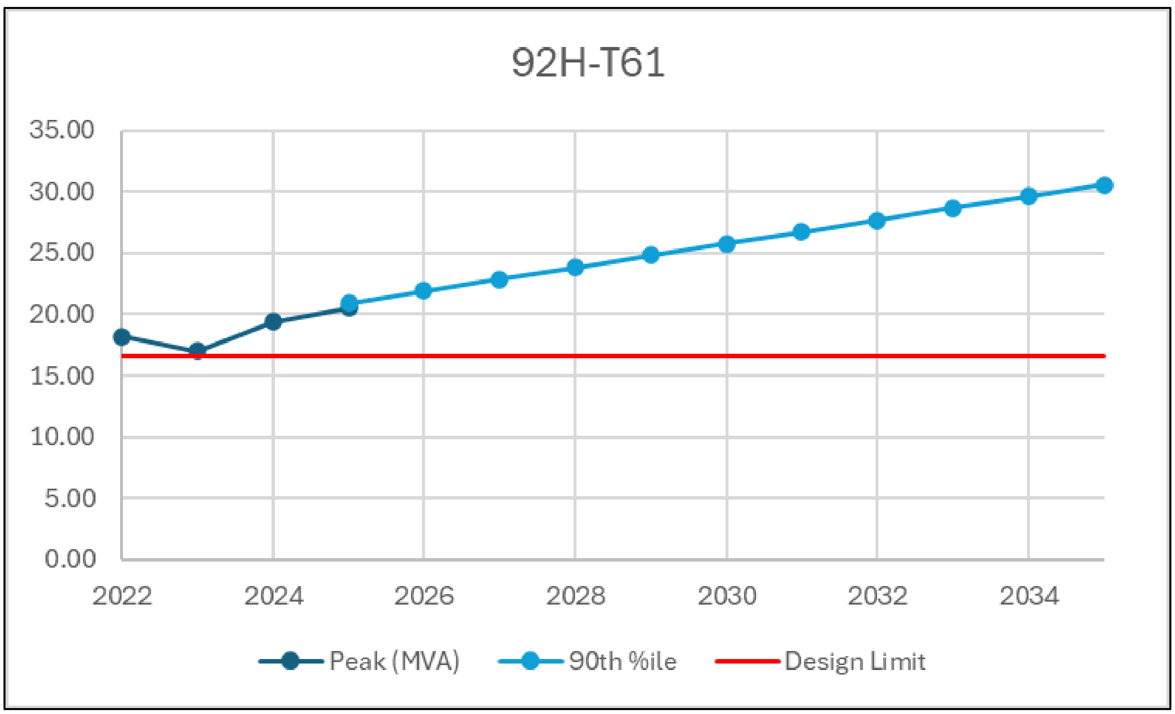


Figure 10: 92H-T61 Load Forecast

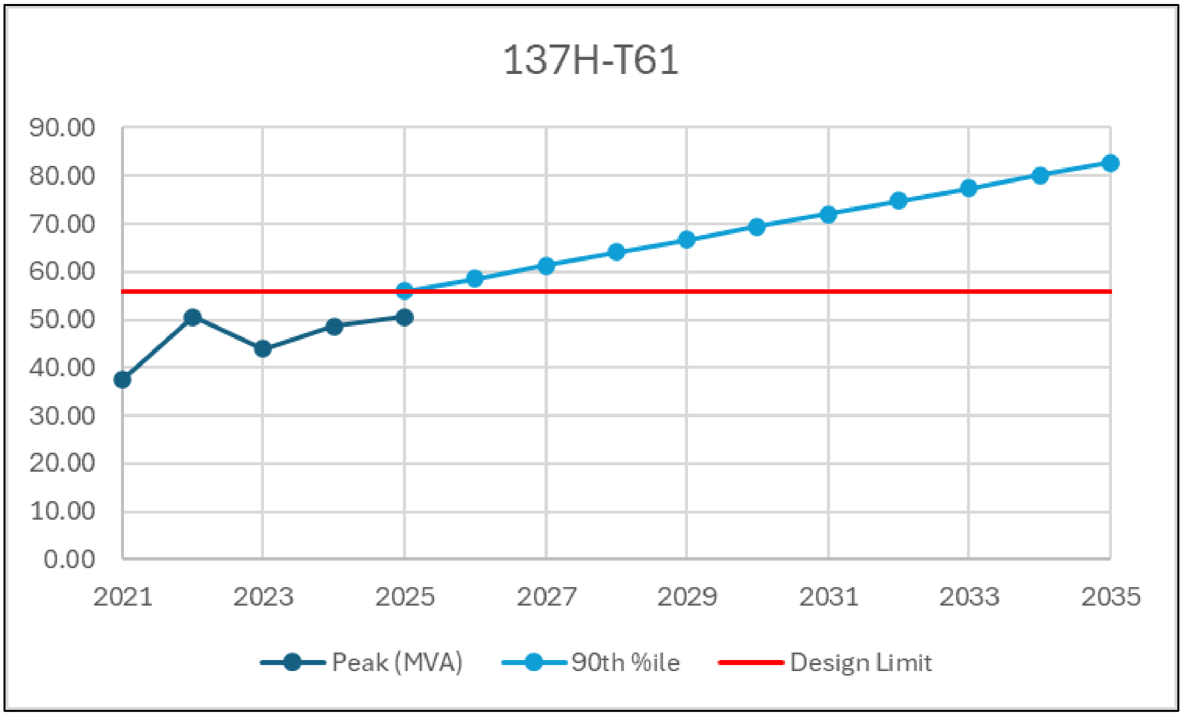


Figure 11: 137H-T61 Load Forecast

4.0 RELIABILITY

NSPI tracks the reliability of each distribution feeder in NS, including the number of Customer Interruptions (CI) and Customer Hours of Interruption (CHI). These are utilized to determine the CKAIFI and CKAIDI parameters, where CKAIFI is the Circuit Average Interruption Frequency Index, and CKAIDI refers to Circuit Average Interruption Duration Index. The figure below provides the previous five years of reliability data for the feeders in this region.

CKAIFI provides the average interruption frequency per customer per year and CKAIDI provides the average cumulative hours of interruption per customer per year.

- CKAIFI = Sum of (Outage) Customer Interruptions / Total number of customers
- CKAIDI = Sum of (Outage) Customer Hours of Interruptions / Total number of customers

All Events Included

Source	Year	CKAIFI	CKAIDI
92H-331	2020	3.92	5.46
	2021	3.06	2.51
	2022	6.48	68.70
	2023	8.71	24.49
	2024	2.28	6.49
	Mar-25	1.25	2.33
92H-332	2020	0.45	0.57
	2021	1.81	0.83
	2022	7.79	47.06
	2023	8.63	34.00
	2024	1.09	1.34
	Mar-25	0.01	0.04
137H-411	2020	1.05	0.77
	2021	0.67	0.85
	2022	4.40	28.06
	2023	3.25	71.58
	2024	6.31	21.32
	Mar-25	1.43	0.69
137H-412	2020	0.04	0.10
	2021	0.56	1.28
	2022	15.75	39.91
	2023	9.68	233.03
	2024	7.30	11.56
	Mar-25	1.01	0.16
137H-413	2020	1.06	1.22
	2021	0.17	0.28
	2022	4.53	18.99
	2023	4.51	12.83
	2024	3.71	8.92
	Mar-25	2.57	2.35
137H-414	2020	1.24	1.42
	2021	0.91	3.23
	2022	5.03	32.43
	2023	2.95	4.65
	2024	5.37	14.75
	Mar-25	0.93	0.16

Performance Standards

	Year	CKAIFI	CKAIDI
92H-331	2020	3.37	2.27
	2021	3.05	2.49
	2022	2.01	6.38
	2023	2.14	1.12
	2024	2.20	6.23
	Mar-25	1.25	2.32
92H-332	2020	0.45	0.55
	2021	1.81	0.83
	2022	3.07	2.80
	2023	4.39	14.41
	2024	1.09	1.34
	Mar-25	0.01	0.04
137H-411	2020	1.05	0.77
	2021	0.67	0.85
	2022	1.09	0.46
	2023	1.26	2.49
	2024	5.31	21.15
	Mar-25	0.43	0.54
137H-412	2020	0.04	0.10
	2021	0.52	1.28
	2022	8.11	6.57
	2023	1.95	10.93
	2024	5.02	8.59
	Mar-25	0.00	0.00
137H-413	2020	1.06	1.22
	2021	0.17	0.28
	2022	1.20	2.52
	2023	2.08	6.19
	2024	3.71	8.92
	Mar-25	1.09	1.99
137H-414	2020	0.12	0.16
	2021	0.91	3.23
	2022	1.12	0.55
	2023	1.10	2.96
	2024	5.32	14.63
	Mar-25	No PS outages	

Figure 12: Annual CKAIFI/CKAIDI for 92H and 137H Feeders

5.0 OVERLOADS AND OTHER CONCERNS

This section will highlight key findings from the analysis of the existing system and load forecasts for the Tidewater and Hammonds Plains areas. These findings are addressed in Section 6.

5.1 Tidewater Area Concerns

5.1.1 92H Transformer Overload

The transformer 92H-T61 would have recorded a peak load of 20.5 MVA in 2025 without embedded hydro generation, exceeding 164% of its 12.5 MVA top nameplate rating. Historical loading on this transformer has increased by 3.9% annually, and winter peaks now far exceed the 133% winter planning criterion.

In 2025, hydro generation from Tidewater, Sandy Lake, and Mill Lake was dispatched during peak periods to manage loading on transformer 92H-T61. However, drought conditions in 2026 limited hydro availability and the station could not rely on hydro dispatch to offset peak loading. As a result, a mobile transformer was installed at the station to maintain acceptable operating conditions during peak demand. This is not an acceptable long-term mitigation strategy, as mobile transformers are required to respond to station transformer failures and planned maintenance and therefore cannot be relied upon as permanent capacity for normal operations. The transformer is well beyond acceptable planning limits and permanent corrective action is required immediately.

The contingency capacity for the 92H substation is based on the loss of transformer 92H-T61 and installation of the maximum available 25 MVA mobile transformer. While hydro generation connected at the station can offset a portion of this load under normal conditions, the mobile transformer has not be designed to accommodate hydro generation interconnection and recent operating experience has shown that hydro availability cannot be relied upon during winter peak seasons. For these reasons, the hydro capacity are not included in 92H contingency capacity calculations.

5.1.2 92H Feeder Overloads

Feeder 92H-331 reached a 2025 winter peak of 432 A, with an annual growth rate of 4.3% from 2022–2025. This significantly exceeds the 325 A planning criterion and presents an immediate reliability and capacity concern that must be addressed in the near term.

Feeder 92H-332 reached 280 A in 2025 and has grown at 3.4% annually since 2022. At this rate, loading is forecast to exceed the 325 A threshold in 2029. Long-term system modifications included in this study will address this emerging violation.

Feeder 92H-334 reached 239 A in 2025 with an annual growth rate of 3.6% from 2022–2025. At this rate, it is expected to exceed 325 A in 2033. Due to uncertainty in long-term load development in this area, no specific capital investment is recommended at this time. Standard planning processes will continue to monitor this feeder for emerging violations.

5.1.3 Voltage Issues

Based on the CYME modelling for the 2025 winter peak, low voltage issues are present on the 92H-331 and 92H-332 feeders. Alternatives to address these overloaded feeders will also ensure the voltage is maintained at 114 V to ensure that the voltage at customer service entrances is at least 110 V nominal, per NSPI's voltage variation limits.

5.1.4 Age of Plant

The Iowa State Survivor Curves were used to determine the remaining useful life of each of the substation transformers included within this study based on a 42-year expected lifespan of a utility transformer on an R2.5 curve.

Table 9: Estimated Remaining Life of Tidewater Transformer

Substation	Transformer	kV	Rating (MVA)	Vintage	Estimated Years Remaining
92H-TIDEWATER	92H-T61	138-13.2	7.5/10/12.5	1985	10.5

Further to the transformer age, the bus structures in the 92H Tidewater substation are wooden and deteriorated. These will need to be fully replaced within 10 years.

5.2 Hammonds Plains Area Concerns

The overloads identified in this section are based on measured winter peak conditions, with future violations forecasted using the observed annual growth rates from 2022–2025. Several major developments in the Hammonds Plains and Bedford West area are expected to create step changes in load, beyond what is captured by a continuation of historical growth trends.

Bedford West Sub-Area 10 is currently under construction, and Sub-Areas 1 and 12 have been fully approved through the Province's Special Planning Area process. These developments collectively represent approximately 5.7 MW of additional residential and mixed-use load and are expected to build out over the next five to seven years. While some of this load will be reflected in the calculated annual growth rate for the 137H feeders, the scale and timing of these projects may result in localized load acceleration beyond the historical trend.

The proposed Sandy Lake development is expected to add approximately 15 MW of predominantly residential load. Portions of this may be captured by the existing growth rate; however, because Sandy Lake is a large greenfield development with concentrated build-out, it may also introduce significant step increases to feeder loading and transformer demand at 137H that exceed the trajectory implied by historical growth alone.

In addition to residential developments, a commercial customer has proposed an expansion that could add 6.9 MVA to 137H-413. This potential load will be evaluated independently as part of a load impact study. The customer will ultimately be responsible for any upgrades required to supply this load, including advancement of planned capital projects.

Together, these developments introduce substantial uncertainty in future loading patterns and may materially advance the timing of capacity violations in the area.

5.2.1 137H Transformer Overload

The transformer 137H-T61 reached a winter peak load of 50.6 MVA in 2025, equal to 121% of its 42 MVA top rating. Historical loading on this transformer has increased by 4.1% annually and it is forecasted to exceed the 133% winter design limit in 2026. This loading violation requires prompt corrective action.

In addition to exceeding transformer loading limits, the 137H substation no longer meets contingency capacity requirements. The 2025 winter peak of 50.6 MVA exceeds the substation's approximate contingency capacity of 39 MVA, which assumes deployment of a 25 MVA mobile transformer and the transfer of 14 MVA to adjacent substations (101H-Cobequid and 129H-Kearney Lake) under an 18 MVA emergency feeder design limit. This contingency issue presents significant risk and must be addressed as soon as possible.

5.2.2 137H Feeder Overloads

Feeder 137H-411 had a peak load of 337 A in 2025 and is expected to grow at an average rate of approximately 4.4% per year. Since this exceeds the planning criteria of 325 A, measures to offload this feeder are required. Although no large new customers are expected to connect, steady residential growth is anticipated.

Feeder 137H-412 had a peak load of 385 A in 2025 and is projected to grow at an average rate of approximately 3.3% per year. Since this exceeds the planning criteria of 325 A, measures to offload this feeder are required. Although no large new customers are expected to connect, steady residential growth is anticipated.

Feeder 137H-413 had a peak load of 376 A in 2025 and is projected to grow at an average rate of approximately 1.9% per year based on recent historical loading. Since this exceeds the 325 A planning criterion, measures to offload this feeder are required. The proposed Sandy Lake development, estimated at approximately 15 MW, is expected to connect in the area currently served by 137H-413 and could materially increase the urgency of recommendations in this study.

Feeder 137H-414 has a typical winter peak load of 80 A in 2025 and did not exceed the planning criteria of 325 A.

5.2.3 Voltage Issues

Based on the CYME modelling for 2025 winter peak there is a low voltage issue past the Pockwock intersection on the 137H-412 feeder. Alternatives to address these overloaded feeders will also ensure the voltage is maintained at 114 V to ensure that the voltage at customer service entrances is at least 110 V nominal, per NSPI's voltage variation limits.

5.2.4 Age of Plant

The Iowa State Survivor Curves were used to determine the remaining useful life of each of the substation transformers included within this study based on a 42-year expected lifespan of a utility transformer on an R2.5 curve.

Table 10: Estimated Remaining Life of Hammonds Plains Transformer

Substation	Transformer	kV	Rating (MVA)	Vintage	Estimated Years Remaining
137H-HAMMONDS PLAINS	137H-T61	138-26.4	25/33/42.0	2008	26.0

This data indicates that 137H-T61 is not approaching end of life within this study period.

6.0 ALTERNATIVES

This section will describe alternatives to address the concerns in Section 5. Final recommendations will be presented in Section 8.

6.1 Immediately Required Actions

The following projects were identified through preliminary analysis in 2024-2025 and address the most urgent violations in the Tidewater area. No feasible alternatives exist that would resolve these issues within acceptable timelines or at a comparable cost.

6.1.1 92H-T61 Replacement

Winter peak load supplied by transformer 92H-T61 significantly exceeds the transformer rating when hydro is unavailable. Replacement with a new 15/20/25 MVA transformer is required.

Monitoring limitations, rapid load growth, and reliance on embedded hydro generation delayed identification of the emerging overload on 92H-T61. Procurement of a replacement transformer was initiated in 2024. In 2025, the overload was temporarily mitigated through modified hydro dispatch procedures, and in 2026, when hydro availability was insufficient, a mobile transformer was installed to partially offload the station. These measures are not acceptable as long-term solutions.

Potential alternatives to replacing the transformer with a larger unit were investigated, but no suitable alternatives were found. Load transfers to adjacent feeders are not possible for several reasons.

The only adjacent 12 kV source, at 87W-Hubbards, is already loaded to 92% of its top rating, and 87W-311, the only tie to 92H (via 92H-334) is near capacity. Leveraging capacity from 87W would require both a transformer upgrade and construction of a 12 km new feeder along the St. Margarets Bay coastline.

Transfers to adjacent 25 kV sources (137H or 103H) via step-down transformers or voltage conversions are also infeasible. These substations and associated feeders are already at, or over, design limits.

Feeder load transfer alternatives would be significantly more expensive, add a minimum of two years to the execution, and provide less benefit, as the aging 92H-T61 transformer would still be heavily relied upon.

An alternative involving adding a second, potentially smaller, transformer at 92H was also evaluated. This would increase capacity and provide redundancy. However, this alternative was ruled out as the existing 92H-Tidewater site cannot accommodate a second transformer. Further, the existing unit 92H-T61 is approaching end of life (approximately 10 years remaining). Implementing this alternative would require constructing a new substation on a separate property, resulting in significantly higher costs and adding multiple years to the project timeline. While a new site with two transformers could address long-term needs and replace aging infrastructure, it is not a viable near-term solution for resolving the urgent capacity violations at 92H and should instead be considered as part of a longer-term strategy for the area.

6.1.2 92H Fourth Feeder

Feeder 92H-331 is severely overloaded and growing rapidly. During extreme cold weather events, the feeder required active monitoring for potential load shedding to avoid exceeding conductor and protection limits. To address this, construction of a fourth feeder, 92H-335, from 92H-Tidewater along Peggy's Cove Road is recommended.

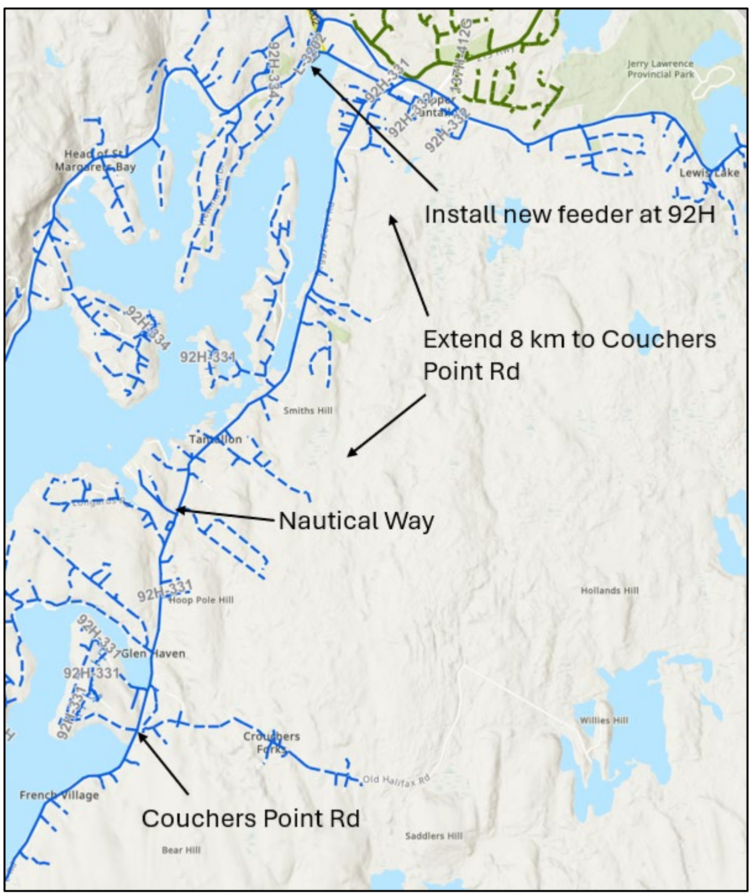


Figure 13: Path of New Feeder from 92H

A feeder extension of 6 km along Peggy's Cove Road allows 92H-335 to pick up load beyond Nautical Way, yielding a projected winter peak of approximately 320 A, just below the planning limit. Extending the feeder an additional 2 km to Crouchers Point Road results in a loading of 228 A on 92H-335, creating sufficient capacity for expected growth. In this configuration, 92H-331 is reduced to 179 A. Under current growth rates, neither feeder is expected to exceed the 325 A limit until 2034, although uncertainty remains regarding whether rural segments of 92H-335 will continue to grow at the same rate as the more developed Tantallon area.

It is therefore recommended that further extension of 92H-335 be based on ongoing monitoring and triggered only when justified by continued load growth.

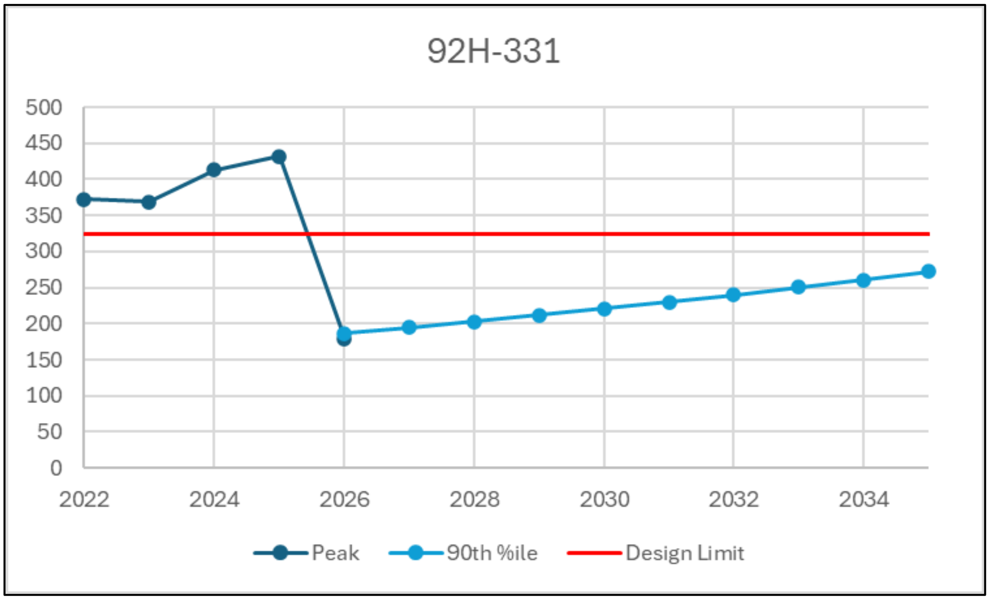


Figure 14: Offloaded 92H-331 Load Forecast

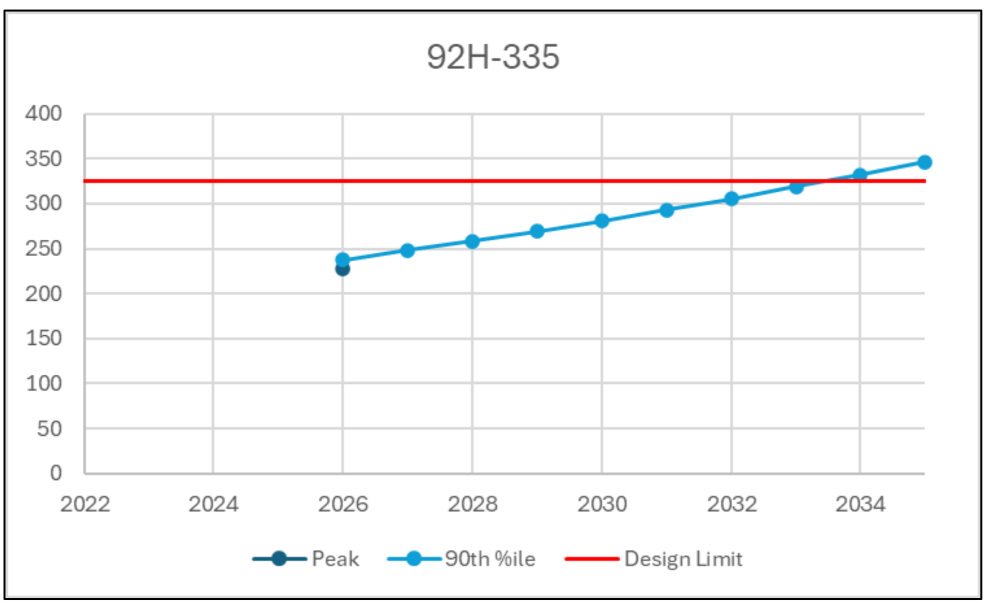


Figure 15: New Feeder 92H-335 Load Forecast

Alternative solutions that were evaluated and eliminated:

The three-phase extent of 92H-331 ends in West Dover. There is over 15 km to the nearest three-phase feeder source, 103H-434. This is a 25 kV feeder that would require step-down transformers to provide a feeder tie with 92H-331, and it is already overloaded.

Using the adjacent feeder 92H-332 would eliminate the need for an additional feeder exit and a 1.2 km line extension from the substation to Peggy's Cove Road. However, 92H-332 is already heavily loaded and is forecasted to exceed the 325 A criterion by 2029. It cannot accommodate additional load from 92H-331.

6.2 Hammonds Plains Capacity

Winter peak loading at 137H-Hammonds Plains has increased to the point where both normal loading limits and contingency capacity shortfall present near-term risk. The existing station exceeds its available contingency capacity and feeders 137H-411, 137H-412, and 137H-413 all exceed the 325 A design criterion. The alternatives considered in this section must restore compliance with planning criteria while providing scalable capacity for continued growth and major developments in the Hammonds Plains and Bedford areas.

6.2.1 Alternative A: New Stillwater Lake Substation

Stillwater Lake was identified as the preferred location for a potential new substation for several reasons. Appropriate land is available for sale near a 138 kV transmission line and Hammonds Plains Road. A distribution source near the significant load in Stillwater Lake and Upper Tantallon will supply load more reliably (less distribution line exposure) and efficiently (less losses from distribution lines). A new substation source in this area provides operational flexibility for feeder reconfiguration between the new substation and 137H Hammonds Plains.

The scope of this alternative is as follows:

- Construct a new substation in Stillwater Lake.
- Leverage existing distribution lines associated with 137H-412 along Hammonds Plains Road:
    - Configure one new feeder east of the new substation into Upper Hammonds Plains.
    - Establish a second feeder west of the new substation to pick up Stillwater Lake area load.
- Reconfigure 137 Hammonds Plains feeders to restore feeder margins.
- Install a second transformer at Hammonds Plains in 2037.

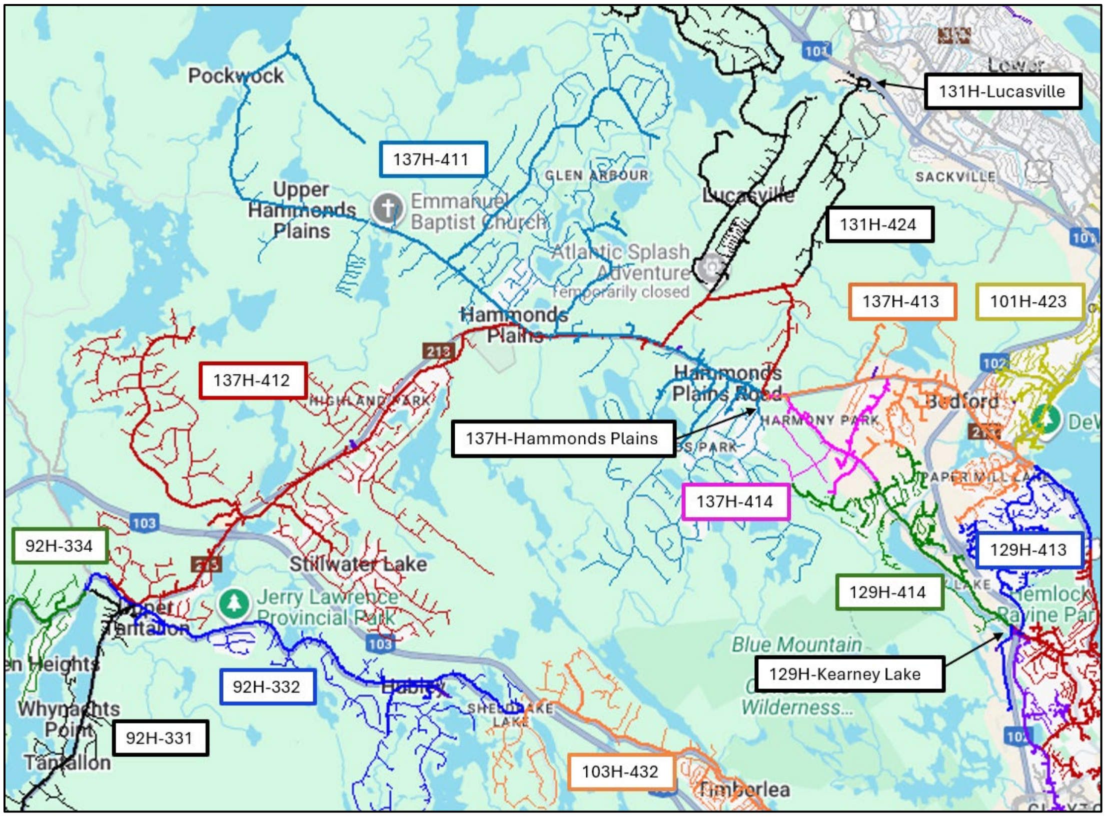


Figure 16: Hammonds Plains Feeder Configurations Before Modifications

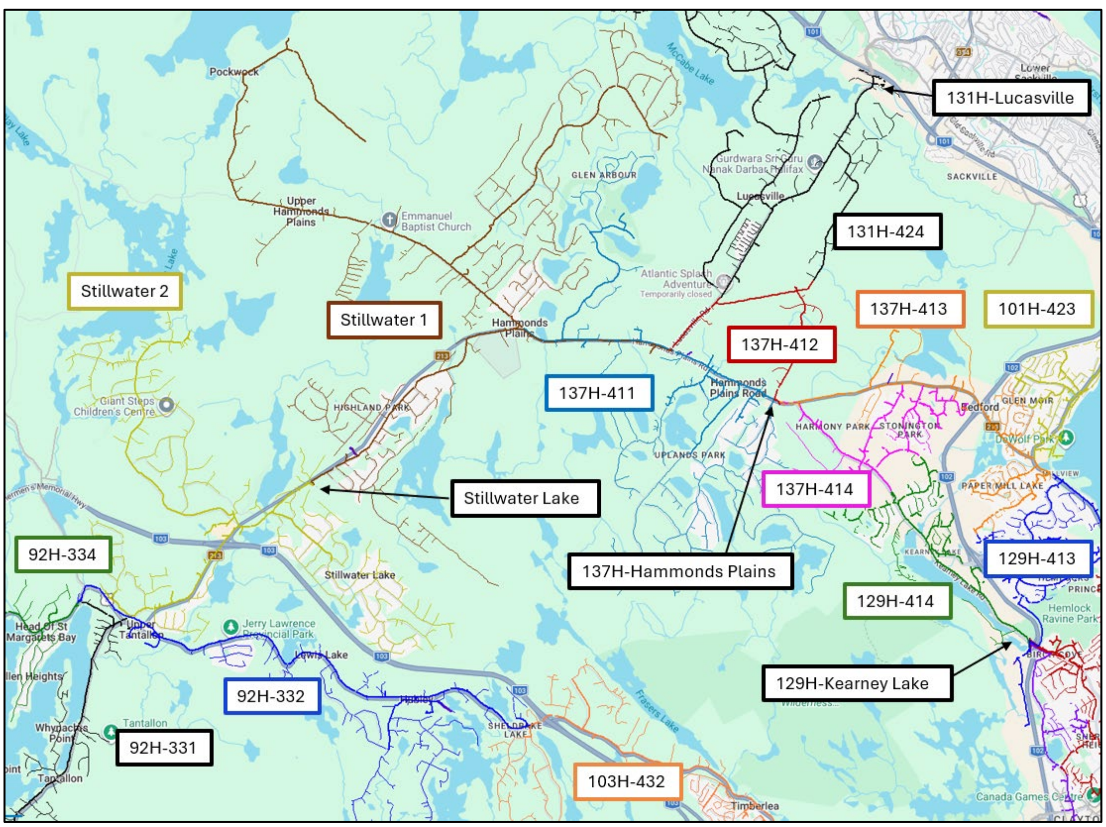


Figure 17: Hammonds Plains Feeder Configurations after Alt A Modifications

Table 11: Hammonds Plains Alternative A Feeder and Transformer Load Forecast

	Loading by Capital Year (Amps)									
Feeder	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
137H-411	340	360	220	230	239	249	259	269	279	289
137H-412	423	441	65	72	80	87	94	102	109	117
137H-413	360	368	266	274	281	289	297	305	312	320
137H-414	88	89	191	191	191	192	192	192	192	193
STILLWATER1	-	-	242	251	259	269	279	288	298	308
STILLWATER2	-	-	265	272	277	284	292	299	306	313

	Loading by Capital Year (MVA)									
Transformer	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
137H-T61	55.3	57.5	33.7	34.9	36.0	37.2	38.3	39.5	40.6	41.8
Stillwater	-	-	23.2	24.0	24.7	25.5	26.3	27.1	27.9	28.7

The construction of Stillwater Lake substation and feeder reconfigurations should be completed in 2027 or as soon as possible, to address existing planning violations. Once complete, transformer 137H-T61 and all its feeders remain within planning criteria through 2035. The load supplied from 137H-Hammonds Plains in 2035 is forecast to be 41.8 MVA, which is below the new expected contingency capacity of 46 MVA.

Under this configuration, the Pockwock wind generation site will be supplied from a Stillwater Lake feeder. This will require a study to ensure there are no negative system impacts from this change.

If the current load growth persists, a second transformer will be required at 137H-Hammonds Plains prior to 2038, when the station contingency capacity is exceeded. A longer-term load forecast for 137H-T61 was developed by applying the historical growth rate of 4.1% to the proposed system configuration of Alternative A. New large incremental loads or accelerated developments could advance this requirement.

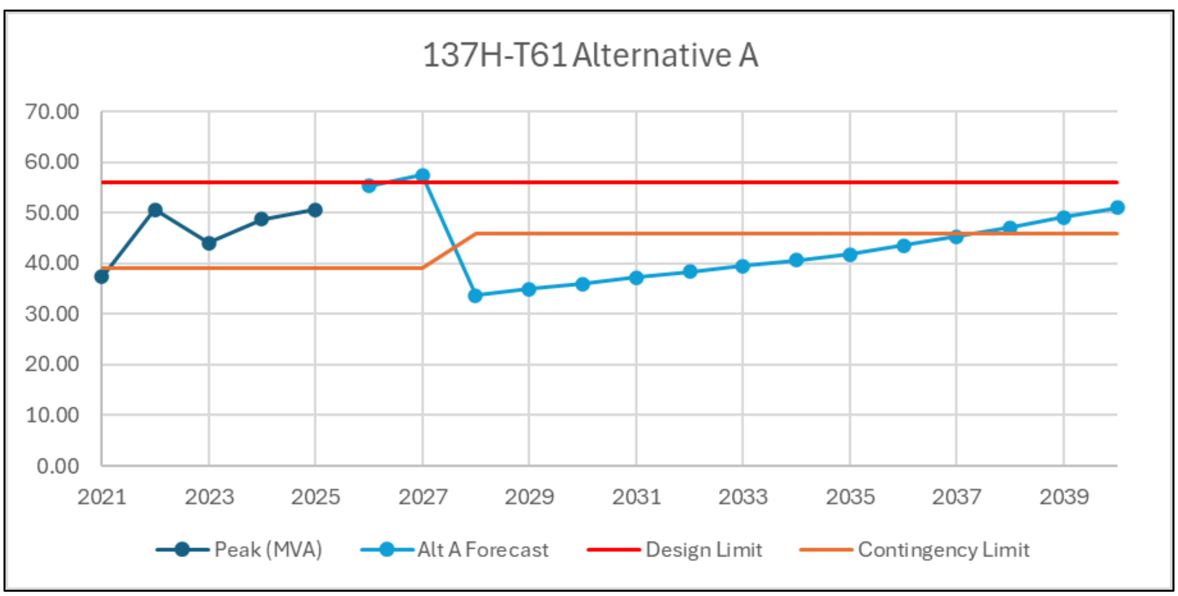


Figure 18: 137H-T61 Forecast for Alternative A

6.2.2 Alternative B: Additional Transformer at Hammonds Plains

Another option for adding new capacity in the Hammonds Plains area is adding a transformer at the 137H-Hammonds Plains substation. This station was built for a second transformer, so that portion of the project would be relatively simple to implement. However, additional capacity at 137H does not address the feeder overloads and significant feeder development is also required.

The scope of this alternative is as follows:

- Install an additional 25/33/42 MVA transformer at 137H Hammonds Plains, complete with low voltage bus and feeder bays.
- Reconfigure underground feeder exits to move 137H-411 to the new bus; this feeder becomes 137H-422 and 137H-411 becomes a spare feeder.
- Install a new feeder exit and extend new distribution lines 9.3 km along Hammonds Plains Road.
- Transfer feeder section 137H-412G to the new feeder 131H-421.
- Offload 137H-422 (137H-411) using capacity on 137H-412.
- Extend double circuit 1.8 km along Pockwock Road to transfer White Hills Run from 137H-412 to 137H-422 (this could be deferred until 2028).
- Reconfigure 137H-413 and 137H-414.
- Construct Stillwater Lake substation in 2032.

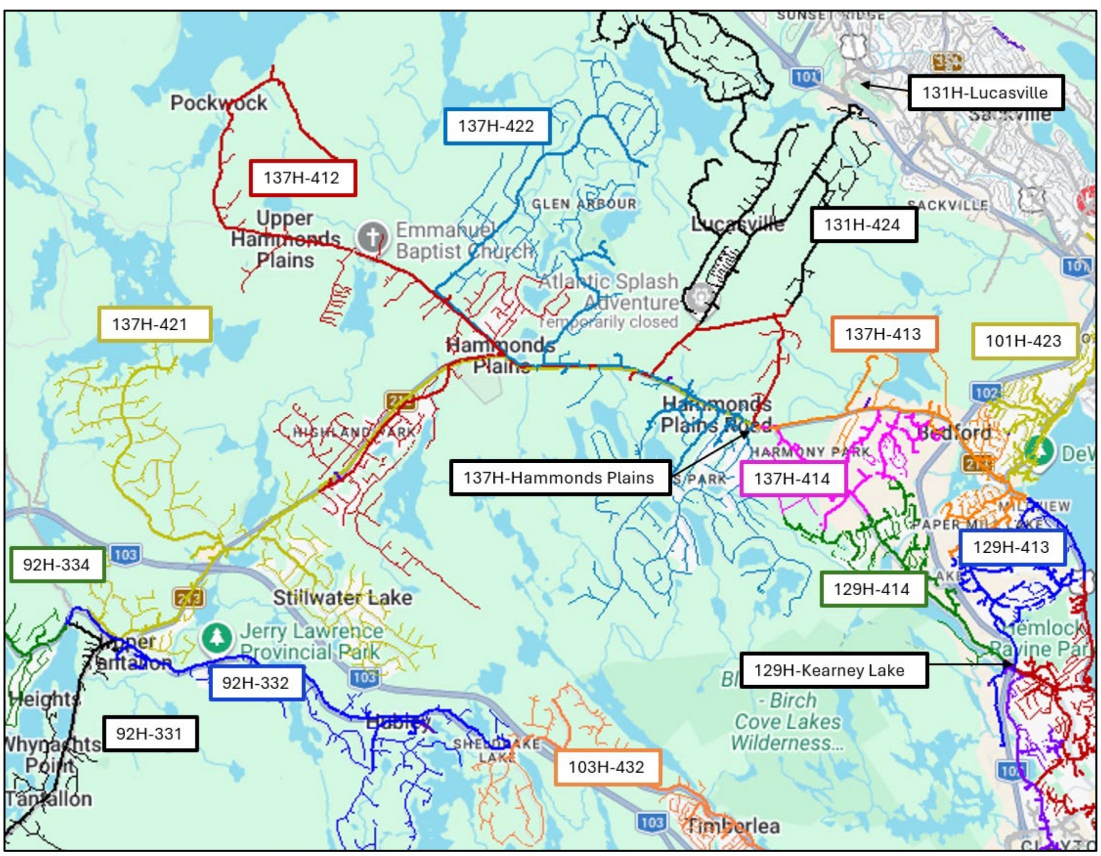


Figure 19: Hammonds Plains Feeder Configuration after Alt B Modifications

This alternative has significant risks to budget and schedule, due to the difficulty in constructing a new feeder along Hammonds Plains Road. There are currently no provisions for an additional feeder exit out of 137H Hammonds Plains, so significant rework will be required to add a feeder. Hammonds Plains Road is very congested along the entire route to Stillwater Lake; it will be very difficult to obtain the required easements and execute construction on this main traffic artery.

Table 12: Hammonds Plains Alternative B Feeder and Transformer Forecast

	Loading by Capital Year (Amps)									
Feeder	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
137H-411	340	360	0	0	0	0	0	0	0	0
137H-412	423	441	246	264	281	299	317	335	353	372
137H-413	360	368	265	273	280	288	296	304	312	320
137H-414	88	89	191	191	191	191	192	192	192	193
137H-421	-	-	266	273	280	288	295	302	308	315
137H-422	-	-	280	289	299	308	318	328	335	345

	Loading by Capital Year (MVA)									
Transformer	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
137H-T61	55.3	57.5	31.9	33.1	34.3	35.4	36.6	37.8	39.0	40.2
137H-T62	-	-	25.2	25.9	26.7	27.5	28.3	29.0	29.8	30.6

Based on the current forecast, this alternative will only supply the required capacity until 2032. Beyond 2032, a new source would be required in Stillwater Lake to maintain design criteria. Construction of a new substation in Stillwater Lake in 2032 must be added to the scope of this alternative.

With a second transformer at 137H Hammonds Plains and the Stillwater Lake substation, it is not expected that additional transformation will be required in the area for the foreseeable future.

6.2.3 Alternative C: Feeders from Lucasville

A third alternative is leveraging capacity from the 131H-Lucasville substation. A new feeder can be built into Stillwater Lake to offload 137H-412 and enable feeder reconfigurations. This additional feeder will increase feeder transfer capability for 137H, which increases the contingency capacity to 44 MVA. This is not sufficient. To provide additional contingency capacity allowing deferral of the Stillwater Lake substation, a second additional feeder must be built from 131H, providing a feeder tie with 137H-412 and increasing contingency capacity to 48 MVA.

Scope of this alternative:

- Construct a new feeder at 131H Lucasville.
- Extend the new feeder 13.3 km from Lucasville to Stillwater Lake.
- Build a second additional feeder from Lucasville and extend 1.8 km to Bryanston Road to provide contingency capacity for 137H.
- Transfer Pockwock Road from 137H-411 to 137H-412.
- Extend double circuit 1.8 km along Pockwock Road to transfer White Hills Run from 137H-412 back to 137H-411.
- Construct Stillwater Lake substation in 2029.

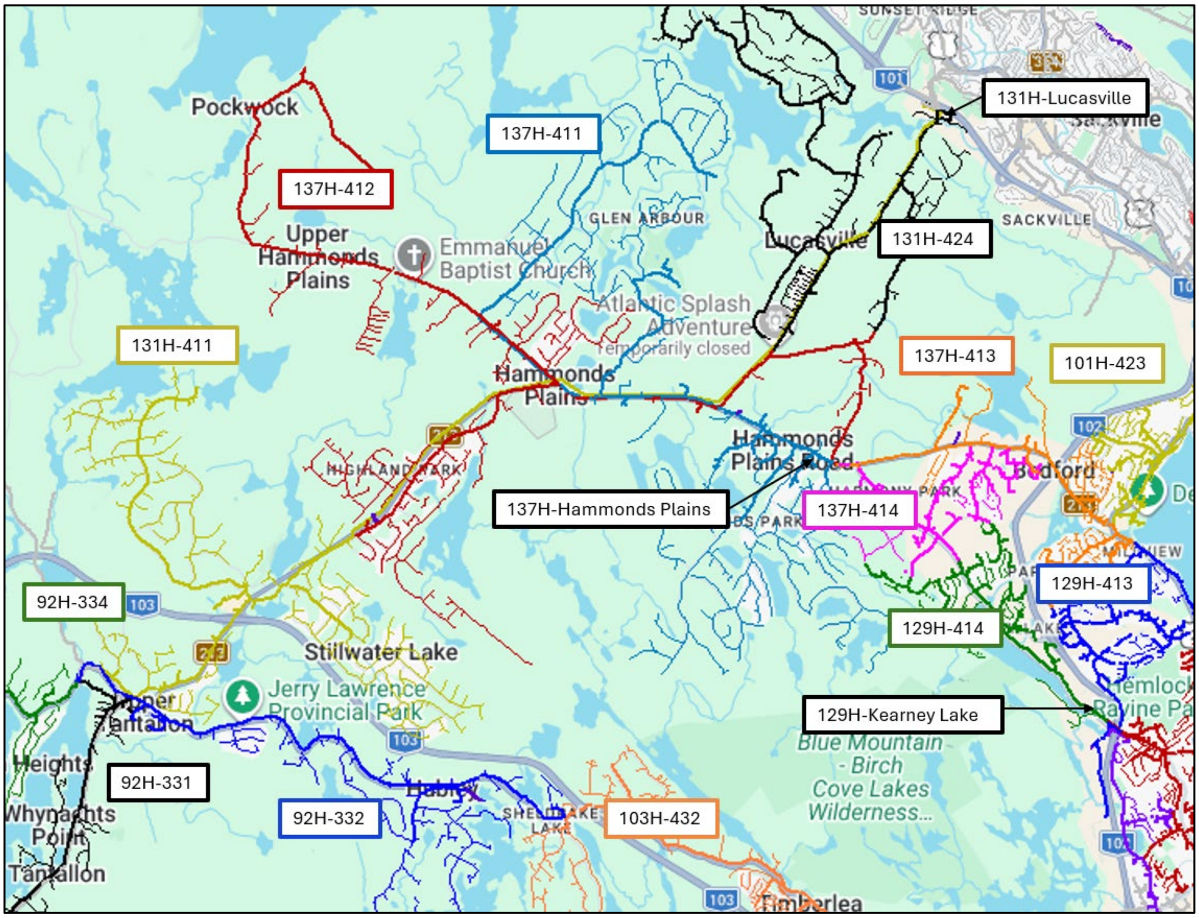


Figure 20: Hammonds Plains Feeder Configurations after Alt C Modifications

Table 13: Hammonds Plains Alternative C Feeder and Transformer Forecast

	Loading by Capital Year (Amps)									
Feeder	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
137H-411	340	360	286	296	307	317	327	336	346	355
137H-412	423	441	248	266	284	302	321	337	356	372
137H-413	360	368	267	275	283	291	299	305	314	320
137H-414	88	89	192	192	193	193	194	193	194	193
131H-411	-	-	270	277	284	291	299	306	313	321

	Loading by Capital Year (MVA)									
Transformer	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
137H-T61	55.3	57.5	45.2	46.8	48.5	50.2	51.9	53.6	55.3	57.1
131H-T62	17.9	18.4	31.2	32.0	32.9	33.7	34.5	35.4	36.2	37.0

Like Alternative B, this option is exposed to significant schedule and cost risk due to the challenge of constructing new feeder infrastructure along Hammonds Plains Road. Under this alternative, construction of the Stillwater Lake substation would still be required in 2029 to address the forecast contingency capacity violation in 2030, feeder overloads beginning in 2032, and transformer overload at 137H by 2035. Although the combination of Stillwater Lake and the Lucasville feeders would significantly increase contingency capacity, the extent of feeder construction required makes this option less attractive than Alternative A.

6.3 Tidewater Capacity

The immediate concerns for Tidewater are addressed by the immediate actions recommended in Section 6.1. However, in 2029 the feeder 92H-332 is expected to exceed the 325 A planning criterion and the total station load is expected to exceed the contingency capacity of 25 MVA. In addition to this, CYME modelling indicates low voltage conditions may occur in the Five Island Lake area beginning in 2027. There are two options available to address these concerns: leverage adjacent 25 kV sources by converting 12 kV distribution in Hubley, or expand capacity at 92H Tidewater and build another feeder into the area.

This section will also consider the overloaded 25 kV feeder 103H-432, which supplies Timberlea and has been used in the past for conversions in Hubley. This area has experienced an annual peak load growth of 4.4% since 2021, mostly driven by developments in Brunello. Methods to address this feeder overload are material to the Tidewater long-term solution, so they will be included in the analysis. All alternatives in this section will assume a 1.15 km extension of 103H-431 along St Margarets Bay Road to Parkdale Avenue and a 350 m line extension to connect distribution on Marketway Lane, which will allow offloading of 103H-432 to 103H-431.

It has been identified that feeder 92H-334 is expected to become overloaded in 2033. All alternatives in this section will assume that an 880 m line extension from 92H Tidewater to Viewmount Drive will be completed to add another feeder source to offload 92H-334.

The deteriorated structures in the 92H substation must also be addressed.

6.3.1 Alternative A: Hubley Conversion and Transfer to Stillwater Lake

The Hubley area has experienced significant load growth, and the feeder 92H-332 has previously been identified as overloaded. To address this, distribution supplied from Silver Birch Drive was converted from 12 kV to 25 kV and transferred to feeder 103H-432 from Lakeside. Further conversion is not possible as this feeder and substation are at capacity. However, with the addition of a new substation in Stillwater Lake, a new 25 kV source will become available.

The conversion of Hubley must start at the extent of the line, so it will need to be temporarily supplied from feeder 103H-432, before making a connection to the 25 kV feeder from Stillwater Lake. This is not an issue if it can be done between peak winter load seasons in one year. It is expected that a stepdown transformer will need to be leveraged to accomplish this. Once completed, there will be a feeder tie between the Stillwater Lake substation and 103H Lakeside, providing significant reliability benefits for customers in Hubley and Timberlea, who are currently supplied via radial feeders with no tie points.

To address the deteriorated structures in the 92H substation, it is recommended that it is rebuilt in place in 2033. The feasibility and scope of this will need to be verified. A very conservative estimate equivalent to building a new substation (less the cost of a transformer) on nearby NS Power land will be used to account for the uncertainty with this work.

The scope of this alternative is as follows:

- Install a third feeder at Stillwater Lake and extend 1.5 km to supply load south of Hwy 103 into Hubley.
- Extend Stillwater Lake feeder 900m from Hammonds Plains Road to St Margarets Bay Road beyond St Margarets Square.
- Install 3x 500 kVA phase stepdown transformers at Big Hubley Lake Road to reduce short-term conversion requirement.
- Convert 6480 kVA of 12 kV to 25 kV to create a tie between the Stillwater Lake feeder and 103H-432 in phases starting Spring 2028 and completed prior to Winter 2029.
- Reconfigure feeders so that the third Stillwater Lake feeder supplies load up to Glengarry Estates, offloading 103H-432.
- Rebuild the Tidewater substation in its current location, using a mobile transformer to temporarily supply feeders during demolition and construction.

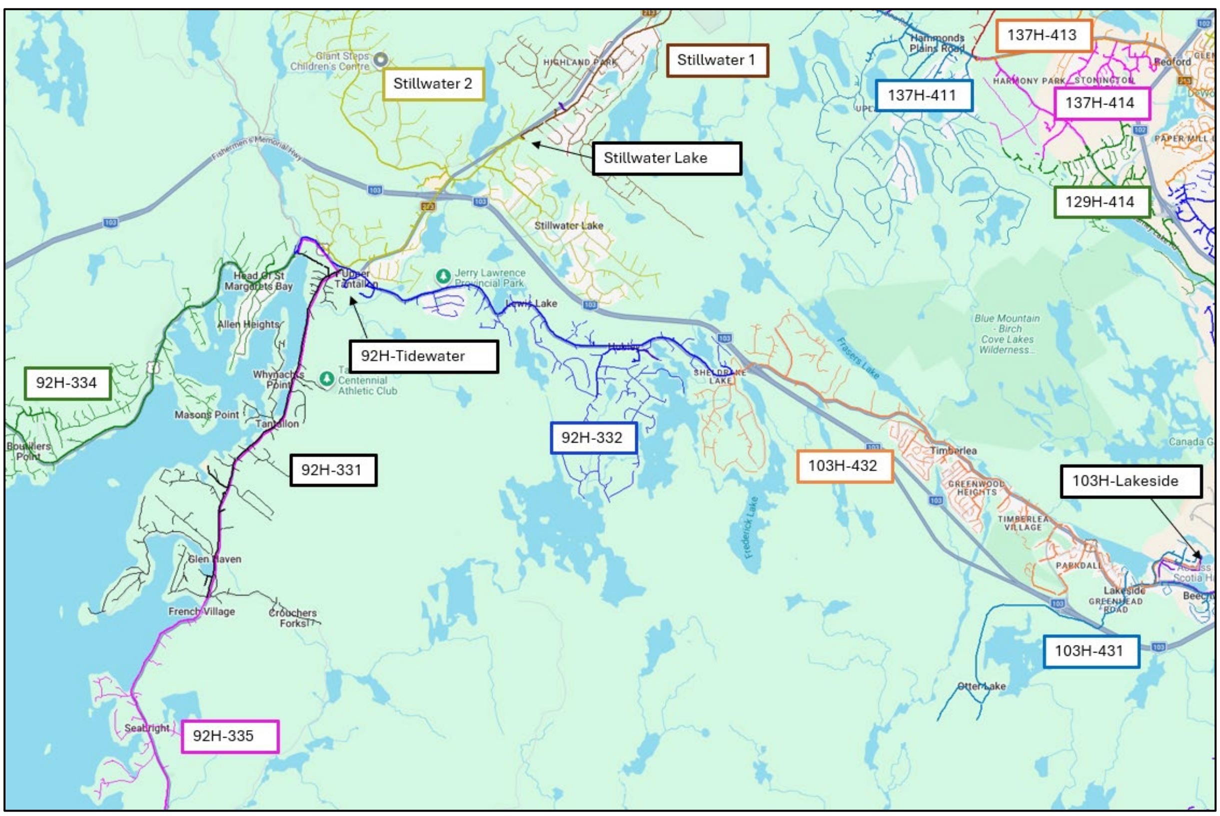


Figure 21: Hubley and Timberlea Feeder Configurations Before Alt A

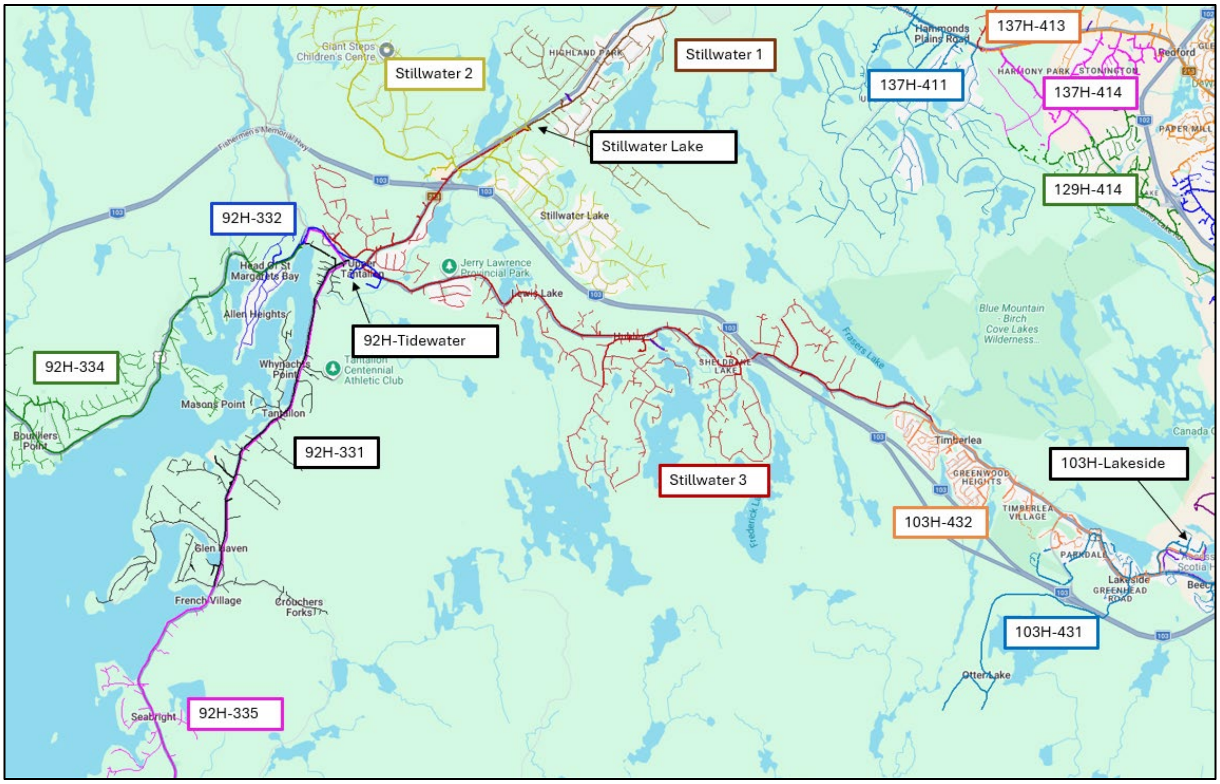


Figure 22: Hubley and Timberlea Feeder Configuration After Alt A

Table 14: Tidewater Alternative A Feeder and Transformer Load Forecast

	Loading by Capital Year (Amps)									
Feeder	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
92H-331	192	203	214	227	237	249	261	273	285	295
92H-332	284	291	303	57	57	57	57	120	120	120
92H-334	257	268	277	289	298	309	320	266	277	286
92H-335	246	264	277	286	296	294	297	305	307	313
STILLWATER1	-	-	242	251	261	270	279	289	299	309
STILLWATER2	-	-	265	228	236	243	249	256	264	271
STILLWATER3	-	-	-	226	233	239	244	250	256	263
103H-431	142	142	225	233	242	249	257	267	274	283
103H-432	374	391	323	265	274	281	289	299	306	315

	Loading by Capital Year (MVA)									
Transformer	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
92H-T61	22.5	23.6	24.8	19.6	20.4	20.9	21.5	22.2	22.7	23.5
103H-T61	54.3	55.1	42.7	40.4	41.2	41.9	42.8	43.8	44.6	45.4

6.3.2 Alternative B: Tidewater Substation Expansion

Rather than converting the Hubley area to 25 kV, it is possible to expand the Tidewater substation and add an additional 12 kV feeder. There is no space for expansion at the current substation site, so a new station would need to be built on Bowater Mersey Rd. As the current Tidewater substation is integrated with the Tidewater hydro generation station, there is some complication that arises from relocating the substation. This can most likely be resolved by constructing a new feeder tie between the hydro generation site and new substation, along with protection upgrades for the hydro site. Once the new substation is built, a new feeder can be used to address capacity issues in Hubley. The scope of this alternative is as follows:

- Build a new Tidewater substation with 15/20/25 MVA transformer.
- Reconfigure distribution and hydro generation collector feeders.
- Protection upgrade for 92H hydro generation site.
- Relocate the existing 15/20/25 MVA transformer to new substation.
- Build new 12 kV feeder 92H-336 7.5 km into Hubley.
- Reconfigure Hubley feeders to offload 92H-332.
- Additional load transfers from 103H-432 to 103H-431.

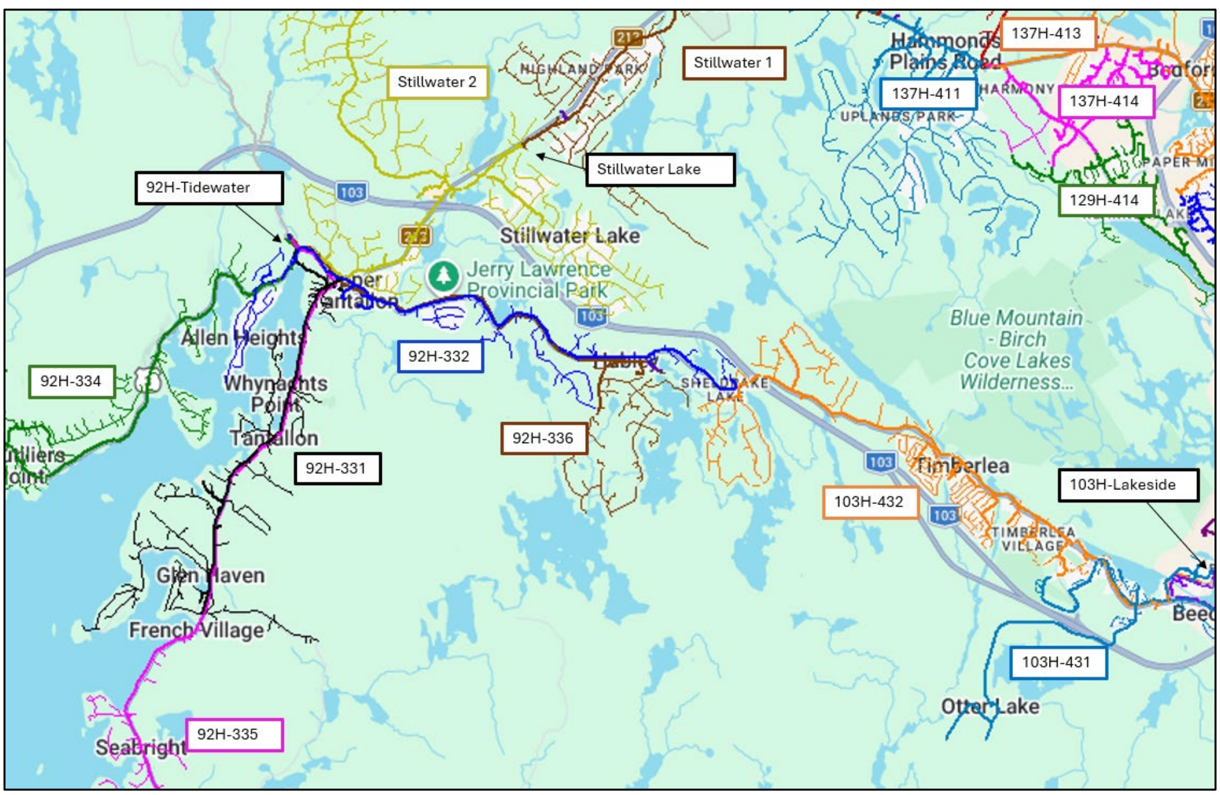


Figure 23: Hubley and Timberlea Feeder Configurations after Alt B

Table 15: Tidewater Alternative B Feeder and Transformer Load Forecast

	Loading by Capital Year (Amps)									
Feeder	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
92H-331	192	203	214	227	238	250	260	272	284	296
92H-332	284	291	303	178	178	180	179	242	242	242
92H-334	257	268	277	289	300	311	319	265	276	287
92H-335	246	264	277	287	289	293	297	303	308	314
92H-336	-	-	-	123	135	147	158	170	182	193
103H-431	142	142	225	269	278	287	296	304	311	320
103H-432	374	391	323	293	302	311	320	329	336	345

	Loading by Capital Year (MVA)									
Transformer	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
92H-T61	22.5	23.6	24.8	11.7	12.2	12.7	13.2	12.2	12.7	13.3
92H-T62	-	-	-	13.4	13.7	14.1	14.4	16.3	16.7	17.1
103H-T61	54.3	55.1	42.7	43.6	44.4	45.3	46.1	46.9	47.7	48.6

This solution only addresses the capacity violation on feeder 103H-432 through 2032, based on current forecasts. Since there is some uncertainty with the growth rate continuing at current levels, this option will not be ruled out, but this is a significant consideration for alternative selection.

7.0 ALTERNATIVE ANALYSIS

This section compares the alternatives described in Section 6 using preliminary capital cost estimates, economic analysis, and qualitative planning considerations. Where applicable, the alternatives are compared using the NS Power economic analysis model, with the net present value (NPV) results used as one input to the final recommendation.

7.1 Estimates

Below are preliminary capital cost estimates by year for capital items associated with the alternatives discussed in Sections 6.2 and 6.3. The economic analysis in Section 7.2 will determine the NPV of these alternatives.

Table 16: Hammonds Plains Alternative Estimates

Hammonds Plains Capacity				
Alternative A - Stillwater Lake	**Year**	**Qty**	**Unit Cost**	**Total**
Construct Stillwater Lake Substation	2027	1	$ 10,000,000	$ 10,000,000
Reconfigure Feeders	2027	1	$ 50,000	$ 50,000
Add transformer at 137H	2037	1	$ 4,000,000	$ 4,000,000
			Total:	**$ 14,050,000**
Alternative B - 137H Transformer	**Year**	**Qty**	**Unit Cost**	**Total**
Add transformer at 137H	2027	1	$ 4,000,000	$ 4,000,000
Add feeder and reconfigure feeder exits	2027	1	$ 500,000	$ 500,000
Extend new feeder 9.3 km to Stillwater Lake	2027	9.3	$ 550,000	$ 5,115,000
Reconfigure feeders	2027	1	$ 50,000	$ 50,000
Extend double circuit to White Hills Run	2028	1.8	$ 460,000	$ 828,000
Construct Stillwater Lake Substation	2032	1	$ 10,000,000	$ 10,000,000
			Total:	**$ 20,493,000**
Alternative C - Lucasville Feeders	**Year**	**Qty**	**Unit Cost**	**Total**
Construct new feeder at 131H	2027	1	$ 250,000	$ 250,000
Extend new feeder 13.3 km to Stillwater Lake	2027	13.3	$ 550,000	$ 7,315,000
Reconfigure feeders	2027	1	$ 50,000	$ 50,000
Second additional feeder at 131H	2027	1	$ 250,000	$ 250,000
Extend second feeder 1.8 km to Bryanston	2027	1.8	$ 460,000	$ 828,000
Extend double circuit to White Hills Run	2028	1.8	$ 460,000	$ 828,000
Construct Stillwater Lake Substation	2029	1	$ 10,000,000	$ 10,000,000
			Total:	**$ 19,521,000**

Table 17: Tidewater Alternative Estimates

Tidewater Capacity				
Alternative A - Hubley Conversion	**Year**	**Qty**	**Unit Cost**	**Total**
Install third Stillwater feeder	2028	1	$ 150,000	$ 150,000
Extend new feeder 1.5 km to Hwy 103	2028	1.5	$ 550,000	$ 825,000
Extend Stillwater feeder 900m to Peggy's Cove Rd	2028	0.9	$ 450,000	$ 405,000
Install 3x500kVA stepdowns at Big Hubley	2028	1	$ 95,000	$ 95,000
Convert 6480 kVA of transformation in Hubley	2028	6480	$ 500	$ 3,240,000
Rebuild 92H Tidewater substation	2033	1	$ 7,000,000	$ 7,000,000
			Total:	**$ 11,715,000**
Alternative B - Tidewater Expansion	**Year**	**Qty**	**Unit Cost**	**Total**
Build new Tidewater substation with 25 MVA Xfmr	2028	1	$ 10,000,000	$ 10,000,000
Reconfigure feeders and hydro protection	2028	1	$ 1,000,000	$ 1,000,000
Relocate 92H transformer to new substation	2028	1	$ 500,000	$ 500,000
Build a new 12 kV feeder 7.5 km to Hubley	2028	7.5	$ 550,000	$ 4,125,000
			Total:	**$ 15,625,000**

7.2 Hammonds Plains Economic Analysis

The economic analysis model evaluating the alternatives to address Hammonds Plains capacity was developed using the estimates shown in Section 7.1. The results of this analysis are shown below:

Hammonds Plains Capacity
Summary of Alternatives

Nova Scotia POWER
An Emera Company

Division :	NS Power	**Date :**	**6-Mar-26**
Department :	Distribution Planning	**CI Number:**	
		Project No. :	

	Alternative	After Tax WACC	PV of Revenue Requirement	PV of EVA / NPV	Rank (based on PV of RR)	IRR	Disc Pay
A	Stillwater Lake Substation	5.77%	10,061,970	-10,105,823	1	-9.32%	0.0 years
B	137H Additional Transformer	5.77%	15,653,301	-14,919,930	3	-8.78%	0.0 years
C	Lucasville Feeders	5.77%	15,578,815	-14,377,163	2	-8.64%	0.0 years
	0	NA	NA	NA	NA	#NUM!	0.0 years

Figure 24: Hammonds Plains Economic Analysis

Alternative A results in the lowest net present value (NPV) cost among the alternatives evaluated.

7.3 Tidewater Economic Analysis

The economic analysis model evaluating the alternatives to address Tidewater capacity was developed using the estimates shown in Section 7.1. The results of this analysis are shown below:

Tidewater Capacity Summary of Alternatives							
Division :	NS Power			Date :		4-Mar-26	
Department :	Distribution Planning			CI Number:			
				Project No. :			

	Alternative	After Tax WACC	PV of Revenue Requirement	PV of EVA / NPV	Rank (based on PV of RR)	IRR	Disc Pay
A	Hubley Conversion and Transfer	5.77%	8,080,983	-7,791,070	1	-9.19%	0.0 years
B	Tidewater Expansion	5.77%	12,231,911	-11,528,346	2	-8.61%	0.0 years
	0	NA	NA	NA	NA	#NUM!	0.0 years
	0	NA	NA	NA	NA	#NUM!	0.0 years

Figure 25: Tidewater Economic Analysis

Alternative A results in the lowest net present value (NPV) cost among the alternatives evaluated.

7.4 Hammonds Plains Qualitative Analysis

This section will provide the qualitative analysis of the three options considered to address the Hammonds Plains area concerns identified in Section 5.2.

7.4.1 Hammonds Plains Alternative A: Stillwater Lake Substation

Construction of a new substation in the Stillwater Lake area provides the most effective solution for the identified capacity concerns. This alternative introduces a new distribution source located near the center of the growing load area in Stillwater Lake and Upper Tantallon. Supplying these customers from a nearby source reduces feeder lengths, improves voltage performance, and reduces exposure to outages on long distribution circuits.

By transferring load from the existing 137H feeders to the new Stillwater Lake source, this alternative reduces loading on transformer 137H-T61 and restores compliance with transformer contingency criteria. The reduction in loading at 137H allows the station to accommodate expected growth associated with the Bedford West and Sandy Lake developments while remaining within planning limits.

From an implementation perspective, this alternative carries relatively low schedule risk. Land acquisition for the Stillwater Lake site has already been initiated and a conditional purchase agreement is in place, allowing the project to proceed quickly once approved.

Alternative A also provides the lowest capital cost of the options considered and establishes a long-term distribution source in an area of sustained load growth. Future capacity can be added through the installation of an additional transformer at 137H, which is expected to be required in 2037.

For these reasons, Alternative A is considered the preferred solution.

7.4.2 Hammonds Plains Alternative B: Second Transformer at Hammonds Plains

Adding a second transformer at 137H provides additional substation capacity and improves operational redundancy at the existing station. The 137H site was originally designed to accommodate a second transformer, which reduces the complexity of the station expansion itself.

This alternative also resolves the feeder capacity issues identified in this study through the construction of new distribution feeders and reconfiguration of the existing feeder network. These modifications redistribute load among feeders and restore compliance with feeder loading criteria.

However, the feeder configuration required under this alternative introduces several long distribution feeders extending along Hammonds Plains Road toward the Stillwater Lake area. Portions of these feeders would share pole lines, increasing the risk of multiple feeder outages from a single distribution line event and increasing exposure to reliability impacts.

Construction along this corridor also presents substantial schedule and cost risk. Hammonds Plains Road is heavily developed and highly trafficked and obtaining easements for new distribution lines would likely be difficult. The feeder construction required under this alternative would also be challenging to complete within a single construction season, potentially extending the period during which planning criteria violations remain unresolved.

In addition, this alternative only defers the need for a new substation in the Stillwater Lake area until approximately 2032. As a result, the Stillwater Lake substation would still need to be constructed within the study window, increasing the overall project cost.

For these reasons, Alternative B is less favorable than Alternative A.

7.4.3 Hammonds Plains Alternative C: Feeders from Lucasville

Alternative C involves extending feeders from the 131H–Lucasville substation to offload 137H and increase contingency capacity.

While this alternative avoids major substation construction in the near term, it requires extensive feeder construction over long distances. The feeder extensions required are longer than those in Alternative B and would encounter similar challenges related to routing, easements, and construction along Hammonds Plains Road.

This alternative also relies on capacity from the Lucasville substation rather than creating a new source in the Hammonds Plains area. As a result, it does not provide additional supply capacity to the broader region and reduces operational flexibility for addressing future capacity concerns in adjacent areas such as Bedford or Cobequid.

This approach would only defer the need for a new Stillwater Lake substation until approximately 2029, after which additional infrastructure would still be required.

Due to the significant construction scope, limited long-term benefit, and continued reliance on distant sources, Alternative C is not considered a preferred solution.

7.5 Tidewater Qualitative Analysis

This section will provide the qualitative analysis of the two alternatives considered to address the concerns identified in Section 5.1, following the immediate actions outlined in Section 6.1.

7.5.1 Tidewater Alternative A: Hubley Conversion and Transfer to Stillwater Lake

This alternative converts portions of the Hubley distribution system from 12 kV to 25 kV and transfers this load to the proposed Stillwater Lake substation.

This approach reduces the long-term loading on the Tidewater substation by transferring the growing Hubley load to a nearby 25 kV source. After the conversion is completed, the remaining load supplied from 92H Tidewater is expected to remain below the contingency capacity provided by a 25 MVA mobile transformer. Further conversions in the Upper Tantallon area can be initiated as required.

This alternative also creates a new feeder tie between the Stillwater Lake and Lakeside distribution systems. The tie significantly improves reliability for customers in Hubley and Timberlea, which are currently supplied by long radial feeders with limited transfer capability.

In addition, transferring load from 103H-432 to the new Stillwater Lake source resolves the forecast overload on that feeder and creates additional flexibility to reconfigure the Lakeside system in the future.

This alternative provides the lowest capital cost among the options considered and leverages infrastructure that will already be constructed as part of the Stillwater Lake substation project. For these reasons, Alternative A is considered the preferred long-term solution for the Tidewater area.

7.5.2 Tidewater Alternative B: Tidewater Substation Expansion

This alternative involves constructing a new Tidewater substation with 25 MVA transformer as well as relocating the replacement 25 MVA transformer to the new facility. A new 12 kV feeder would then be constructed to supply the Hubley area.

While this option would provide redundancy for transformer maintenance or failures at the Tidewater station, it is significantly more expensive than Alternative A and requires construction of an entirely new substation site.

This alternative also provides less benefit to the broader distribution system. The conversion approach described in Alternative A improves integration between the Lakeside, Stillwater Lake, and Hammonds Plains systems, while this alternative continues to rely primarily on the nearly islanded 12 kV Tidewater source.

In addition, the proposed feeder configuration under this option only resolves the projected overload on feeder 103H-432 until approximately 2032 based on current forecasts. If growth continues at recent rates, further system modifications may still be required.

For these reasons, Alternative B is not considered the preferred solution.

8.0 RECOMMENDATIONS

This study identified immediate and long-term capacity constraints affecting the 92H-Tidewater and 137H-Hammonds Plains substations. These include transformer overloads, feeder loading violations, voltage concerns, and insufficient contingency capacity. The recommended plan addresses the immediate risks at Tidewater, restores contingency capacity in the Hammonds Plains area, and provides a path to accommodate forecast load growth through the 2035 study horizon.

Immediate action is required at 92H-Tidewater. Replacement of transformer 92H-T61 with a 15/20/25 MVA unit is required to address the existing transformer overload and remove reliance on temporary mobile transformation during winter peak conditions. Construction of a fourth feeder (92H-335) is also required to offload feeder 92H-331, which currently exceeds the 325 A planning criterion and has no available load transfer options. It is recommended that a minimum of 6 km of new feeder be constructed in 2026, with an additional 2 km extension to Crouchers Point Road completed in 2027 to create additional margin for future growth.

For the Hammonds Plains area, Alternative A – construction of the Stillwater Lake substation, is recommended. This project provides the most effective solution to the identified capacity concerns by introducing a new distribution source near the Stillwater Lake and Upper Tantallon load area. This reduces loading on transformer 137H-T61, restores contingency capacity at 137H, and relieves the existing feeder overloads on 137H-411 and 137H-412. Feeder reconfigurations are recommended to address 137H-413. The Stillwater Lake substation and associated feeder reconfigurations should be completed in 2027.

Following completion of the Stillwater Lake substation, the preferred long-term solution for the Hubley and Timberlea area is Alternative A – conversion of Hubley distribution from 12 kV to 25 kV and transfer to the Stillwater Lake source. This work will reduce loading on the Tidewater substation, address forecasted overloads on 92H-332, create a new feeder tie between Stillwater Lake and 103H-Lakeside, and improve reliability for customers in Hubley and Timberlea. This work should begin in 2028 and be completed prior to the 2029 winter peak.

The existing structures at the 92H-Tidewater substation are also approaching the end of their useful life. A rebuild of the substation structures is recommended in approximately 2033. The feasibility of rebuilding this station in its current location should be evaluated as soon as possible.

Based on the preferred Hammonds Plains configuration, a second transformer at 137H-Hammonds Plains is expected to be required just beyond the study horizon, approximately in 2037, if current growth trends persist. This timing should be confirmed through a future study refresh or load forecast update before the project is advanced into the capital plan.

The recommended capital program is summarized below:

2026:

- Replace transformer 92H-T61 with a 15/20/25 MVA unit.

- Build new feeder 92H-335 and extend a minimum of 6 km along Peggy's Cove Road.

2027:

- Extend feeder 92H-335 an additional 2 km to Crouchers Point Road.
- Construct a new Stillwater Lake substation with one 25/33/42 MVA transformer and two feeders.

2028:

- Construct a third feeder from Stillwater Lake.
- Convert Hubley distribution from 12 kV to 25 kV.
- Transfer Hubley load to the Stillwater Lake substation by creating a feeder tie with 103H-Lakeside.

2033:

- Rebuild Tidewater substation structures.

2037:

- Install a second transformer at 137H-Hammonds Plains.

Implementation of these projects will restore compliance with planning criteria, provide sufficient contingency capacity, and accommodate forecast load growth in the Tidewater and Hammonds Plains areas through the study horizon. Continued monitoring of development activity in the Bedford West, Sandy Lake, and Hubley/Timberlea areas is recommended to confirm project timing and identify any requirement to advance long-term work.

Appendix A

System Operating Diagram

[redacted]

[redacted]

Appendix B

Preliminary Assessment

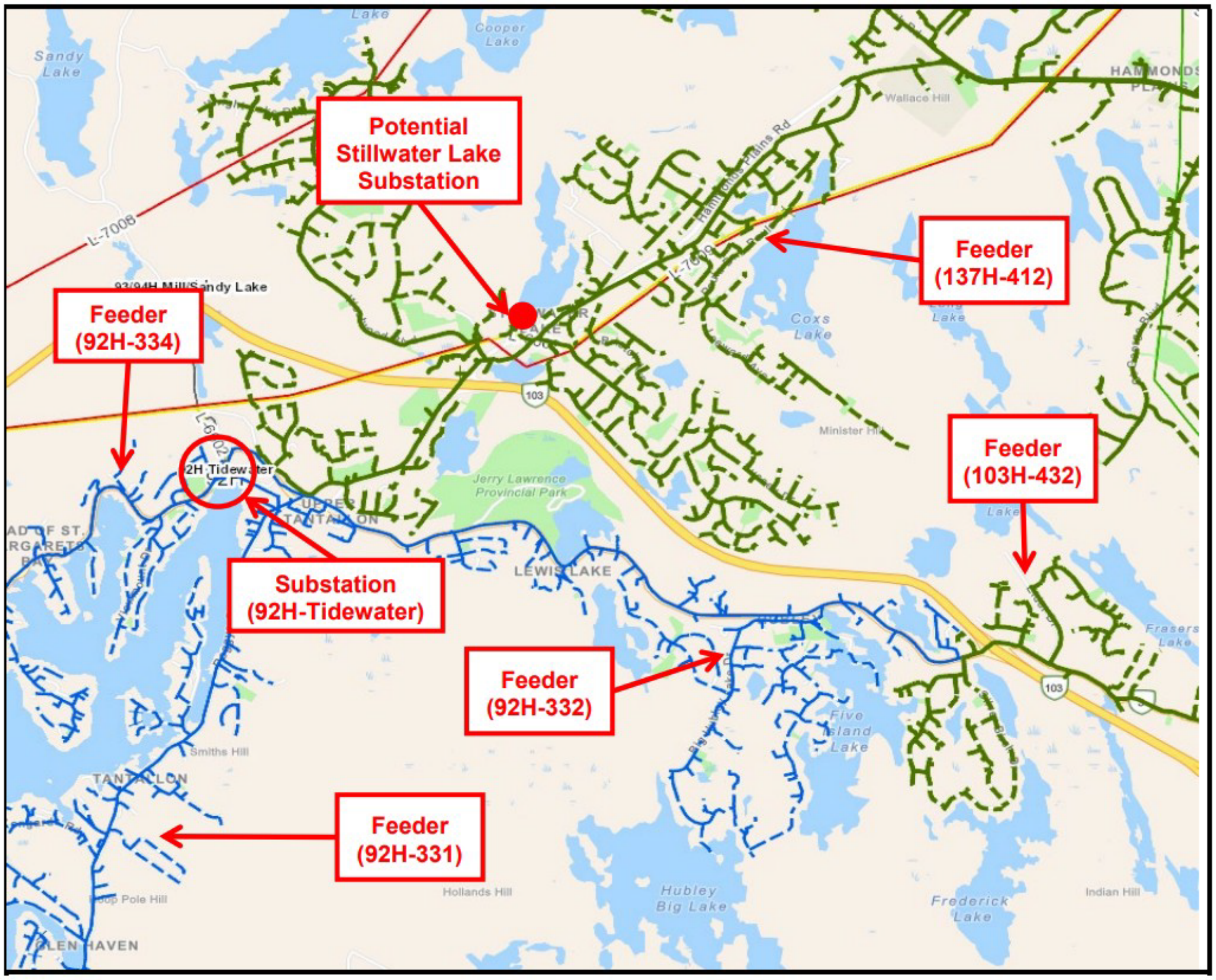
Proposed Tidewater Area Area/Planning Study Metro Region			
Prep. By:	BH	June 28, 2024	Page 1 of 2

Project	The purpose of this preliminary assessment is to identify projects based on CEJC criteria that require urgent action due to the long lead-time of equipment and land procurement, engineering design, and construction. A planning study will be executed in parallel with initial project stages to provide more detailed analysis and comparison of alternatives.
Why do this project?	There are several existing and forecasted capacity issues in the area. The 92H-T61 transformer and 92H-331 feeder at Tidewater substation are severly overloaded. There is only one adjacent 12 kV source from 87W-Hubbards and transfer capability is very limited. It is recommended to initiate a capital project to secure transformer production slots, procure real estate, begin preliminary design, and perform a full area planning study.
Why do this project now?	Transformer 92H-T61 would reach 170% loading, based on 2023 winter peak, without the hydro generation from Tidewater, Sandy Lake and Mill Lake. This transformer has a maximum risk score of 25 and a risk-adjusted life expectancy of 2025. Feeder 92H-331 is loaded well beyond 325 A CEJC criteria and has severe cold load pickup issues as seen during the February 4 extreme cold event. Adjacent 25 kV feeders are overloaded and major developments are anticipated. A new 25 kV source in the area may be the best long-term solution.
Why do this project this way?	There are several no regrets investments that can be made based on the preliminary analysis of the area. These investments must be initiated as soon as possible due to the long lead-time for procurement and construction, and cannot wait for a full area planning study to be published.
High Level Estimates	The estimated project costs are as follows: replace 92H-T61 ($3M), double-circuit 3km on Peggy's Cove Rd ($1.1M), build Stillwater Lake substation ($10M). Other estimates will be determined in the planning study once alternatives are selected.

Relevant Subtations			
Substation ID	92H-TIDEWATER	137H-HAMMONDS PLAINS	87W-HUBBARDS
Transformer ID	92H-T61	137H-T61	87W-T61
Voltage (kV)	138-13.2	138-26.4	138-13.2
Transformer Rating (MVA)	7.5/10/12.5	25/33/42.0	7.5/10/12.5
2024 Peak Load (MVA)	21.3	48.0	0

Relevant Feeders				
Feeder Circuit ID	92H-331	92H-332	103H-432	137H-412
2024 Peak Load (Amps)	369	230	318	350
2033 Forecast (Amps)	438	267	495	386

Proposed Tidewater Area Area/Planning Study Metro Region		Nova Scotia POWER An Emera Company
NSPI: Existing Distribution System Assets	Page 2 of 2	



Justification Criteria
92H-331 and 137H-412 exceed 325 A during winter peak; 103H-432 is at capacity.
92H-T61 load greatly exceeds 130% during winter peak; it is in poor condition at maximum (25) risk score.
Significant developments are expected in Hammonds Plains and Beechville-Timberlea.

Next Steps
Replace 92H-T61 as soon as possible (2026)
Investigate potential real estate for a Stillwater Lake substation.
Create a Placeholder for Stillwater Lake power transformer in 2027.
Prioritize a project to double circuit 3km on Peggy's Cove Rd. to offload 92H-331 to just under 325 A
Determine best alternative to address 137H-412 overload and Hammond's Plains load growth.
Determine best alternative to address 103H-432 overload and Beechville-Timberlea load growth.
Determine best alternative to address long-term growth on 92H-331.
Publish a planning study to evaluate alternatives over a 10-year study window.

Appendix C

Economic Assessment Model

Hammonds Plains Capacity
Summary of Alternatives

Division :	NS Power	**Date :**	**6-Mar-26**
Department :	Distribution Planning	**CI Number:**	
		Project No. :	

	Alternative	After Tax WACC	PV of Revenue Requirement	PV of EVA / NPV	Rank (based on PV of RR)	IRR	Disc Pay
A	Stillwater Lake Substation	5.77%	10,061,970	-10,105,823	1	-9.32%	0.0 years
B	137H Additional Transformer	5.77%	15,653,301	-14,919,930	3	-8.78%	0.0 years
C	Lucasville Feeders	5.77%	15,578,815	-14,377,163	2	-8.64%	0.0 years
	0	NA	NA	NA	NA	#NUM!	0.0 years

Recommendation :

Alternative A – construction of the Stillwater Lake substation – is recommended. This option restores contingency capacity at 137H, resolves existing feeder overloads, and provides a new distribution source near the growing Stillwater Lake and Upper Tantallon load area. It also represents the lowest capital cost and avoids the significant construction challenges associated with building long feeders along Hammonds Plains Road

Notes/Comments :

Stillwater Lake Substation

This alternative involves constructing a new substation in the Stillwater Lake area supplied from the 138 kV transmission system. New distribution feeders would be established from this station and existing 137H feeders would be reconfigured to transfer load from the Hammonds Plains substation to the new source. This reduces loading on transformer 137H-T61 and restores feeder loading margins while creating a new distribution source closer to the growing load in the Stillwater Lake and Upper Tantallon areas.

137H Additional Transformer

This alternative adds a second transformer at the existing 137H Hammonds Plains substation and constructs additional distribution feeders to redistribute load among the feeders serving the area. Feeder extensions along Hammonds Plains Road would transfer load away from the existing overloaded feeders and provide additional capacity supplied from the expanded 137H station.

Lucasville Feeders

This alternative involves constructing new distribution feeders from the 131H Lucasville substation to supply load currently served by the Hammonds Plains substation. These feeders would extend into the Stillwater Lake area and enable reconfiguration of existing feeders to offload 137H and increase available contingency capacity.

Tidewater Capacity
Summary of Alternatives

Nova Scotia POWER An Emera Company

Division :	NS Power	**Date :**	**4-Mar-26**
Department :	Distribution Planning	**CI Number:**	
		Project No. :	

	Alternative	After Tax WACC	PV of Revenue Requirement	PV of EVA / NPV	Rank (based on PV of RR)	IRR	Disc Pay
A	Hubley Conversion and Transfer	5.77%	8,080,983	-7,791,070	1	-9.19%	0.0 years
B	Tidewater Expansion	5.77%	12,231,911	-11,528,346	2	-8.61%	0.0 years
	0	NA	NA	NA	NA	#NUM!	0.0 years
	0	NA	NA	NA	NA	#NUM!	0.0 years

Recommendation :

Alternative A – conversion of the Hubley distribution system to 25 kV and transfer to the Stillwater Lake substation – is recommended. This option reduces loading on the Tidewater substation while leveraging the new Stillwater Lake source and improving reliability through additional feeder ties with the Lakeside distribution system.

Notes/Comments :

Hubley Conversion and Transfer

This alternative converts portions of the Hubley distribution system from 12 kV to 25 kV and transfers this load to the proposed Stillwater Lake substation. The conversion would be completed in phases and would allow load currently supplied from the Tidewater substation to be served from a nearby 25 kV source

Tidewater Expansion

This alternative involves constructing a new Tidewater substation at a nearby location and relocating the replacement 25 MVA transformer to the new facility. Additional feeder capacity would then be constructed from the new station to supply the Hubley area and relieve loading on the existing Tidewater distribution feeders.