

NON-CONFIDENTIAL

Request IR-1:

As the application noted, this project was approved as part of 2025 Annual Capital Expenditure (ACE) Plan with an estimated budget of \$2,478,537. This ATO application has increased the approved budget cost by \$4,358,247, bringing the total cost of the project to \$6,836,784. The project application noted that the L5004 is a 13.06-kilometer 69kV transmission line that was originally built in 1966 and this project includes the removal of nine existing wooden pole structures and replacing them with six new steel poles.

In response to NSEB IR-116(d), and noting that these IRs were issued as part of the original application for Matter M12012: the 2025 ACE Plan, the utility stated the following:

...The project will relocate the existing structure from Kearney Lake to the shoreline Addressing any issues with structures located inside a body of water is expected to take a long time due to the need for permissions and access to replace the structure in the lake....

In response to NSEB IR-116(b), Matter M12012: 2025 ACE Plan, the utility provided a plan-view drawing in Attachment 2 showing the locations of both the existing and new structures. Board Staff's analysis of the drawing indicates that only one existing structure (L5004-047) will be relocated from Kearney Lake to the shoreline.

In response to NSEB IR-12(b), M11707: L6549 – Replacement and Upgrades Phase 2, the utility indicated that the estimated cost of a full 138 kV structure replacement ranges from \$34K to \$120K. However, Board Staff notes that the project in the application is a 69 kV transmission line, so the associated cost would generally be expected to be lower.

(a) Please confirm Board Staff's understanding that only one existing structure is being relocated from Kearney Lake to the shoreline. If this is incorrect, please provide a list of all structures being relocated to the shoreline, along with their original and new coordinate positions.

NON-CONFIDENTIAL

(b) Please list all required permissions and permits needed to replace the existing wooden structures, including their jurisdiction, expected timelines for obtaining them, and associated costs.

(c) How much delay was expected in getting the permissions and permits during the original submission of the project in ACE 2025.

(d) What environmental agency expectations apply to the removal of the existing frames?

Response IR-1:

(a) Confirmed. One structure must be removed from Kearney Lake. Structure L5004-047 is currently located in the lake.

(b) Please refer to the table below.

Permit Description	Jurisdiction/Body	Estimated timelines	Estimated Cost (\$)
Increased encroachment request into the lake	NS Department of Natural Resources – Submerged Crown Land License	2-6 months	1,868
Request to perform work in and around the lake	- Nav. Canada – Land use Notification - Transport Canada Civil Aviation – Aeronautical Assessment Form - Navigation Protection Program – Work on a Non-Scheduled waterway	6-12 months	0
Request to do construction at the Kearney Lake beach access	Halifax Parks	1-2 months	0

NON-CONFIDENTIAL

Permit Description	Jurisdiction/Body	Estimated timelines	Estimated Cost (\$)
Traffic control and lane closure / diversion, including bike lane disruption	Halifax Regional Municipality and DPW – Work Within Highway ROW	2-6 months	0
Temporary removal of road barrier for construction	Halifax Regional Municipality	2-6 months	0
Working in proximity of underground water main	Halifax Water	1-2 months	0
Pole butt removal from lakebed	NS Department of Natural Resources	2-3 months	0
Request to take the line out for 8 weeks (non-recallable)	NS Power outage coordination		0

Please note that internal NS Power labour is required to prepare, submit, coordinate, and obtain approvals for each permit application and regulatory request noted above. Based on previous experience, each request typically requires approximately 6 to 8 labour hours for application preparation, supporting documentation, stakeholder coordination, response to agency inquiries, and permit closeout activities through approval.

(c) NS Power originally estimated a maximum of 6-12 months.

(d) For the removal of pole butts associated with the structure located within the lake, approval from the Nova Scotia Department of Natural Resources is required prior to undertaking any work. Removal activities shall be conducted in a manner that avoids any disturbance to the lakebed, shoreline, or surrounding aquatic environment. All other wooden structures will be removed and disposed of in accordance with NS Power's standard construction and disposal practices and all applicable regulatory requirements.

NON-CONFIDENTIAL

Request IR-2:

- (a) Please identify and provide any significant incremental information discovered during the supplemental geotechnical investigation detailed in Attachment 2 to the application, dated April 16, 2025. Specifically those that required structure designs that were much more costly than originally anticipated in the 2025 ACE Plan, which presumably incorporated the findings of the initial geotechnical investigation detailed in Attachment 1 to the application, dated November 20, 2020.**
- (b) Please explain why the proposed structural design changes could not have been identified solely from the geotechnical investigation dated November 20, 2020.**
- (c) Please explain what factors triggered the need for supplemental geotechnical investigation, and why are those activities not considered part of preliminary engineering?**

Response IR-2:

- (a) The two geotechnical investigations were conducted independently and addressed different structure locations. The initial investigation, completed in 2020, evaluated Structures 44, 45, 46, and 47, while the second investigation completed in 2025 provided foundation recommendations for Structures 43 and 50.**

The second investigation did not identify a new geotechnical condition at locations previously assessed in 2020 that resulted in a significant change in foundation design. Rather, it provided site-specific geotechnical information for additional structure locations that had not been included in the initial investigation. Based on soil conditions identified, the limited available land within the existing NS Power transmission right-of-way made a guying option not feasible, and the significant loading demands determined by the self-

NON-CONFIDENTIAL

1 supporting long-span steel pole design, Structures 43, 44, and 45 require micro pile
2 foundations to safely support the structures under full design load conditions.

3
4 The foundations were engineered and designed by the project consultant based on site-
5 specific geotechnical conditions and structural loading requirements.

6
7 (b) Please refer to part (a). The foundation designs were finalized in 2025 upon completion of
8 all six geotechnical investigations and the associated structural loading calculations for
9 each steel transmission structure. The structural loading analyses were performed by the
10 selected steel pole manufacturer and could not be completed prior to finalizing the steel
11 pole supplier selection. As a result, both the structural loading and foundation designs were
12 finalized in 2025.

13
14 (c) Please refer to part (a). The initial geotechnical study conducted in 2020 was undertaken
15 to support early project development and assessed only Structures 44, 45, 46, and 47. At
16 that stage, the final project scope, structure configurations, and foundation requirements
17 had not yet been fully developed to a Class 3 estimate that would allow for detailed
18 foundation design or an accurate estimate of foundation costs.

19
20 As the project advanced in 2024, additional geotechnical information was required for
21 Structures 43 and 50 to support the detailed engineering design of the transmission line
22 structures and foundations. The second investigation completed in 2025 provided site-
23 specific foundation recommendations for those locations and enabled the final foundation
24 designs to be developed based on actual soil conditions and structural loading
25 requirements.

26
27 These activities are considered preliminary engineering despite occurring later in the
28 project because they were undertaken to support the detailed engineering and final
29 foundation design of the project scope, structure locations, and loading requirements. The

NON-CONFIDENTIAL

- 1 2025 investigation provided information necessary to engineer and design the foundations
- 2 for the finalized project scope and to accurately determine construction costs.

NON-CONFIDENTIAL

Request IR-3:

On page 2, the application notes that

“While NS Power did investigate an alternative transmission route to avoid a complex water crossing, this alternative was not viable, and the best option remained the installation of the steel poles with concrete foundation within NS Power’s existing transmission line Right-of-Way easement.”

(a) Please provide a cost estimate to replace a single 69-kV transmission line structure, including a breakdown by task and component.

(b) Given the significant cost increase has the utility considered doing like for like replacement of the existing wooden pole structure.

(c) Please provide the cost replacing the existing structure with like for replacement structures.

(d) Did NS Power consider using guyed structures, such as H-Grame or Three Pole, to achieve the desired single span crossing of the lake between proposed new structures #46 & #47, as shown on page 27 of 28 of Attachment 1 to the application?

(i) If yes, what was the estimated cost of using guyed structures?

(ii) If no, please explain why not, considering that guyed structures could have significantly reduced the foundation requirements for these crossing structures. Board staff understands that replacing all existing structures on a like-for-like basis using wood-pole H-frame structures may have reduced the environmental permitting requirements. Board staff also understand that the crossing structures may require guys fore and aft, and that this need could have been confirmed during detailed design Please provide engineering

NON-CONFIDENTIAL

1 **documentation demonstrating that guyed structures would not have been**
2 **feasible for this project.**

3
4 **(e) Please provide an all-in Net Present Value comparison of the operating and capital**
5 **carrying costs for the proposed rebuild using structures with 100-year expected**
6 **service lives versus a like-for-like rebuild using wood structures with typical expected**
7 **service lives. Please provide the analysis in an Excel sheet, including all formulas and**
8 **underlying assumptions.**

9
10 **(f) Would achieving a 100-year useful life, as proposed in this application, require**
11 **rebuilding the entire line with similar structures?**

12 **(i) If yes, please estimate the capital cost of the required rebuild.**

13
14 Response IR-3:

15
16 (a) On average, a typical 69 kV has a replacement cost range of \$5K – \$125K. Due to the
17 location of the existing structures and the nature of the design, the standard cost associated
18 with rebuilding a 69 kV transmission structure is not applicable. One structure is currently
19 located within the lake, while two additional structures are situated along the shoreline
20 adjacent to the roadway. As a result, compared to a more typical project, significant
21 additional construction costs will be incurred to replace these structures due to the
22 challenging site conditions and limited access.

23
24 (b) Given the strategic and grid level importance of L-5004, NS Power does not support the
25 installation or replacement of transmission structures within bodies of water from a safety,
26 access, and reliability perspective whenever a viable alternative exists. A like-for-like
27 replacement within the lake is inconsistent with NS Power's goals to enhance reliability
28 for customers while maintaining public safety. The removal of this structure from the
29 waterway will strengthen the transmission network, helping to support reliable service.

NON-CONFIDENTIAL

1 (c) A cost comparison was not performed, as no other technically viable alternatives were
2 identified.

3
4 (d) As the water crossing spans are modified/re-built in this project, NS Power is obligated to
5 meet the latest CSA 22.3 standard clearance requirements. To meet Class 4 water body
6 clearances, structures and poles that are to be replaced have to be over 100 feet tall and
7 combined with the long span and line angles created due to the removal of the structure in
8 the lake, such structures would need guying. There is limited transmission right-of-way
9 easements in this area to construct guyed structures (please refer to images below). Both
10 the importance of this transmission line to the overall Nova Scotia transmission system and
11 the challenges in building in this urban location, the structure types for this project were
12 selected accordingly.

13
14 **Structure-43 Existing**



NON-CONFIDENTIAL

1 **Structure-44 Existing**



2
3
4 **Structure-45 Existing**



NON-CONFIDENTIAL

1

Structure-46 Existing



2

3

4

Structure-46A Existing (to be removed)



5

6

NON-CONFIDENTIAL

1 **Structure-47 Existing (to be removed from the lake)**



2

3

4 **Structure-48 Existing (on the beach)**



5

6

NON-CONFIDENTIAL

1 **Structure-49 Existing (to be eliminated)**



2

3

4 **Structure-50 Existing**



5

6

NON-CONFIDENTIAL

1 Based on the transmission line design calculations and simulation results, wood pole
2 structures are not considered a feasible long term reliable solution.

3
4 (i) N/A.

5
6 (ii) Please refer to part (c).

7
8 (e) A cost comparison was not performed, as no other technically viable alternatives were
9 identified. Please also refer to part (d).

10
11 (f) Yes; however, the remaining structures along Line L5004 would be upgraded using NS
12 Power's standard 138 kV wood pole transmission line structures. The six structures
13 included in this project are unique due to the long-span Kearney Lake crossing and the
14 associated site-specific design requirements. No cost estimate has been developed for
15 upgrades to the remaining portions of Line L5004, as such work is not anticipated in the
16 near term and is not within the scope of the current project.

NON-CONFIDENTIAL

Request IR-4:

Please provide the amounts spent to date, itemized by task.

Response IR-4:

Please refer to the table below.

Description / Task	Actual spend to date (CAD \$)
Six steel poles	605,562
Tree Trimming / ROW Clearing	9,500
Construct Road Access to L-5004#050	72,855
QA/QC checks (steel poles)	8,338
Transmission Line Engineering Design	69,000
Engineering Foundation Design (inclusive of geotechnical study & optimization)	83,952
Civil drawings for construction- site plans	22,068
Construction Staking	8,624
Survey and Topography Study	12,640
Site Visit -Travel & Meal Expenses	31,000
Import Duty Tariffs and Tax charges for Steel Poles	126,139
Internal NS Power field labour, as well as Admin Overheads	276,028
Total spent to date (Aug 2026)	1,325,706