REDACTED

NORTHERN UTILITIES, INC.

DIRECT TESTIMONY OF
ROBERT S. FURINO

EXHIBIT NUI-RSF-1

New Hampshire Public Utilities Commission
Docket No. DG 19-___

June 28, 2019

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I. INTRODUCTION AND SUMMARY

Q. Please state your name and business address.

A. My name is Robert S. Furino. My business address is 6 Liberty Lane West, Hampton, New Hampshire.

Q. What is your position and what are your responsibilities?

A. I am the Director, Energy Contracts of Unitil Service Corp. ("Unitil Service") which provides centralized utility management services to Unitil Corporation's subsidiary companies. I am also a Vice President of Unitil Corporation's utility operating subsidiaries Fitchburg Gas and Electric Light Company, Northern Utilities, Inc. ("Northern" or the "Company"), and Unitil Energy Systems, Inc. My responsibilities are primarily in the areas of wholesale supply procurement and management of retail supplier programs.

Q. Please describe your educational background and professional experience in the energy and utility industries.

A. I received a Bachelor of Arts degree in Economics from the University of Maine in 1991 and completed coursework toward a Master of Arts degree also at the University of Maine. I joined Unitil Service in March 1994 as an Associated DSM Analyst in the Regulatory Services Department and have worked in the Regulatory, Product Development, Finance and Energy Contracts departments, while assuming positions of increasing responsibility. I have been in my current position since 2008.

Q. Have you previously testified before the New Hampshire Public Utilities Commission or other regulatory agencies?

A. Yes. I testified in support of Northern's 2015 Integrated Resource Plan (DG 15-033). In Massachusetts, I provided testimony before the Department of Public Utilities in support of natural gas Integrated Resource Plans and electric long-term renewable contracts. In Maine, I have testified before the Maine Public Utilities Commission in support of natural gas contract approval filings, retail choice rules, Integrated Resource Plans and other gas supply matters. Dating back to the implementation of UES's electric industry restructuring in 2003 and continuing until 2011, I regularly submitted testimony to obtain New Hampshire Public Utilities Commission ("Commission") approval of electric transition/ default service procurements and resulting rates.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to describe the Company's decision to enter into certain precedent agreements with Portland Natural Gas Transmission System ("PNGTS"), TransCanada Pipelines Limited ("TransCanada") and Enbridge Gas, Inc.[1] ("Enbridge") for a firm natural gas pipeline transportation path from Dawn, Ontario to Granite State Gas Transmission, Inc.'s ("Granite") interconnects as part of PNGTS' Westbrook XPress Phase III Project (the full capacity path is referred to herein as "WXP Capacity" or "WXP Project"; the precedent agreements are collectively referred to herein as the "WXP PAs" or the "Agreements"). The WXP PAs will provide Northern the ability to transport 10,000 Dth/day of natural gas from Dawn to Granite for a 15-year initial term, with an

[1] Formerly known as Union Gas Limited.

option to extend. The projected in-service date for Westbrook XPress Phase III is November 1, 2022. Applying the Company's latest design year forecast for the 2022-2023 gas year, approximately 4,200 Dth/day of the proposed capacity will be supported by New Hampshire Division customers.[2] My testimony will demonstrate that the Company's decision to execute the WXP PAs is prudent, reasonable and consistent with the public interest.

Q. Please describe the WXP PAs impact upon the Company's resource portfolio.

A. Northern's projected portfolio as of November 1, 2022 includes long-term resources capable of delivering a maximum daily quantity ("MDQ") of 89,593 Dth, which includes 7,500 Dth of Atlantic Bridge pending capacity and 9,965 Dth of Portland Xpress Phase III Project ("PXP") pending capacity.[3] The proposed WXP Capacity would increase the MDQ of long-term resources in the portfolio to 99,558 Dth, an increase of 9,965 Dth[4] or percent (11%), and enhance reliability and price stability for Northern's customers by moving existing receipts points away from an area where supply is declining and toward an area where supply is increasing. The proposed WXP Capacity will initially replace supply that Northern currently buys as delivered peaking supply on PNGTS or Maritimes & Northeast U.S. ("Maritimes"), which is an illiquid market due to limited supplies and competing demand from markets in Maine and Atlantic Canada, with supply that can be purchased at the Dawn Hub, a highly liquid trading point, offering access to multiple pipeline interconnects and many trading companies as well as underground storage

[2] The Modified Proportional Responsibility Allocator, which is used to allocate demand costs, is based on Design Year utilization.
[3] Volume of 9,965 Dth/day reflects an MDQ of 10,000 Dth/day less 0.35% fuel reimbursement to Granite.
[4] The WXP Capacity is 10,000 Dth/day less 0.35% fuel reimbursement to Granite.

facilities. The proposed WXP Capacity would be releasable to retail marketers under the Company's Delivery Service Terms and Conditions.

Ongoing regional constraints in pipeline capacity and dwindling supply from Atlantic Canada sources have resulted in high and volatile winter market prices for natural gas consumers. At this time, there are no pipeline capacity options into northern New England other than projects that access mainland Canadian receipts via PNGTS. By the time WXP Phase III is placed into service in late 2022, PNGTS' system capacity will be approximately 400,000 Dth/day, nearly double its legacy design capacity of 210,840 Dth/day, and PNGTS is expected to be fully subscribed under long-term contracts that extend to 2032 and beyond with shippers such as LDCs who are likely to renew their capacity.[5] Although Granite and Northern's system wraps around PNGTS on the so-called Joint Facilities,[6] supplies delivered via the Joint Facilities cannot be expected to be available during colder portions of the winter period unless Northern reserves capacity. The WXP Capacity will reduce Northern's need for peaking resources. However, even after the WXP Capacity is put into service Northern will continue to have significant long-term peaking needs. If the pending Atlantic Bridge and PXP capacity and the proposed WXP Capacity are all placed into service and defined as pipeline capacity, Northern's portfolio would include two-third pipeline and storage and one-third peaking.[7]

[5] Portland Natural Gas Transmission System presentation, NGA Regional Market Trends Forum, April 25, 2019, slide 7.
[6] The Joint Facilities are the shared pipeline from Westbrook, Maine, to Dracut, Massachusetts, that is jointly owned by PNGTS and Maritimes ("Joint Facilities").
[7] Northern's 2022/23 design day planning load is projected to be 147,664 Dth. Pipeline and Storage would be 93,058 Dth (63 percent) and Peaking would be 48,381 Dth (37 percent).

Q. Please explain why the Company has requested an expedited review from the Commission.

A. The precedent agreements with PNGTS and with Enbridge allow Northern to terminate those agreements without liability if all approvals from jurisdictional regulatory authorities that the Company determines are necessary in connection with the WXP Capacity have not been obtained by October 31, 2019.[8] Thus, the Company respectfully requests that the Commission conduct an expedited review of the Agreements and issue an Order by October 31, 2019 to allow Northern to provide timely notice of satisfaction of the conditions precedent (or lack thereof). Complete copies of the Agreements are attached hereto as Appendix 1-A CONFIDENTIAL (PNGTS), Appendix 1-B CONFIDENTIAL (TransCanada) and Appendix 1-C CONFIDENTIAL (Enbridge). Highlighted text in the CONFIDENTIAL versions of the Agreements reflects material that has been redacted in the REDACTED versions.

II. BACKGROUND ON RESOURCE PLANNING

Q. Please describe the Company.

A. Northern is a local distribution company ("LDC") providing natural gas supply and distribution service to customers in the states of Maine and New Hampshire. Its predecessor companies date back over 160 years to the Portland Gas Light Company, which was formed in 1849. In 1979, Northern was acquired by Bay State Gas Company ("Bay State"), and in 1999, Northern and Bay State were acquired by NiSource, Inc. In

[8] The Enbridge and PNGTS precedent agreements were amended to extend this termination right from September 30, 2019 to October 31, 2019.

2008, Unitil Corporation purchased Northern from NiSource, Inc. As of year-end 2018, Northern provides service to approximately 33,071 customers in 23 communities in southern Maine and to approximately 33,715 customers in 22 communities in the seacoast region of New Hampshire. Northern's highest annual throughput was 19,760,331 Dth, which occurred during the split-year of November 1, 2017 to October 31, 2018. Northern's maximum daily throughput was 146,749 Dth, which occurred on January 21, 2019.

Q. **Please describe the Company's supply portfolio and the resource planning process that resulted in the execution of the WXP PAs.**

A. Northern manages a dynamic supply portfolio with the objective of delivering reliable natural gas service to its customers at a reasonable cost. To achieve this objective within shifting market, operational, and regulatory conditions, the Company has developed a portfolio that is diverse, with contracts on multiple pipeline paths that provide access to several gas supply basins, and comprises a variety of assets (e.g., flowing supplies, natural gas storage, and LNG facilities). Having identified a need for long-term peaking capacity in its portfolio, Northern monitored and evaluated pipeline options being provided by TransCanada and PNGTS, issued a Request for Proposals ("RFP") for delivered peaking supplies seeking proposals for a term of 3 to 5 years, and hired a full-time consultant to explore non-pipeline gas supply alternatives. [BEGIN CONFIDENTIAL] [redacted]

[redacted] [END CONFIDENTIAL]. The delivered peaking supply contract provides assurance of supply in the near term and provides Northern time, working with its consultant, to identify viable non-pipeline supply options to meet its remaining peaking capacity needs. Northern is not seeking pre-approval of this delivered peaking supply contract.

As described herein, Northern evaluated the WXP Capacity to be superior to the other pipeline offering from TransCanada and PNGTS and competitively priced relative to a delivered supply alternatives, as well as to have valued qualitative attributes including reliable and renewable access to supply as well as cost mitigation opportunities. As such, when presented with the opportunity to acquire the proposed capacity, Northern committed to the projects and ultimately entered into the WXP PAs.

The WXP Project was driven by projects announced by TransCanada and Enbridge, for which PNGTS then offered capacity to successful bidders on the upstream projects. On August 22, 2018, TransCanada issued an open season for long-term fixed price ("LTFP") service from Empress, Alberta to North Bay Junction in Ontario along with an associated open season for new capacity from North Bay Junction to East Hereford, the interconnect with PNGTS ("North Bay Junction LTFP Open Season"). Service under the North Bay Junction LTFP Open Season included discounted and fixed prices from Empress to North Bay Junction and tariff rates from North Bay Junction to East Hereford for a 15 year term, but did not include provisions for renewal under comparable terms. Ultimately, Northern concluded that although commodity pricing at

Empress might offer advantages and would diversify receipt points, Northern would be unable to utilize the capacity sufficiently to merit a commitment given the high demand charges. TransCanada's North Bay Junction LTFP project led to PNGTS' WXP Phase I and Phase II projects.

On October 15, 2018, TransCanada issued a New Capacity Open Season for Firm Transportation service with targeted in-service dates of November 1, 2021 and November 1, 2022 ("NCOS 21/22"), which was coordinated with an Enbridge open season initially issued on August 29, 2018 and then extended on October 10, 2018 ("Enbridge Open Season"). Northern bid for capacity in the NCOS 21/22 and the Enbridge Open Season in mid-November, 2018 and was awarded capacity on both projects in early December 2018. In late December 2018, Northern agreed to general commercial terms with PNGTS for service on the WXP Phase III project. The contracts with TransCanada and Enbridge are largely form contracts with very limited room to negotiate terms. Contract negotiations with PNGTS concluded in February 2019 and precedent agreements with each of the three pipelines were signed with an effective date of February 28, 2019.[9] PNGTS then issued an open season for WXP Phase III on March 6, 2019. The WXP Phase III open season announcement is attached as Appendix 2-A, the NCOS 21/22 announcement is attached as Appendix 2-B and the Enbridge Open Season announcement is attached as Appendix 2-C.

[BEGIN CONFIDENTIAL] [redacted]

[redacted]

[9] Northern signed the three precedent agreements on or about February 28, 2019, but did not have signatures from all counterparties until April 1, 2019.

[redacted] [END CONFIDENTIAL]

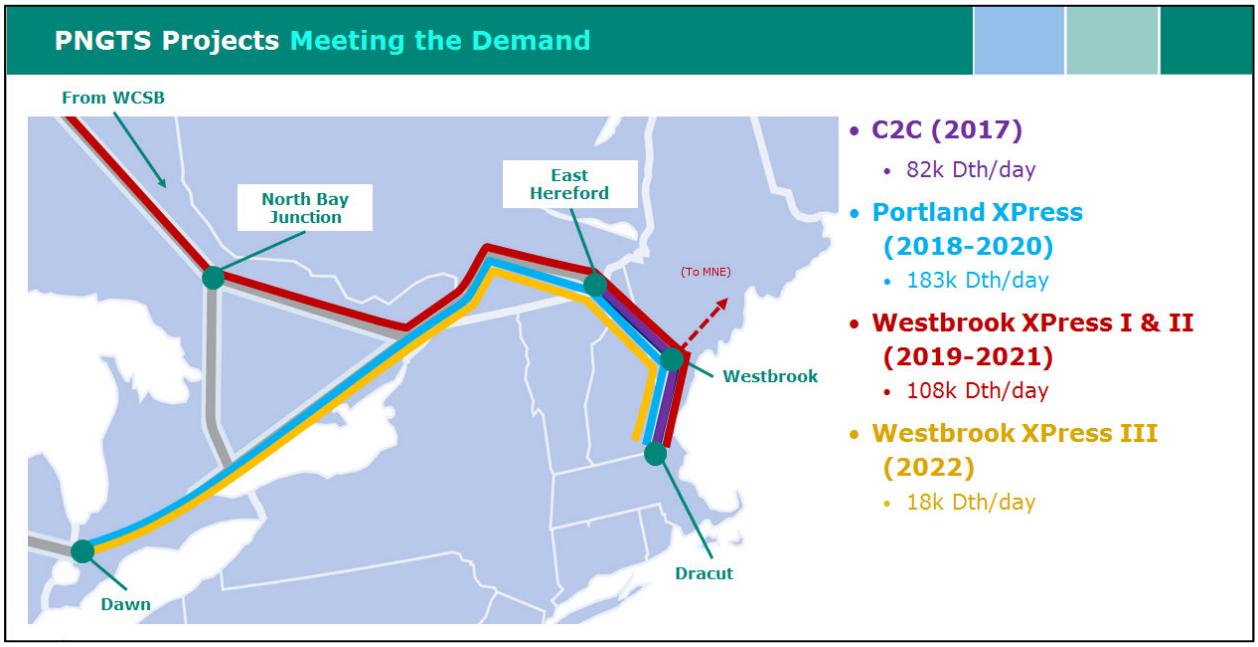
Q. Please describe the WXP Project.

A. PNGTS' Westbrook Xpress Project will be implemented in three phases. Phase I provides 42,652 Dth/d beginning November 1, 2019. PNGTS filed their certificate application for Phase I with the Federal Energy Regulatory Commission ("FERC") on December 21, 2018.[10] Phase II provides 63,242 Dth/d beginning November 1, 2021 and Phase III provides another 18,040 Dth/d beginning November 1, 2022. In total, WXP is

[10] Abbreviated Application for Certificate of Public Convenience and Necessity and Presidential Permit Amendment, December 21, 2018, CP19-32.

designed to provide 123,934 Dth per day of service.[11] Planned expansion facilities to support WXP include a new compressor to be located in Westbrook, Maine. Figure 1 summarizes the recent TransCanada and PNGTS projects.

Figure 1: Summary of PNGTS Projects[12]



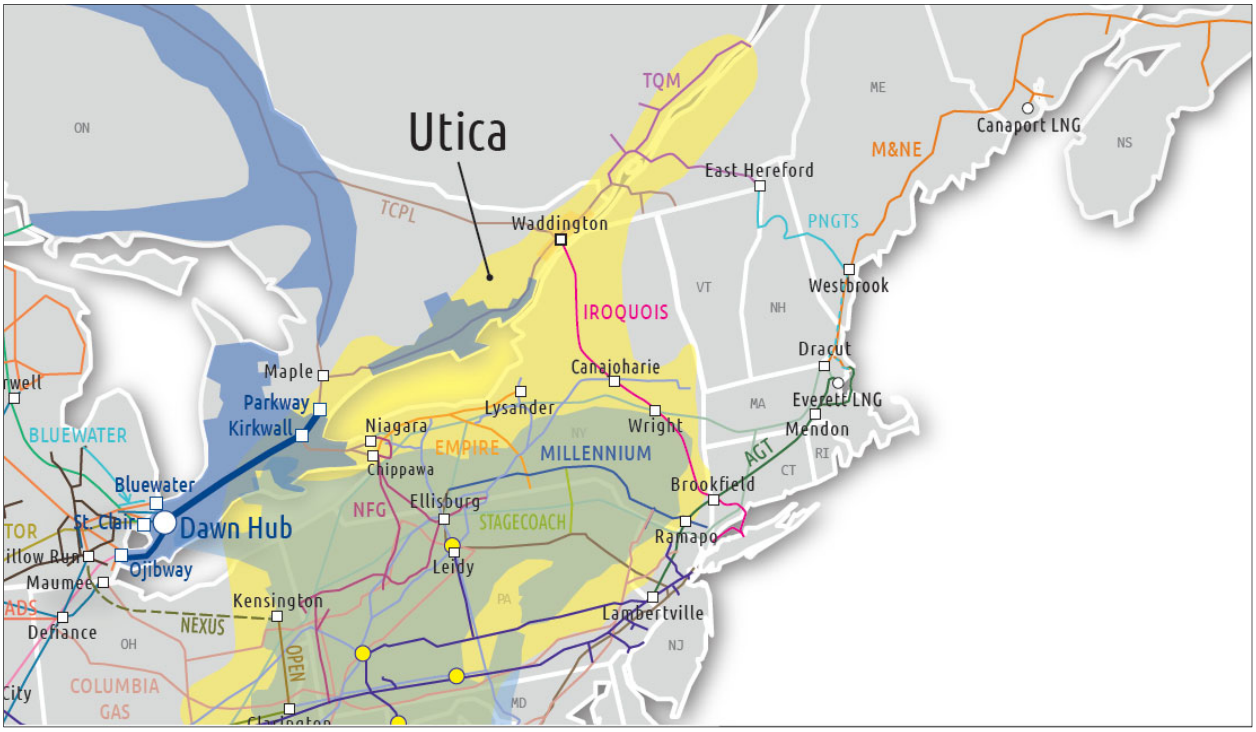
Northern entered into the WXP PAs in order to reduce reliance on delivered supplies. The proposed capacity would reduce 2022-23 design day reliance upon delivered supply from thirty-nine percent (39%) to thirty-two percent (32%).[13] Long term reliance upon delivered supply poses the risk of inconsistent availability and exposes customers to high demand costs and/or volatile price spikes. Northern projects

[11] Portland Natural Gas Transmission System presentation, NGA Regional Market Trends Forum, April 25, 2019, slide 7.
[12] Source: Provided by Portland Natural Gas Transmission System.
[13] Projected 2022-23 Design Day Planning Load equals 147,664 Dth (See Table 3). Total pending Pipeline, Storage and on-system Peaking Capacity without the WXP Capacity is equal to 89,593 Dth, leaving 58,071 Dth (39%) requiring delivered service. Proposed total Pipeline, Storage and on-system Peaking Capacity including the WXP Capacity would be equal to 99,558 Dth, leaving 48,106 Dth (32%) requiring delivered service. See Figure 14 and Figure 19.

WXP utilization to be 167 days under design conditions, or 86 percent utilization rate during the winter period or 43 percent annually in the first year following the in service date.[14]

The proposed WXP Capacity provides access to the Dawn Hub, which, as described further below, offers access to underground storage, interconnects with major pipelines and many active trading companies. The map in Figure 2 below shows the location of the Dawn Hub, the Utica shale (orange area), Marcellus shale (green area) and the pipeline infrastructure in the region.

Figure 2: Map of Dawn Hub and Regional Pipeline Infrastructure[15]



III. THE PRECEDENT AGREEMENTS

[14] See Appendix 4, page 3.
[15] Source: https://www.uniongas.com/storage-and-transportation/resources/maps

Q. Please summarize the terms of the WXP PPAs.

A. Northern executed precedent agreements, effective as of February 28, 2019, with PNGTS, TransCanada and Enbridge for the transportation capacity associated with the WXP III Project. Under the Portland Xpress Project, PNGTS contracted with TransCanada and Enbridge for upstream capacity back to Dawn, Ontario, which will be assigned to the project shippers for effect upon the in-service date. Under the Westbrook Xpress Project, project shippers are required to directly acquire the upstream capacity from TransCanada and Enbridge. The notable impact of this change is that under WXP shippers bear the risk of project cancellation costs associated with the upstream projects, as explained below under Liability Upon Cancellation, whereas PXP shippers did not. Northern's WXP precedent agreement with PNGTS also includes certain differences from Northern's PXP precedent agreement, which are outlined below. Again, complete copies of the Precedent Agreements are provided as Appendix 1-A CONFIDENTIAL (PNGTS), Appendix 1-B CONFIDENTIAL (TransCanada) and Appendix 1-C CONFIDENTIAL (Enbridge).

Key terms of the WXP Precedent Agreements:

Expected In Service Date – November 1, 2022, common to all Agreements;
Initial Term – Fifteen (15) years, common to all Agreements;
Renewal Rights

- Enbridge = per tariff
- TransCanada = per tariff
- PNGTS = [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL]

Transportation Quantity – greater upstream quantities provide for in-kind fuel

- Enbridge = 10,308 Dth/day (10,875 GJ/day)

- TransCanada = 10,104 Dth/day (10,660 GJ/day)
- PNGTS = 10,000 Dth/day

Receipt and Delivery Points

- Enbridge = Dawn to Parkway
- TransCanada = Union Parkway Belt to East Hereford
- PNGTS = Pittsburgh, NH to Dracut, MA

Toll / Rate

- Enbridge = tariff toll, currently $0.0967 per Dth/day ($0.1222 CN per GJ/day)
- TransCanada = tariff toll, currently $0.44664 per Dth/day ($0.48494 CN per GJ/day)
- PNGTS = [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL]. The fixed rate is the same for all phases of the WXP Project for deliveries onto the Joint Facilities.

Credit Support – Expansion facilities are required on all three pipelines to bring the requested capacity into service. Therefore, financial agreements have been required, as listed below, under which Northern has agreed to [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL]

- Enbridge = Financial Backstopping Agreement ("FBA")
- TransCanada = Financial Assurances Agreement
- PNGTS = Attachment C

PNGTS Precedent Agreement – Other Notable Terms

- [BEGIN CONFIDENTIAL] [redacted]
- [redacted]
- [redacted]

- [redacted] [END CONFIDENTIAL]

Liability Upon Cancellation The upstream Canadian projects involve the risk of significant costs if the projects are cancelled. The overall probability of project cancellation appears to be low, but the consequence of a project cancellation has the potential to be high. All shippers on the project face similar risks.

- Enbridge. The Enbridge Financial Backstopping Agreement provides for the payment of Pre-Service Costs by Northern and other shippers for Cancelled Facilities. Liability for Pre-Service Costs results from a termination of the Precedent Agreement due to a failure of shippers or Enbridge to meet conditions precedent that results in Enbridge canceling the project. FBA, Section 3. Enbridge provides estimates of each shipper's share of Pre-Service Costs by quarter from project inception to completion, which is updated quarterly. FBA, Section 7. Enbridge has an obligation to minimize Pre-Service Costs, and Northern understands that equipment is not purchased until all approvals have been received. [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL]

- TransCanada. Upon an Event of Cancellation, Northern would be liable for Cancellation Costs. TransCanada may declare an Event of Cancellation under a variety of circumstances whereby Northern does not execute the Firm Transportation Service Contract, TransCanada is unable to obtain their Authorizations or TransCanada otherwise decides to cancel the project. PA, 9th Recital, Sections 3, 4, 7, 8, 9, 10, 11, 13, 14, 15, 16. TransCanada has an obligation to minimize Cancellation Costs, including minimizing costs before all Authorizations are received and accepted. PA, Section 13. [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL]

- PNGTS. [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL]

Shipper Conditions Precedent

- Enbridge. [BEGIN CONFIDENTIAL] [redacted] on or before October 31, 2019. [redacted] [END CONFIDENTIAL]
- TransCanada. The TransCanada Precedent Agreement does not include conditions precedent relating to regulatory approval for cost recovery under the Precedent Agreement, the Firm Transportation Service Contract or the Financial Assurances Agreement. Northern may terminate its commitment under the TransCanada Precedent Agreement at any time, however Northern will be subject to Cancellation Costs upon such termination. PA, Section 10 (in connection with definition of "Event of Cancellation").
- PNGTS. [BEGIN CONFIDENTIAL] [redacted] by October 31, 2019, [redacted] [END CONFIDENTIAL]

IV. ANALYSIS

Q. **Please describe the process employed by the Company to identify and evaluate the merits of the WXP Project.**

A. For the purpose of conducting its analysis of the WXP Capacity, the Company updated certain components of its planning approach to better reflect current conditions. As an initial step, Northern has updated its Regional Market Overview to demonstrate that the conditions threatening reliability and price stability documented in the 2015 IRP persist

or have worsened today. Northern conducted a quantitative analysis using an updated long-term forecast prepared for the pending 2019 Integrated Resource Plan.[16] The forecast was used to assess the extent to which existing and pending resources meet the Company's planning load obligations and to show the expected utilization of the proposed capacity. Although currently there is no other pipeline capacity available into the region, the Company did prepare a landed cost analysis comparing the proposed WXP Capacity back to the Dawn Hub to WXP I & II capacity, with receipts in the Western Canadian Sedimentary Basis ("WCSB") via the TransCanada Mainline Long-Term Fixed Price option from Empress to North Bay Junction, as well as to continued reliance on delivered supply. Finally, the Company depicts its proposed long-term portfolio that would result assuming the WXP Capacity is approved and brought into service.

a. Updated Regional Market Overview

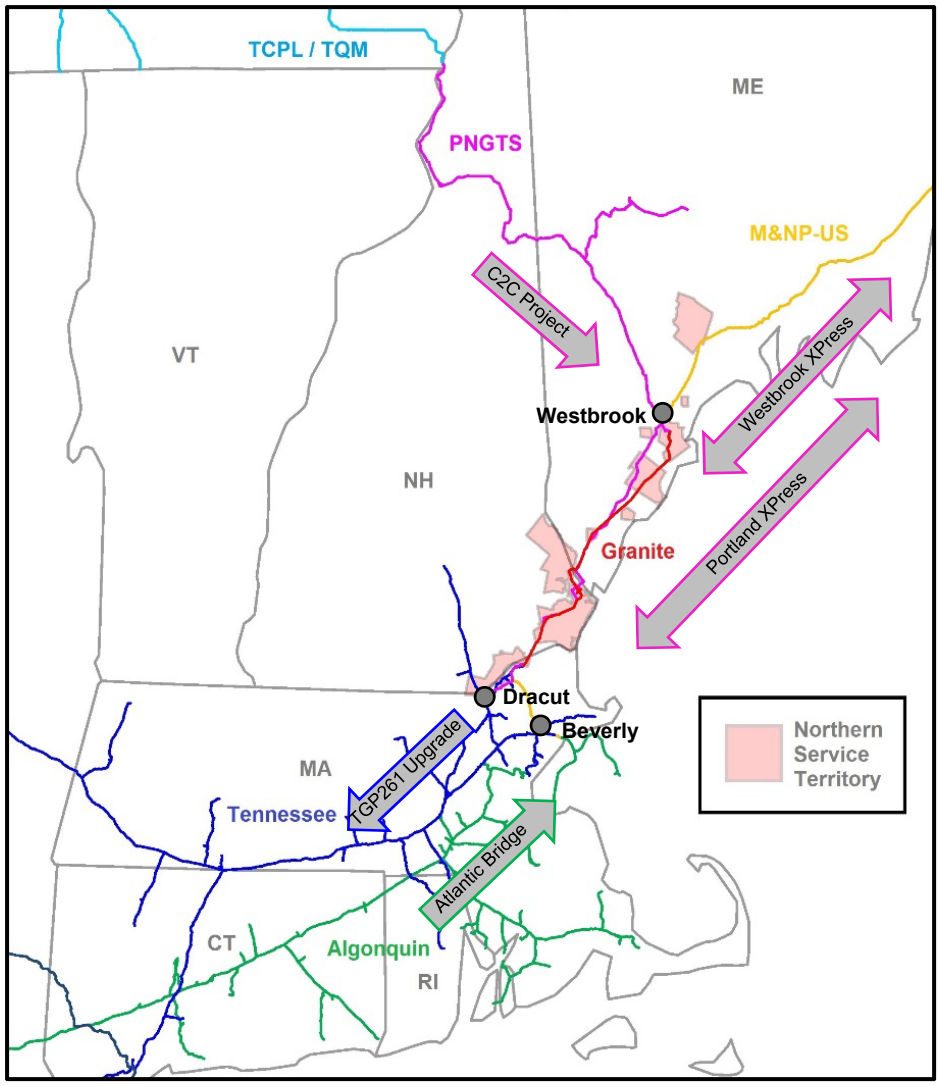
Q. Please summarize the Company's updated regional market overview.

A. As discussed in the Regional Market Overview of the Company's 2015 IRP[17], the Company continues to face significant uncertainty in the regional natural gas market. Specifically, the New England natural gas environment can be characterized as one with high market area prices with significant volatility; and the expected natural gas supply dynamics in the region will likely exacerbate the market uncertainty. To provide the appropriate context for the Regional Market Overview with respect to natural gas infrastructure, Figure 3 below illustrates Northern's service territory in Maine and New

[16] The initial long-term forecast used to assess Northern's WXP commitment reflected actual data through May 2018. Given that Northern experienced a new all-time peak day during the winter of 2018/19, Northern updated its long-term forecast to reflect actual data through March 2019 for the 2019 Integrated Resource Plan.
[17] Northern Utilities, Inc.'s 2015 Integrated Resource Plan, Docket 2015-00033 (January 16, 2015).

Hampshire relative to the existing natural gas pipelines and proposed pipeline capacity projects in the New England region.

Figure 3: Northern Service Territory and Natural Gas Pipeline Infrastructure



As shown in Figure 3 above, the Northern service territory is served by three major interstate pipelines in New England; specifically, Maritimes, PNGTS, and Tennessee, each of which deliver to Northern directly or via Granite and provide the Company with access to various natural gas supply sources.

As further detailed in the sections that follow, since the Company's filing of its 2015 Integrated Resource Plan, the natural gas supply sources delivered to Maritimes from off-shore Nova Scotia (i.e., Sable Island and Deep Panuke) have ceased production, leaving vaporized LNG from Canaport as the only remaining source of gas supply into Maritimes.[18] In addition, there is uncertainty regarding future service offerings and associated prices from the Distrigas facility in Everett, MA, which is another major source of imported LNG into the New England region via interconnections with Tennessee and Algonquin. Finally, the only new pipeline capacity project announced to provide incremental gas supply to the region since the Portland XPress Project is the Westbrook XPress Project; and, at this time, there continues to be no new projects for pipeline capacity from the south on Tennessee or Algonquin. As discussed in detail below, these natural gas market challenges continue to place upward pressure on New England natural gas price indices thus increasing exposure to entities that contract for gas supplies priced at these market area prices.

i. Decline in Natural Gas Supplies into Maritimes

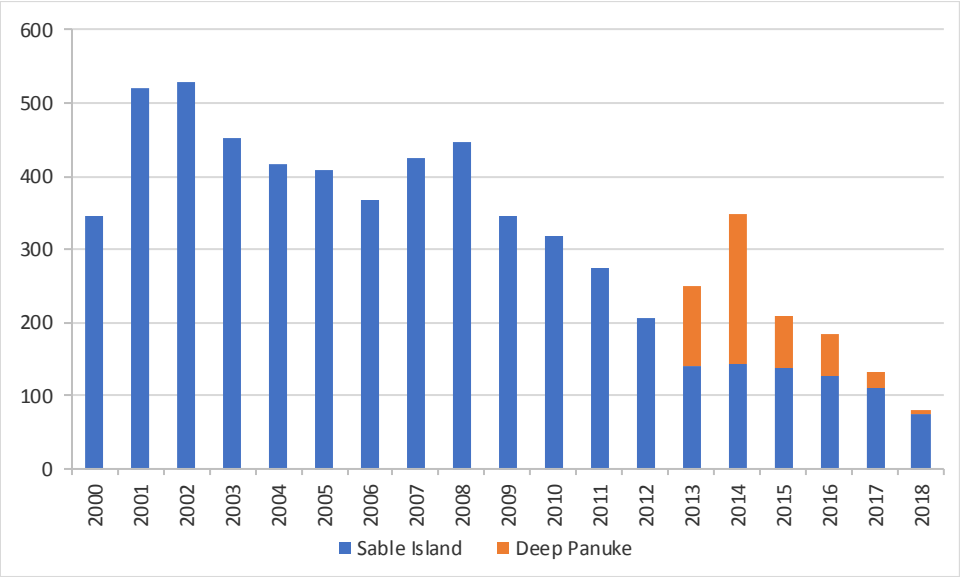
Q. Please describe the decline in the availability of natural gas supplies into Maritimes.

A. Prior to 2019, the major sources of natural gas supply delivered to Maritimes were Sable Island, Deep Panuke, and Canaport. While natural gas production from off-shore Nova Scotia was expected to end in the 2019 to 2020 time frame, both Sable Island and Deep Panuke permanently shut down in 2018, further limiting the availability of natural gas

[18] This does not include a limited amount of natural gas production from Corridor Resources in New Brunswick. Source: Corridor Resources press release, "Corridor Announces 2018 Year End Results and Reserves", March 27, 2019.

supply sources to serve demand in the New England and Atlantic Canada regions. Figure 4 below illustrates the historic production from Sable Island and Deep Panuke.

Figure 4: Sable Island and Deep Panuke Average Daily Production (MMcf/day)[19]



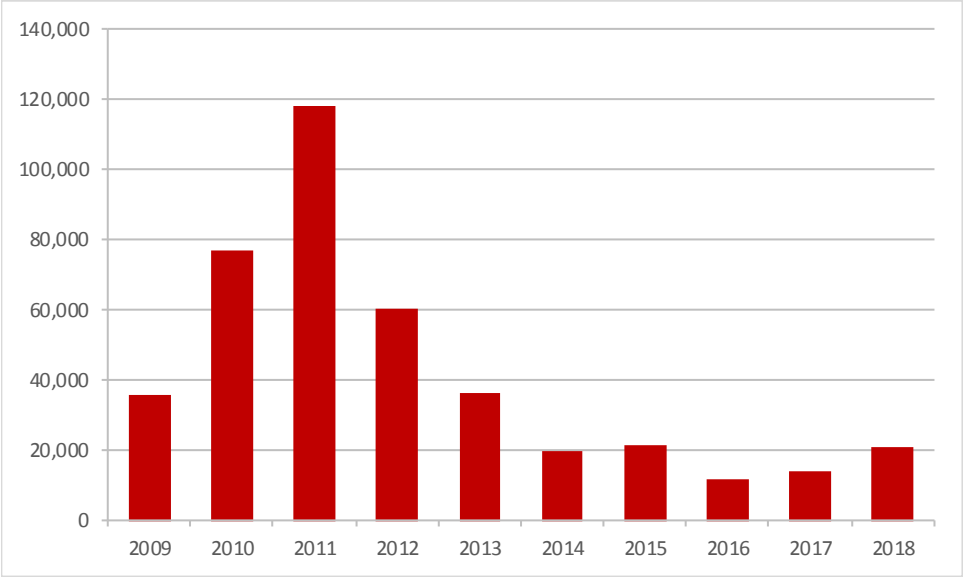
As shown in Figure 4 above, the combined Sable Island and Deep Panuke average daily production ranged from approximately 100 MMcf/day to 200 MMcf/day over the 2015 to 2018 time period.[20] This loss of nearly 200 MMcf/day of production from Sable Island and Deep Panuke reduces the natural gas supply options in the regional market and places upward price pressure on New England gas price indices.

The other source of gas supply into Maritimes from Atlantic Canada is vaporized LNG from Canaport, which is largely provided as a winter peaking service. The pricing and availability of gas supplies into Canaport are subject to competing global markets for LNG such that the availability of gas supply from Canaport will be affected by

[19] Source: Canada-Nova Scotia Offshore Petroleum Board, Sable Monthly Production Reports and Deep Panuke Monthly Production Reports.
[20] The average production over the past four years is well below the Sable Island peak production average of over 500 MMcf/day in 2002.

international market dynamics for LNG. As illustrated in Figure 5 below, the total annual volumes of LNG imports into Canaport have decreased significantly since their peak in 2011.

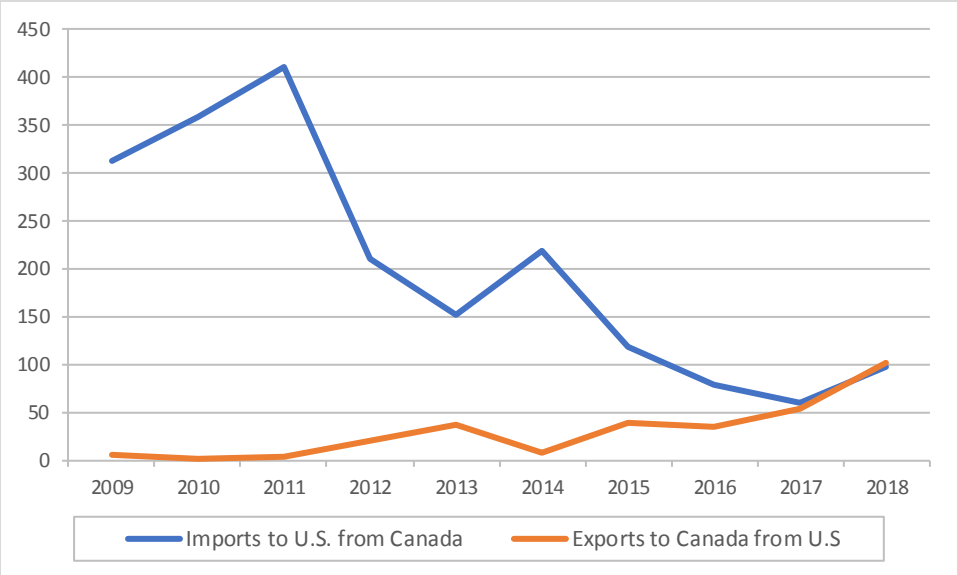
Figure 5: Annual Canaport LNG Imports (MMcf)[21]



The decline in natural gas supplies available from Sable Island, Deep Panuke, and Canaport LNG has resulted in a changing flow pattern on Maritimes. Specifically, there are increasing volumes of natural gas being exported from the U.S. to Canada on Maritimes at the Calais, ME point[22] to meet the natural gas demand requirements of LDCs and end-users in Atlantic Canada. Figure 6 below illustrates the increasing trend of volumes exported to Canada at Calais, and the declining volumes of natural gas imports to the U.S. from Canada at the Calais, ME point.

[21] Source: National Energy Board, LNG – Shipment Details, Canaport LNG Volumes.
[22] Calais, ME is defined by the U.S. Department of Energy as the U.S. point of entry/exit on the Maritimes pipeline system at the U.S./Canadian border.

Figure 6: Average Daily Volumes at Calais, ME (MMcf/day)[23]



Notably, LDCs and end-users in Atlantic Canada have supported several recent pipeline capacity projects, by contracting for capacity on the Atlantic Bridge Project and the Portland XPress Project. Stated differently, the natural gas market participants in Atlantic Canada, recognizing the need to replace gas deliveries from historical supply sources (e.g., Sable Island and Deep Panuke), have executed precedent agreements for capacity on certain pipeline projects that are consistent with decisions made by the Company.

ii. Significant Uncertainty Related to Supplies from Distrigas

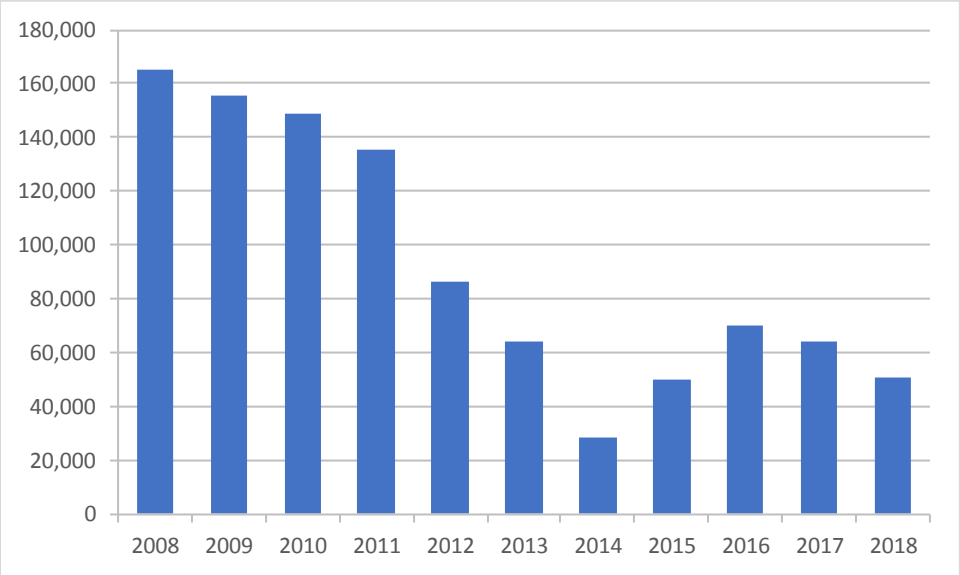
Q. Please summarize the uncertainity associated with the Everett, MA LNG terminal.

A. Another primary source of natural gas supply to the New England region is imported LNG at the Distrigas facility in Everett, MA, which is now owned by Exelon Generation

[23] Sources: U.S. Energy Information Administration, Calais, ME Natural Gas Pipeline Imports from Canada, March 29, 2019; and U.S. Energy Information Administration, Calais, ME Natural Gas Pipeline Exports to Canada, March 29, 2019.

Company, LLC ("Exelon") and operated by Exelon's subsidiary, Constellation LNG, LLC ("CLNG").[24] As discussed below, CLNG has recently received approval for certain cost recovery strategies that may increase uncertainty with respect to the type of services and associated costs offered by the Distrigas facility. Figure 7 below illustrates that the total annual volumes of imported LNG to the Distrigas facility have decreased significantly since 2008, with the annual imported LNG volumes at Distrigas averaging between 50,000 to 70,000 MMcf (or approximately 150 to 200 MMcf/day) over the past four years.

Figure 7: Annual Distrigas LNG Imports (MMcf)[25]



In addition to providing delivered natural gas supplies (i.e., vapor and liquid) to certain LDCs in the region, the Distrigas facility is the sole source of natural gas supply for Constellation Mystic Power, LLC ("Mystic") Units 8 and 9. In March 2018, Exelon filed a notice with the ISO New England to retire the Mystic 8 and 9 units, due to fuel

[24] Exelon completed the acquisition of the Distrigas facility from ENGIE Gas & LNG LLC in October 2018.
[25] Source: U.S. Department of Energy, LNG Annual Reports.

security concerns; however, subsequent to that filing, the parties (i.e., Mystic, Exelon, and ISO New England) entered into a cost-of-service agreement to support the continued operation of the Mystic 8 and 9 units through March 2024. The Federal Energy Regulatory Commission ("FERC") approved the cost-of-service agreement subject to certain conditions in December 2018.[26] Notwithstanding the cost of service agreement, the long-term service availability and associated price signals from CLNG are unknown, thus adding significant uncertainty with respect to the future availability and pricing of delivered natural gas supplies from the Distrigas facility.

iii. Limited Pipeline Expansion Projects to Serve New England

Q. Please describe the availability of pipeline expansion projects and the implications of such status.

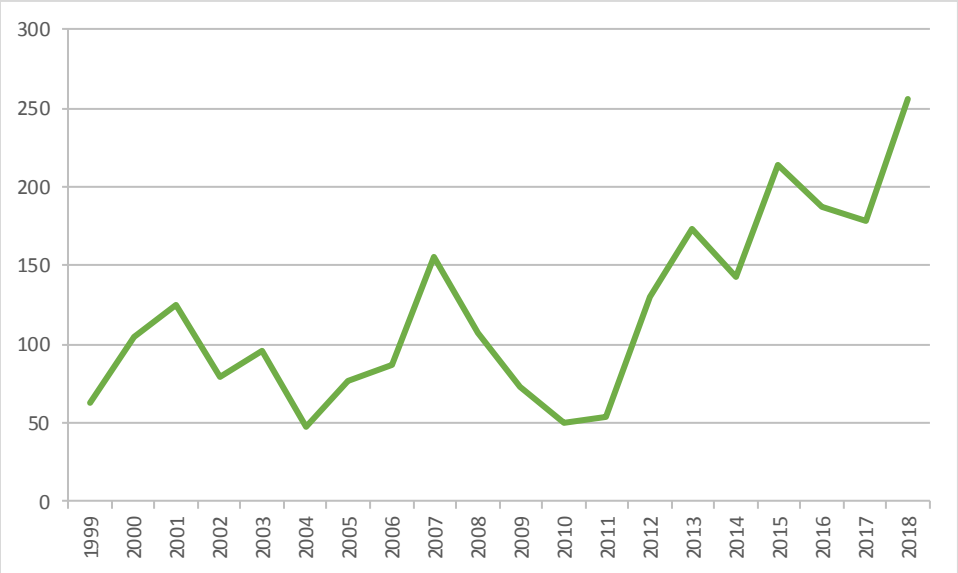
A. As illustrated in Figure 3 above, there have been limited pipeline capacity expansion projects to serve the New England region, in general, and the Company, in particular. Over the past two years, the successful pipeline projects in the region include: the Atlantic Bridge (partial in-service late 2017 to southern New England), Continent-to-Coast ("C2C") (in-service late 2017), and Portland XPress (Phase I in-service late 2018) projects. At this time, there are no prospects for new natural gas pipeline capacity into New England from the south (i.e., expansions on Tennessee or Algonquin). The two major pipeline projects that were proposed, Tennessee's Northeast Energy Direct and Enbridge's Access Northeast projects, have been cancelled or suspended indefinitely. There are currently no new expansion projects announced on Algonquin; and the most

[26] Source: Federal Energy Regulatory Commission, Order Accepting Agreement, Subject to Condition, and Directing Briefs, FERC Docket No. ER18-1639-000, December 20, 2018.

recent proposed expansion on the Tennessee system is limited to the TGP 261 Upgrade Project, which would transport natural gas from Dracut, Massachusetts to serve LDCs located in western Massachusetts (i.e., does not provide incremental supply to the region). The Westbrook XPress project is the only new pipeline project announced since the Portland XPress project that would be able to provide service to the Company and adds incremental supply/capacity to the New England region.

As a result of the successful development of the PNGTS C2C and Portland XPress (Phase I) projects, there have been increases in Canadian natural gas imports via PNGTS pipeline at the Pittsburg, NH interconnection with TransCanada. As illustrated in Figure 8 below, the level of natural gas imports at Pittsburg, NH has increased to an average daily volume of approximately 255 MMcf/day in 2018. The Portland XPress (Phases II and III) and Westbrook XPress projects will further increase the volumes of natural gas imported from Canada at Pittsburg, NH.

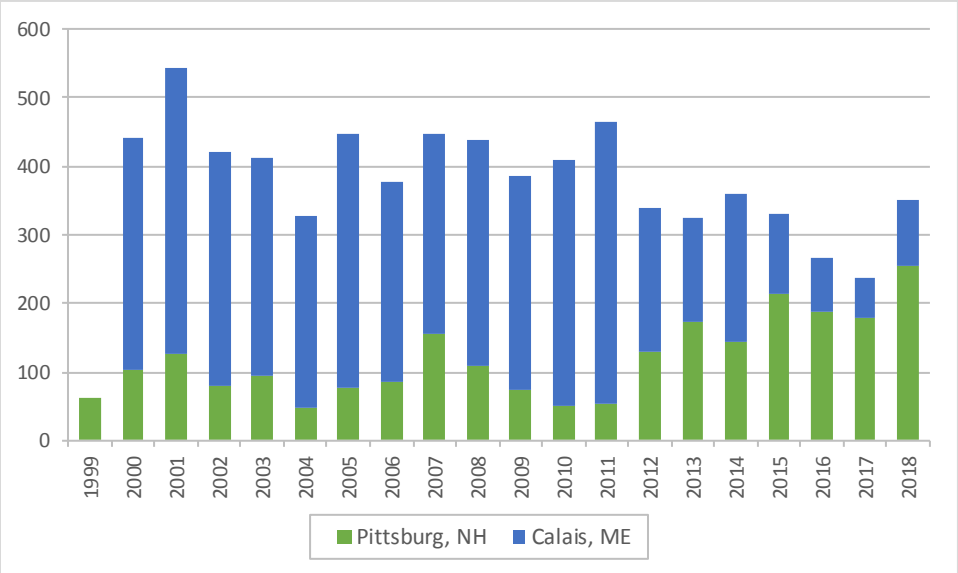
Figure 8: Average Daily Volumes at Pittsburg, NH (MMcf/day)[27]



To provide more context regarding the importance of the recent PNGTS expansions, Figure 9 below shows the contribution of natural gas deliveries to New England on PNGTS (i.e., imports at Pittsburg, NH) and Maritimes (i.e., imports at Calais, ME). Specifically, as illustrated in Figure 9, the volumes of gas supplies imported at Pittsburg, NH on PNGTS have increased significantly and represent approximately 70 to 75 percent of the total volumes imported to the U.S. on the PNGTS and Maritimes systems over the past three years.

[27] Source: U.S. Energy Information Administration, Pittsburg, NH Natural Gas Pipeline Imports from Canada, March 29, 2019.

Figure 9: Average Daily Volumes on PNGTS and Maritimes (MMcf/day)[28]



The proposed Westbrook XPress Project would increase the volumes of natural gas imported at Pittsburg, NH to the New England region. In addition, the proposed Westbrook XPress Capacity would provide Northern with additional access to the Dawn Hub in Ontario via the Enbridge and TransCanada systems. Over the past several years, Enbridge and TransCanada have successfully developed pipeline expansion projects increasing natural gas supplies to various markets including PNGTS, which increases the probability of a successful development for the proposed Westbrook XPress Project. Enbridge increased its Dawn to Parkway transmission capacity by approximately 20 percent from 2015 to 2017.[29] In mid-2018, Enbridge held an open season for up to 350,000 GJ/day of capacity beginning in 2021 and up to 250,000 GJ/day of capacity beginning in 2022 on the Dawn Parkway system. The Enbridge open season was held

[28] Sources: U.S. Energy Information Administration, Pittsburg, NH Natural Gas Pipeline Imports from Canada, March 29, 2019; and U.S. Energy Information Administration, Calais, ME Natural Gas Pipeline Imports from Canada, March 29, 2019.
[29] Source: Union Gas presentation, "Dawn Hub – Crossroads of Supply & Demand", October 23, 2017, slide 11.

concurrently with the TransCanada new capacity open season for up to 30,000 GJ/day from Parkway to East Hereford beginning on November 1, 2022. The open season announcements are provided as Appendix 2-B (TransCanada) and Appendix 2-C (Enbridge).

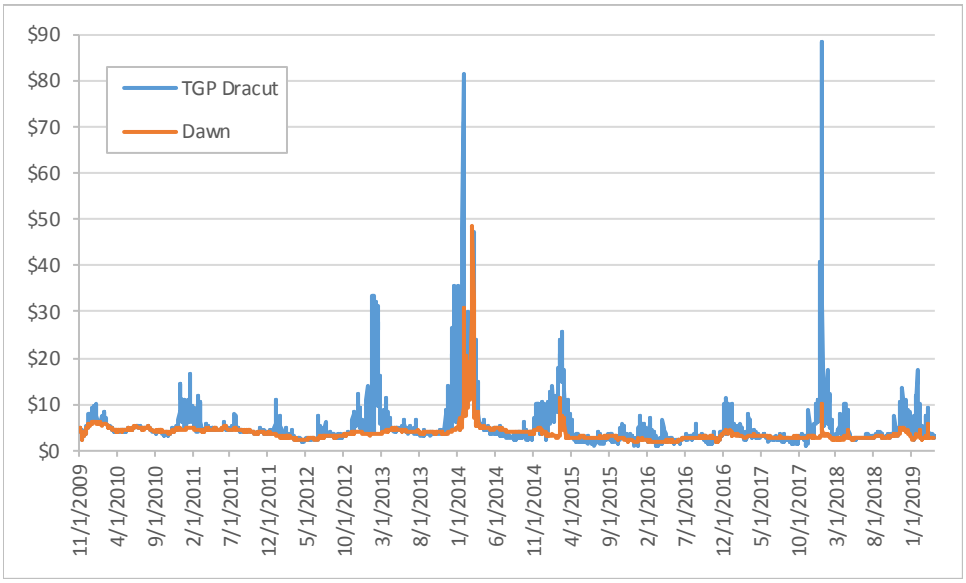
As discussed above, while supplies into Maritimes from Atlantic Canada are ceasing or subject to global competition, natural gas supply available at Dawn continues to increase and diversify. These incremental natural gas supplies into Dawn include deliveries from the Rover and Nexus pipeline projects, as well as gas supply from producers in Western Canada who participated in TransCanada's Dawn Long-Term Fixed Price ("Dawn LTFP") service. The Rover and Nexus pipeline projects were placed in service between mid-2017 and 2018, and the Dawn LTFP service commenced in November 2017. Figure 10 illustrates the various pipelines and gas supply basins that serve the Dawn Hub.

iv. Natural Gas Price Implications

Q. Please summarize the price implications associated with the market challenges you describe.

A. The regional natural gas market challenges for New England have resulted in high price levels, significant volatility, and liquidity issues at the various New England natural gas price indices. Figure 13 below illustrates the high price levels of the TGP Dracut price index relative to Dawn Hub over the past ten years.

Figure 13: Daily Spot Prices ($/MMBtu) – 2009/10 to 2018/19[30]



As shown in Figure 13 above, the TGP Dracut price index experiences significant price spikes in the winter period. A broader comparison of the various New England delivered natural gas pricing indices (i.e., Algonquin City-gates ("ALGCG"), Tennessee Zone 6 ("TGP Z6"), TGP Dracut price indices) to the Dawn Hub price index not only further illustrates the lower prices at the Dawn Hub, but also shows the relatively lower volatility of the Dawn Hub (see Table 1 below).

[30] Source: Based on ScottMadden, Inc.'s ("ScottMadden's") analysis of data from S&P Global Market Intelligence.

Table 1: Average Winter Spot Prices and Volatility – 2009/10 to 2018/19[31]

	Average Winter Spot Prices ($/MMBtu)				Winter Price Volatility			
Winter	TGP Z6	ALGCG	TGP Dracut	Dawn	TGP Z6	ALGCG	TGP Dracut	Dawn
2009/10	$ 5.92	$ 5.96	$ 5.84	$ 5.19	115%	117%	111%	68%
2010/11	$ 6.52	$ 6.57	$ 6.46	$ 4.59	249%	227%	228%	23%
2011/12	$ 3.86	$ 3.86	$ 3.85	$ 3.24	171%	171%	180%	22%
2012/13	$ 9.31	$ 9.64	$ 9.28	$ 3.83	298%	312%	327%	20%
2013/14	$ 14.93	$ 15.09	$ 15.76	$ 8.06	472%	473%	452%	287%
2014/15	$ 8.88	$ 9.27	$ 8.95	$ 3.87	370%	385%	358%	143%
2015/16	$ 2.97	$ 3.02	$ 3.07	$ 2.10	272%	321%	267%	45%
2016/17	$ 4.82	$ 4.69	$ 4.92	$ 3.27	231%	268%	294%	48%
2017/18	$ 8.28	$ 8.13	$ 8.71	$ 3.08	421%	514%	418%	129%
2018/19	$ 5.45	$ 5.40	$ 5.77	$ 3.38	318%	327%	315%	108%

With respect to volatility,[32] as shown in Table 1 above, over the past ten winter periods, the volatility level for the New England price indices have consistently exceeded 100% every winter, with average winter price levels exceeding $5/MMBtu in seven of the ten winters. In contrast, the Dawn price index has only one observation with relatively higher volatility, which reflected certain price spikes at Dawn in the colder-than-normal winter of 2013/14; three observations with volatility levels between 100% and 150% and price levels below $4/MMBtu; and six observations with volatility levels below 100% and prices levels between $2-6/MMBtu. Focusing on the average prices over the past five years, the average winter price at the Dawn Hub has been approximately $3/MMBtu below the prices of the New England indices.

Finally, in November 2018, the S&P Global Platts' price index for TGP Z6 was split into four price points (TGP Zone 6 delivered, TGP Zone 6 delivered North, TGP Zone 6 delivered South, and TGP Zone 6 (300 Leg) delivered), which will further impact

[31] Source: Based on ScottMadden's analysis of data from S&P Global Market Intelligence.
[32] Price volatility calculated as the standard deviation of daily relative changes in natural gas prices. Source: U.S. Energy Information Administration, An Analysis of Price Volatility in Natural Gas Markets, August 2007.

the volatility and liquidity of Tennessee Zone 6 pricing. The level of liquidity of certain New England price indices relative to the Dawn price index is summarized in Table 2 below.

Table 2: S&P Global Platts – Liquidity Tiers – 2009/10 to 2018/19[33]

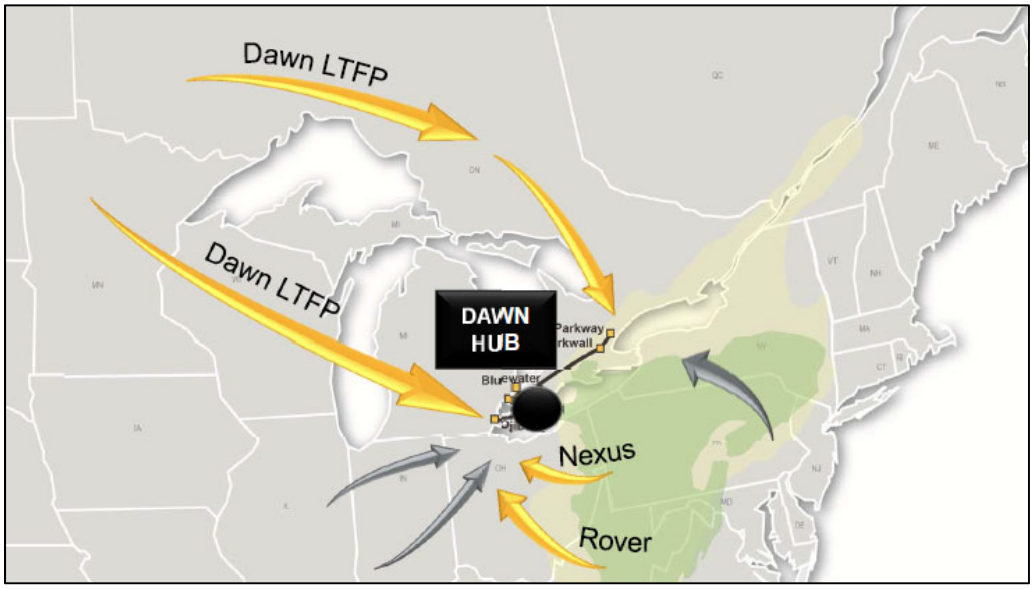
	Algonquin City-gates			Tennessee, Zone 6 (delivered)			Dawn, Ontario		
Split-Year (Nov-Oct)	Avg. Volume (MMBtu/ day)	Average Deals	Average Tier	Avg. Volume (MMBtu/ day)	Average Deals	Average Tier	Avg. Volume (MMBtu/ day)	Average Deals	Average Tier
2008/09	80,847	16	2	114,516	23	1	811,930	132	1
2009/10	125,733	21	1	141,427	26	1	594,463	110	1
2010/11	172,700	32	1	144,547	27	1	623,962	123	1
2011/12	291,095	51	1	154,991	33	1	508,674	97	1
2012/13	127,894	32	2	83,673	22	2	661,873	105	1
2013/14	54,547	15	2	34,223	6	3	394,948	92	1
2014/15	59,588	14	2	29,609	8	3	408,992	105	1
2015/16	56,667	14	2	25,167	8	2	435,083	102	1
2016/17	23,417	6	3	25,500	6	2	348,500	85	1
2017/18	81,117	26	2	15,158	6	3	433,342	103	1
Average	**108,378**	**24**	**2**	**64,108**	**14**	**2**	**476,922**	**101**	**1**

As shown in Table 2, the Dawn index is currently, and has been consistently, rated a Tier 1 price index, which is the highest level of liquidity by S&P Global Platts; whereas, the ALGCG and TGP Z6 price indices have significantly lower volumes traded, number of transactions, and tier ratings (with Tier 3 being the lowest level of liquidity). While Dawn experiences significantly more trading activity than Tennessee and Algonquin, it is important to note that PNGTS does not have a published index and experiences significantly less trading activity than Tennessee and Algonquin. For example, from April 2018 through March 2019, PNGTS traded on Intercontinental Commodity Exchange ("ICE") only 116 out of 365 days, while Tennessee and Algonquin traded each day with published prices. Absent the WXP Capacity, Northern would be

[33] Source: S&P Global Platts, Liquidity in North American Monthly Gas Markets, February 2019. Data represents bidweek activity for first-of-month transactions.

buying those volumes primarily on PNGTS, not Tennessee or Algonquin. As such, the natural gas supply pricing point for the WXP Capacity (i.e., the Dawn Hub), will provide the Company access to a growing natural gas supply pool, which has a highly liquid price signal.

Figure 10: Gas Flows to the Dawn Hub[34]

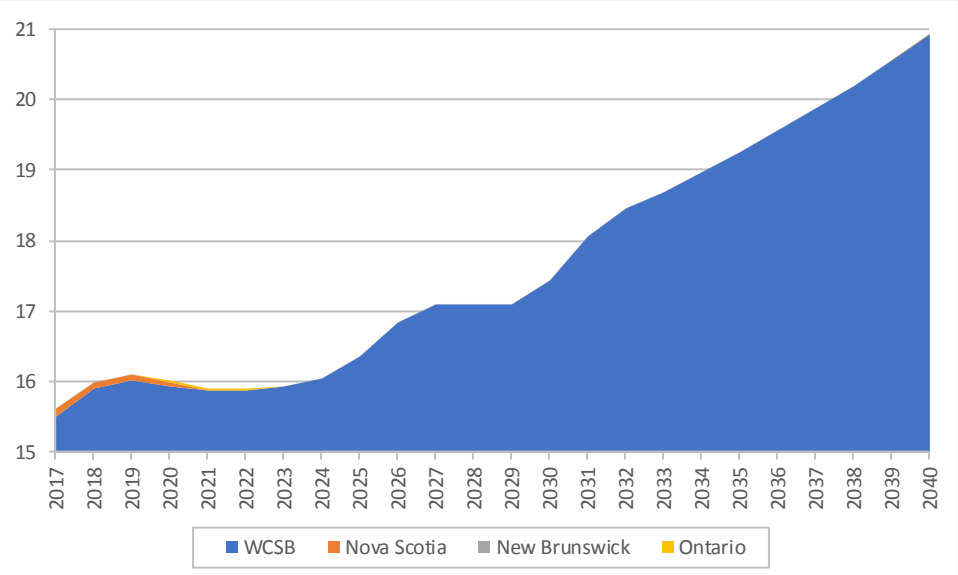


As a result of these projects, the Dawn Hub has more access to Marcellus/Utica and Western Canadian Sedimentary Basin ("WCSB") natural gas production, which are two of the primary gas supply basins in North America. Specifically, Figure 11 below shows the projected increase in natural gas production from the WCSB; and Figure 12 illustrates the significant increase in Appalachian (i.e., Marcellus and Utica) natural gas production. By 2050, the U.S. Energy Information Administration Annual Energy

[34] Source: Enbridge Gas, Dawn Hub presentation.

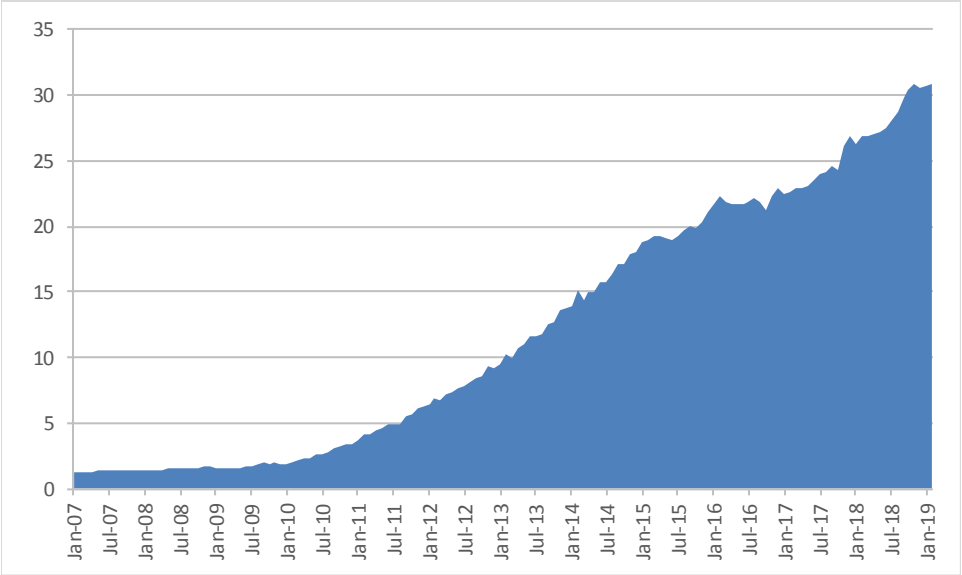
Outlook projects natural gas production in the Appalachian region to be greater than 50 Bcf/day.[35]

Figure 11: WCSB Projected Natural Gas Production (Bcf/day)[36]



[35] Source: U.S. Energy Information Administration, Annual Energy Outlook 2019, January 24, 2019.
[36] Source: National Energy Board, Canada's Energy Future 2018: Energy Supply and Demand Projections to 2040, October 30, 2018.

Figure 12: Marcellus/Utica Historic Shale Gas Production (Bcf/day)[37]



Finally, the increase in supplies to the Dawn Hub has placed downward pressure on the natural gas prices, and increased price stability while maintaining liquidity at the Dawn price index (as discussed further in the following section).

b. Identification of Need

i. Planning Load Forecast

Q. Please describe how the Company evaluated its planning load requirements.

A. In considering the WXP Project, Northern estimated its planning load requirements, which reflect the demand of sales service customers and customers subject to capacity assignment. In preparation for its 2019 Integrated Resource Plan, the Company prepared an updated long-term planning load forecast. The updated long-term planning load forecast takes into account recent trends in customer growth and use per customer and fully reflects the changes in the Maine and New Hampshire Capacity Assignment

[37] Source: U.S. Energy Information Administration, Drilling Productivity Report, March 18, 2019.

programs that have occurred since the 2015 IRP.[38] Table 3 below summarizes Northern's projected Planning Load for the 2022-23 gas year, the initial year of service for the WXP III Project.

Table 3: Northern Planning Load, 2022-23 (Dth)

2019 Updated IRP Long-Term Planning Load Forecast	2022-23 Design Day Planning Load (Dth)	2022-23 Design Year Demand Planning Load (Dth)
Maine Division	81,266 Dth	9,873,041 Dth
New Hampshire Division	66,398 Dth	7,158,788 Dth
Northern Planning Load	147,664 Dth	17,031,828 Dth

Northern's design day planning load estimate for 2022-23 is approximately 148,000 Dth and Northern's design year planning load estimate is 17.0 Bcf. Design year planning load is based on design winter demand and normal summer demand. The forecast assumes all current capacity exempt customers remain exempt from the Company's Capacity Assignment and excluded from Planning Load.

ii. Existing Long-Term Portfolio Resources

Q. Please describe the Company's existing resource portfolio.

A. Without further contracting and assuming Atlantic Bridge and PXP go into service, Northern's current long-term capacity portfolio as of November 1, 2022, provides a combined maximum daily quantity (MDQ) of 89,593 Dth as summarized in the following table.

[38] New Hampshire Public Utilities Commission Docket DG 17-104, Maine Public Utilities Commission Docket 2014-00132.

Table 4: Current 2022-23 Capacity Path Summary

Northern Utilities, Inc.
Existing, Pending and Proposed Long-Term Portfolio Resources

November 1, 2022 Capacity Paths	Resource Type	Max Daily Quantity	Method of Assignment	Status
Iroquois Receipts Path	Pipeline	6,434	Company-managed	Existing
Tennessee Niagara Capacity	Pipeline	2,327	Capacity Release	Existing
Tennessee Long-haul Capacity	Pipeline	13,109	Capacity Release	Existing
Algonquin Receipts Path	Pipeline	1,251	Company-managed	Existing
Tennessee Firm Storage Capacity	Storage	2,644	Capacity Release	Existing
Dawn Storage Path	Storage	39,863	Capacity Release	Existing
Lewiston On-System LNG Plant	Peaking	6,500	Company-managed	Existing
Existing Long-Term Capacity		**72,128**		**Existing**
Portland XPress Project	Pipeline	9,965	Capacity Release	Pending
Atlantic Bridge Capacity	Pipeline	7,500	Capacity Release	Pending
Pending Long-Term Capacity		**89,593**		**Pending**

Below are brief narrative descriptions of each capacity path. Capacity path diagrams that map each path by segment, including receipt and delivery points, contract numbers and termination dates are provided in Appendix 3.

1. *Iroquois Receipts Path*

The 'Iroquois Receipts' path initiates at the Iroquois Gas Transmission ("Iroquois") interconnect with TransCanada in Waddington, New York, which delivers into Tennessee at Wright, New York. A small portion of deliveries on this path feed into Granite at the Pleasant Street interconnect with Tennessee in Haverhill, Massachusetts, while the majority feeds into the Bay State Gas system at Agawam, Massachusetts and Brockton, Massachusetts via Tennessee and Algonquin. This path utilizes the Bay State Exchange Agreement. The portion of this path that delivers into Granite is assigned via

capacity release and the portion that delivers to Bay State is assigned to marketers of delivery service customers as a Company-managed resource.

2. *Tennessee Niagara Capacity*

Northern has entitlements on two transportation contracts on the Tennessee Gas Pipeline with primary receipts at Niagara in Zone 5 on the 200 leg, and primary deliveries to Zone 6 on the 200 leg at Bay State city gates and Pleasant Street, the interconnection with Granite in Haverhill, Massachusetts. Northern receives the deliveries on Tennessee to Pleasant Street on its corresponding firm Granite capacity for transport to Northern city gates. This path is assigned to marketers of delivery service customers via capacity release.

3. *Tennessee Long-haul Capacity*

Northern has one long-haul transportation contract on Tennessee Gas Pipeline, which allows Northern to deliver up to 13,155 Dth into Granite. The primary receipt points within this contract are located throughout the Gulf Zones 0 and 1 on the 100, 500, and 800 legs. Primary delivery meters on this contract are in Zone 6 on the 200 leg at Pleasant Street and Bay State's city gates as well as in Zone 4 on the 300 leg at the injection meter for TGP's Northern Storage - FS-MA. This path is assigned to marketers of delivery service customers via capacity release.

4. *Algonquin Receipts Path*

Northern combines Texas Eastern Transmission Company ("TETCO") capacity with Algonquin long-haul capacity to access Leidy storage in Pennsylvania, which is a liquid supply hub. Northern's Algonquin contract includes receipt capacity at the interconnection between Algonquin and TETCO's Zone M3 at Lambertville, New Jersey

and at the interconnection between Algonquin and Transcontinental Gas Pipe Line ("Transco") in Zone 6 at Centerville, New Jersey. This capacity has primary delivery rights to Bay State's Algonquin city-gate at Taunton, Massachusetts. This path utilizes the Bay State Exchange Agreement and is assigned to marketers of delivery service customers as a Company-managed resource.

5. *Tennessee Firm Storage*

Northern has firm underground storage entitlements on the Tennessee system in Zone 4 on the 300 leg in Pennsylvania. Northern's maximum storage quantity is 259,337 Dth, and the maximum withdrawal quantity is up to 4,243 Dth/day. The primary receipt meter in this transportation contract is the FS-MA storage withdrawal meter, and the primary delivery meter is at Pleasant Street, the interconnection between Tennessee and Granite. Northern receives this gas on its corresponding Granite capacity to make deliveries to Northern city gates. This path is assigned to marketers of delivery service customers via capacity release.

6. *Dawn Storage Path*

The Dawn Storage Path provides 4.0 Bcf of storage that can deliver up to 39,863 Dth/day, sourced from Dawn Storage during the winter or via purchases at the Dawn Hub year round. Northern holds firm transportation capacity for this path on Enbridge, TransCanada and PNGTS which resulted from contract restructuring and incremental commitments under PNGTS' C2C project and TransCanada's 2015 New Capacity Open Season. The Dawn Storage Path is assigned to marketers via capacity release.

7. *Lewiston On-System LNG*

The Lewiston LNG facility is an important resource within Northern's portfolio. Northern relies on the Lewiston plant to produce up to 6,500 Dth per day, which reflects approximately two days of onsite storage. LNG is assigned to marketers of delivery service customers as a Company-managed resource.

8. *Atlantic Bridge*

Atlantic Bridge is pending capacity in the Company's portfolio. Northern's capacity on the project is 7,500 Dth/day. Atlantic Bridge involves expanding the Algonquin pipeline system and adding compression in Weymouth, Massachusetts, in order to provide adequate pressure to deliver gas northward into Maritimes. The Algonquin capacity provides for receipts from either Millennium at Ramapo, New Jersey or Tennessee's Zone 5, 300 Leg at Mahwah, New Jersey. When the Algonquin capacity goes into service, Northern will acquire downstream capacity on Maritimes with a primary delivery point in Lewiston, Maine.

The southern portion of the Atlantic Bridge project, providing for deliveries to customers on the Algonquin system, is in service. Deliveries to customers on Maritimes require the construction of the Weymouth compressor station, which has been delayed due to permitting challenges. The project has received its critical permits and the projected in-service date of the full Atlantic Bridge path is mid-2020. Deliveries to customers on Maritimes, including Northern, require the construction of the Weymouth compressor station, which has been delayed due to permitting challenges. Earlier this year, Enbridge received critical permits related to the proposed new compressor station in Weymouth, Massachusetts, and the full project is expected to be in service by mid-2020. This capacity will be assigned to marketers via capacity release.

9. *Portland Xpress Project (PXP)*

PXP is pending capacity in the Company's portfolio. Northern's capacity on the project is 10,000 Dth/day. The PXP project enhances Portland Natural Gas Transmission System ("PNGTS") capacity by adding a compressor in Eliot, Maine. Northern's capacity is on Phase III of the project, which has an expected in service date of November 2020. This capacity will allow Northern to transport gas from the Dawn Hub in Ontario, Canada to Granite State Gas Transmission, Inc. ("Granite") at Newington, New Hampshire and other delivery points on the PNGTS system for a 20 year initial term. PNGTS has acquired corresponding upstream capacity on TransCanada and Enbridge and will assign that capacity to Northern for effect on the in service date. PNGTS received approval of their PXP Phase III certificate February 21, 2019 and accepted the certificate on March 6, 2019.

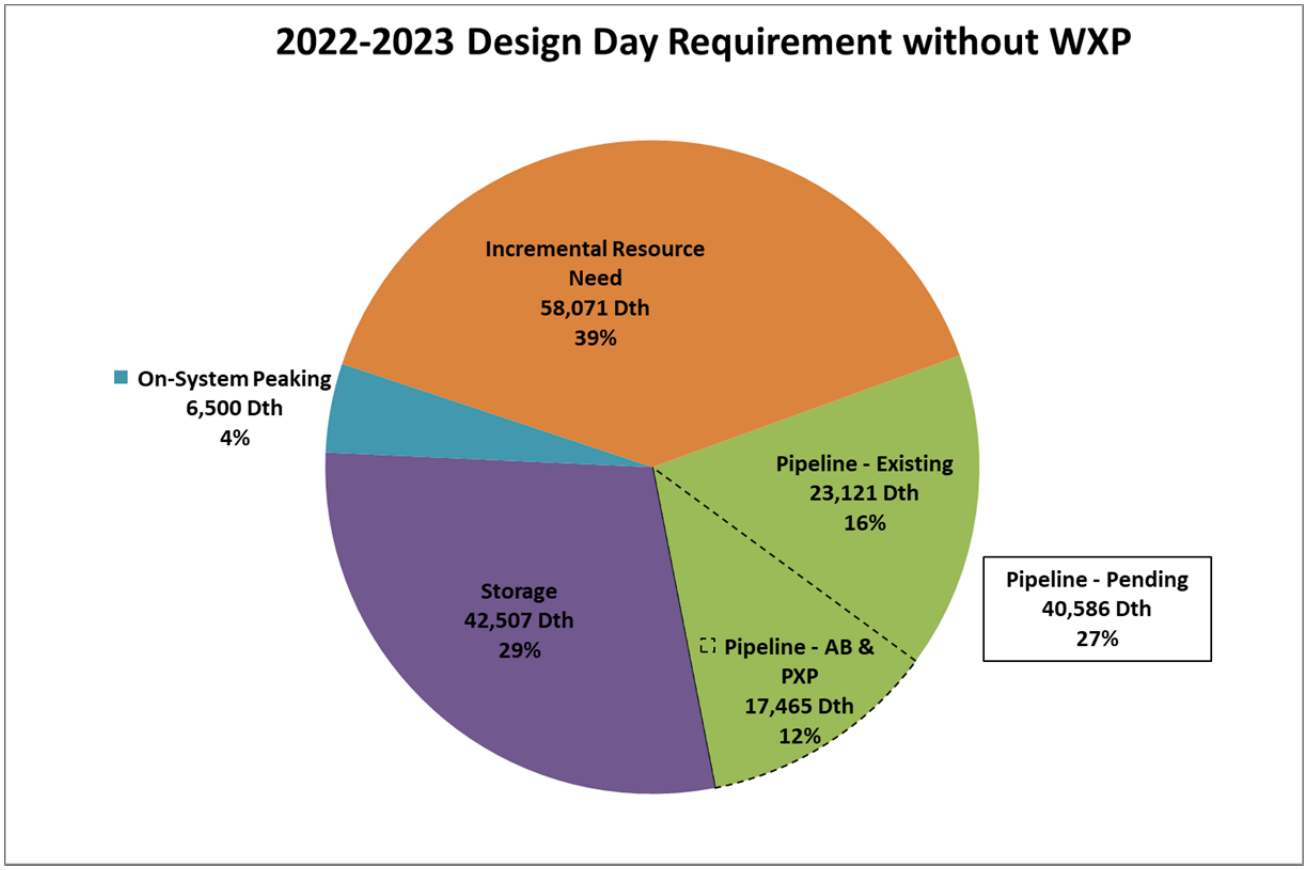
iii. Incremental Resource Need

Q. Is the Company's existing resource portfolio sufficient to meet its planning load requirements?

A. No. Northern's current long-term portfolio is insufficient to meet all of its planning load requirements, which include the design day and design year requirements of Northern's sales service and capacity assigned delivery service customers. Specifically, Northern's current 2022-23 long-term capacity of 89,593 Dth shown in Table 4 is less than the 2022-23 design day planning load of 147,664 Dth shown in Table 3. Northern will require 58,071 Dth of additional capacity in order to meet its projected 2022-23 design day planning load, or 39 percent, as shown in Figure 14 below, which graphically depicts the

2022-23 resources in the portfolio by resource type relative to design day planning load. Unless additional capacity is brought into service, the design day Incremental Resource Need would be met with purchases of delivered supply.

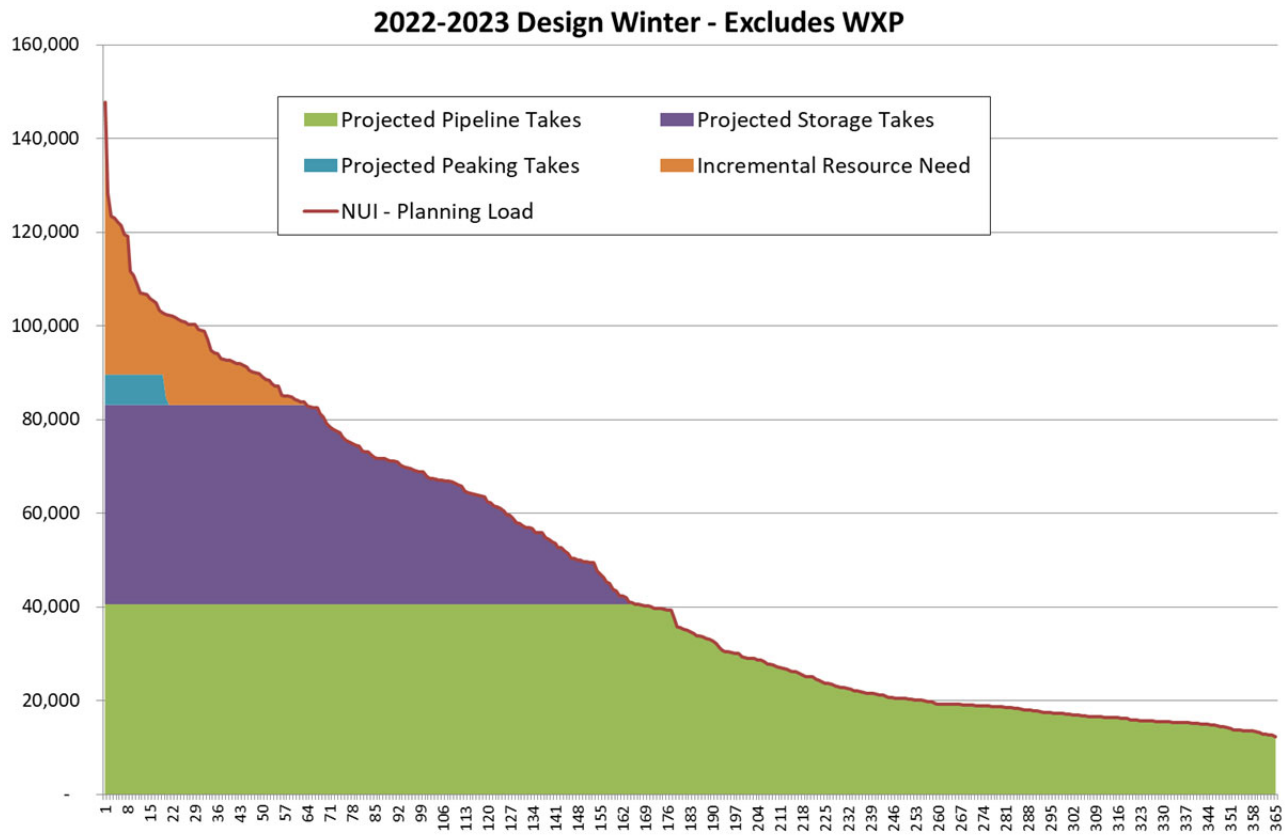
Figure 14: Current 2022-23 Portfolio relative to Design Day Planning Load



In addition to reviewing resource adequacy on a design day basis, Northern reviews adequacy over the course of a design year, which reflects a design winter and normal summer. Figure 15 below presents a load duration curve based on Northern's 2022-23 planning load and 2022-23 long-term portfolio, including Atlantic Bridge and PXP. Resources in the portfolio are shown by resource type to demonstrate how much of the planning load is projected to be met with each type of resource. The load duration

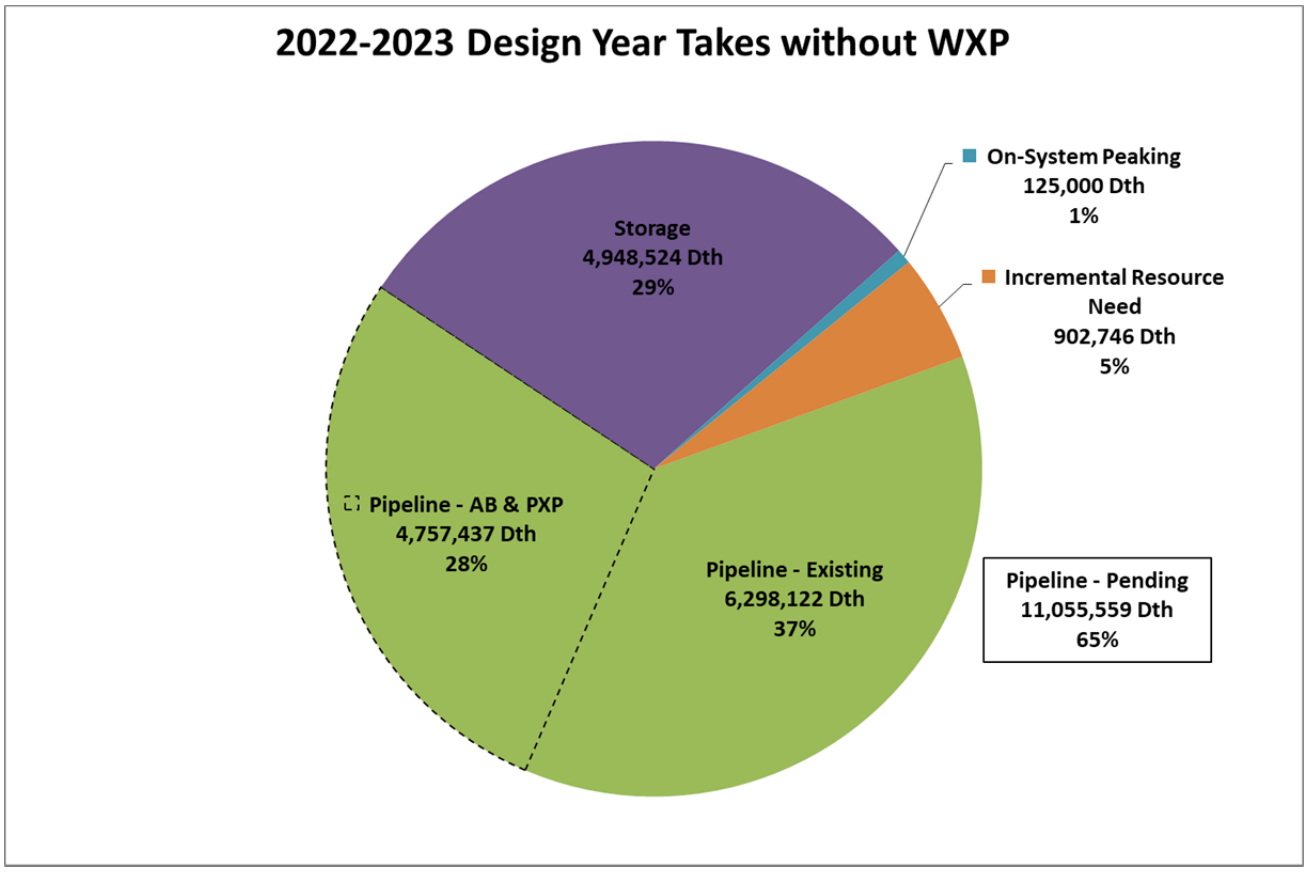
curve depicts the utilization of each type of resource over the course of the first year following the in-service date, as well as the expected order of dispatch for planning purposes, with pipeline dispatching first followed by storage and then peaking on the coldest days. As readily seen, Northern has a significant need for peaking resources that is not met by the portfolio. The orange area under the curve labeled "Incremental Resource Need" reflects the planning load that cannot be met with current 2022-23 resources, and which absent the acquisition of new capacity would need to be met with delivered supply. Although Northern has unmet peaking needs, as shown later, the proposed WXP pipeline capacity would be significantly utilized and reduces the need for delivered peaking supplies.

Figure 15: Load Duration Curve – Current 2022-23 Portfolio



Finally, Figure 16 below provides a pie chart that shows projected annual volumes from Northern's current 2022-23 long-term portfolio under projected 2022-23 design year conditions. As shown, the largest portion of supply would be met with pipeline capacity, followed by storage capacity. The portfolio is capable of meeting all but 5 percent of projected 2022-23 design year requirements, the portion labeled "Incremental Resource Need". Appendix 4 provides a summary showing monthly and seasonal utilization by resource type.

Figure 16: Current 2022-23 Portfolio relative to Design Year Planning Load



c. Available Resources

Q. What alternative resources did the Company evaluate and why was the WXP Project preferred?

A. The Company considered WCSB as an alternate supply source to Dawn for WXP, as Northern did consider participation in TransCanada's offering of long-term fixed price capacity from Empress to North Bay Junction. However, as explained below, there are no viable alternatives to the proposed WXP capacity.

As discussed in the Regional Market Overview section, natural gas production from off-shore Atlantic Canada has ceased; specifically, both the Sable Island and Deep Panuke production fields permanently shut down in 2018. In addition, the volume of LNG deliveries at the Canaport LNG importation facility has been well below the peak volumes experienced in 2011. Also, there are no announced expansion projects on either Tennessee or Algonquin that would provide the Company an opportunity to contract for incremental capacity. Continuing to seek delivered service for all of the current Incremental Resource Need shown in the figures above is not a practical option, particularly since the Maritime Canada market is also now competing for more delivered supplies to offset the loss of Sable Island and Deep Panuke production. The proposed WXP Capacity would meet approximately one-quarter of the Company's projected remaining long-term incremental need for peaking supply, which does not preclude the Company from identifying additional future resources such as on-system or off-system LNG storage and vaporization or renewable natural gas opportunities.

The proposed WXP Project provides access to Dawn, Ontario via firm transportation capacity on Enbridge, TransCanada and PNGTS. As explained in the Regional Market Overview, Dawn is a significant natural gas supply and storage hub and

Enbridge and TransCanada have demonstrated the ability to expand from the Dawn Hub to Canadian and U.S. markets. Moreover, the PNGTS capacity associated with the WXP Project is available with limited facilities (e.g., adding new compression to existing pipeline facilities at an existing site), whereas future PNGTS projects are likely to involve more construction and siting risk.

As discussed in the Updated Regional Market Overview section, the Dawn Hub is one of the most liquid supply hubs and is often touted as the second most physically traded natural gas hub in North America, due to significant access to both underground storage and many of North America's major supply basins. Dawn has underground storage capacity of 278 Bcf and 7.5 Bcf per day of takeaway capacity from Dawn to TransCanada at Parkway.[39] In addition, the Dawn Hub has several new sources of supply given the recent completion of the Rover and NEXUS pipelines that provide more connectivity between Marcellus/Utica natural gas production and the Dawn Hub. The WXP Project provides a valuable opportunity for Northern to continue diversifying away from less liquid and highly volatile New England supply points to the Dawn Hub, which has significantly more access to growing and durable supplies, diversity in assets, and much more price stability.

d. Resource Evaluation

i. Landed Cost Analysis

Q. Please describe how the Company evaluated the cost of the WXP Project.

[39] Union Gas presentation, "Dawn Hub – Crossroads of Supply & Demand", October 23, 2017.

A. A landed cost analysis is used to compare alternative resource options by providing the estimated delivered costs of alternative supply paths to Northern's service territory assuming the transportation path is used every day at full volume, or on a 100 percent load factor basis. This approach allows multiple paths to be compared in terms of expected cost of supply in a transparent manner. The landed cost analysis compares alternative transportation paths by calculating projected gas supply costs based on Henry Hub pricing plus or minus a basis differential and adding projected transportation costs including demand charges, variable commodity and fuel charges for all pipelines within the path.

Table 5 provides a landed cost analysis comparing the cost of gas supply from the proposed Westbrook XPress Project under both the proposed Dawn supply and alternative WCSB supply scenarios.[40] The commodity price forecast utilized covers the November 2022 through October 2023 period and was based on NYMEX Henry Hub futures contract and future basis pricing as of April 17, 2019.

[40] Northern assumed that WCSB pricing is equal to the AECO Hub. To access AECO Hub pricing, the Company would need to contract with NOVA Gas Transmission, upstream of the TransCanada Mainline. The Landed Cost Analysis includes these costs.

Table 5: Landed Cost Analysis – CONFIDENTIAL VERSION

All figures stated in US$/MMBtu		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Path	Delivering Pipeline	Gas Supply Basin	Henry Hub	Basis	Gas Supply Cost	Unitized Demand Charge (100% Load Factor)	Commodity & Fuel Charges	Transportation 100% Load Factor	Total Landed Cost
Westbrook XPress Project (Dawn Supply via Union, TransCanada, PNGTS)	PNGTS	Dawn	$2.83	$0.08	$ 2.91	[redacted]			
Westbrook XPress Project (AECO Hub Supply via NOVA, TransCanada, PNGTS)	PNGTS	AECO Hub	$2.83	($1.13)	$ 1.70				

Notes:
[1] Assumed gas supply basin.
[2] Equals the simple average of the monthly NYMEX futures contracts (as of 4/17/2019) for November 2022 through March 2023.
[3] Equals the simple average of the monthly ICE futures contracts (as of 4/17/2019) for November 2022 through March 2023.
[4] Equals Column [2] plus Column [3].
[5] Based on current posted tariff rates and confidential Negotiated Rates. Assumed currency exchange rate of Cdn$1.0000 = US$0.7501 (as of 4/17/2019).
[6] Based on current posted tariff rates and historic fuel rates.
[7] Equals Column [5] plus Column [6].
[8] Equals Column [4] plus Column [7].

The landed cost analysis shows that under 100 percent load factor utilization scenarios, [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL] However, as seen further below in Table 6, under winter-only usage scenarios, [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL] The WXP AECO Hub Supply alternative assumes that Northern elected the Long-Term Fixed Price ("LTFP") service from Empress to North Bay Junction and took out new capacity from North Bay Junction to East Hereford. The LTFP service represents a significant discount to tolls for regular Firm Transportation service. One of the concerns that Northern had with the LTFP was that the capacity was non-renewable, although the Company would have the option to convert to the more expensive FT service at the end of the term.

Since Northern will not utilize the proposed capacity on a 100 percent load factor basis, Northern prepared landed cost scenarios that reflect expected usage of the proposed capacity to provide a more accurate comparison of the expected cost of these supply options. Specifically, Northern evaluated a winter baseload scenario, under which Northern would use the capacity for the 151 days of winter, and also used a dispatch approach to assess usage and delivered cost under design and normal conditions. Northern compared these scenarios for the WXP Contracts based on access to the Dawn Hub, WXP I and II based on access to AECO Hub Supply and also for delivered service (city-gate supply). Delivered service was evaluated for comparison purposes only, and as discussed elsewhere, Northern believes that continuing to rely on delivered service for all Incremental Resource Needs is not viable in the long term.

Table 6: Landed Cost Scenarios – CONFIDENTIAL VERSION

Westbrook XPress Project - Dawn via Union and TCPL

Winter Baseload			Design Conditions			Normal Conditions		
City-Gate Volume	Rate	Cost	City-Gate Volume	Rate	Cost	City-Gate Volume	Rate	Cost
1,504,715	[redacted]		1,550,864	[redacted]		1,505,408	[redacted]	

Westbrook XPress Project - AECO Hub via TCPL Long-Term Fixed Price Contract

Winter Baseload			Design Conditions			Normal Conditions		
City-Gate Volume	Rate	Cost	City-Gate Volume	Rate	Cost	City-Gate Volume	Rate	Cost
1,504,715	[redacted]		1,550,864	[redacted]		1,505,408	[redacted]	

Delivered Service (NOT RELIABLE)

Winter Baseload			Design Conditions			Normal Conditions		
City-Gate Volume	Rate	Cost	City-Gate Volume	Rate	Cost	City-Gate Volume	Rate	Cost
1,504,715	[redacted]		1,550,864	[redacted]		1,505,408	[redacted]	

[BEGIN CONFIDENTIAL] [redacted]

[redacted]

[END CONFIDENTIAL]

ii. Qualitative Assessment

Q. What qualitative factors were considered by the Company?

A. Regarding the Qualitative Assessment, Northern bases its long-term resource decisions primarily on qualitative criteria as this approach recognizes that many factors, such as diversity, project viability, operational characteristics and contracting issues cannot be modeled quantitatively. This approach also limits the likelihood that major resource decisions will be based primarily on price forecasts that may be subject to change in unexpected ways. Moreover, qualitative assessment helps in understanding why a particular resource may or may not be a good addition to the portfolio. Given the relative lack of viable alternative resources, the qualitative assessment focuses on the qualitative merits of the proposed WXP Capacity.

1. Viability of Upstream Supply

By providing access to the Dawn Hub, the proposed WXP Capacity offers access to robust natural gas supplies flowing from numerous upstream pipelines, which are anchored by significant underground storage. Recent expansions to the Dawn Hub (e.g., Rover, NEXUS, and TransCanada's Dawn LTFP projects) have improved the deliverability of supply to the Dawn Hub, while Enbridge and TransCanada Mainline projects have expanded the takeaway capacity from Dawn Hub to eastern markets including Northern's system. With respect to upstream gas supplies, and as discussed in the Updated Regional Market Overview section, natural gas production from certain of the Dawn Hub supply sources is expected to grow. Specifically, the WCSB natural gas production is forecasted to reach 21 Bcf per day by 2040, while Marcellus and Utica natural gas production is expected to exceed 50 Bcf per day by 2050. This significant increase in natural gas production coupled with the new (e.g., NEXUS) and expanded (e.g., storage, transportation) infrastructure at the Dawn Hub provide assurance that supply will be available for the foreseeable future. Lastly, the delivering pipelines, Enbridge, TransCanada and PNGTS are well established and have been flowing gas to Northern's system for many years.

2. Downstream Deliverability

The PNGTS system traverses the Granite and Northern systems and is directly connected to Granite interconnects at various delivery points including Westbrook and Eliot in Maine and Newington in New Hampshire. PNGTS also allows for deliveries into the Tennessee system in Haverhill, Massachusetts, in close proximity to the Granite receipt point at Pleasant Street in Haverhill. [BEGIN CONFIDENTIAL] [redacted]

[redacted]

[redacted] [END CONFIDENTIAL]. These multiple delivery points provide significant flexibility in accessing Northern's distribution system that is not available from other pipelines. As such, PNGTS is a critical component of the Company's gas supply portfolio and, in turn, the Company is a significant shipper on PNGTS.

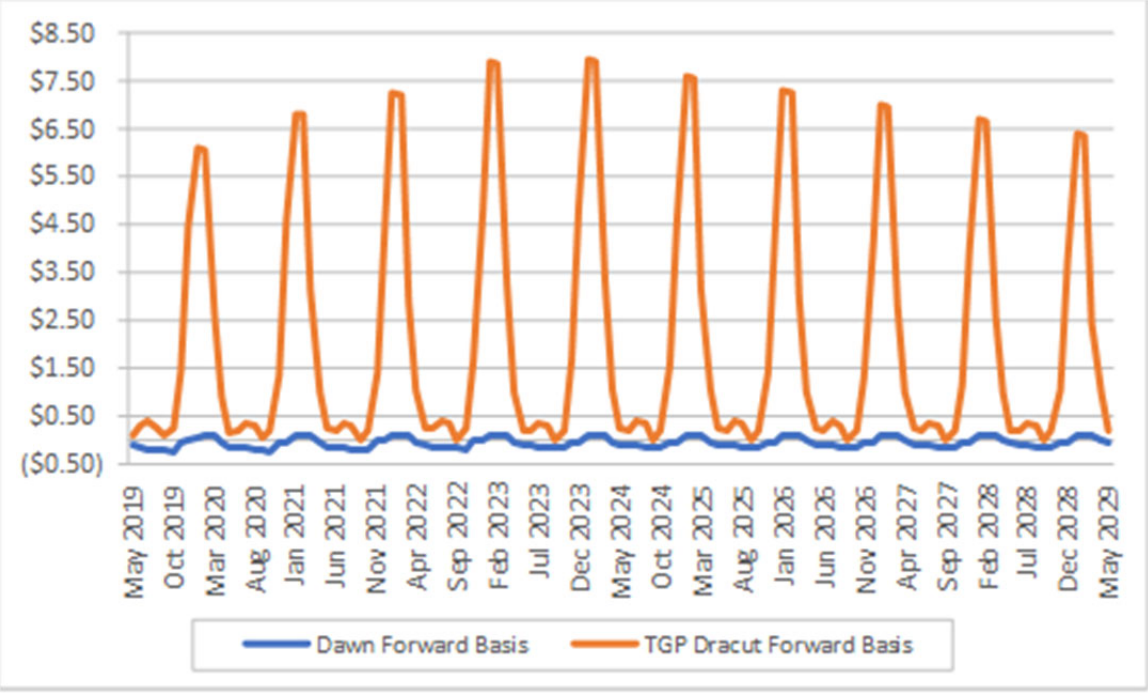
3. Project Development Risks

The only construction required on the PNGTS system with respect to the Westbrook XPress Project is the addition of a compressor in Westbrook, Maine. Although all projects proposed in New England continue to face significant public challenge and criticism, adding the required compression is a relatively small project and is being done within the existing footprint of Maritimes and PNGTS facilities. Looking upstream, Enbridge and TransCanada have been successful in placing expansion projects into service. The upstream Canadian projects involve the risk of significant Cancellation Costs. The probability of project cancellation is low, but the impact of project cancellation has the potential to be high. All other shippers on the project face similar risks and there are no ways to obtain new capacity on Enbridge and TransCanada without such exposure [BEGIN CONFIDENTIAL] [redacted]. [END CONFIDENTIAL] Notwithstanding the potential significant financial consequences if the projects are cancelled, overall project development risk appears to be low. Also, it is important to note that the project developers are significant owners, operators, and developers of natural gas infrastructure and, as such, have significant experience addressing and managing regulatory issues and considerations likely resulting in an on-time project delivery.

4. Mitigation of Price Volatility

As discussed in the Updated Regional Market Overview section, Dawn offers access to lower priced supplies with less volatility relative to the New England market area price indices. As an example of the price stability of the Dawn Hub price, Figure 17 compares the forward price at the Dawn Hub and Tennessee at Dracut to the Henry Hub price. As illustrated, the Dawn Hub forward basis is trading in a relatively narrow bandwidth of plus and minus $0.15 per MMBtu, in stark contrast to the volatile basis at Dracut, peaks between $5.50 and $7.50 per MMBtu during the winter seasons.

Figure 17: Forward Dawn and TGP Dracut Basis[41]



5. Contributions to Diversity

[41] Source: Based on ScottMadden's analysis of forward basis data as of April 15, 2019 from S&P Global Market Intelligence.

The WXP Capacity would increase the diversity of the existing portfolio as it provides the Company with supplies from the Dawn Hub, which has direct access to 11 pipelines (over 10 Bcf/day of capacity) and all major supply basins, as well as 278 Bcf of underground storage. In addition, the Dawn Hub is one of the most liquid supply points in North America, and has an active forward market. The WXP PAs will allow the Company to increase its exposure to the Dawn Hub, which offers a robust market for natural gas supply with many buyers and sellers, and transparency for day-ahead, month-ahead and futures prices. It will similarly reduce the Company's exposure to the PNGTS / Maritimes delivered supply market, which has very few buyers and sellers, limited access to supply basins, and little to no price transparency. Thus, increased access to Dawn greatly increases supply diversity within Northern's portfolio.

6. Renewal Rights

One of the important qualitative benefits of the WXP is the right of Northern to extend each of the capacity contracts (PNGTS, TransCanada and Enbridge) beyond the initial term of the agreements at prices that are based on the cost of service. The Company does not have the right to extend its delivered supply contracts and the number of parties that are able to offer delivered supply is extremely limited. The prices for and availability of delivered supply in the future are subject to great uncertainty, as discussed in the Regional Market Overview. Renewal rights are critical because they provide assurance that Northern has control over the capacity beyond the initial commitment of the contract. Even the alternative project to the WXP Capacity, the WXP Phase I & II capacity back to the WCSB lacks the right to renew the entire capacity path, since the Long-Term Fixed Price from Empress (the receipt point on the TransCanada Mainline of

WCSB Supply) to North Bay Junction was non-renewable. Northern would have had the right to convert the LTFP Contract to FT and pay the higher tariff tolls.

7. Higher Cost of Future Projects

The Westbrook XPress Project will provide 123,934 Dth per day of capacity. Incremental facilities on PNGTS will include the construction of a compressor in Westbrook. Additional future expansion of PNGTS capacity is likely to require the installation of additional pipeline facilities, which would be more expensive to site and construct than the proposed project. Thus, the WXP capacity is currently available at a relatively low price for capacity on the U.S. side of the border.

8. Rate / Toll Design

Pipeline rate design differs for U.S. and Canadian transportation capacity, with reservation charges for expansion capacity in the U.S. based on incremental cost and charges for expansion capacity in Canada capacity based on system average or rolled-in costs. The proposed Agreement involves a combination of U.S. based pricing, reflected in the negotiated rate for service on PNGTS, and Canadian pricing based on the Enbridge and TransCanada tolls, which are subject to adjustment as system average costs change over time. Having diversity among U.S. and Canadian capacity may have pricing benefits over time. The toll design on TransCanada and Enbridge systems are cost-of-service based, as regulated by the National Energy Board of Canada and the Ontario Energy Board, respectively. As such, any toll change will receive regulatory review by those bodies. In addition, the transportation path from the Dawn Hub to PNGTS has a significant level of volumes and shippers and thus the Company's interest is aligned with these other shippers. The PNGTS project rate is fixed, which provides certainty.

9. Demand Charge Mitigation

Northern does not consider potential asset management arrangement ("AMA"), capacity release or off-system sales revenue in its quantitative assessment of long-term capacity, but such revenue opportunities are considered in the qualitative assessment. Northern's current AMA path sourced from Dawn Storage to PNGTS has yielded significant value thus far which mitigates demand costs for customers.[42] By comparison, purchasing delivered supply does not provide mitigation opportunities. The capacity path passes through various Canadian markets before coming to Northern's system, and sales could be made at Dracut, Massachusetts for sales to customers in southern New England or at Westbrook for sales to customers in New Brunswick. As such, it is reasonable to expect positive mitigation value.

iii. Expected Utilization of Proposed Capacity

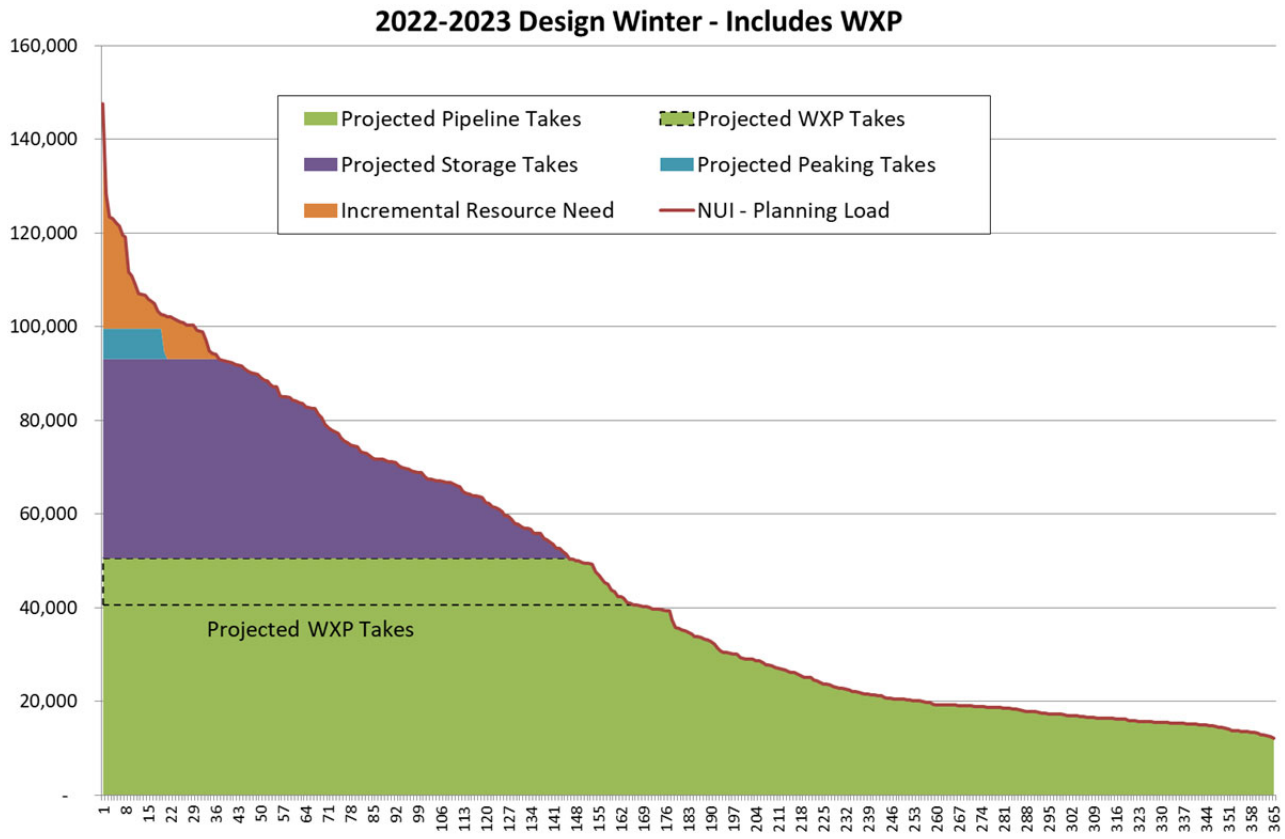
Q. Please describe how the proposed capacity will be utilized.

A. Northern updated the load duration curve presented earlier to reflect the addition of the proposed WXP capacity. As shown in the updated load duration curve in Figure 18 below, Northern anticipates using the proposed WXP Capacity fully for approximately 145 days and partially for another 20 days in the first year of the contract term. The load duration curve assumes that existing Pipeline Capacity would be dispatched before the WXP Capacity, however in actual operation the capacity that accesses the lower cost supply would be dispatched first. The load duration curve reflects nearly full utilization

[42] For example, Northern's AMA for the Union Dawn Storage capacity path provided [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL] in asset management revenue for the 12-months ending April 2019. The replacement AMA for the 12-month period ending April 2020 will provide [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL] in asset management revenue.

of the proposed capacity during the winter period. Appendix 4 provides a summary showing monthly and seasonal utilization by resource type. During periods when Northern does not require the proposed capacity to meet customer requirements, unutilized capacity will be optimized either through asset management arrangements, capacity releases or off-system sales.

Figure 18: Updated Load Duration Curve – Proposed 2022-23 Portfolio



e. Proposed Portfolio

As discussed, adding the proposed Westbrook XPress Project capacity to the portfolio would bring reliable and competitively priced supply to Northern's customers, reduce reliance on delivered supply and improve reliability and price stability. Table 7

provides an update to Table 4, reflecting the addition of the proposed WXP capacity. Adding the proposed PXP capacity increases the long-term capacity in the portfolio by approximately 11 percent. A capacity path diagram for the proposed WXP capacity has been included in Appendix 3.

Table 7: Proposed 2022-23 Long-Term Portfolio Summary

Northern Utilities, Inc.
Existing, Pending and Proposed Long-Term Portfolio Resources

November 1, 2022 Capacity Paths	Resource Type	Max Daily Quantity	Method of Assignment	Status
Iroquois Receipts Path	Pipeline	6,434	Company-managed	Existing
Tennessee Niagara Capacity	Pipeline	2,327	Capacity Release	Existing
Tennessee Long-haul Capacity	Pipeline	13,109	Capacity Release	Existing
Algonquin Receipts Path	Pipeline	1,251	Company-managed	Existing
Tennessee Firm Storage Capacity	Storage	2,644	Capacity Release	Existing
Dawn Storage Path	Storage	39,863	Capacity Release	Existing
Lewiston On-System LNG Plant	Peaking	6,500	Company-managed	Existing
Existing Long-Term Capacity		**72,128**		**Existing**
Portland XPress Project	Pipeline	9,965	Capacity Release	Pending
Atlantic Bridge Capacity	Pipeline	7,500	Capacity Release	Pending
Pending Long-Term Capacity		**89,593**		**Pending**
Westbrook XPress Project	Pipeline	9,965	Capacity Release	Proposed
Proposed Long-Term Capacity		**99,558**		**Proposed**

The figures below provide updated pie charts showing the expected relative use of different types of resources in the proposed 2022-23 portfolio as well as remaining Incremental Resource Need under design day and design year conditions. As shown in Figure 19, the proposed WXP capacity would meet 7 percent of design day requirements, reducing the remaining Incremental Resource Need from 39 percent of design day demand as shown earlier on Figure 14 to 32 percent. Similarly, Figure 20 shows that the

proposed capacity would meet 9 percent of design year requirements, which would reduce the remaining Incremental Resource Need from 5 percent of design year demand as shown on Figure 16 to 2 percent.

Figure 19: Proposed 2022-23 Portfolio relative to Design Day Planning Load

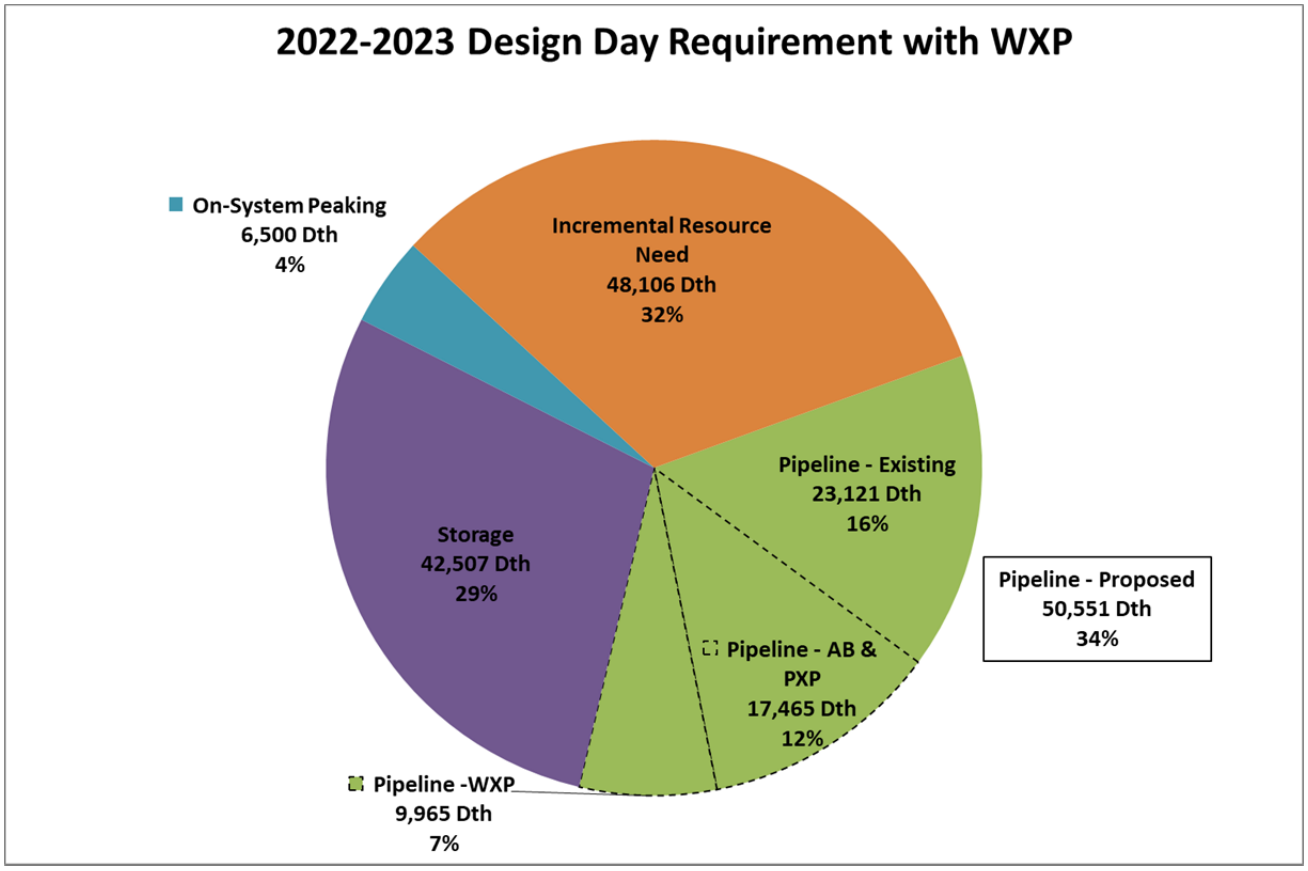
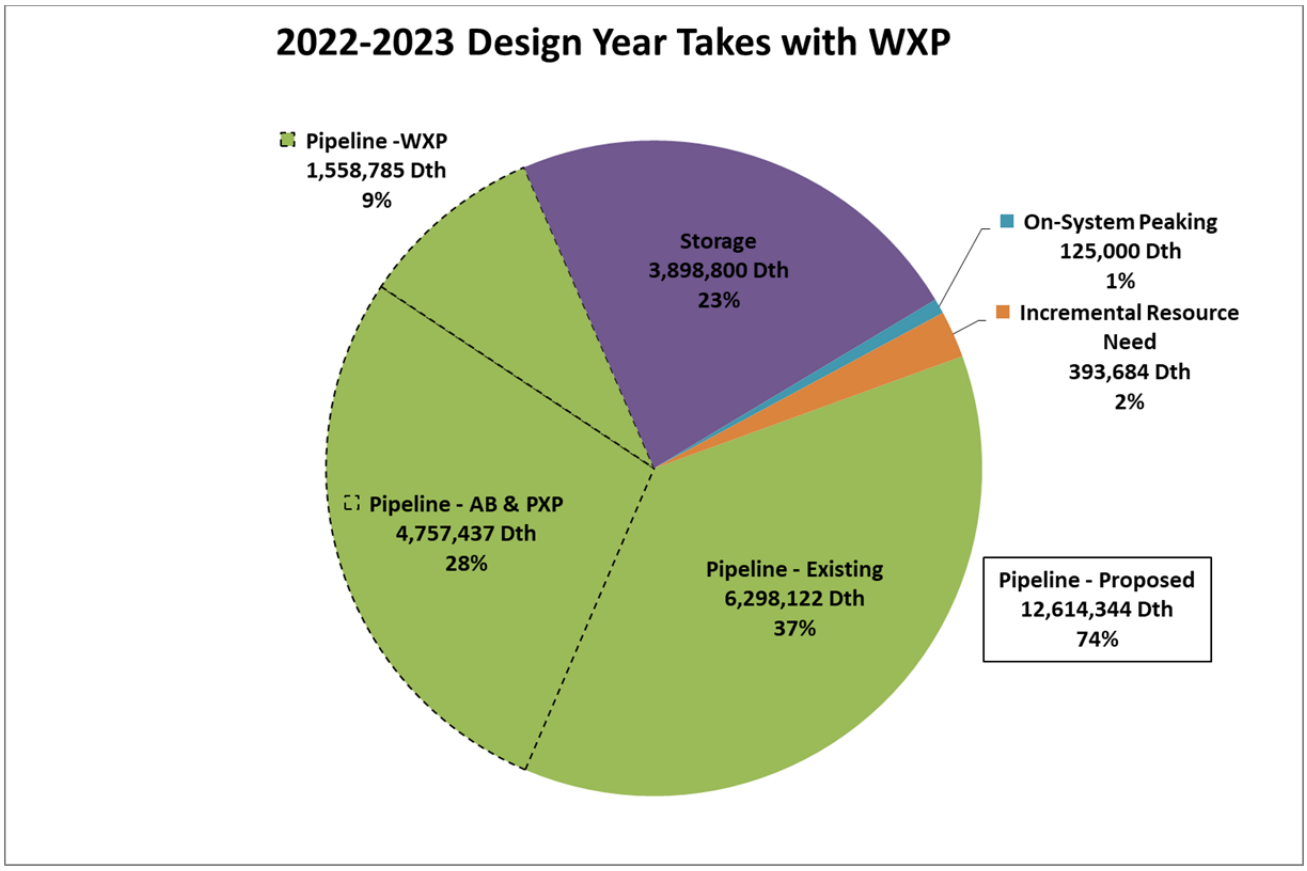


Figure 20: Proposed 2022-23 Portfolio relative to Design Year Planning Load



V. CONCLUSION - NORTHERN'S DECISION TO ENTER INTO THE AGREEMENTS IS PRUDENT, REASONABLE AND CONSISTENT WITH THE PUBLIC INTEREST

Q. Please summarize your testimony.

A. Based on the foregoing analysis and discussion, Northern's decision to enter into the WXP PAs is prudent, reasonable and consistent with the public interest in light of existing and reasonably knowable circumstances, and is representative of efficient utility operation and sound management practices. The addition of the proposed WXP capacity provides critical protection from over-reliance on delivered supplies in an environment where such supplies are being reduced and the demand for them is increasing. Continuing to rely on delivered service purchased at Granite interconnects for the

planning load requirements that could be supplied with reliable and competitively priced supply from the Dawn Hub under the proposed Agreements will unnecessarily expose Northern's customers to reliability and price volatility risk that would otherwise be mitigated through the WXP PAs.

Contracting for long-term, firm capacity on upstream pipelines offers reliability and pricing advantages, and is synchronous with regulatory policy. There are critical advantages to access to liquid trading points such as the Dawn Hub such as reliability and firm access to diverse production regions with an increased supply assurance and greater price stability.

The Company must address the question of how to manage gas procurement to serve current and growing load at reasonable cost in the face of few supply alternatives. Ongoing regional constraints in pipeline capacity and dwindling supply from Atlantic Canada sources can cause higher and more volatile pricing. The acquisition of capacity connecting Northern to the Dawn Hub will help the Company broaden its portfolio of resources in a manner that will offer access to lower cost supply and protection against basis volatility.

The WXP PAs provide Northern with the ability to meet a portion of its identified incremental resource need while enhancing reliability and price stability for its customers. Taking into account Northern's identified incremental resource need, the current regional outlook, and the economic and operational advantages of acquiring capacity on the Westbrook XPress Phase III Project, Northern's decision to enter into the WXP PAs is a prudent, reasonable and consistent with the public interest.

Other things being equal, it is prudent and beneficial to customers over the long term to replace receipts in areas where supply is scarce and declining with receipts in areas where supply is increasing. Extensive reliance on the continued future availability of delivered supplies on Maritimes and PNGTS is not a viable long-term strategy to avoid reliability and price volatility risk, particularly when reliable access to supply is available. The proposed WXP capacity would replace a portion of Northern's current need for delivered supply with access to Dawn that would enhance reliability and price stability for Northern's customers, and is thus a superior resource option.

Q. Does this complete your testimony?

A. Yes, it does.