ALTERNATIVES

Note: Elements of this evidence have been updated through the submission of Exhibit A, Tab 3, Schedule 9 (filed on July 22, 2013).

1. The purpose of this evidence is to discuss other alternatives that were considered prior to proposing the GTA Project as it is currently described in this Application. Some of the alternatives explored can have some positive impact on Enbridge's objectives. However, in order to achieve the full range of objectives, additional infrastructure was ultimately required. Enbridge spent considerable time examining alternatives where existing pipeline infrastructure could be utilized, both on the distribution system, and external to Enbridge's system. Details on the examination of different options are described below.

2. As mentioned in Exhibit A, Tab 3, Schedule 1, Enbridge had specific objectives that were considered while evaluating the alternatives. These objectives included:
    a. Meet customer growth requirements to 2025;
    b. Reduce operational risk by incorporating the capability of lowering the operating pressures on critical supply lines that are key to system reliability;
    c. Provide enhanced operational flexibility and improved connectivity between the western and eastern part of the GTA XHP system;
    d. Mitigate supply concentrations at gate stations; and,
    e. Displace less secure elements of its supply portfolio with more reliable supply, while reducing gas supply costs.

    There are a number of alternatives that could be considered, alone, or in combination in order to meet the objectives.

Demand Side Management

3. Enbridge has a long history of providing Demand Side Management ("DSM") and conservation programs. These programs help consumers manage and lower their consumption of natural gas, benefiting consumers, the economy, and the

environment. In examining a conservation approach to meet the objectives, there are three important points to note:

a. Enbridge currently implements a robust DSM program that has been reviewed and approved through a regulatory process. The currently planned DSM activities and conservation are already included in the forecast presented.
b. The issues with the distribution system are related to peak demand system loading, whereas conservation programs are typically targeted at lowering overall consumption. It is important to recognize the fundamental difference between these two items. Conservation programs will be focused on lowering total annual consumption in order to be economic over the life of the program. This can, at times, align with lowering of peak demand system loading. Examples include items such as higher equipment efficiency, better building envelopes, and higher efficiency heat recovery ventilators. However, some conservation programs can actually accentuate the system peak demand, particularly at hourly intervals. System controls, such as set back thermostats, typically lower the temperature differential from the inside to the outside of the building, thus lowering the heating requirement during the period of setback. However, when employed on a large scale, the system impact on peak loads can be significant when a large proportion of customer equipment turns on to re-heat the buildings at approximately the same time. Nighttime set back controls, while economic for consumers, increases peak loading as the system has lost the diversity factor from that group of customers. Other examples are instantaneous water heating, where the storage tank losses are eliminated. This benefits the consumer; however, the system diversity is lost during periods of high demand which creates a larger peak demand on the system. This is demonstrated in Exhibit A, Tab 3, Schedule 5, Figure 5.

c. Conservation efforts, while a worthy and important goal, cannot be expected to replace the capacity within the system due to the lowering of pressures on large diameter, higher pressure lines, or create the needed diversity in the supply chain.

Compression within the Distribution System

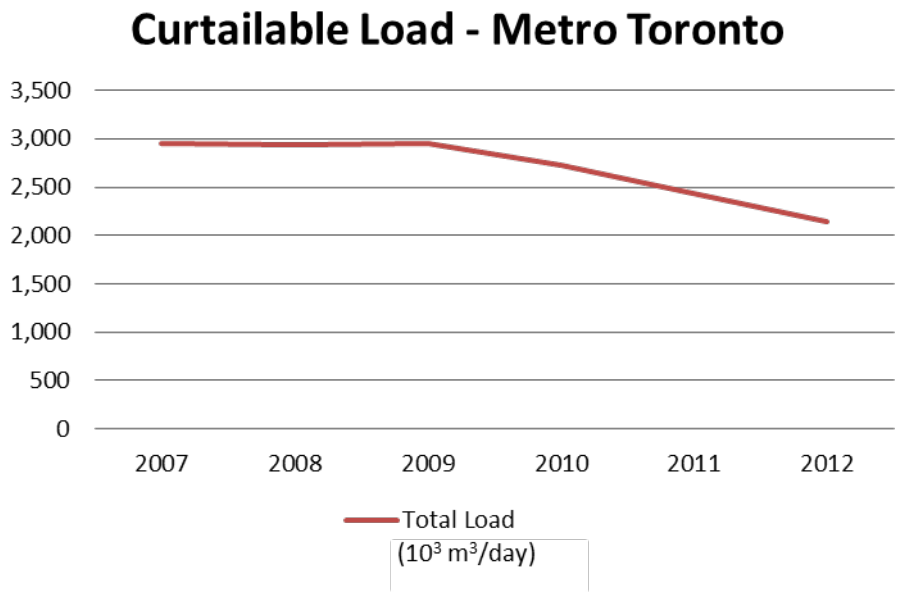
4. Consideration was given to add compression at key locations, such as Station B for example, to alleviate the potential of falling below minimum system pressure requirements. In order to accomplish the same supply and reliability objectives as the GTA Project scope proposed, adding compression would be required at numerous locations. Finding a suitable location for a compression facility is problematic in an urban setting. This is particularly true if consideration is given to Loss of Critical Unit ("LCU") requirements and design standards on separation distances between compression units. Multiple units, and appropriate separation between units, are required to achieve comparable operational reliability as a reinforcement pipeline. In addition, the distribution system currently does not use compression in the distribution system. This would require several new business and labour processes for the Company in this geographic area. Therefore, compression was considered to be a less favourable alternative for the system.

Curtailment of Existing Firm Customers

5. Enbridge could approach existing firm customers to determine their willingness to switch to non-firm contracts. The intent would be to reduce the system's present firm capacity requirements in order to support further customer growth and remove the need for reinforcement. This was determined to be an impractical approach since it would yield minimal additional capacity without the benefit of long term capacity availability. It was also identified as a lengthy process with minimal success. Enbridge currently offers interruptible service. Those customers that find

it a practical and economic alternative already contract for interruptible service. Finally, this runs counter to the trend in curtailment over the last five years, as shown in Figure 1.

Figure 1: Historical Curtailable Load within Metro Toronto /u



Liquefied Natural Gas ("LNG")

6. LNG was considered to provide the additional peaking capacity required for the system, offsetting the need for other infrastructure. Although benefits could be achieved through this type of facility, obstacles to finding an appropriate site area are significant. Given the current location of minimum system pressure at Station B, the site would need to be in close proximity to this area in order to minimize the need for other infrastructure. Location of an LNG facility would require significant setbacks, particularly one that could handle the large demand of the GTA. If a facility was sited outside of the GTA, a corresponding pipeline with associated takeaway capacity would then be required to connect to the GTA XHP grid as a

supply source. Finally the other distribution system objectives would still have to be addressed. The total combined costs were expected to be more costly in comparison to other alternatives considered.

Procurement of Transport Services

7. Procurement of transmission services was also considered. As noted previously in Exhibit A, Tab 3, Schedule 2, the Company has previously delayed building infrastructure internal to the distribution system through consulting with upstream transport providers and procurement of transport services. Historically, this has been procurement of services that flow through the Parkway to Maple portion of the TransCanada system, in order to move firm transport volumes further east prior to entry into the GTA distribution system. This has been a fundamental business decision for Enbridge over a number of years. The decision to "buy" versus "build" is a common decision for many companies, in many different industries. What makes the natural gas transport/distribution business different is the very long life and significant upfront costs associated with decisions to build new infrastructure. Ultimately, the costs of new infrastructure are born by consumers, whether it is built by a transport company or a distribution company, and therefore, any new infrastructure requires careful consideration. Enbridge invested a significant amount of time and effort in considering both internal and external alternatives, or comparing "buy" versus "build" alternatives, as detailed below.

8. In order to procure firm, short haul capacity, infrastructure must be available. Currently, there is a constraint between Parkway and Maple, as demonstrated by the recent open seasons and new builds by TransCanada along this path. Significant new capacity along this path would require new infrastructure to be built. As noted above, the cost of the infrastructure is ultimately born by consumers, regardless of whether the infrastructure is built for transmission or distribution. The

GTA XHP grid is also constrained at Parkway, as it cannot flow more gas from west to east through the existing infrastructure. The Parkway constraint is an important consideration for any new infrastructure requirement.

Distribution System Expansion

9. In examining the distribution system constraint, it should be noted that the Company had planned Parkway Phase 3 for many years. This segment of pipeline would extend the current NPS 36 Parkway North line from Keele/CNR Station, along the utility corridor known as the Parkway Belt West Plan corridor to connect with the NPS 30 Don Valley line. This system reinforcement has been continuously deferred through purchase of transport services from Parkway to the CDA, ultimately brought into the GTA system at the Victoria Square Gate Station. This section of pipeline would alleviate the west-east constraint on the XHP grid, and is also critical to allow for the reduction in the operating pressure on the NPS 26 line.

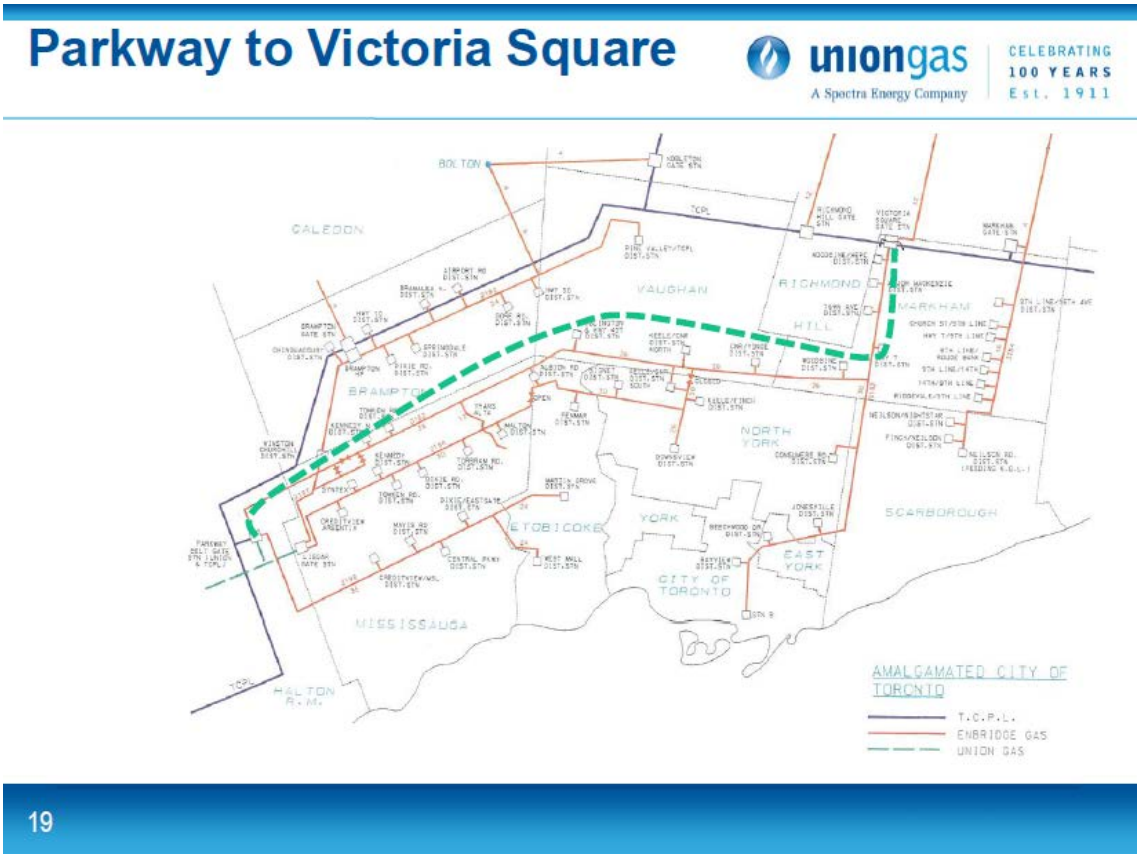
10. The Company had also planned an extension of the NPS 36 line that parallels the NPS 30 Don Valley line, extending the line north from Sheppard Avenue. The purpose of this north–south section pipeline is to allow for greater flow and higher pressure to be maintained at the point of minimum system pressure.

11. Parkway Phase 3 and the NPS 36 Don Valley line extension are part of the facilities proposed in this Application and, in combination, are referred to as Segment B. Segment B will complete a continuous NPS 36 line from Parkway Gate Station to the NPS 30 Don Valley line and as far south as Eglinton Avenue. In conjunction with the existing NPS 30 Don Valley line, this would create a large diameter linkage in the XHP system, increasing the flexibility of the entire XHP grid. For this reason, Segment B is considered to be a core distribution requirement and would be required under any alternative. Although Segment B creates a large diameter

linkage between Victoria Square and Parkway Gate Stations, allowing the two stations to diversify one another, this alone is inadequate to meet all the objectives. The distances and loads served are too large for this to be viable in even moderate winter conditions. In addition, Segment B would not diversify the over-dependence on the two largest gate stations within the system. This could only be accomplished with the addition of a new supply source, requiring consultation with upstream suppliers.

12. Enbridge consulted extensively to ensure it had examined all viable alternatives. In consulting with Union Gas as far back as early 2011, an option was presented to alleviate the Parkway to Maple constraint through construction of a transmission line through the Enbridge's franchise area. The proposed line is shown in Figure 2 below.

Figure 2[1]: Union Gas Parkway to Victoria Square Proposal



13. This alternative has several attractive features, most notably:
    1. Relieving the Parkway to Maple constraint; and,
    2. Allowing for one or more gate stations to be placed along the path diversifying supply sources for distribution.

14. However, the total cost is an issue. As previously noted, all costs, whether they are transmission or distribution, are ultimately paid by customers. This solution was new

[1] Source: EB-2011-0210, J.B-1-7-8 Attachment 12, Slide 19

infrastructure and did not optimize the use of existing assets, in the transmission systems or the distribution system.

15. Continued discussion on how to meet both the transmission and distribution needs at Parkway ultimately led to the concept of a joint use pipeline. A joint use pipeline would relieve the Parkway constraint on both the distribution system and the transmission system. This would allow for the shortest overall distance being constructed and maximize the use of the existing infrastructure. Also, for a significant length of the new pipelines, it would allow for economies of scale through the joint use of a section. This concept also has benefits for the community, as there would only be construction of one pipeline, versus two if the distribution and transmission needs were considered in isolation. This was the concept behind Union's Parkway Expansion Project[2] where Union hosted an open season for capacity between Parkway and Maple. This service would be facilitated through a joint use pipeline (Segment A), and through another to be constructed pipeline from Albion Road Station to Maple. Although the Open Season for Union's Parkway Expansion Project was not successful, the analytical work that went into it identified the importance of the path of transmission expansion. A path from Parkway to Albion to Maple allowed for the joint use of facilities. This joint use arrangement has two primary benefits:

    1. Economies of scale; and,
    2. Less disruption from construction for the community.

16. Significant time and effort went into looking at other alternatives for meeting the stated objectives. There are many options for routes and/or transport arrangements that could achieve the objectives in a large system such as the GTA. For simplicity

[2] Reference: EB-2011-0210, J.B-1-7-8 Attachment 13

of presentation, these variants are grouped together into thematic options in the following paragraphs.

Northern Perimeter Capacity Purchase

17. The Northern Perimeter Capacity Purchase option would involve increasing take away capacity off TransCanada along the northern perimeter of the GTA east of Maple. It also included reinforcement of the distribution system to maintain minimum pressure at Station B during peak conditions.

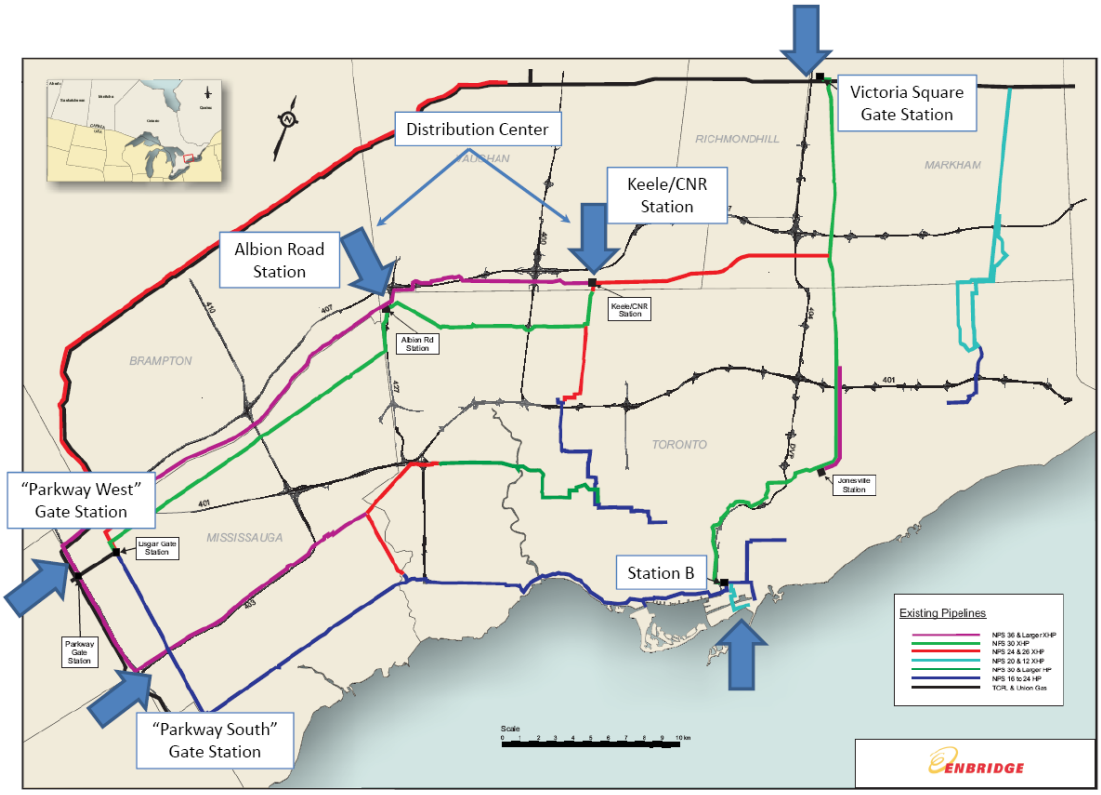
18. Under this alternative, the majority of gas supply required for the new demand growth would be delivered through Victoria Square Gate Station, which is already the second largest supply point within the system. New supply would be sourced from the WCSB, due to the current restriction in short haul capacity. From an economic perspective, the most appropriate service would be 3-month STFT service. This service would best match the seasonal peaking nature of the demand growth on the system as described in Exhibit A, Tab 3, Schedule 5.

19. In order to meet minimum system pressure at Station B, a new NPS 36 pipeline from Victoria Square Gate Station to a connection with the existing NPS 30 Don Valley line and the NPS 36 line at Eglinton Avenue would be required in order for more supply to be brought into the XHP system. This line would need to be connected to the existing Parkway North NPS 36 line at Keele/CNR Station to eliminate the restriction caused by the NPS 26 line. This variant is depicted in Attachment, Figure 1 and is essentially Segment B proposed in this application with the addition of a north-south line connecting Victoria Square and Buttonville Stations.

20. This alternative would not meet all of the objectives defined. It would not diversify the entry points to the distribution system and it would increase the dependence of the supply portfolio on less reliable forms of transport, such as STFT. As described in Exhibit A, Tab 3, Schedule 5, increased reliance on a non-renewable transportation service such as STFT is not considered prudent, given the potential of reduced capacity on the TransCanada Mainline, declines in WCSB supply and increases in U.S. North East supply. To meet all the objectives, diversification of entry points and displacement of STFT with short haul supply would require a new gate station in the vicinity of Victoria Square Gate Station, capable of serving as a back-up to either Parkway or Victoria Square Gate Stations, and an expansion on TransCanada's system from Parkway to Maple facilitating a new short haul path.

21. Variants of this alternative envision a different north-south lateral from a new gate station on the TransCanada Mainline. Mainline points east of Maple that facilitate a connection either into Albion or Keele/CNR Stations, rather than from Victoria Square Gate Station to Buttonville Station, all in combination with Segment B would be near equivalents. Figure 3 depicts these entry points. All variants require new infrastructure in order to expand capacity from Parkway to Maple, unless greater use of long haul STFT is contemplated.

Figure 3: New Entry Points Considered



Southern Perimeter East West Expansion

22. As described in Exhibit A, Tab 3, Schedule 3, reinforcement options to accommodate customer growth must ensure that minimum inlet pressure at Station B is met by the 2015/2016 heating season. Station B is one of the furthest points from any upstream supply which makes it more challenging to maintain minimum pressures as peak day demand increases. The Southern Perimeter route would originate at the west end of the GTA System, south of the existing Parkway Gate Station and terminate at Station B.

23. Delivering supply to Station B, across the southern perimeter of the GTA, has particular space and cost constraints owing to the intensity of development and use

of traffic corridors through the south of the GTA. The necessary takeaway capacity would need to consider pressure elevating existing infrastructure, building new infrastructure, a combination thereof, or on a new, more southern, route through Lake Ontario.

24. First, a pressure elevation of the existing NPS 20 HP Lake Shore line was not considered due to its prior pressure reduction.

25. Second, consideration was given to full and partial replacement, at both NPS 30 and NPS 36 diameter pipe sizes, and integrating the new line into the XHP network at various pressures. This alternative was considered to be unfavourable due to the higher cost compared to other alternatives and socio-economic challenges with construction on the highly-travelled and utility-congested road along Lake Shore Boulevard West.

26. Third, an option was considered for reinforcement through the elevation of the NPS 36 MSL line and installing a parallel NPS 24 or NPS 30 line to the existing NPS 24 XHP line that terminates at West Mall Station. From West Mall Station, the NPS 20 HP Lake Shore line would be replaced with a new NPS 30 pipeline, terminating at Station B. This alternative would complete an XHP loop and provide significantly increased reliability of the XHP grid. However, the associated costs for construction were estimated to be high compared to other alternatives. In addition, the disruption to the community for the type of urban construction that would be required was considered to be problematic. This solution did not fulfill the objective to reduce the vulnerabilities in the supply chain, nor did it assist in alleviating the restriction across the NPS 26 Parkway North line.

27. Fourth, and lastly, the Company considered a new pipeline routed through Lake Ontario from "Parkway South" to Station B. A pipeline with this route had several attractions for reinforcement of the GTA system. It would allow new supply to be delivered directly into Station B. It would also avoid difficulties with urban construction (including tight urban working spaces, traffic management, and conflicts with the congested underground utility infrastructure). This alternative would require both a pressure elevation of the existing NPS 36 MSL line and a new NPS 30 pipeline routed through Lake Ontario. However, evaluation of the new pipeline routes through Lake Ontario concluded that magnitudes and uncertainties in costs and timing overruns were unacceptable. It also does not provide the advantage of looping along existing corridors which provides greater flexibility in the longer term.

Central Access with East West Expansion and North South Expansion

28. This alternative included a new gate station in the vicinity of the existing Parkway Station (Parkway West), combined with take away capacity to a central point in the distribution system. Consideration was given to whether the central point would be defined as the load center or the central point for takeaway capability. The latter option was viewed as more desirable as it would meet system reliability objectives, while maximizing the use of the existing infrastructure, and decreasing any new infrastructure requirements for future growth.

29. The optimal central point for take away capacity was identified as Albion Road Station or Keele/CNR Station. This is due to their central location and ability to tie into existing infrastructure and distribute gas in all directions. This would be advantageous under both peak and adverse conditions to be able to move gas to the areas within the distribution network with greatest demand.

30. A route from “Parkway West” Gate Station to Albion Road Station could parallel the existing NPS 36 XHP Parkway North line constructed through Parkway Phase 1 (described in Exhibit A, Tab 3, Schedule 2) and could be mainly located within the same designated Parkway Belt utility corridor.

31. The Parkway West Gate Station would also serve to diversify the existing Parkway Gate Station supply, via a short 315 metre tie-in pipeline segment, allowing the supply to be sourced for the system from both facilities. In addition, should a situation arise at either site, such as an integrity or maintenance requirement, the other site would be available to ensure a continuous supply for customers.

32. “Parkway West” Gate Station, a new NPS 36 XHP line paralleling the existing NPS 36 XHP Parkway North line (along with the 315 metre tie-in between the two lines), and associated station expansion to Albion Road Station and upgrade to the Parkway Bypass, were later labeled as Segment A.

33. Although the benefits of this route were extensive, they were limited by the ability to move gas further east and south to the point of minimum system pressure at Station B. An additional west-east pipeline segment would be required to alleviate the restriction in the NPS 26 XHP Parkway North line and a north-south segment to facilitate gas supply delivery to Station B to meet peak day demand requirements. The two pipeline spans would also allow for increased utilization of gas supply benefits acquired through new “Parkway West” interconnection.

34. As mentioned in Exhibit A, Tab 3, Schedule 2, the need for the pipeline NPS 36 XHP segment from Keele/CNR Station to the NPS 30 Don Valley line was originally identified as Parkway Phase 3. This project was initially planned in the early 1990’s, then revisited in the early 2000’s, but postponed until now since the

additional west to east gas transportation volumes could be delivered by TransCanada under short haul contracts. The construction of this pipeline route is still deemed to be required to alleviate the west to east restriction in the XHP grid. This section strengthens the connectivity between the two major entry points into the system (Victoria Square and Parkway Gate Stations), allowing for one source to offset potential shortfalls from the others. This section of pipeline also allows for increased takeaway capacity from Parkway Gate Station for distribution to the eastern portion of the GTA.

35. The north-south segment was still required to add the capacity needed to bring gas supplies towards the downtown Toronto core to meet the minimum pressure requirements at Station B. Previous long range planning for system load growth had identified the northward extension of the NPS 36 XHP pipeline in the Buttonville corridor from Sheppard Avenue East to just north of Highway 407 as the best alternative for meeting the replacement capacity requirements for PEC.

36. The new NPS 36 XHP east-west and north-south segments described above, the new “Buttonville Station”, and the associated station modifications and expansions to both Keele/CNR Station and Jonesville Station, were later labeled as Segment B.

37. The Central Access options showed greater supply chain benefits than any of the Northern Perimeter Capacity Purchase or Southern Perimeter alternatives. In addition, it offered constructability and right of way benefits relative to the Southern Perimeter options considered and as a result was carried forward for Environmental Review.

Central Access Variations Considered

38. Enbridge considered other variations as part of the project development process. Most notably, particular consideration was given to other existing infrastructure, and how it could potentially be utilized to meet Enbridge's objectives. There is a significant amount of existing gas transportation infrastructure in the area around the Parkway facility. It is not only a major gate station, but also a major compression, transmission, and gas interchange point. Enbridge noted that TransCanada currently has a NPS 36 and NPS 42 transmission system that parallels the proposed routing of Segment A up until these pipelines cross Highway 407 and continue north to TransCanada's Maple compressor facility. Enbridge approached TransCanada and suggested a new delivery point be considered at or near the point where the existing lines cross Highway 407. This would reduce the length of Enbridge's proposed Segment A by approximately 5 km. Details of discussions are described in more detail in Exhibit A, Tab 3, Schedule 1, page 10. Overall, this would be a variation in the project scope and does not significantly alter the purpose, need or timing. The two potential initiation points for the Segment A pipeline, interconnecting with Union Gas or TransCanada are shown in Figure 4. Enbridge had initially applied for the connection to Union Gas and has amended the Application via Update No.1 to interconnect with TransCanada. The primary difference is the Segment A pipeline is approximately 5 km shorter and utilizes TransCanada's existing facilities between Parkway and the Bram West Interconnect.

39. Enbridge has agreed with TransCanada to shared usage of Segment A. In order to accommodate the combined volumes of the two companies, the Segment A pipeline will be NPS 42. As described in Exhibit A, Schedule 3, Section 6, some of the originally proposed facilities locations would change due to the combination of

new interconnection point and the shared usage. This arrangement with TransCanada is subject to NEB approval.

40. The new starting point for Segment A and the upsizing and shared usage of the pipeline will potentially eliminate the need for duplicative pipelines/facilities resulting in less environmental and community impacts

41. Enbridge expects to continue to work with TransCanada to formalize details with respect to the tolling impacts of utilizing TransCanada's Mainline from Parkway to Bram West Interconnect, and the cost implications of the shorter Segment A, increased pipe size, and shared usage. Once these details are completed Enbridge will update the Board at that time. The updates are currently expected to be submitted in late March 2013.

Figure 4: Map of the Variation on the Initiation Point with Union Gas or TransCanada