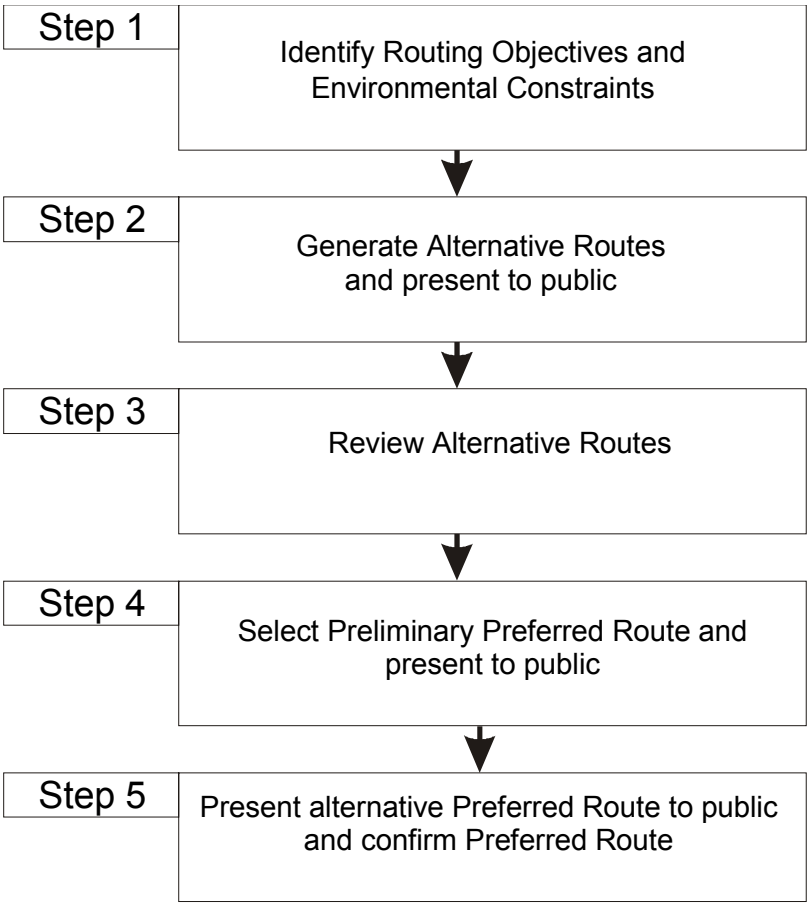
5.0 Route Evaluation Methodology

The Preferred Route for the proposed pipeline was selected through a five-step process, illustrated in **Figure 5-1**. The five-step process confirmed many findings and assumptions made by the study team through the implementation of a public consultation program.

Figure 5.1 Route Evaluation Methodology



5.1 STEP 1: ROUTING OBJECTIVES AND ENVIRONMENTAL CONSTRAINTS

5.1.1 Routing Objectives

The process of developing alternative routes commenced with the identification of routing objectives. Routing objectives are the general principles used to create reasonable and/or feasible alternative routes. The following objectives were used to assist in the generation of alternative routes within the Study Area:

1. Existing linear features should be utilized or paralleled to the greatest extent possible in order to minimize impacts to previously undisturbed land;

2. Where new easements are required, existing lot/property lines should be followed to avoid diagonal crossings of properties;

3. Routes should avoid sensitive environmental features to the extent possible, where they cannot be avoided, routes should be located to minimize impacts; and,

4. Routes should follow a reasonably direct path between end-points, minimizing length as well as potential for environmental and socio-economic impacts.

Consideration was also given to provincial planning policies, guidelines, and regulations as described in **Sections 1.3 and 1.4** of this report.

5.1.2 Environmental Constraints and Opportunities

Environmental constraints are features that would be adversely affected by pipeline construction or operation, or features that possess unique attributes. Opportunities are existing features, such as a linear corridor or physical boundary, which provides a suitable location for the alignment of a pipeline. The environmental inventory, undertaken in Phase I of the study process, identified many of the features considered either as pipeline routing constraints or opportunities.

The identification of sensitive environmental features (*i.e.* constraints) was based on the following criteria:

- Site-specific mitigation measures would be required to minimize potential impacts;

- The feature has been selected or designated for protection; or,

- The feature has been recognized through local, regional, provincial, or federal policy, plan, or statute, or is otherwise valued as a social or economic resource.

Considering the criteria listed above, examples of significant environmental and socio-economic features in the Study Area include:

- Businesses and industrial facilities;
- Residential homes; and,
- Socio-economic features such as Niagara Detention Centre, Welland Canal, community centres and churches, etc.

The configuration of the Study Area, combined with the presence and location of these significant environmental features, resulted in the identification of several logical alternative routes adjacent to existing linear features.

5.2 STEP 2: GENERATE ALTERNATIVE ROUTES

Paralleling existing linear features presents opportunities to reduce the area of land potentially impacted by construction and operation of the proposed pipeline. This opportunity allowed the study team to generate individual route segments that were interconnected to create alternative routes that could be considered for the alignment of the proposed pipeline. The alternative routes are shown in **Appendix A, Figure A-2**.

Generation of the alternative routes was based on the routing objectives and environmental constraints and opportunities identified in Step 1. The route segments were interconnected to create alternative routes between the end points. Linear features within the Study Area that met the first routing objective, while avoiding and/or minimizing impacts to sensitive environmental features, were considered as route segments that could eventually form part of an alternative route.

Once the alternative routes were generated, they were presented to the public for their comment at the First Public Information Session. Comments made by the public were considered during the selection of the Preliminary Preferred Route.

5.3 STEP 3: ALTERNATIVE ROUTE SCREENING AND SELECTION OF THE PRELIMINARY PREFERRED ROUTE

The alternative routes were subject to preliminary screening and comparative evaluation. This process consisted of discarding route segments with significantly greater environmental or socio-economic impacts and comparatively evaluating the effects of the remaining segments using biophysical and socio-economic criteria. The primary goal of the comparative evaluation was to determine the potential environmental or socio-economic impacts of each alternative segment.

A total of eleven route segments were created, the combination of the route segments resulted in the generation of five alternative routes. Only reasonable, or logical, interconnections of route segments were considered in the generation of the alternative routes. Route segment

combinations, which have been linked to create the alternative routes, are identified in **Table 5-1** below. Each alternative route is comprised of various route segments, the routes can be defined by referring to **Appendix A, Figure A-2,** and the shaded cells within **Table 5-1**. For example, Route 1 is formed by joining Route Segments A, D, and K.

Table 5.1 Preliminary Alternative Routes and Route Segments

	A	B	C	D	E	F	G	H	I	J	K
Route 1											
Route 2											
Route 3											
Route 4											
Route 5											

Following generation of the preliminary alternative routes, Stantec completed a field review of the Study Area to determine the alignment of each alternative route and to identify a Preliminary Preferred Route. The Preliminary Preferred Route and alternative routes can be seen on **Appendix A, Figure A-2**. This component of the route selection process is referred to as the Preliminary Route Screening.

The purpose of the Preliminary Route Screening is to eliminate the least acceptable alternative route segments from further consideration. During this step, Stantec eliminated from further consideration Routes Segment A, B, C, D, and E. The rationale, provided below, for eliminating each of these segments is subjective and based on the past experiences and professional judgment of Stantec.

Route Segments A, B, C, and E

Route Segment A travels south from Enbridge's Blackhorse Gate Station to Lundy's Lane (Highway 20). It then travels west along Lundy's Lane (Highway 20) until Davis Road (Highway 58) where it then travels north adjacent to the road until the start point of Route Segment C. Route Segment B travels north along an existing Hydro One corridor from Enbridge's Blackhorse Gate Station and ends at the start point of Route Segment E. Route Segment C begins at the end point of Route Segment A and travels northeast adjacent to Davis Road (Highway 58) and ends at the start point of Route Segment E. Route Segment E travels northeast adjacent to David Road from the end points of Route Segments C and B and ends at the start point of Route Segment H. These route segments have been excluded from further consideration because it was decided by Enbridge that their Blackhorse Gate Station was not a suitable start point due to the need for an expansion of the existing facility in order to accommodate the proposed pipeline. It was determined that constructing a new facility at the point where TransCanada PipeLine's existing natural gas pipeline crosses Thorold Townline Road was a better option. In addition, routes commencing at Enbridge's existing Blackhorse Gate Station would have potentially greater impacts on the residential component of the proposed Rolling Meadows development than routes commencing from Thorold Townline Road. In Stantec's opinion this was a suitable decision with respect to the environmental and socio-economic features within the Study Area.

Route Segment D
Route Segment D travels north from the end point of Route Segment A adjacent to Allanburg Road and ends at the start of Route Segment K. Route Segment D has been excluded from further consideration due to potential socio-economic impacts. This route travels adjacent to the entrance of a fire station, an elementary school and within 100 m of several homes and businesses.

5.3.1 Route Screening Summary

Alternative routes that utilized Route Segments A, B, C, D, and E (**Appendix A, Figure A-2**), were excluded from advancing to a more detailed route comparison and evaluation. The Alternative Routes eliminated through the Preliminary Route Screening were Routes 1, 2, and 3.

5.4 SELECTION OF THE PRELIMINARY PREFERRED ROUTE

The remaining Alternative Routes, 4 and 5, were subject to a comparative analysis. The comparative analysis identified a Preliminary Preferred Route that was presented on June 26, 2007 at the Second Public Information Session.

Enbridge and Stantec considered several factors prior to identification of the Preliminary Preferred Route. The comparison of the routes considered the advantages and disadvantages of each route both quantitatively (measurable) and qualitatively (professional judgment from an environmental, engineering, lands, and economic perspective).

5.4.1 Common Route Segments

The first step in selecting the Preliminary Preferred Route was to focus the evaluation process. Alternative Route Segments G, J, and K were the common segments to each of the remaining alternative routes under evaluation. At this point of the study it was determined that these route segments would each form a section of the Preliminary Preferred Route.

Route Segment G
Route Segment G commences at the point where TransCanada PipeLine's existing natural gas pipeline crosses Thorold Townline Road and travels north to the start point of Route Segment's F and I.

Route Segment J
Route Segment J commences at the end point of Route Segment H and travels west along Niagara Falls Road to the start point of Route Segment K.

Route Segment K
Route Segment K commences at the terminal point of Route Segment J. Route Segment K extends north onto Abitibi-Consolidated – Thorold Division's property and ends at the future location of the Thorold CoGen L.P.

5.4.2 Preliminary Preferred Route Interconnection

Interconnection of the Preliminary Preferred Route remained to be determined between the end of Route Segment G and the start point of Route Segment J. The selection of the Preliminary Preferred Route between these points is discussed below.

Connecting the end of Route Segment G and the start point of Route Segment J

Either a combination of Route Segments F and H or Route Segment I can achieve the connection between the end of Route Segment G and the start point of Route Segment J. Route Segment F travels south west along an existing Hydro One corridor, until it reaches Davis Road (Highway 58). Route Segment H travels north along Davis Road (Highway 58) until it reaches Niagara Falls Road and the start point of Route Segment J. Route Segment I travels west along Beaverdams Road from the terminal point of Route Segment G until reaching the start point of Route Segment J.

The quantitative evaluation revealed that the combination of Route Segments F and H resulted in a longer route length than Route Segment I. An increase in route length usually results in an increase in environmental and socio-economic disturbance; however, Route Segment I actually has a greater socio-economic disadvantage because of the disruption to Thorold Townline Road and Beaverdams Road. Route Segment F travels adjacent to an already disturbed area, the Hydro One corridor. The area adjacent to the Hydro One corridor has been designated as Open Space and Recreation in the Rolling Meadows Plan; therefore, the presence of the proposed pipeline will not affect future residential lots. From a qualitative perspective, Route Segment I has a greater potential to disrupt traffic and local residents and business owners because it travels within road allowance. In addition, the crossing of Beaver Dams Creek at Thorold Townline Road along Segment I is believed to be very difficult from a construction perspective. Following the quantitative and qualitative comparisons between interconnections, the combination of Route Segments F and H were determined to be the routing option that would cause the least disturbance to environmental and socio-economic features.

The consideration of qualitative data, collected at the onset of the route selection process, such as field observations and the professional judgment of Stantec, did not provide any information that did not support the decision to use Route Segments F and H for the interconnection.

Following careful consideration of all of the factors involved, the project team selected the combination of Route Segments H and F to interconnect Route Segment G to Route Segment J.

5.4.3 Preliminary Preferred Route

The interconnection of Alternative Route Segments G, F, H, J, and K, formed the aligned Preliminary Preferred Route presented at the Second Public Information Session on June 26, 2007. This alignment appears as a solid blue line on **Appendix A, Figure A-2.** The selection of the Preliminary Preferred Route was presented to agencies and the public through written correspondence and public consultation.

There were no agency or landowner comments or concerns relating to the alignment of the Preliminary Preferred Route.

5.5 SELECTION OF THE PREFERRED ROUTE

There were no revisions made to the Preliminary Preferred Route based on comments or concerns from agencies and the public. The alignment of the Preliminary Preferred Route became the original Preferred Route. **Appendix A, Figure A-3** illustrates the alignment of the original Preferred Route.

The original Preferred Route was presented to Enbridge by Stantec in August 2007 for their review and approval. Enbridge determined the original Preferred Route to be acceptable from an engineering and construction perspective; however after further consultation with landowners during easement acquisition Enbridge sought Stantec's opinion of the environmental acceptability of an alternative Preferred Route that did not require easements from private landowners. The alternative Preferred Route is comprised of the interconnection of Route Segments G, I, J, and K (revised). The only difference between the original Preferred Route, and the alternative Preferred Route, is the use of Route Segment I, and the slight revision to Route Segment K.

Route Segment I was not selected to become part of the original Preferred Route due to the potential for socio-economic disturbance during construction and it was originally believed that crossing Beaver Dams Creek along Thorold Townline Road would be very difficult. Upon further examination, performed by Stantec in March 2008, it was determined that there will not be a significant increase in socio-economic impact, and the constructability issues associated with the water crossing will be offset by the savings incurred by not needing to acquire land from the ORC to allow for aligning the pipeline within the existing Hydro One corridor. The alternative Preferred Route will also avoid the potential disruption to the cemetery on Thorold Townline Road because it will be aligned along the east side of the road until well north of the cemetery. Since the majority of the alternative Preferred Route will be aligned within road allowance, there will be less potential for socio-economic impact on the Rolling Meadows Development.

Route Segment K was revised in order to fulfill the needs of Abitibi Consolidated Inc.'s construction plans.

A Public Information Session was held on March 18, 2008 to provide an opportunity for agencies, First Nations, stakeholders, landowners and the general public to review the alternative Preferred Route. There were no concerns regarding the alignment of the alternative Preferred Route. In a letter dated March 17, 2008, the MNR stated that the alternative Preferred Route would probably have less impact than the original Preferred Route as it appears to follow existing road allowance.

After conducting a windshield survey, further examination of previously collected materials, and considering public input, Stantec has determined that the alternative Preferred Route proposed by Enbridge is an environmentally and socio-economically acceptable route. The alternative Preferred Route ("Preferred Route") is illustrated in **Appendix A, Figure A-4.**