



National Energy Board

Reasons for Decision

**TransCanada Pipelines
Limited**

GH-4-90

April 1991

Facilities

National Energy Board

Reasons for Decision

In the Matter of

TransCanada Pipelines Limited

Review Under Part I of the National Energy Board Act of the Board's Decision to deny issuance of a certificate in respect of the Gananoque Extension; and

Application entitled "Gananoque Extension Facilities Review Application"

GH-4-90

April 1991

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Abbreviations

Act	National Energy Board Act
Assessment Reports	Environmental and Socio-Economic Reports (June 1990)
Bcf	billion cubic feet
Beak	Beak Consultants Ltd.
Board	National Energy Board
Can.	Canadian
CNG	CNG Transmission Corporation
Corps	(United States of America) Department of the Army Corps of Engineers
CSA	Canadian Standards Association
CWS	Canadian Wildlife Service
DEC	New York State Department of Environmental Conservation
DOE/FE	(United States of America) Department of Energy, Office of Fossil Energy
Dt	decatherm(s)
EIA	Export Impact Assessment
Empire	Empire State Pipeline
Fairm	C.B. Fairm & Associates
FERC	(United States of America) Federal Energy Regulatory Commission
FS	Firm Service
GH-1-89	Hearing Order GH-1-89 in respect of TransCanada's application for 1990/91 facilities
GH-5-89	Hearing Order GH-5-89 in respect of TransCanada's application for 1991 and 1992 facilities
GH-6-89	Hearing Order GH-6-89 in respect of various gas exports
GHW-4-89	Hearing Order GHW-4-89 in respect of certain aspects of the Market-Based Procedure

GH-1-90	Hearing Order GH-1-90 in respect of the review of previously denied GH-1-89 gas exports
GHW-4-90	Hearing Order GHW-4-90 in respect of environmental screening of those exports being reviewed in GH-1-90
GH-4-90	Hearing Order GH-4-90 in respect of TransCanada's proposed Gananoque Extension
ha	hectares
HP	horsepower
ICG Ontario	ICG Utilities (Ontario) Ltd
IPAC	Independent Petroleum Association of Canada, The
Iroquois	Iroquois Gas Transmission System
KFN	Kingston Field Naturalists, The
km	kilometre(s)
kPa	kilopascal(s)
LDC	local distribution company
m	metre(s)
m ³ /d	cubic metres per day
MBP	Market Based Procedure
MCC	Ontario Ministry of Culture and Communication
MLV	mainline valve
MM	million
mm	millimetre(s)
MMcfd	million cubic feet per day
MNR	Ontario Ministry of Natural Resources
MOE	Ontario Ministry of the Environment
MTR	Ontario Ministry of Tourism & Recreation

mw	megawatt(s)
National Fuel	National Fuel Gas Supply Corporation
Niagara Mohawk	Niagara Mohawk Power Corporation
NOVA	NOVA Corporation of Alberta
NYSPSC	New York State Public Service Commission
O.D.	outside diameter
Ontario	Minister of Energy for Ontario
OPCC	Ontario Pipeline Coordination Committee
Playgroup	Wolfe Island Cooperative Playgroup
psig	pounds per square inch gauge
PSL	New York Public Service Law
Regulations	Onshore Pipeline Regulations
Seaway Authority	St. Lawrence Seaway Authority
SLEOC	St. Lawrence Eastern Ontario Commission
TIARA	1000 Island Area Residents' Association, The
TransCanada	TransCanada PipeLines Limited
Union	Union Gas Limited
U.S.	United States of America
WGML	Western Gas Marketing Limited
WGML/ TransCanada	Western Gas Marketing Limited as agent for TransCanada PipeLines Limited
WIAA	(Ontario) Woodlands Improvement Act agreement

Recital and Appearances

In the Matter of the *National Energy Board Act*, R.S.C. 1985, c. N-7, as amended ("the Act"), and the regulations made thereunder;

And in the matter of a review, under Part I of the Act, of the Board's decision of 20 November 1989, to deny the application of TransCanada PipeLines Limited ("TransCanada") dated 29 December 1988, as amended, for a certificate in respect of certain proposed facilities known as the Gananoque Extension;

And in the matter of an application dated 22 June 1990, by TransCanada entitled "Gananoque Extension Facilities Review Application";

And in the matter of Hearing Order GH-4-90, as amended.

HEARD at Kingston, Ontario on 10, 11 and 12 September and 1, 2, 3, 4, 9, 10, 11, 12, 15, 16, 17, 18, 19, 22, 23, 29 and 30 October 1990 and at Gananoque, Ontario on 18 September 1990.

Before:

D.B. Smith	Presiding Member
A. Côté-Verhaaf	Member
C. Bélanger	Member

Appearances:

G. Sadvari J. Schatz M. Forster	TransCanada PipeLines Limited
A. Hollingworth M. Newton	Independent Petroleum Association of Canada, The
P.C.P. Thompson, Q.C. P. Doody G. Pratt	Industrial Gas Users Association, The
G. Vance	Kingston Field Naturalists, The
P.M. Murray L. Houldsworth	1000 Island Area Residents' Association, The
G.E. BisailonWhitmount L. Attfield	Estates Homeowners' Association, The
E. Huffman	Wolfe Island Co-operative Playgroup, The
L.E. Smith	Alberta Northeast Gas Export Project, The

T.G. Kane R.J. Harrison	ANR Pipeline Company
L.E. Smith	Boundary Gas, Inc.
S. Carscallen	CanStates Gas Marketing
F.X. Berkemeier	Consumers Power Company
S. Lockwood	FSC Resources Limited
F. Hébert J.S. Bulger	Gaz Métropolitain, inc.
J. Smellie	ICG Utilities (Ontario) Ltd.
I.A. Blue, Q.C. D.M. O’Leary J. Day	Niagara Mohawk Power Corporation
J. Hopwood, Q.C.	NOVA Corporation of Alberta
E. Legresley W. Houston	Rochester Gas and Electric Corporation
G. Cameron D. Sullman W. Killeen	Union Gas Limited
A. Bigué	Vermont Gas Systems, Inc.
N.J. Schultz D. Purdy	Western Gas Marketing Limited
P. McCunn-Miller	Alberta Petroleum Marketing Commission, The
P. Milliken, M.P. R. Brisson	Kingston and the Islands (Federal Constituency)
G. Wilson, M.P.P.	Kingston and the Islands (Provincial Constituency)
V. Black	Minister of Energy for Ontario, The
J. Robitaille	Procureur général du Québec, Le
G. Hobbs C.N. Graham	Township of Howe Island, The
N. Argue	N. Argue and S. Argue

G.P. Arsenault	C.M. Arsenault
G.P. Arsenault	On his own behalf
G.E. Bisailon	L. Attfield
M. Baxter	On his own behalf
B.F. Bennett J.R. Bennett	On their own behalf
P.D. Beseau	On his own behalf
G.E. Bisailon	Mr. and Mrs. G.E. Bisailon
S. Byrne	On her own behalf
B. Chesney	On her own behalf
P. Chesney	On his own behalf
Dr. P. Connup	On his own behalf
R.G. Deeley, Ph.D.	On his own behalf
S. Deluca	On his own behalf
E. Dumm	On his own behalf
J.H. Edwards	On his own behalf
J.T. Ellerton	On his own behalf
T. Ellerton	T. Ellerton and K. Ellerton
W. Ellerton	W. Ellerton and I. Ellerton
C.N. Graham	On his own behalf
W.H. Gravey	W.H. Gravely and 465980 Ontario Limited
E. Greenlees	M. Greenlees and D. Greenlees
R.E. Henderson	On his own behalf
W. Henderson	On her own behalf
W.C. Henderson	On his own behalf
B. Hogan	On her own behalf

F.E. Hogan	On her own behalf
H.E. Hogan	On his own behalf
E. Huffman	On her own behalf
B. Humphrys	B. Humphrys and D. Humphrys
C.G. Jackson	On his own behalf
J. Josiak	On his own behalf
G. Joslin	G. Joslin and D. Joslin
G. Joslin	W.P. Joslin
J.M. Kane	On his own behalf
K. Keyes	On his own behalf
W.L. Kirkwood	On his own behalf
C. Ladiges	C. Ladiges and A. Ladiges
Dr. K.W. Lawless	On his own behalf
W. Mabel	On his own behalf
P. Maitland	On his own behalf
S.B. Martin	On her own behalf
W.A. Martin	On his own behalf
James McReynolds Joanne McReynolds	On their own behalf
Joe McReynolds	On his own behalf
M. McReynolds	On her own behalf
I. Meagher	On her own behalf
G. Metcalfe I. Metcalfe	On their own behalf
R. Moizer	On her own behalf
A. Morales D. Morales	On their own behalf

D. Munroe	On his own behalf
M.I. O'Shea N. O'Shea	On their own behalf
J. Peters	On his own behalf
L. Pilszak	On her own behalf
H. Sharpe	On his own behalf
M. Spoljaric	Mr. and Mrs. M. Spoljaric
J.A. Vockeroth J. Syme	National Energy Board, The

Chapter 1

Background

A chronological table of the events that preceded the GH-4-90 hearing can be found in Appendix I.

1.1 Introduction

The applied-for Gananoque Extension is a lateral pipeline proposed to be constructed, owned and operated by TransCanada PipeLines Limited ("TransCanada"). The line would extend from TransCanada's mainline Compressor Station 142 near Joyceville, Ontario through the Townships of Pittsburg, Howe Island and Wolfe Island to a point on the international border in the St. Lawrence River south of Wolfe Island. The pipeline, consisting of 25.2 km of 406 mm O.D. pipe and one meter station, would be installed at an estimated capital cost of \$29.6 million (Can.) in 1990 dollars. It is designed with a 1991-92 capacity of 4 970 10³m³/d (175.4 MMcfd) under winter peak day conditions and loss of unit at Compressor Station 1217.

The Gananoque Extension would connect at the international border with a pipeline known as the TransYork Extension, proposed to be constructed, owned and operated by Niagara Mohawk Power Corporation ("Niagara Mohawk"). The applied-for facilities would enable TransCanada to export gas directly to Niagara Mohawk pursuant to a Gas Purchase Contract between the two companies.¹ The Gananoque Extension could also be used to export additional volumes into the Niagara Mohawk system and to facilitate the introduction of local gas service into the Townships of Pittsburgh, Howe Island or Wolfe Island by a Canadian local distribution company ("LDC").

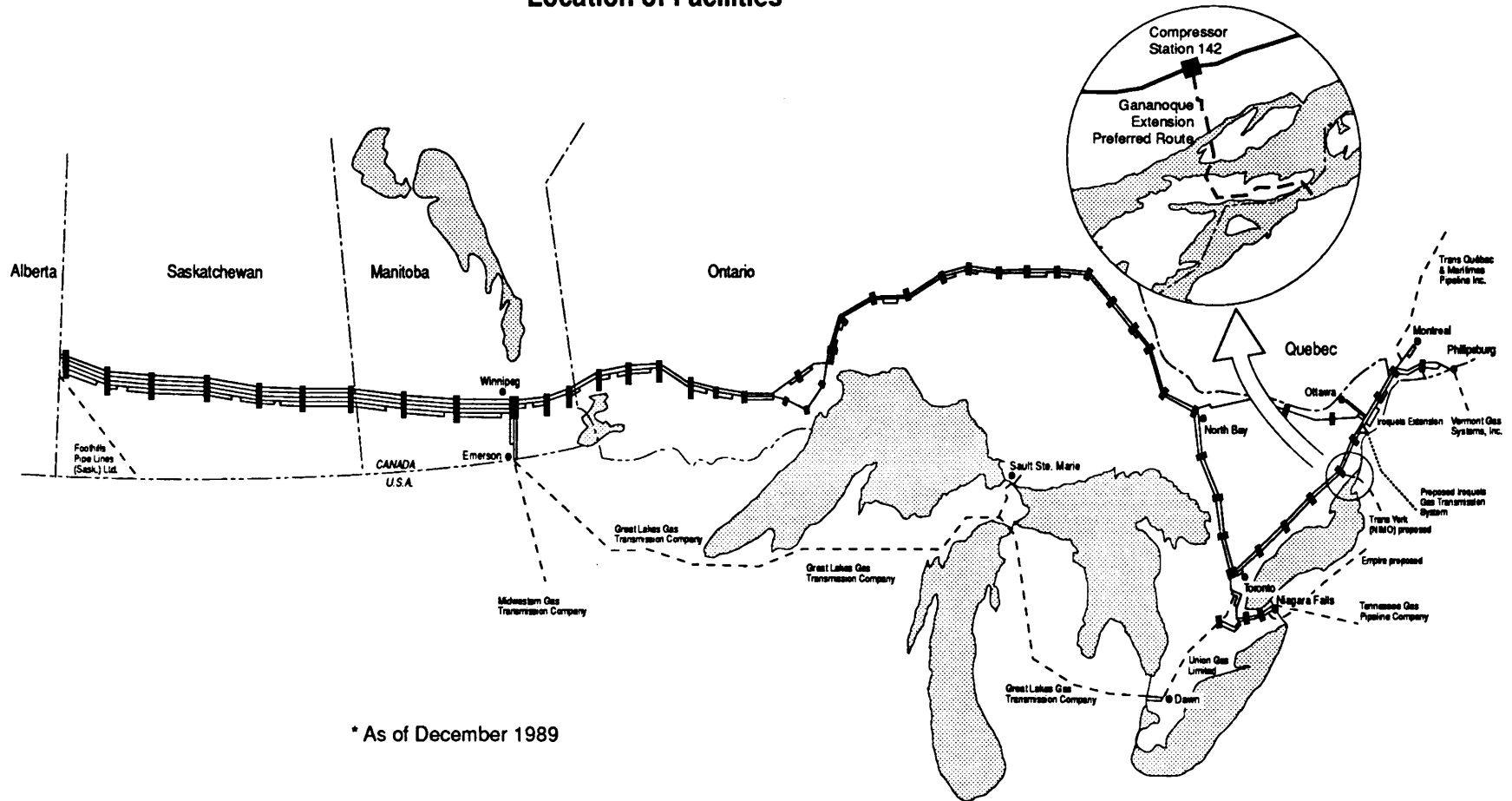
1.2 The Applicant

TransCanada owns and operates a natural gas pipeline system that extends from the Alberta/Saskatchewan border to delivery points in Saskatchewan, Manitoba, Ontario and Quebec (Figure 1-1). The system serves domestic markets at delivery points within the aforementioned provinces and serves markets in the United States of America ("U.S.") at delivery points on the international border.

In addition to transporting natural gas for itself and others, TransCanada is engaged in the business of purchasing natural gas for resale to Canadian and U.S. customers. Gas that is transported through the TransCanada system, therefore, is owned by either TransCanada or any of over 100 shippers that contract with TransCanada for transportation service on its system. All of TransCanada's natural gas sales are administered by its wholly-owned subsidiary, Western Gas Marketing Limited ("WGML"), which is subject to the same rules of access to the TransCanada system as all other shippers.

¹ The pro forma Gas Purchase Contract would, upon its execution, provide for the sale by TransCanada of 1 445 10³m³/d (51 MMcfd) of gas to Niagara Mohawk over a 15-year term.

**Figure 1-1
TransCanada PipeLines Limited
Location of Facilities***



* As of December 1989

1.3 Initial Application (GH-1-89)

On 28 December 1988, TransCanada applied to the Board for, among other things, a certificate under Part III of the *National Energy Board Act* ("the Act") in respect of the incremental facilities it proposed to construct in 1990. TransCanada's proposed 1990 facilities included the Gananoque Extension.

TransCanada's 1990 facilities application was set down for public hearing by the Board pursuant to Hearing Order GH-1-89. In the GH-1-89 proceeding, the Board also heard applications under Part VI of the Act from numerous companies seeking licences for the long-term exportation of gas to the U.S. One of such applications was that of Western Gas Marketing Limited as agent for TransCanada PipeLines Limited ("WGML/TransCanada"), dated 14 February 1989, seeking a licence authorizing the exportation of gas to Niagara Mohawk.

The GH-1-89 Hearing was held in Calgary and Ottawa from April to July 1989. During and subsequent to the GH-1-89 Hearing, the Board received many letters from concerned residents opposing the Gananoque Extension. These letters prompted the Board to announce, by letter dated 2 August 1990, that in the event that WGML/TransCanada's export licence application were approved, the Board would hold a public hearing in the Kingston area to obtain further evidence on the proposed Gananoque Extension.

1.4 Denial of Export Licence and Related Facilities

On 20 November 1989, the Board issued its Decision with respect to the export licence applications heard during the GH-1-89 proceedings. Four of those applications (including that of WGML/TransCanada) were denied. The Board denied the application of WGML/TransCanada for a licence to export gas to Niagara Mohawk because:

- (i) the Board's assessment of WGML/TransCanada's benefit-cost analysis led it to the conclusion that the proposed export sale would be unlikely to generate net benefits to Canada; and
- (ii) the contractual pricing mechanisms underpinning the proposed export sale were unlikely to allow the prices generated to fully reflect market conditions.

As the denial of the applied-for WGML/TransCanada export licence obviated the need for the proposed Gananoque Extension, the Board notified TransCanada, by letter dated 20 November 1989, that its application for a certificate in respect of the Gananoque Extension was denied.

1.5 Review of the Market-Based Procedure

From time to time, the Board has conducted reviews of its natural gas export licensing procedures. Following a review conducted in 1987, the Board established its Market-Based Procedure ("MBP") which is founded on the premise that the marketplace will generally operate in such a way that Canadian gas requirements will be met at fair market prices.

The Act provides that the Board must hold public hearings to consider applications for licences to export natural gas. The MBP provides that the Board will monitor Canadian energy markets on an ongoing basis and that during export licence hearings, the Board's assessment will consist of the following three main components:

- (i) Complaints Procedure;
- (ii) Export Impact Assessment ("EIA"); and
- (iii) public interest determination.

The MBP established that in making its public interest determination, the Board would consider, among other things, details of the gas supply and sales arrangements pertaining to each export licence application and evidence that the revenues derived from each export proposal would fully recover the costs to Canada incurred in making the export.

Since its inception in 1987, the MBP has twice been publicly reviewed by the Board. Firstly, in August 1989, the Board decided to review the use of the EIA in the MBP. In November 1989, the Board released its Decision to retain the EIA but to revise the procedures for its introduction into evidence in public hearings.

Secondly, in light of concerns expressed about the use of benefit-cost analysis in the Board's export licensing procedures, the Board decided, in December 1989, to conduct a review of the role that benefit-cost analysis should play in the MBP. The Board also decided to review the extent to which it should examine the provisions of export contracts to determine whether the contracts allow flexibility to reflect changing market conditions over time. This review, carried out pursuant to Hearing Order GHW-4-89, led the Board to conclude that wide fluctuations in the calculation of gas production costs (depending on the assumptions used) and the uncertainty regarding the difference, if any, between public and private valuations of these costs were too great to warrant the continued use of benefit-cost analysis in gas export licensing. With respect to contractual responsiveness to changing market conditions, the Board decided that, where contracts are freely negotiated at arm's length, they will be presumed to be in the public as well as the private interest and that intervention by the Board would only be necessary in exceptional circumstances. The Board's GHW-48-9 Decision was released on 15 March 1990.

1.6 Review Decisions Affecting the Gananoque Extension

1.6.1 Niagara Mohawk and WGML/TransCanada

On 6 February 1990, Niagara Mohawk applied to the Board, under Part I of the Act, for a review of its Decision of 20 November 1989 to deny the export licence application of WGML/TransCanada.

On 2 March 1990, WGML/TransCanada filed an application for review of that same Decision.

In light of changed circumstances arising from its GHW-4-90 Decision (released on 15 March 1990), the Board, on 19 March 1990, granted the above-mentioned applications of Niagara Mohawk and WGML/TransCanada by indicating that a review of the 20 November 1989 export Decision would be held.

On 11 April 1990, pursuant to Hearing Order GH-1-90, the Board set the review down for public hearing commencing 23 April 1990 in Calgary, Alberta. The GH-1-90 Hearing consisted of a review not only of the denial of the WGML/TransCanada export licence application, but also of the three other export licences denied in the GH-1-89 Decision.

On 12 April 1990, the Board issued Hearing Order GHW-4-90 which, pursuant to the *Environmental Assessment and Review Process Guidelines Order*, provided for an environmental screening of the four export projects, including that of WGML/TransCanada, being reviewed pursuant to Hearing Order GH-1-90.

The Board's GH-1-90 Decision was rendered from the Bench on 25 April 1990. The Board decided that, in the event that the GHW-4-90 environmental screening determined that an environmental review of the WGML/TransCanada export project was not necessary, an export licence would be issued to WGML/TransCanada.

The GHW-4-90 environmental screening was completed on 19 June 1990. It determined that an environmental review would not be a necessary prerequisite to the issuance of a licence to WGML/TransCanada, but would be a necessary prerequisite to the issuance of a certificate to TransCanada in respect of the Gananoque Extension facilities.

1.6.2 TransCanada

On 9 March 1990, TransCanada applied to the Board, under Part I of the Act, for a review of the Board's 20 November 1989 facilities Decision denying TransCanada's application of 28 December 1988 for a certificate in respect of the Gananoque Extension. On 20 March 1990, the Board granted TransCanada's review application on a conditional basis by indicating that, in the event that it decided to issue an export licence to WGML/TransCanada, the Board would hold a further public hearing in respect of the Gananoque Extension.

1.7 The GH-4-90 Hearing

On the basis of its findings in GH-1-90 and GHW-4-90, the Board decided on 21 June 1990, to issue an export licence to WGML/TransCanada, thereby necessitating a public hearing to review the Board's Decision of 20 November 1990 concerning the Gananoque Extension. To facilitate such a review, TransCanada filed an application dated 22 June 1990 entitled "Gananoque Extension Facilities Review Application". The Board decided to conduct the review by setting TransCanada's application of 22 June 1990 down for public hearing.

Pursuant to Hearing Order GH-4-90, issued 12 July 1990, the public hearing commenced on 10 September 1990 in Kingston, Ontario and concluded on 30 October 1990.

The evidentiary portion of the hearing included two bus trips during which the Board and interested parties viewed much of the pipeline's proposed route and two of the alternative routes rejected by TransCanada, namely, Routes 3A and 3B (see Figures 1-2, 5-2 and 5-3). The viewing of the proposed route was suggested by the Board and sponsored by TransCanada. The viewing of Routes 3A and 3B was suggested and sponsored by K.W. Lawless.

Argument was submitted in writing between 16 November and 21 December 1990.

1.8 Project Description

In the course of selecting a route for the Gananoque Extension, TransCanada identified and evaluated seven alternative routes, including the proposed route.

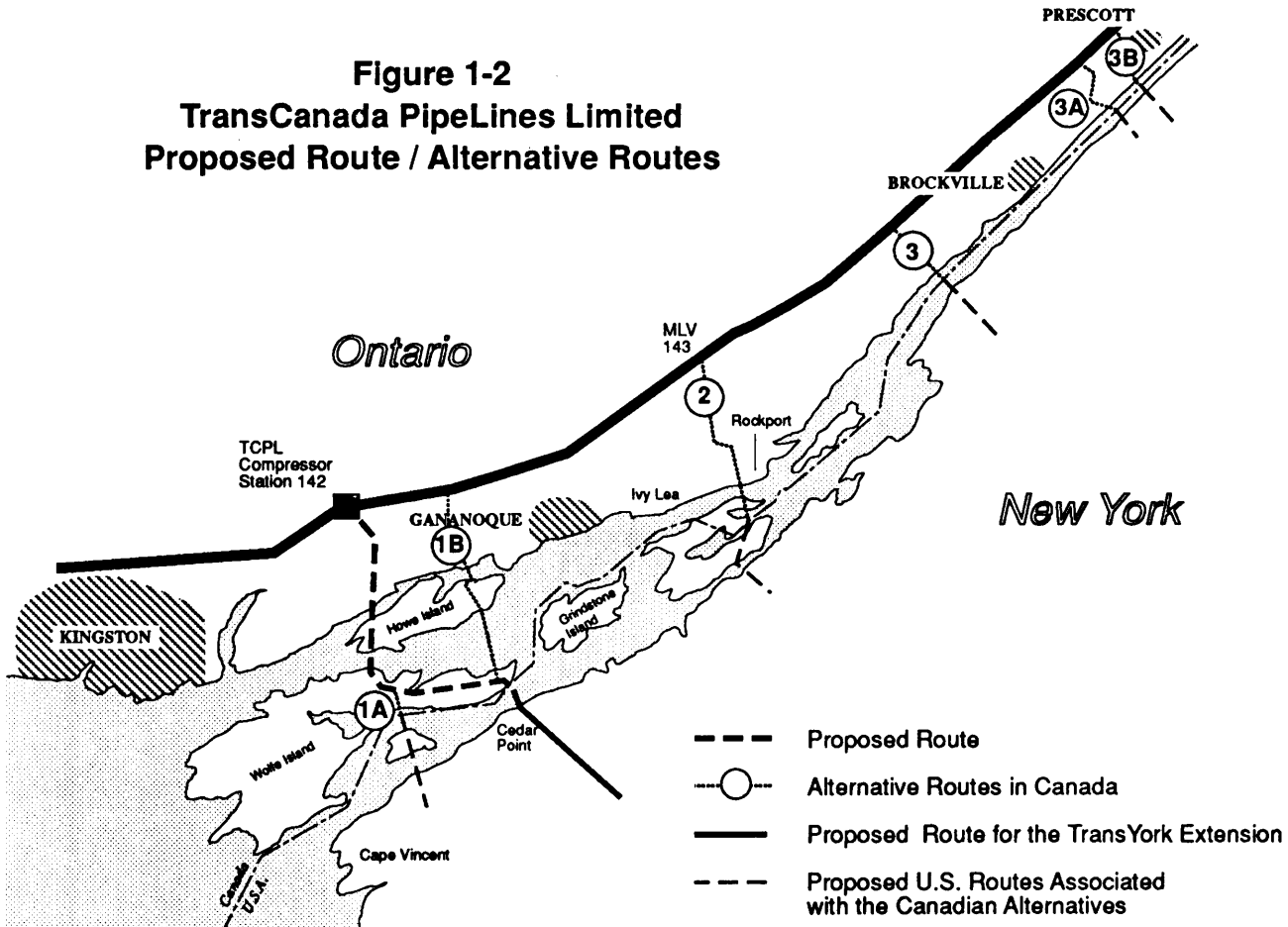
1.8.1 Proposed Route

TransCanada's proposed route for the Gananoque Extension is approximately 25.2 km in length. Figure 1-2 sets out the proposed route as well as the alternative routes described below. From its point of origin at Compressor Station 142, near Joyceville, Ontario, the proposed route traverses approximately 8.2 km of the Canadian mainland, 1.8 km of the western end of Howe Island and 12.9 km of the eastern arm of Wolfe Island. It also crosses three channels of the St. Lawrence River and connects with the TransYork Extension at the international boundary in the St. Lawrence River near the southeastern tip of Wolfe Island. The total Canada/U.S. route length is approximately 65 km.

1.8.2 Alternative Routes (Canadian)

Alternative 1A involves a route identical to the proposed Gananoque Extension from Compressor Station 142 to a point approximately 3.5 km along Wolfe Island on the proposed route and then proceeds 0.8 km southeast to the south shore of Wolfe Island. From the south shore of Wolfe Island, it crosses the Main Navigation Channel in two sections separated by Carleton Island. This route stretches approximately 17.7 km to the Canada/U.S. border which is approximately 8 km shorter than that shown for the proposed route to the Canada/U.S. border. The U.S. mainland pipeline route associated with Alternative 1A is about 8 km longer than that associated with the proposed route. The total Canada/U.S. route length is approximately 66 km.

Figure 1-2
TransCanada PipeLines Limited
Proposed Route / Alternative Routes



Alternative 1B begins 7.1 km east of Compressor Station 142 and 1.5 km north of Woodburn and traverses approximately 7.3 km of Canadian mainland. From a landfall 0.8 km east of Thompson Point on Howe Island, this alternative traverses 2.5 km of the island. The landfall on the south shore of Howe Island is east of Rush Bay and the landfall on the north shore of Wolfe Island is 1.8 km west of Quebec Head at the east end of the island. Approximately 1.6 km of Wolfe Island is crossed. This alternative traverses approximately 17.9 km to the Canada/US border which is approximately 8 km shorter than the proposed route to the Canada/U.S. border. Alternative 1B uses the same landfall on the south shore of Wolfe Island as the proposed route. The total Canada/U.S. route length is approximately 58 km.

Alternative 2 originates at MLV 143. This route involves three channel crossings, namely, Raft Narrows, Lake of the Isles Outlet Channel and the American Narrows. It also involves crossings of Hill and Wellesley Islands from the Canadian landfall west of Rockport, Ontario to a U.S. landfall site west of Point Vivian, New York. This alternative traverses approximately 13 km to the Canada/US border which is approximately 12 km shorter than the proposed route to the Canada/U.S. border. The total Canada/U.S. route length is 63 km.

Alternative 3 originates 20 km downstream of MLV 143, near Brockville, Ontario. Its onland portion is 6 km in length. It involves a single 2 km crossing of the Upper St. Lawrence River from a Canadian landfall west of Brockville to a U.S. landfall west of Morristown, New York. This alternative traverses approximately 7.2 km to the Canada/U.S. border which is approximately 18 km shorter than that shown for the proposed route to the Canada/U.S. border. The U.S. onland route associated with Alternative 3 is approximately 71 km in length. The total Canada/U.S. route length is 78.0 km.

At the request of the Board, TransCanada extended its original study area by 20 km along the St. Lawrence River to a point east of Brockville, Ontario. TransCanada identified two additional alternative routes within this extended study area, namely, Alternatives 3A and 3B.

Alternative 3A begins 350 metres downstream of Compressor Station 144 and crosses the St. Lawrence River 9 km east of Brockville. The route stretches a total of 7.4 km to the U.S. landfall, 5 km of which is on the Canadian mainland. Estate residential development occurs on both sides of the potential U.S. landfall site, which is a wooded area approximately 500 metres in width. This alternative traverses approximately 6 km to the Canada/U.S. border which is approximately 19 km shorter than the proposed route to the Canada/U.S. border. The total Canada/U.S. route length is approximately 97 km.

Alternative 3B originates 3.75 km downstream of Compressor Station 144 and proceeds southeast where it intersects the St. Lawrence River approximately 12 km downstream of Brockville. This alternative traverses approximately 5.1 km to the Canada/U.S. border which is approximately 20 km shorter than the proposed route to the Canada/ U.S. border. The total distance from the point of origin to the U.S. landfall is 6 km, 2.1 km of which is the St. Lawrence River crossing. The U.S. landfall would be located immediately upstream of Nevins Point, New York.

Chapter 2

Supply Matters

2.1 Project-Specific Supply

To supply its many natural gas sales (as well as those of its wholly-owned marketing subsidiary, WGML), TransCanada relies upon its aggregate gas supply pool. This pool consists of gas purchased by TransCanada from approximately 750 producers and suppliers. It is TransCanada's policy to satisfy all of its gas sales commitments (and those of WGML) from its aggregate pool without dedicating specific fields to specific gas sales contracts. As such, in order to determine whether or not TransCanada or WGML has sufficient gas supply to meet the requirements of a specific contract, the Board must perform an analysis of TransCanada's entire aggregate pool and measure the results against the total sales obligations of TransCanada and WGML.

The Board reviewed TransCanada's total gas supply during the GH-1-89 proceeding and found it to be adequate to meet the contracted domestic and export sales volumes of TransCanada and WGML, including the Niagara Mohawk volumes.

TransCanada's aggregate supply pool was again fully analyzed by the Board in the GH-6-89 proceedings, during which the Board heard an application by WGML to export gas to Southeastern Michigan Gas Company. In its GH-68-9 Decision, which was released immediately prior to the commencement of the GH-4-90 hearing, the Board concluded, as a result of its review of TransCanada's contracted gas reserves, productive capacity estimates and contractual arrangements, that TransCanada had adequate gas supply to meet all the sales requirements of itself and WGML, including the sale to Niagara Mohawk.

2.2 Overall Supply

The Board reviewed the issue of overall supply during the GH-1-89 proceeding and determined that adequate reserves and productive capacity would be available from the Western Canada Sedimentary Basin to support the incremental facilities, including the Gananoque Extension, that TransCanada proposed to construct in 1990.

Views of the Board

The Board was satisfied, prior to the commencement of this hearing, that TransCanada's evidence on overall and project-specific gas supply was adequate. The Board therefore concluded that it was not necessary to review the issue of gas supply during the GH-4-90 hearing.

Chapter 3

Requirements and Contractual Arrangements

3.1 Overall Gas Market Requirements

The gas to be transported via the proposed facilities would be sold to Niagara Mohawk, an electric and gas utility located in Syracuse, New York. Niagara Mohawk is a LDC that provides gas to approximately 460,000 customers in central, northern and eastern upstate New York, including the cities of Albany, Syracuse and Watertown. Of its 460,000 gas customers, over 420,000 are residential. Niagara Mohawk also provides gas transportation service to commercial, industrial, and cogeneration customers who have arranged their own gas supply.

In addition to serving its gas customers, Niagara Mohawk provides electricity to over 1.5 million residential, commercial and industrial customers from generating facilities powered by gas, coal, oil, hydro, and nuclear power. In 1989, approximately 12 percent of Niagara Mohawk's thermal electric generation was gas-fired.

TransCanada stated that the long-term firm Canadian gas supply to be transported through the applied-for facilities would be utilized by Niagara Mohawk to diversify its existing gas supply portfolio, which in turn is used to meet the firm sales requirements of its residential and commercial customers. TransCanada noted that Niagara Mohawk has traditionally purchased most of its gas supply from a single supplier, CNG Transmission Corporation ("CNG") and that, in addition to the CNG supply source, Niagara Mohawk purchases some gas on the spot market.

TransCanada provided a forecast of Niagara Mohawk's total system sales and transportation service gas requirements for a ten-year period commencing in 1989, which projected that Niagara Mohawk's requirements would increase by approximately 25 percent from 3 258 10⁶m³ (115 Bcf) in 1989 to 4 108 10⁶m³ (145 Bcf) in 1999. Whereas Niagara Mohawk's system sales are only forecasted to increase by approximately four percent, from 2 323 10⁶m³ (82 Bcf) in 1989 to 2 408 10⁶m³ (85 Bcf) in 1999, transportation service is forecasted to increase by approximately 82 percent from 935 10⁶m³ (33 Bcf) in 1989 to 1 700 10⁶m³ (60 Bcf) in 1999, with most of the growth expected to occur in the power generation sector.

TransCanada indicated that Niagara Mohawk has filed for new franchises which Niagara Mohawk proposes to serve directly with gas purchased under the TransCanada gas supply arrangement. Canadian-sourced gas is expected to account for four percent of Niagara Mohawk's system sales requirements in 1990 and increase to approximately 21 percent by 1999.

TransCanada noted that, whereas Niagara Mohawk is currently a full requirements customer of CNG, it has obtained a partial waiver of the full requirements nature of its existing gas supply contract to allow it to purchase up to 25 percent of its gas supply requirements from gas suppliers other than CNG. TransCanada added that Niagara Mohawk intends ultimately to secure elimination of the full requirements provision in the contract. TransCanada stated that these efforts reflect Niagara Mohawk's obligation under New York State law and by regulation of the New York State Public Service Commission ("NYSPSC") to maintain a least-cost gas purchase policy and to have a gas supply diversification plan.

TransCanada noted that its sale to Niagara Mohawk reflects Niagara Mohawk's need to obtain a long-term, secure and reliable source of gas supply to fulfill its existing and future obligations to meet the needs of its high priority, gas-dependent firm residential and commercial customers. In this regard, TransCanada pointed out that Niagara Mohawk currently has under contract a U.S.-sourced gas supply which generally has a lower reserves-to-production ratio than the gas supply supporting the TransCanada arrangement. TransCanada argued that the latter will complement Niagara Mohawk's domestic supply and strengthen its gas supply base.

TransCanada directed the Board to its GH-1-90 Reasons for Decision, in which the Board found that the evidence supported the existence of an export market and that the export sale would likely occur at a high load factor.

In responding to those who argued that the gas supply to be transported via the Gananoque Extension is not needed by Niagara Mohawk, TransCanada submitted that the need to supplement gas supply can be as significant as the need to replace a gas supply or to satisfy an incremental demand.

WGML argued that the existence of an export market and the resulting need for the subject facilities are evidenced by TransCanada's sales contract with Niagara Mohawk, by the fact that the sale has received the support of producers in the TransCanada supply pool and by the issuance of an export licence by the Board. WGML pointed to Niagara Mohawk's strategic objective of obtaining direct access to Canadian gas supplies from the TransCanada pipeline system to serve its residential and commercial customers in the northern part of its distribution system.

Niagara Mohawk argued that the 1 445 10³m³/d (51.0 MMcfd) of firm service contemplated under the TransCanada gas supply arrangement will displace gas currently supplied by U.S. suppliers and transported by CNG and will therefore serve a firm and established market. Niagara Mohawk submitted that its undertaking to construct the TransYork Extension, at an estimated cost of \$33.5 million (Can.), demonstrates a substantial and long-term commitment to the purchase of Canadian-sourced gas.

Niagara Mohawk indicated that it does not interconnect with any pipeline systems other than CNG, have access to its own gas production, nor does it own or have access to gas storage or peak shaving facilities.

Niagara Mohawk argued that the Gananoque Extension and TransYork Extension facilities were designed to accommodate significant future market growth, particularly in the cogeneration market sector. Niagara Mohawk added that it is reviewing the possibility of purchasing additional Canadian gas for use in its power generation facilities and that, in this regard, it has commissioned a feasibility study to investigate converting two of its oil-fired generation plants to gas. Specifically, Niagara Mohawk argued that the Gananoque/TransYork facilities allow for the delivery of 4 250 10³m³/d (150 MMcfd) into the Watertown, New York area and that, with additional compression, deliveries could be increased to 6 800 10³m³/d (240 MMcfd).

Niagara Mohawk noted that it has been approached by an increasing number of direct-purchase industrial customers wanting to secure firm and interruptible transportation services on the TransYork Extension.

The Independent Petroleum Association of Canada ("IPAC") expressed concern that, since Niagara Mohawk is simply diversifying its gas supply sources by contracting for a long-term firm gas supply from Canada, the Canadian gas supply will likely displace existing U.S.-sourced gas. IPAC argued that it follows that the Canadian-sourced gas may not be taken at the forecasted levels and that in the absence of alternative gas markets or customers, the applied-for facilities could be unused for significant periods of time. IPAC acknowledged that, while it could support the benefits associated with designing a reasonable level of advanced capacity, it could not, in this particular case, support the level of advanced capacity proposed by TransCanada. In particular, IPAC expressed concern that the Gananoque Extension's proposed capacity of 7 080 10³m³/d (250 MMcfd) is currently supported by only 1 445 10³m³/d (51 MMcfd) of contracted-for service. IPAC acknowledged, however, Niagara Mohawk's obligation to pay the transportation demand charges associated with the 1 445 10³m³/d (51 MMcfd) of transportation service under the terms of the yet to be executed Firm Service ("FS") Contract between WGML and TransCanada.

Union Gas Limited ("Union") was not opposed in principle to Niagara Mohawk's goal of contracting for alternative gas supplies, including a competitive alternative to its existing gas supplier, CNG. However, Union was of the view that Niagara Mohawk has no significant potential incremental market growth or other development that creates a need for this new source of gas. Union also argued that Niagara Mohawk is currently satisfying its requirements with gas supplied through CNG and that deliveries through the Gananoque and TransYork facilities would simply displace an equivalent quantity of gas currently being purchased from CNG. Union believed that, to the extent that there was any market growth at the north end of Niagara Mohawk's distribution system, it could be served as it had been in the past, namely, by increasing existing capacity and by making additional gas supply available from the south end of Niagara Mohawk's system.

Several other intervenors, including J. Josiak, B. Chesney, The Township of Howe Island, I. Meagher, R.G. Deeley, N. Argue, K.W. Lawless and P. Beseau, argued that the need for the gas supply has not been demonstrated since Niagara Mohawk and its customers have access to existing and alternative gas supplies. These intervenors further argued that the TransCanada gas supply would simply permit Niagara Mohawk to diversify its gas supply and obtain some operational flexibility. Some of these intervenors also argued that the TransCanada gas supply is not needed by Niagara Mohawk because it only goes towards reducing the price of gas to Niagara Mohawk's customers and not towards satisfying an incremental demand for gas.

3.2 Contractual Agreements

3.2.1 Gas Sales Agreement

In support of its application, TransCanada filed a copy of an executed precedent gas sales precedent agreement between TransCanada and Niagara Mohawk entitled, "TransCanada/Niagara Mohawk Precedent Agreement". The contractual terms and conditions associated with the gas sale are set out in the *pro forma* Gas Purchase Contract appended to the Precedent Agreement.

The *pro forma* Gas Purchase Contract provides for the sale of 1 445 10³m³/d (51 MMcfd) for a 15-year term commencing 1 November 1990 or upon receipt of all necessary regulatory approvals. Whereas the delivery point is defined as being near Gananoque, Niagara Falls and Iroquois, Ontario are identified as alternative delivery points. The Contract allows Niagara Mohawk to purchase gas in excess of 1 445 10³m³/d (51 MMcfd) at a negotiated price and provides that this additional gas would be made available on an interruptible best efforts basis.

The Contract requires Niagara Mohawk to purchase gas at a minimum load factor of 60 percent and to pay the full TransCanada and NOVA Corporation of Alberta ("NOVA") demand charges, a supply administration fee and a commodity charge.

A more detailed discussion of the various contractual provisions is set forth in the Board's Reasons for Decision, GH-1-89, Volume I, "Gas Exports", Section 8.7.2 "Sales Contract".

TransCanada noted that no party to the proceedings questioned the commercial substance of the export arrangement underpinning the applied-for facilities. TransCanada further noted that the Board has, through the issuance of export Licence No. GL-135, satisfied itself that the Contract ensures:

- (i) recovery of associated Canadian transportation costs;
- (ii) flexibility to meet changing market conditions;
- (iii) that the contracted quantities will be taken; and
- (iv) that support has been received from the Canadian gas producers supplying the gas to the export project.

WGML pointed out that the Gas Purchase Contract has the support of its producers and that it contains competitive pricing, renegotiation and arbitration provisions, all of which ensure that the gas will be taken at a high load factor and that the demand charges will be paid.

Niagara Mohawk argued that there was no evidence adduced expressing concern regarding the Contract and that there is therefore no basis for challenging the Board's previous findings, as set out in the GH-1-89 and GH-1-90 Reasons for Decisions, that the gas will flow at a high load factor and that the contractual terms are satisfactory. Niagara Mohawk similarly argued that there was no evidence challenging the Board's previous findings that the Contract was freely negotiated at arm's length and that there was therefore no need for the Board to intervene in such regard.

Niagara Mohawk submitted that in November 1989 it received from the (United States of America) Department of Energy, Office of Fossil Energy ("DOE/FE") an Opinion and Order granting conditional long-term import approval. This approval, it noted, was conditional upon the completion of an environmental review of the related downstream U.S. pipeline facilities. The Opinion and Order granted Niagara Mohawk's request for authorization to import 1 445 10³ m³/d (51 MMcfd) on a firm basis for a 15-year term commencing 1 November 1991. The authorization also granted Niagara Mohawk permission to import 2 975 10³m³/d (105 MMcfd) of Canadian-sourced gas on an interruptible basis as that gas is required and is available.

3.2.2 Transportation Service Agreement

The proposed export to Niagara Mohawk would be transported within Alberta by NOVA for delivery to the point of interconnection with the TransCanada system near Empress, Alberta, in accordance with an existing long-term firm T-5 transportation service agreement. No additional facilities would be required to be constructed by NOVA.

WGML has executed a transportation Precedent Agreement with TransCanada, dated 28 December 1988, for the transportation of gas from Empress, Alberta to the proposed Gananoque export point.

Upon TransCanada and WGML satisfying the conditions precedent contained in their transportation Precedent Agreement, the two parties intend to execute a fifteen-year FS Contract for the delivery of $1\,445\,10^3\text{m}^3/\text{d}$ (51 MMcfd).

TransCanada indicated that the construction of all upstream facilities necessary to deliver the Niagara Mohawk volumes to the Gananoque Extension have already been approved by the Board through the issuance of Certificate No. GC-77.

3.3 Potential Canadian Markets

TransCanada testified that in the event of an emergency, such as a mainline break or a compressor failure, the Gananoque Extension could be used, with the agreement of Niagara Mohawk, to import either Canadian or U.S.-sourced gas into Canada to help overcome any potential shortfalls.

TransCanada submitted that in such an emergency, gas supply could be made available either through displacement or through a back-haul arrangement. TransCanada acknowledged that this benefit might also be realized should gas be exported to Niagara Mohawk at the Niagara Falls or Iroquois export points rather than through the Gananoque Extension.

TransCanada filed evidence to indicate that ICG Utilities (Ontario) Ltd ("ICG Ontario") would be prepared to serve any economically viable domestic market along the proposed Gananoque Extension. The area around the Joyceville Road and Highway No. 2 was identified by ICG Ontario as a likely candidate for service. In addition, ICG Ontario did not rule out the possibility of serving the island communities should additional markets develop. ICG Ontario noted that any new project of this nature would be developed in accordance with the company's economic feasibility policy.

Niagara Mohawk noted that, while the level of demand at this time would not satisfy ICG Ontario's economic feasibility test, a potential future demand exists. Niagara Mohawk argued that the fact that ICG Ontario has been unable to identify an immediate market in the vicinity of the proposed Gananoque Extension should not bear on the Board's assessment as to the merits of TransCanada's application, since the Gananoque Extension is justifiable even if used only to serve the TransCanada/Niagara Mohawk export sale.

Union argued that the prospect for a domestic Ontario market in the vicinity of the proposed Gananoque Extension is remote and would at best only materialize in the distant future. Union also submitted that in the event of an emergency, the idea of moving gas from the Niagara Mohawk system to the TransCanada system on a back-haul basis is highly theoretical.

Views of the Board

In its GH-1-89 and GH-1-90 Reasons for Decision, the Board expressed the opinion that the terms of the TransCanada/Niagara Mohawk Precedent Agreement and the appended *pro forma* Gas Purchase Contract would ensure, among other things, the recovery of all fixed Canadian transportation costs and that the sale of the gas would be at high load factor. In addition, the Board found that the Gas Purchase Contract was freely negotiated at arm's length and that the Board need not intervene in this regard.

The Board continues to believe that Niagara Mohawk represents a viable long-term market for the export of gas contemplated under the TransCanada/Niagara Mohawk Precedent Agreement. The Board has not, however, been persuaded that a future long-term market will develop for Canadian gas in the area served by the TransYork Extension beyond that associated with the 1 445 10³m³/d (51 MMcfd) contracted for by Niagara Mohawk. The Board finds that, in the absence of any substantial evidence having been adduced with respect to specific markets or prospective shippers, the nature and extent of these future markets are speculative.

The Board does not agree with those intervenors who submitted that because the gas to be exported would serve only to replace Niagara Mohawk's existing gas supply, an inadequate market exists for TransCanada's sale of natural gas to Niagara Mohawk. The Board notes that Niagara Mohawk, like many Canadian LDCS, is responding to a more deregulated gas market environment by seeking to secure alternative gas supplies to lessen its dependence on a single source and to foster price competition amongst its gas suppliers.

With regard to the possibility of ICG Ontario or some other LDC serving future domestic markets from the Gananoque Extension, the Board concurs with ICG Ontario that there is insufficient evidence to identify those markets at this time. The inability to define those markets, however, has not been a consideration in the Board's assessment of the subject facilities application.

The Board also agrees with Union that in the event of an emergency, the idea of a physical back haul of U.S.-sourced gas into Canada via the Gananoque Extension is highly theoretical.

Chapter 4

Route Selection Criteria, Notification and Route Selection Methodology

4.1 Route Selection Criteria

TransCanada's application describes the process used to identify, evaluate and compare alternative routes for the proposed Gananoque Extension. The factors of primary importance in identifying and evaluating alternative routes for the proposed pipeline included physical features that would require special construction procedures from an engineering standpoint or that would preclude construction from a land acquisition or regulatory standpoint, as well as environmental features with which pipeline construction and operation would be incompatible.

TransCanada indicated that "early in the route selection process the identification of suitable landfall sites on the upper St. Lawrence River presented the primary overall routing constraint." As a result, Beak Consultants Ltd. ("Beak") was asked to carry out comparison studies of the alternative crossings of the St. Lawrence River.

TransCanada used an iterative process to identify, evaluate and compare the alternative routes. TransCanada believed that this process allowed it to make informed decisions on route selection through the incorporation of features and conditions that may not have been apparent from aerial photographs, over-flights, roadside reconnaissance or generally available mapped data. TransCanada stated that it was guided by three broad considerations during the general route selection process, namely:

- regional or locally important environmental features, conditions or land uses;
- policies, issues or concerns raised by federal, provincial and state agencies; and
- policies, concerns or future plans related to individual properties or groups of properties.

The primary environmental factors that TransCanada utilized in identifying alternative routes are included in its evaluation criteria for the onland pipeline and the St. Lawrence River crossings. The Onland Pipeline Criteria are listed in Appendix II, while the St. Lawrence River Crossing Criteria are listed in Appendix III.

Views of the Board

Any company proposing to construct pipeline facilities is free, at the outset, to utilize whatever criteria it considers appropriate in the selection of a proposed route. The Board must then determine whether the criteria selected are sufficiently comprehensive and therefore acceptable.

The Board is of the opinion that the criteria identified by TransCanada comprehensively encompass the considerations and constraints (including those relating to the environment) that pertain to the selection of a pipeline route within the original

and extended study areas. The Board therefore considers these criteria to be acceptable. Section 4.3 of these Reasons for Decision examines the process by which TransCanada's criteria were used to identify and select the proposed route.

4.2 Public Notification

TransCanada stated that, in an effort to notify the public of its plan to construct the Gananoque Extension, it placed advertisements in local newspapers and contacted the municipalities involved. In its view, it was through those activities that the general public was made aware of the proposed project. Moreover, TransCanada stated that because the general route covered such a wide area, it would neither have been reasonable, nor practical, to contact all the landowners that might be located within that corridor. TransCanada acknowledged that the notification procedures used in this particular instance could have been improved.

Several intervenors, including R.G. Deeley, expressed concern that TransCanada's approach to route selection precluded input from the public and its elected representatives until after TransCanada had reached a decision on the proposed route and filed the environmental and socio-economic assessments with the Board. They were of the view that TransCanada simply chose not to address the opposition raised by local governments and many local residents. They further suggested that precluding public input during the planning stages resulted in many environmental and socio-economic questions being raised during the public hearing. Several intervenors believed that the resulting new information, such as that relating to river bed profiles and the description of the environmental constraints associated with Alternative 3, constituted substantive changes to the information that had been originally filed by TransCanada.

Views of the Board

The Board considers that in arriving at its proposed route for the Gananoque Extension, TransCanada did not consult in a meaningful manner with potentially affected Townships, individuals and public interest groups regarding the policies, concerns and plans of such parties. As it is the stated policy of TransCanada¹ to identify at an early stage the concerns, if any, of various parties, the Board notes that, in respect of this particular pipeline proposal, TransCanada did not adhere to its own policy.

4.3 Route Selection Methodology

TransCanada used a two-phase process to establish the proposed route for the proposed Gananoque Extension. In the first phase TransCanada identified alternative routes and in the second, it compared the alternatives in order to select the proposed route.

TransCanada stated that the identification of suitable crossings of the upper St. Lawrence River presented the primary overall routing constraint. In TransCanada's view, there was a high likelihood of finding a constructible and environmentally feasible onland route in both Canada and the U.S.

¹ Environmental Protection Practices Handbook (1986)

In the first phase, alternative routes that appeared to be feasible from an environmental, socio-economic, construction, engineering and land acquisition perspective were established.

In evaluating the alternatives and selecting a proposed route, TransCanada devised the 27 evaluation criteria listed in Appendices II and III and was also mindful of the following considerations:

- physical features requiring special engineering procedures;
- physical features that would preclude construction from a land acquisition or regulatory standpoint; and
- environmental features in respect of which impacts would be so major that they could not effectively be mitigated.

TransCanada submitted that in applying its evaluation criteria, it was only necessary to reach a reasonable compromise among all competing environmental, engineering and economic considerations, provided that the results of the proposed/possible mitigation, would be insignificant environmental impacts and/or other minor temporary effects. In addition, TransCanada submitted that although the proposed route did not "perfectly satisfy" each of the evaluation criteria, the resulting impacts would be either slight or mitigable. Furthermore, TransCanada stated that a route selection process is intended to result in a proposed route that is reasonable. TransCanada submitted that the route need not be perfect nor even be the best possible route.

After having selected its proposed route for the Gananoque Extension, TransCanada engaged Beak to provide a comparative analysis of alternative crossings of the St. Lawrence River.

Several intervenors, including K.W. Lawless and R.G. Deeley, took exception to the entire route selection process and the method of gathering and presenting information. In their opinion, there was something inherently wrong with a process whereby TransCanada could select several routes and then indicate its proposed route to whomever was going to collect and provide data on the alternative routes. For that reason, many intervenors were of the view that it would be impossible to obtain an unbiased evaluation.

Several intervenors commented on TransCanada's choice of criteria, noting that many criteria were apparently used to compare the proposed land route with the alternatives that eventually were rejected. While they did not dispute the comprehensiveness of the criteria, several intervenors, including R.G. Deeley and K.W. Lawless, found it difficult to accept the conclusion that the proposed route was environmentally preferable to the alternative routes on the basis of the stated criteria. These intervenors were also critical of the basis on which the alternative routes were rejected. It was their understanding that on the basis of almost all of the onland and river crossing criteria, the proposed route was at best only as acceptable as certain of the alternative routes. B. Hogan stated that, in her view, the proposed route did not meet 21 of the 27 stated criteria for the land and St. Lawrence River crossings.

Several intervenors contended that in the route selection process, environmental constraints existing on the U.S. portion of several of the alternative routes were given substantial weight, whereas similar constraints on the Canadian portion were not accorded similar weight. R.G. Deeley contended that the potential impact of U.S. routes connecting to the alternatives rejected by TransCanada had not been

subject to regulatory review, since Niagara Mohawk's Article VII application before the NYSPSC for approval of the TransYork Extension was predicated on the assumption that TransCanada's proposed route would be approved.

Views of the Board

It is incumbent upon TransCanada to establish that it has selected an appropriate route from a reasonable set of alternatives through the application of a relevant and adequate set of criteria. TransCanada's two-phased approach in establishing a proposed route has been previously recognized by the Board as an acceptable approach to route selection. The Board continues to endorse this methodology. However, the Board is of the view that, in adopting the methodology, it would have been clearly preferable for TransCanada to have retained the services of a consultant prior to selecting a proposed route for the Gananoque Extension. Furthermore, as mentioned in Section 4.2 of these Reasons for Decision, TransCanada should have taken into account the concerns of local governments, public interest groups and potentially affected individuals in its route selection process.

As noted in Section 4.1 of these Reasons for Decision, the Board has found TransCanada's route selection criteria to be acceptable. However, TransCanada's proposed route does not satisfy many of these criteria, for example:

- avoidance of habitats known for rare animal species (the proposed route passes through the habitats of several avian species with special status classification);
- avoidance of sensitive wetlands (the proposed route intersects at least three sensitive wetlands);
- avoidance of known waterfowl nesting and/or staging habitats (the proposed route crosses three waterfowl migration stop-over and production areas);
- avoidance of speciality crop lands (the proposed route crosses an evergreen farm and an orchard);
- minimization of the number of crossings such as roads, highways and railroads (the proposed route has numerous road and highway crossings, particularly on Wolfe Island); and
- avoidance of incompatible land uses at the landfall (the land uses at Pittsburgh Township and Howe Island north shore landfalls are incompatible with a pipeline right-of-way).

It would be unreasonable to expect the proposed route of the Gananoque Extension to fully satisfy each of TransCanada's route selection criteria. However, as it has concluded that several of those criteria have not been met, the Board is not satisfied that TransCanada applied its route selection criteria in a rigorous manner.

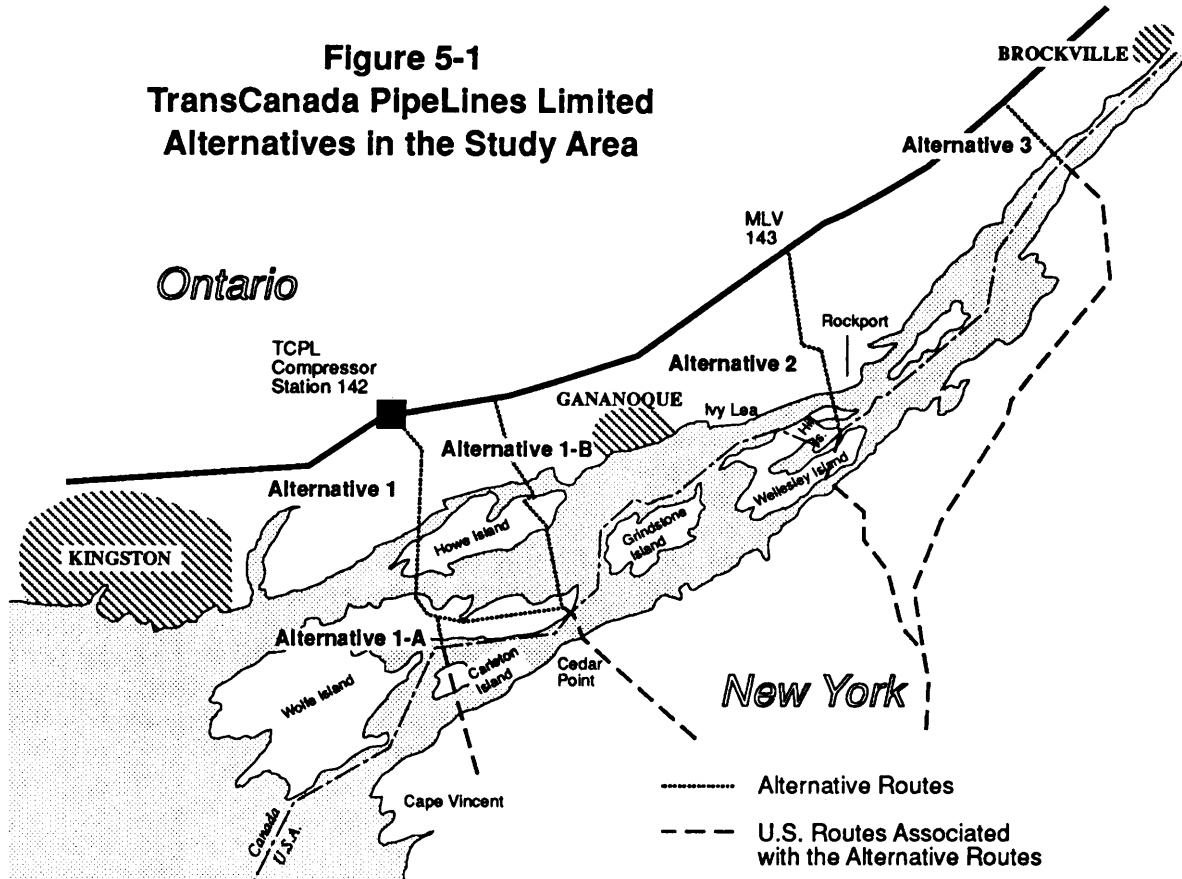
Chapter 5

Routing Alternatives

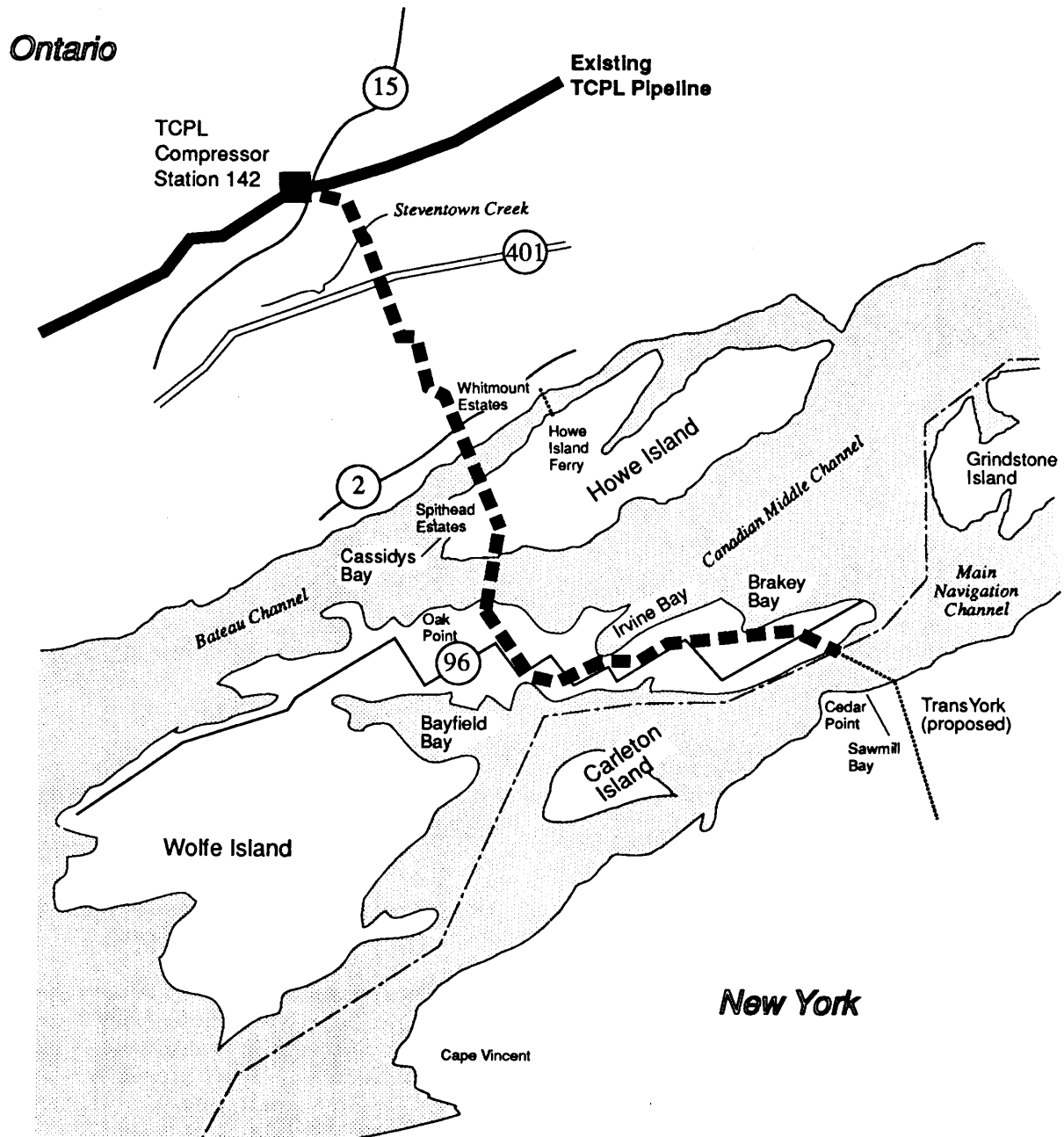
5.1 Canadian

Within the general study area along the St. Lawrence River extending from Kingston to Brockville, TransCanada identified and evaluated three alternative routes, namely, Alternatives 1, 2 and 3. Other minor route variations resulted in Alternatives 1A and B (see Figure 5-1). Alternative 1 was subsequently presented as TransCanada's proposed route (see Figure 5-2). That original study area encompassed what TransCanada felt were reasonable route alternatives "in terms of directness and length" to provide the service requested by Niagara Mohawk. However, at the Board's request, the original study area was extended by 20 km to the east of Brockville, and two more alternative routes, 3A and 3B, were identified and evaluated within the extended study area (see Figure 5-3).

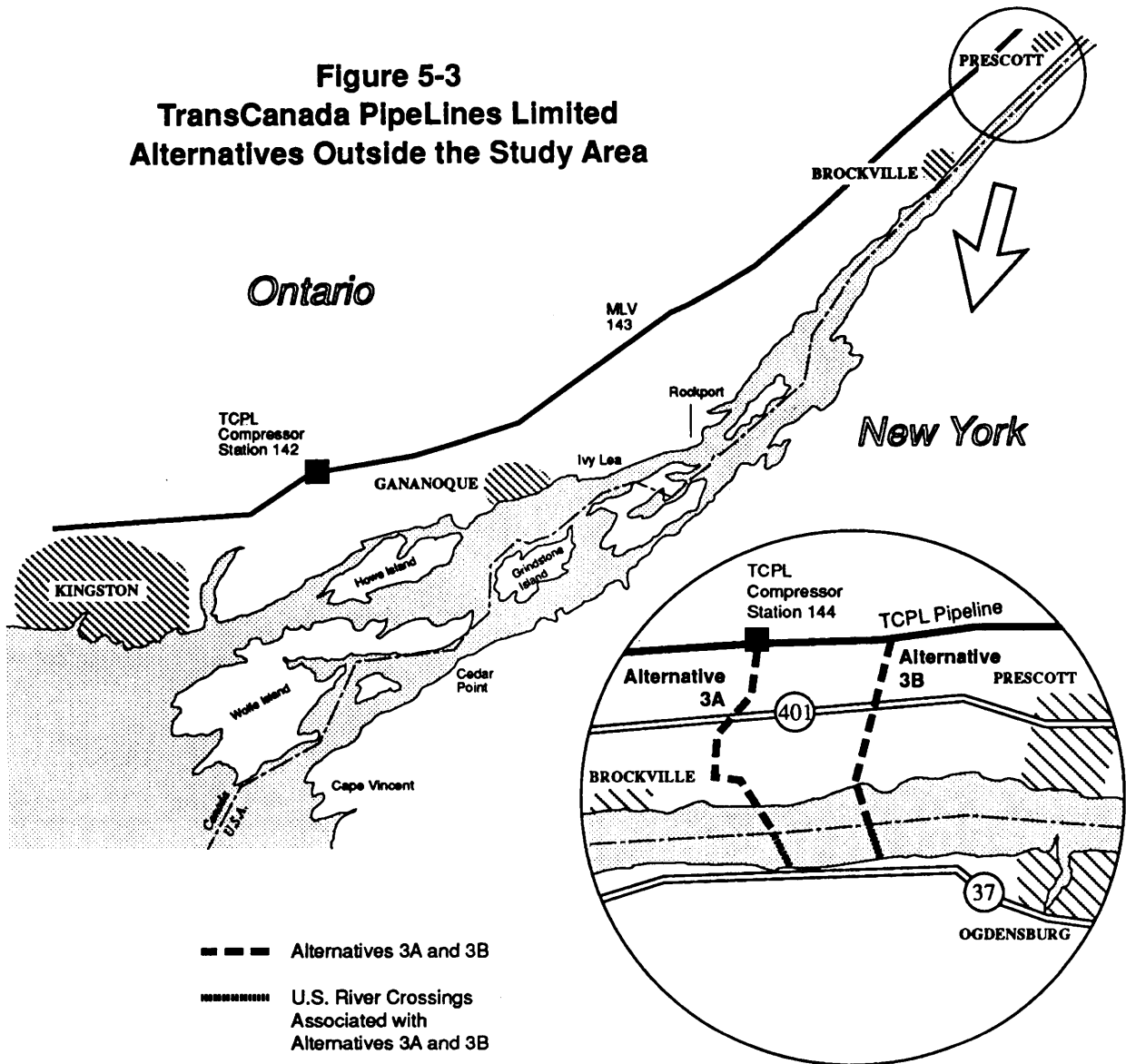
Figure 5-1
TransCanada PipeLines Limited
Alternatives in the Study Area



**Figure 5-2
TransCanada PipeLines Limited
Proposed Route**



**Figure 5-3
TransCanada PipeLines Limited
Alternatives Outside the Study Area**



5.1.1 Proposed Route

TransCanada's proposed route, Alternative 1, from Compressor Station 142 near Joyceville, Ontario to the U.S. border, is approximately 25.2 km in length. The route crosses six watercourses, four of which are intermittent. The only sensitive watercourse along the onland portion of the Canadian route is Steventown Creek in Pittsburgh Township in which northern pike spawning occurs. The proposed route involves the crossing of three channels of the Upper St. Lawrence River - the Bateau Channel, Canadian Middle Channel and Main Navigation Channel - which are approximately 750 m, 1.2 km and 2 km long, respectively. Howe and Wolfe Islands would also be crossed. TransCanada submitted that approximately 80 percent of the total land route is devoted to agriculture, 10 percent is forested, 7 percent is scrubland and 3 percent is wetland. Approximately 45 landowners would be directly affected by the proposed route.

TransCanada submitted that Alternative 1 was selected as its proposed route following an objective study performed by TransCanada's team of in-house professionals. TransCanada further stated that its reason for selecting Alternative 1 as its proposed route for the Gananoque Extension was the fact that the route generally met its route selection criteria (see Appendices II and III). Moreover, TransCanada stated the following reasons for selecting the proposed route:

- it is situated largely through "less intensively farmed agricultural land", a land use compatible with a buried natural gas pipeline;
- it minimizes the impacts on environmentally sensitive areas such as wetlands, forested areas, designated parks, habitats of rare and endangered species, areas of speciality crops, and developed recreational areas;
- it involves an acceptable river crossing that can be engineered, avoided incompatible uses at the landfalls and avoided sensitive biological areas; and
- it begins at a compressor station, thereby providing flexibility in operating the pipeline.

The local intervenors disagreed with TransCanada's choice of the proposed route. B. Hogan, along with several other intervenors, submitted that the proposed route clearly failed to meet a number of TransCanada's stated route selection criteria. In their opinion, the proposed route did not: avoid habitats known for rare and endangered avian species; avoid sensitive wetlands; avoid specialty crop lands; avoid known waterfowl nesting and/or staging habitats; minimize disturbance to forests/woodlots; or minimize the number of crossing of roads and sensitive streams.

S.B. Martin and other intervenors contended that the eastern boundary (i.e. Brockville) of the initial study area had been purposely set to minimize the U.S. onland portion. In their view, the evidence seemed to suggest that the same consideration had not been given to the Canadian onland portion, thereby indicating that the Canadian social and environmental costs were not a major factor in the route selection process. They also disagreed with TransCanada's original choice of study area, contending that if the "many islands and shoals" in the area posed such an obvious constraint, an early decision should have been made to expand the study area beyond the eastern boundary of Brockville where a single crossing, without islands and shoals, exists.

Several intervenors expressed the view that the Pittsburgh Township landfall site, with its granite rock and pine trees, should not have been included in the pipeline route selection process. Also, several intervenors stated that since there was so little flexibility in routing through staging and landfall sites, the route was tantamount to a detailed route in those areas. In their view, TransCanada repeatedly tried to defer the concerns of landowners until after certification (*i.e.*, until a detailed routing hearing). TransCanada's position was, according to R.G. Deeley, at odds with the claims TransCanada made when describing its route selection process.

Several intervenors expressed their dissatisfaction with TransCanada's approach towards dealing with the concerns expressed about the proposed route by the Canadian Wildlife Service ("CWS"), the Ontario Ministry of Natural Resources ("MNR") and the Kingston Field Naturalists ("KFN"). In their view, TransCanada and Beak consistently chose to take issue with those parties that had expressed strong concerns over the impact of the proposed route on wetlands, fish spawning grounds, migratory waterfowl and rare and significant bird species.

On the subject of the crossing of the St. Lawrence River, TransCanada had submitted, according to R.G. Deeley, that the length of its preferred crossing would be offset by an ideal river bed profile. Several intervenors, including W.A. Martin, observed that from the additional evidence filed at the proceedings, the river bed profiles of the Bateau Channel and Canadian Middle Channel seemed to bear little resemblance to their original description.

The Township of Howe Island strongly opposed TransCanada's proposed general route and argued that it would severely affect individual Howe Island properties. Several other intervenors expressed the view that there were other alternative routes that would affect fewer individuals.

In general, local resident intervenors were not convinced that among the alternatives, TransCanada's proposed route was acceptable, since it consists of the longest Canadian route, crosses two islands and three river channels and would result in environmental and socio-economic impacts that are equivalent to or greater than those of the other alternatives.

5.1.2 Alternatives in the Study Area

Alternative 2 starts from TransCanada's MLV 143, crosses the eastern end of Hill Island and enters the U.S. on Wellesley Island. It is approximately 13 km long in Canada. Its topography is more variable than some of the other alternatives, with rock outcroppings expected along 20 to 30 percent of the onland route. The route would also involve three channel crossings, namely, Raft Narrows, Lake of Isles Outlet Channel and the American Narrows. The channel crossings are 500 metres, 70 metres and 250 metres wide, respectively. The Canadian landfall is located to the west of Rockport, Ontario and the U.S. landfall to the west of Point Vivian, New York.

Although Alternative 2 presented the most direct route between TransCanada's mainline and the Watertown, New York area, TransCanada ultimately rejected this alternative largely because it crosses Hill Island which is part of the St. Lawrence Islands National Park. TransCanada stated that it was unaware of the existence of the park at the outset of its search for an appropriate route. It stated further that when it became aware of the park's existence, it was unaware of the recent amendments to the *National Parks Act* that prohibit the construction of new pipelines through a national park. Because of this prohibition and other considerations, including topography, Alternative 2 was rejected.

Many intervenors, including G.P. Arsenault, submitted that Alternative 2 was never a viable route despite TransCanada's claim to the contrary and further contended that TransCanada could have determined the status of Alternative 2 far sooner and subsequently removed it from contention.

Alternative 3 starts approximately 20 km east of MLV 143 along TransCanada's Toronto-Montreal line and traverses varied topography and land uses for 7.2 km to the U.S. border on the St. Lawrence River upstream of Brockville, Ontario. It involves only a single crossing of the St. Lawrence River, however, when combined with the associated U.S. mainland route, it comprises the longest total Canada U.S. route of those presented inside the original study area.

Alternative 3 was deemed unacceptable by TransCanada due to its crossing of the St. Lawrence River "in and near extremely sensitive areas" and because the river profile would necessitate extensive drilling, blasting and rock movement during construction. In addition, the routing of the U.S. land portion would be affected by a number of natural and cultural resources, such as French Creek Wildlife Management area, known habitats of endangered and threatened species, rare natural communities (e.g. alvar grassland), stream and river crossings, and known cultural resources eligible for the National Register of Historic Places. Given the St. Lawrence River's ship traffic, the narrowness of the shipping channel would also pose further problems throughout the construction phase. Moreover, the additional costs associated with providing three metres of cover over the pipe across the St. Lawrence River at this site, as requested by the St. Lawrence Seaway Authority ("the Seaway Authority"), made this alternative far less attractive to TransCanada than the proposed route.

Based upon their examination of Alternative 3, several intervenors argued that from a Canadian perspective, this route offers less risk of adverse environmental and socio-economic impacts than the proposed route. G. and I. Metcalfe, R.G. Deeley and others questioned Beak's readiness to defer to the concerns of the St. Lawrence Eastern Ontario Commission ("SLEOC") regarding Alternative 3, while consistently taking issue with the concerns identified by the CWS, MNR and KFN in respect of the proposed route. R.G. Deeley submitted that in the case of Alternative 3, the environmental constraints had been incorrectly described in the original application, apparently as the result of miscommunication between Beak and SLEOC. R.G. Deeley further indicated that SLEOC's comments were cited by Beak as a major factor in its rejection of Alternative 3. SLEOC was, according to R.G. Deeley, incorrectly identified by Beak as a regulatory agency.

Intervenors mentioned that both the CWS and the KFN had indicated a preference for Alternative 3 based upon an avian wildlife perspective. The KFN, among others, were of the view that there was not enough information to reject Alternative 3 as a viable option. Several intervenors claimed that Beak rejected that alternative largely on the basis of the limited contact it had with SLEOC and the New York State Department of Environmental Conservation ("the DEC").

Alternative 1A stretches approximately 17.7 km from Compressor Station 142 to the U.S. border. It crosses the Main Navigation Channel between Wolfe Island and the U.S. mainland shore in two sections, each about 1.9 km long, which are separated by Carleton Island (Carleton Island is located in the U.S. portion of the Main Navigation Channel). The shallow waters around the island are heavily utilized as a waterfowl staging area and provide a good area for fish spawning. This alternative is approximately 9 km shorter on the Canadian side than the proposed route but approximately 8 km longer on the U.S. side. TransCanada rejected this alternative because of the dense residential development on the U.S. mainland landfall area, because it would require a fourth crossing of the St.

Lawrence River and because the crossing of Carleton Island would require that all movement of equipment, material and manpower to Carleton Island be by private barge carriers, since no regular ferry service is available.

Alternative B stretches approximately 17.9 km from the point of origin on TransCanada's Toronto-Montreal line to the U.S. border. It crosses the eastern side of Howe Island and only 1.6 km of Wolfe Island, using the same landfall site on the U.S. mainland as the proposed route. This alternative makes three crossings of the St. Lawrence River, namely, 1.2 km across the Bateau Channel, 5 km across the Canadian Middle Channel and 2 km across the Main Navigation Channel. Although this alternative is one of the shortest overall routes, TransCanada stated that it had rejected it because the 5 km water crossing from Howe Island to Wolfe Island had significant engineering and timing considerations that could have resulted in scheduling delays and unpredictable costs.

Intervenors offered no substantive evidence challenging TransCanada's rationale for rejecting Alternatives 1A and B, although J.T. Ellerton submitted that Alternative 1A had not been considered viable because of residential development on the U.S. landfall and shallow shore approaches, whereas similar constraints in Canada did not render Alternative 1 unacceptable to TransCanada.

5.1.3 Alternatives Outside the Study Area

During the GH-1-89 hearing, TransCanada stated that although Alternative 3 was a feasible route, it had been rejected because of the sensitive nature of the crossing. The Board pursued the question of additional alternative routes in the Brockville area by requesting TransCanada to identify alternative crossings within the area 20 km east of Brockville. As a result, Beak identified two additional routes, Alternatives 3A and 3B, which are set out in Figure 5-3.

Alternative 3A originates 350 metres downstream of Compressor Station 144 on TransCanada's Toronto-Montreal line and crosses the St. Lawrence River approximately 9 km east of Brockville. The route stretches 5 km on the Canadian mainland and 2.4 km across the St. Lawrence River for a total of 7.4 km to the U.S. landfall.

The proposed take-off point for Alternative 3B is located approximately 3.75 km downstream of Compressor Station 144. It intersects the St. Lawrence River approximately 12 km east of Brockville. The total distance from the take-off point to the U.S. landfall is 6 km, of which 2.1 km is the St. Lawrence River crossing.

TransCanada's assessment of Alternatives 3A and 3B identified a number of sensitive areas located near the routes. These include areas of spawning for particular fish species (e.g. the blackchin shiner), foraging and resting areas for waterfowl and wintering areas for gulls and water birds. Residential development occurs on both sides of the potential U.S. landfall site for both alternatives.

TransCanada's reasons for rejecting Alternative 3A included the same environmental concerns pertaining to the associated U.S. land route that led to Alternative 3 being rejected. The shore approach to the Canadian landfall, with its series of steps would, in TransCanada's opinion, require extensive excavation to provide the 3.04 metres of cover requested by the Seaway Authority. Contributing to the elimination of Alternative 3A from contention were the extremely small staging area available on the Canadian landfall and the fact that the U.S. land route associated with this alternative is approximately 50 km longer than that associated with the proposed route. The U.S. land

route associated with this alternative would affect a number of natural and cultural resources including rare natural communities such as alvar grassland, known habitats of endangered and threatened species (e.g. the Indiana bat and the peregrine falcon) and certain wildlife management areas.

TransCanada submitted that Alternative 3B shares many of the problems of Alternative 3A, for example, concerns with the associated U.S. land route. TransCanada also stated that Alternative 3A has the additional concerns of possible lead contamination in river bottom sediments in close proximity to the route and an even more restricted landfall location on the Canadian side.

Several intervenors expressed the view that, in comparing the pros and cons of Alternatives 3A and 3B, in Canada, versus TransCanada's proposed route (Alternative 1), those alternatives offered far less risk of adverse environmental and socio-economic impacts than TransCanada's proposed route.

On the subject of the specific criteria used by TransCanada, R.G. Deeley and other intervenors stated that the proposed route met fewer of those criteria than Alternatives 3, 3A and 3B. They stated that the proposed route did not follow existing corridors and had more road crossings, more areas subject to erosion, more river crossings, affected more forests and woodlots covered by (Ontario) Woodlands Improvement Act agreements ("WIAAs"), more habitat for rare or endangered species, and crossed or infringed upon more wetland than Alternatives 3, 3A or 3B. R.G. Deeley noted that the proposed route involves six landfalls (in Canada and the U.S.) rather than two, as in the case of each of Alternatives 3, 3A and 3B, notwithstanding TransCanada's statement that selection of river crossings presented the major limitations in terms of route selection, particularly in availability of staging and landfall sites. According to R.G. Deeley the use of several riverside properties along the proposed route by TransCanada would have a major and lasting effect on their use by and value to their owners. B. Hogan stated that TransCanada applied the criteria in eliminating all the alternative routes but ignored the criteria in selecting the proposed route. She further stated that if the criteria had been properly applied, the proposed route would have been rejected.

In R.G. Deeley's view, one of the reasons for rejecting Alternatives 3A and 3B was the unavailability of U.S. landfall sites, and although two sites had been located, the limited clearing of trees on one had led to the conclusion that the entire landfall was to be developed imminently. R.G. Deeley also maintained that TransCanada was apparently concerned about receiving a right-of-way from Du Pont Canada Inc. with respect to Alternative 3A, yet was unswayed by the prospect of having to obtain right of entry orders from the Board with respect to several rights-of-way along the proposed route.

Several intervenors also expressed concern that TransCanada had double standards in comparing the proposed route with the alternatives. In their view, that which was claimed to be mitigable on the proposed route was seemingly enough to support dismissal of an alternative. They claimed that in the case of Alternative 3A, TransCanada submitted in evidence that the river crossing would involve traversing an ecologically sensitive area, whereas in its written argument the status of the area was elevated to "areas of extreme environmental sensitivity in the St. Lawrence River."

With respect to TransCanada's claim that the river crossing associated with Alternative 3A was difficult from an engineering standpoint because of the river bed profile at this location, R.G. Deeley indicated that evidence presented during the hearing by W.A. Martin regarding river bottom profiles revealed that the river bottom profiles of Alternative 3A and of the main channel crossing of the proposed route were not totally dissimilar.

Views of the Board

In a certificate hearing, the purpose of evidence on alternative routes is twofold:

- 1) If a company is required to choose its proposed route from a reasonable set of alternatives, it is more likely to arrive at an acceptable route than if it chooses its proposed route in isolation.
- 2) By seeing a pipeline company's reasons for having rejected various alternative routes, the Board is assisted in understanding the manner in which the company has applied its route selection criteria.

The Board does not make a ruling on which alternative route is the best. The Board only determines whether the proposed route is acceptable. The proposed route could be the best of the studied alternatives and nonetheless be unacceptable to the Board. On the other hand, the proposed route could be the worst of the alternatives and nonetheless represent an acceptable route.

The ultimate decision to be made by the Board, following a certificate hearing is whether or not the pipeline (along the proposed route) is required by the present and future public convenience and necessity. Evidence on alternative routes is of assistance to the Board in arriving at this decision.

The Board acknowledges that the Gananoque Extension's Alternative 2 represents the shortest overall Canada/U.S. route. However, the Board is of the view that because the route passes through a national park, it was never a reasonable alternative and should not have been presented as such.

Although it has not concluded that Alternatives 3, 3A and 3B constitute acceptable routes, the Board is not convinced by TransCanada's reasons for having rejected those routes.

TransCanada's rejection of Alternative 3 appears to have been based largely on comments received from SLEOC and from the DEC. One of SLEOC's concerns was that Alternative 3 passes through a designated "high priority sensitive area". The Board notes that the proposed route also crosses a "high priority sensitive area" but that TransCanada did not feel that construction of the pipeline along the proposed route would result in any lasting detrimental environmental impacts. In view of the fact that the CWS indicated a preference for Alternative 3, the Board feels that TransCanada should have more fully investigated the possibility of alleviating the concerns of SLEOC and the DEC through mitigative measures.

Many of the problems associated with Alternatives 3A and 3B (e.g. residential development, fish spawning areas and waterfowl foraging and resting areas) are also associated with the proposed route. The Board feels that mitigation of those problems was not properly explored in respect of Alternatives 3A and 3B. In addition, problems with the U.S. mainland routes associated with Alternatives 3A and 3B (e.g. the

crossing of wetlands and habitats of rare animal species) also apply to the proposed route.

The Board has concluded that possible mitigative measures with respect to the proposed route (Alternative 1) were more thoroughly investigated than those associated with the alternative routes 3, 3A and 3B. The Board does not believe therefore, on the basis of a balanced assessment of the alternatives, that TransCanada's proposed route was selected in a completely objective manner. The Board notes with concern TransCanada's position that it can successfully mitigate most problems associated with the proposed route, when similar problems associated with alternative routes were cited as reasons for rejection of those routes.

5.2 American

5.2.1 TransYork Extension and Related U.S. Regulatory Approvals

The proposed TransYork Extension (otherwise known as Pipeline #59) consists of a 406 mm O.D. pipeline approximately 43.8 km long. The pipeline would connect with the Gananoque Extension in the St. Lawrence River south of the southeastern tip of Wolfe Island. From the U.S. landfall east of Sawmill Bay (which is approximately 8 km west of Clayton, New York), the route proceeds in a southeasterly direction to its terminus at the interconnection with Niagara Mohawk's existing gas distribution system on Beutel Road, Watertown, New York. The TransYork Extension would be entirely located in Jefferson County.

Existing Niagara Mohawk electric transmission rights-of-way were incorporated into approximately 30 percent of the TransYork route. Most of the route crosses active or inactive agricultural lands, while approximately 20 percent of the route traverses forest lands. It also includes three river crossings - the Chaumont, Perch and Black Rivers - in addition to the crossing of the St. Lawrence River. The route crosses the Perch River by paralleling a transportation right-of-way and crosses the Black River using Niagara Mohawk's existing aerial gas pipeline crossing.

Existing rights-of-way would be utilized where possible, which in Niagara Mohawk's view reduces impacts to the wetlands that would be crossed by the pipeline. The route avoids crossing the French Creek State Wildlife Management Area and the Perch River State Wildlife Management Area. It also avoids identified Indiana bat caves and would have no significant impact on bald eagles, peregrine falcons or osprey occurring in the area. Rare natural communities (e.g. alvar grassland) and cultural resources would not be affected by the route.

At the terminus on Beutel Road, Watertown, the TransYork Extension would tie into two other existing Niagara Mohawk pipelines - Pipelines #33 and #39. Pipeline #33 enables gas to flow north and south to serve the area between Watertown and Syracuse, New York, while the tie-in to Pipeline #39 would allow gas to flow south to serve the area between Watertown and Syracuse and east into another portion of the system to serve the areas between Watertown and Carthage, New York.

On 3 January 1991, the NYSPSC voted under Article VII of the New York Public Service Law ("PSL") to grant Niagara Mohawk a Certificate of Environmental Compatibility and Public Need related to the construction of the TransYork Extension. Niagara Mohawk indicated that it would

submit to the NYSPSC an Environmental Management and Construction Plan which lays out the means by which Niagara Mohawk intends to comply with the NYSPSC's construction order.

With respect to its Article VII filing, Niagara Mohawk noted that it has conformed to the legal standard established by that Article. It explained that the courts have held that an applicant does not need to examine all conceivable routes for a project but needs only to examine reasonable alternatives so that a route can be established that has the minimum adverse environment impact.

In October 1990, Niagara Mohawk received a Water Quality Certificate from the NYSPSC in accordance with section 401 of the (U.S.) Clean Water Act, Article VII of the PSL and relevant DEC regulations.

In June 1989, Niagara Mohawk filed with the (United States) Department of the Army Corp of Engineers ("Corps") for authorizations under section 10 of the Rivers and Harbours Act of 1899 and section 404 of the Clean Water Act. At the time of the hearing, Niagara Mohawk was preparing a submission to the Corps in response to a request by the St. Lawrence Seaway Development Corporation ("SDC") that the pipeline be buried rather than simply laid on the river bed and bermed.

In November 1990, Niagara Mohawk received from the (United States) Federal Energy Regulatory Commission ("FERC") a Presidential Permit and authorization under section 3 of the Natural Gas Act for the installation and operation of the TransYork facilities at the international border, subject to the completion of an Environmental Assessment. The FERC has issued its notice of intent to prepare an environmental assessment. Comments in this regard were due in October 1990 and the assessment was being prepared.

5.2.2 Alterative U.S. Transportation Routes

TransCanada argued that the proposed routing via the yet-to-be-built TransYork pipeline facilities is the only routing that would allow the export sale to Niagara Mohawk to proceed. TransCanada noted that the Empire State Pipeline ("Empire")¹ and the Iroquois Gas Transmission System ("Iroquois")² alternatives had been dismissed by Niagara Mohawk. TransCanada also noted Niagara Mohawk's testimony that it would not proceed with the purchase of the TransCanada gas supply package were the applied-for Gananoque Extension not approved, since it believed there to be no alternative export points available with the required capacity or at a reasonable cost.

TransCanada provided a comparison of the applied-for facilities and their associated capital and operating costs with those facilities that would be required to provide service to Niagara Mohawk at the Canada/U.S. border, were Niagara Mohawk to use either:

¹ Empire is a 249 km, 610 mm O.D. gas pipeline to be constructed entirely in the State of New York from a point on the international border near Chippawa, Ontario to Syracuse, New York. Initial capacity of the pipeline is expected to be 4 250 10³m³/d (150 MMcfd).

² Iroquois is a proposed 594 km, 610 mm O.D. and 762 mm O.D. gas pipeline to be constructed from a point on the international border near Iroquois, Ontario to South Cornmack, New York. Initial capacity of the pipeline is expected to be 16 310 10³m³/d(575.8 MMcfd). Iroquois plans to interconnect with the existing systems of Tennessee Gas Pipeline Company, Algonquin Gas Transmission Company and CNG.

- (i) the Iroquois system; or
- (ii) the Empire or National Fuel Gas Supply Corporation ("National Fuel")/CNG systems via Chippawa or Niagara Falls, Ontario.

TransCanada's analysis revealed that it could realize savings in capital costs of approximately \$26.7 million (1989 Can. dollars) were the gas to be exported into the proposed Iroquois system and approximately \$29.7 million (1989 Can. dollars) were the gas to be exported via the proposed Empire or National Fuel/CNG systems at Chippawa, Ontario or via the proposed Niagara Spur facilities at Niagara Falls, Ontario.

TransCanada indicated that the change in its annual operating costs associated with any of the aforementioned alternatives would be negligible (i.e. less than \$20,000 per year).

TransCanada argued that were Niagara Mohawk required to seek transportation service to one of the alternative export delivery points, it would likely jeopardize its current position in the TransCanada queue for transportation service. TransCanada indicated that, as an open access transportation utility responding to transportation service requests on a non-discriminatory basis, it cannot simply change the requested delivery point but must apply for facilities that satisfactorily respond to the requests of its prospective shippers.

TransCanada submitted that no alternative route can meet the 1 November 1991 in-service deadline and that there are therefore no reasonable alternatives. TransCanada added that these are not "optional" facilities but are required to effect an export sale that will generate over \$1 billion in revenues, which export sale has already received the support of Canadian gas producers, and has been found to be in the Canadian public interest.

TransCanada argued that the only evidence presented during the proceedings clearly demonstrated that there are no viable alternative transportation routes since all of the alternative capacity being proposed or constructed has already been contracted. TransCanada added that any new capacity would likewise require certification hearings.

TransCanada argued that unlike the Iroquois and Empire alternatives, the Gananoque/TransYork Extension would have sufficient capacity to satisfy future market growth.

Niagara Mohawk argued that the detailed comparison of the Gananoque/TransYork Extension and each of the Iroquois, Empire and Niagara alternatives clearly demonstrated the wisdom of Niagara Mohawk's decision to pursue the Gananoque/ TransYork Extension.

With respect to downstream U.S. facilities, Niagara Mohawk presented evidence comparing the projected unit costs for delivering gas to its distribution area via each of the aforementioned alternatives. While cautioning that its analysis was incomplete because it was, at the time, impossible to ascertain all of the associated capital costs, Niagara Mohawk estimated the unit costs of the U.S. transportation alternatives, on a per Dt basis, to be \$0.18 (U.S.) to \$0.30 (U.S.) greater than those of the TransYork Extension. Niagara Mohawk added that this differential occurs even though not all of the capital costs associated with the alternatives were included in the analysis.

Niagara Mohawk argued that none of the alternatives could deliver the contract quantity of gas to the Watertown, N.Y. area without the construction of additional pipeline capacity in both Canada and the U.S. Niagara Mohawk added that it had not considered such alternative facilities and felt that its efforts to secure access to Canadian-sourced gas could be delayed by several years because of the lead time required to design alternative facilities and to obtain appropriate U.S. regulatory approvals. Niagara Mohawk felt that such approvals could not be taken as a certainty.

With respect to the Iroquois alternative, Niagara Mohawk pointed out that that alternative would require the construction of a 31 km lateral by CNG from Niagara Mohawk's existing system to interconnect with the Iroquois system at an estimated cost of \$22 million (\$U.S.). In addition to the lateral, Niagara Mohawk indicated that it would be forced to dedicate a 32 km pipeline (Pipeline #56) solely for transporting gas from the Iroquois system. Pipeline #56 was at the time of the hearing still awaiting NYSPSC certification. The preparation of the necessary facilities applications and their consideration by the NYSPSC would, by Niagara Mohawk's estimate, cause a delay in the availability of service to 31 October 1993.

Niagara Mohawk stated that the Iroquois interconnection would cross rugged terrain, making pipeline construction more difficult and thus raising considerable environmental concerns. Niagara Mohawk believed these environmental concerns, which include those associated with the crossings of wetlands, to be greater than those associated with the TransYork Extension.

Niagara Mohawk also raised the concern of whether excess capacity would in fact exist on the Iroquois system for $1\,445\,10^3\text{m}^3/\text{d}$ (51 MMcfd) and whether use of the Iroquois system would provide the same degree of flexibility and diversity that would be offered by the TransYork Extension. Niagara Mohawk argued that because it would be the sole owner of the TransYork Extension, it would be in a better position to offer capacity to future prospective shippers and to further diversify its gas supply, thereby lessening its reliance on CNG. Niagara Mohawk noted that its ability to lessen its dependence on CNG would be further reduced through the construction of the lateral between the Iroquois and Niagara Mohawk systems since Niagara Mohawk and CNG (a partner in the group backing the Iroquois project) would have to reach agreement on its ownership, this situation arising as a result of a previous decision by the FERC.

With respect to the Empire alternative, Niagara Mohawk pointed out that this project is awaiting U.S. regulatory approvals at both the federal and state levels. Niagara Mohawk estimated the cost of the interconnection to the Empire system, between Syracuse and Watertown, New York, to be approximately \$37 million (U.S.). Niagara Mohawk added that plans for such an interconnection have not been developed. Niagara Mohawk noted Empire's testimony at the NYSPSC Article VII proceedings at which it testified that it would not build the pipeline unless it were given special rate treatment and that it would also re-assess the potential market after receipt of a construction certificate to determine whether or not to proceed.

Niagara Mohawk indicated that, in the event the Board did not certificate the proposed Gananoque Extension, it could expand its existing system Pipeline #39 (a 323.9 mm O.D. pipeline between Oswego and Watertown) to transport gas in a northerly direction. Were the gas Canadian sourced, it would have to be imported at the Niagara import point. Niagara Mohawk added, however, that no preliminary work had been done in this regard and that, if feasible, a minimum of two to three years would be required to implement a project to expand Pipeline #39.

Niagara Mohawk noted that the TransCanada queuing procedures preclude TransCanada from simply changing the requested delivery point since other prospective shippers in the queue could be affected by such a change. Niagara Mohawk argued that to secure an alternative delivery point, it would have to re-apply for inclusion in the TransCanada queue, which it believed would result in it being placed in a much lower position, thereby causing significant delays in its project in terms of obtaining regulatory approvals associated with the construction of pipeline facilities in both Canada and the U.S.

Niagara Mohawk re-affirmed its position that it would not purchase the same package of Canadian-sourced gas from TransCanada were it to face the aforementioned uncertainties, risks and lengthy delays. Niagara Mohawk testified that it had committed itself entirely to the TransYork project and that it had not sought and would not seek to secure an alternative delivery point. Niagara Mohawk added that it does not have any other long-term gas supply arrangements with Canadian gas producers.

Niagara Mohawk pointed out that in the event the applied-for facilities were not approved, there are in the U.S., what it termed, "... other avenues and opportunities open to it involving domestic natural gas supply that involve much less risk and lead time, thereby making them more attractive to Niagara Mohawk". In this regard, Niagara Mohawk pointed out that it is currently receiving price quotations from U.S. gas producers for long-term gas supply that it considers to be competitive with the TransCanada supply.

Niagara Mohawk noted that the loss of this export sale would result in the loss of revenues to Canada associated with the sale of gas and the purchase of pipeline material. Niagara Mohawk also noted that Canada would lose the revenues associated with the additional gas export sales that could be accommodated in the future by the excess capacity of the Gananoque/TransYork Extension.

It was the view of IPAC that Niagara Mohawk had not adequately explored alternative routes to secure access to Canadian gas supplies. IPAC submitted that, while the identified regulatory complications and associated timing delays may be of concern to Niagara Mohawk, such concern is insufficient justification for certificating the applied-for facilities. IPAC expressed its disappointment with Niagara Mohawk's evidence which it interpreted as suggesting that Niagara Mohawk, as a matter of corporate policy, was not prepared to consider alternative delivery points and interconnections with the TransCanada system.

Union characterized the applied-for facilities as being optional since it believed that Niagara Mohawk's gas requirements could be met either through existing facilities or through facilities that were likely to become available sometime in the near future.

Union argued that, to the extent Niagara Mohawk experiences any market growth in the northern part of its franchise area, that growth could be served by expanding its existing delivery system in the south. Union submitted that while it did not take issue with Niagara Mohawk's goal for greater security of supply through a second source of gas and for the operational flexibility that would come from having a supply of gas at the north end of its franchise area, it did question whether these goals warranted the construction of the applied-for facilities.

Union submitted that Niagara Mohawk could achieve its goal of additional security of supply by interconnecting with the Iroquois or Empire systems. Similarly, Union believed that the goal of securing operational flexibility could be achieved by deliveries from the Iroquois system, although

Union acknowledged that this could result in Niagara Mohawk continuing its reliance on CNG for transportation service.

Union submitted that Niagara Mohawk's evidence on the costs of the alternative routes was unreliable and that the Board, having no direct knowledge of what the costs of those alternatives might be, should place no reliance on it.

Union noted that there is no evidence as to the urgent need to construct the Gananoque/TransYork Extension and that careful consideration of the costs of the alternatives should first be thoroughly examined. Union added that the lack of urgency is born out by the fact that the TransCanada gas supply will be used to displace existing supplies to serve an existing market that is not rapidly expanding.

Several other intervenors, including Doreen and Charles Greenwood, The Township of Howe Island, G. and I. Metcalfe, R.G. Deeley, K.W. Lawless and G.E. Bisailon, believed that there are alternative routes in the U.S. capable of accommodating the proposed export sale to Niagara Mohawk and that these were not adequately considered. Most of these intervenors acknowledged that those alternatives would require the construction of additional interconnecting pipeline facilities upon receiving the associated regulatory approvals, all of which would result in delaying of the commencement of the export project.

Views of the Board

The Board concurs with TransCanada that it has a responsibility to propose the construction or use of facilities that respond reasonably closely to the requests of its prospective customers or shippers unless such requests are unreasonable. WGML's request for service in the Gananoque area was based upon the request of Niagara Mohawk to have Canadian gas transported directly into its system from the north. As Niagara Mohawk's delivery-area request was not conceptually unreasonable, TransCanada had the responsibility to propose the construction of facilities, if feasible, from its Toronto-Montreal mainline to a suitable point on the Canada/U.S. border somewhere north of Syracuse. TransCanada's task was therefore to assess alternative Canadian routes that would satisfy the specific transportation request of its shipper.

The Board believes that the assessment of possible U.S. downstream transportation alternatives and, therefore, the need for the TransYork Extension, is a matter to be dealt with by the appropriate U.S. regulatory authorities. The Board believes that its responsibilities lie principally with the assessment of the applied-for Canadian facilities and any possible Canadian alternatives thereto, while recognizing that an adverse decision on Canadian facilities, for example, for reasons of location, could affect a U.S. decision to a major degree.

Chapter 6

Environmental, Socio-Economic and Land Use Issues Associated with the Proposed Route

6.1 Environmental Issues

6.1.1 Agriculture

In its Environmental and Socio-Economic Reports, June 1990 ("Assessment Reports"), TransCanada stated that construction of the proposed route could lead to loss of agricultural potential as a result of the mixing of topsoil with subsoil, rutting and compaction of topsoil, erosion, and bringing of rocks to the surface. TransCanada submitted that should the right-of-way become too wet, the contractor would be required to temporarily shut down to prevent or reduce soil compaction. TransCanada further indicated that if rocks were to work their way to the surface, the affected owner(s) would be compensated accordingly. TransCanada concluded that any agricultural use of the right-of-way would remain unchanged subject to minor restrictions.

A number of intervenors expressed concern regarding the potential for significant disruption of agricultural properties and associated operations. R.E. Henderson, in particular, voiced strong concern that a pipeline leak might disqualify his certification as an organic grower. Concern was also expressed regarding the impact of pipeline construction on prime agricultural land in general and orchards in particular.

Views of the Board

The Board is of the view that given TransCanada's considerable experience in constructing pipelines through agricultural land, the construction-related impacts on agricultural lands along the proposed route would be mitigable.

The Board is of the opinion that given the mitigative and restorative measures currently practiced in the pipeline industry, any adverse effects of pipeline construction on prime agricultural lands would be short-term.

The Board is satisfied that the existence of the pipeline right-of-way in proximity to R.E. Henderson's organic farming operation would not negatively affect the use of his land. Furthermore, the Board is satisfied that even in the unlikely event of a line break in the vicinity of the Henderson property, there would be no adverse impacts on his farming operation, because the effects would be localized.

With respect to the potential for disruption to orchard land along the proposed route, the Board is of the opinion that some productive potential of the property could eventually be restored.

6.1.2 Wetlands

TransCanada testified that the proposed pipeline would cross narrow sections of three Class 2 wetlands,¹ namely, Cassidys Bay Wetland, Oak Point Wetland and Holliday Bay Wetland.

TransCanada stated that, based upon a preliminary assessment, construction through those wetlands could be undertaken with the implementation of appropriate mitigative and restorative measures consisting of the scheduling of construction at the end of the August breeding period for certain bird species utilizing those wetlands, reducing the width of the right-of-way through the wetlands and replanting native aquatic macrophytes. In addition, TransCanada indicated that information regarding nesting locations of the least bittern would be taken into account during a detailed route hearing. Construction through those wetlands could involve one backhoe with oversized tracks on swamp mats.

The KFN, B. Chesney, B. Hogan and other intervenors did not agree with TransCanada's view that it could successfully mitigate all of the potential environmental impacts associated with pipeline construction through wetlands. In their view, TransCanada should have examined the route in sufficient detail to avoid sensitive areas and fully develop its plan of mitigative action. They felt that without offering any concrete proof that mitigation would be possible, it was inappropriate for TransCanada to simply state that if there were problems, it would take the steps necessary to reduce the impacts to an acceptable level.

The KFN testified that with respect to some of the highly sensitive wetlands that would be crossed by the proposed route, construction would have serious and lasting detrimental impacts. Those wetlands were noted by the KFN as nesting areas for endangered, rare and significant species. Furthermore, the KFN stated that it had seen examples of vegetation regrowth over trenched wetlands and that the regrowth was quite different from the original species. In its view, wetlands are in jeopardy through invasion of purple loosestrife² which, given an opportunity to establish itself, eradicates all other species. A cleared path through the wetlands for one season would provide an ideal opportunity for purple loosestrife to establish itself. The KFN questioned TransCanada's ability to mitigate any damage successfully and/or restore affected wetlands.

Other intervenors presented evidence that the CWS had reservations about the proposed routing of the pipeline through wetlands, particularly the Oak Point Wetland.

Views of the Board

The Board shares the concern of intervenors with respect to the potential negative impact that construction of the proposed facilities could have on wetlands. In particular, the Board is concerned that construction of the pipeline through the wetlands located along the proposed route could adversely affect the nesting habitat of several rare and significant avian species.

¹ The NMR rates wetlands using a point scoring system based upon four main components, namely, hydro geological, biological, social uses and special features such as habitats of rare, threatened or endangered species. A wetland, in order to be deemed a Class 2 wetland, must score at least 650 points out of 1000 or two out of the four components must score greater than 200 points each.

² Purple loosestrife-a marsh herb (genus *Lythrum*) of Europe and eastern U.S. having a long spike of purple flowers.

6.1.3 Fish and Wildlife

6.1.3.1 Fish Spawning/Habitat

Based on its previous experience with river crossings, TransCanada concluded that due to reproduction and recolonization, fish populations recover rapidly from the effects of pipeline construction. In evaluating the potential effects of construction related activities on smallmouth bass spawning habitat, Beak conducted a bass spawning survey at each landfall site along the proposed route. Based upon the results of that survey, Beak concluded that only poor to limited spawning potential existed at those locations. In further evaluating the potential for impacts on fisheries resources in the St. Lawrence River during pipeline construction, TransCanada assessed the potential for turbidity generation and siltation and was of the opinion that problems in that regard would likely be minimal. Construction activities with direct impacts on spawning habitat included blasting and/or trenching, both of which, in the view of TransCanada, would be temporary since indigenous sediment would be backfilled into the trench, thereby restoring the original sub-strata conditions.

To address the concerns raised by the Ontario Pipeline Coordination Committee ("OPCC"),¹ TransCanada agreed to a number of undertakings which are listed in Appendix IV. Those undertakings include the adherence to specific "timing windows" and blasting requirements to protect spawning activities and fisheries populations. In addition, TransCanada committed to undertake fisheries studies on habitat, species composition and abundance of adult fish populations at the proposed landfall sites and at a specified distance downstream.

Various parties, including the Township of Howe Island, contended that TransCanada's evidence with respect to potential damage to fish spawning areas and fish habitat was incomplete. P. Chesney submitted that in order to assess impacts on fish and fish habitat properly, fish studies should be conducted over extended periods. He cited, as an example, the ongoing three-year Queen's University study. Several intervenors were unconvinced that construction and blasting activities would not destroy valuable fish nursery stock and spawning beds.

G. and I. Metcalfe did not agree that there would be minimal impact on fisheries resources due to turbidity generation and siltation. This concern was also raised by the MNR in correspondence with TransCanada and was further reflected in the undertakings requested by the OPCC.

Several intervenors stated that the bass spawning surveys conducted by Beak provided a rather narrow viewpoint. In their view, an inadequate amount of time had been given to testing procedures and to the period of observation. In particular, concern was voiced about the presence of another species that received little or no attention, namely, the muskellunge.

¹ The OPCC is an InterMinisterial Committee of the Ontario Government and includes representation from the Ministries of Energy, Environment, Natural Resources, Agriculture and Food, Consumer and Commercial Relations, Municipal Affairs, and Transportation. The OPCC was represented at the hearing by the Minister of Energy for Ontario.

Views of the Board

The Board notes that through the establishment of strict in-stream "construction windows", the adverse impacts of pipeline construction on fisheries resources could, for the most part, be significantly reduced or eliminated. In the Board's view, the potential for lasting disruption to spawning beds and to fish populations has not been clearly demonstrated by the evidence presented. The Board notes that through its undertakings to the OPCC, TransCanada would be accumulating more definitive data relating to the nature and protection of fisheries resources and their habitat.

6.1.3.2 Waterfowl Staging and Migration

TransCanada noted in its Assessment Reports that the CWS had identified the Wolfe Island Zone as one of the most important areas along the lower Great Lakes shoreline for the staging of migrant waterfowl in the spring and fall. Although that zone is considered "provincially significant" (as a result of the waterfowl component), TransCanada stated that not all specific areas within that zone have provincial significance. Furthermore, it stated that areas having provincial and regional significance for waterfowl staging occur to the west of the proposed route. TransCanada indicated that the Oak Point, Cassidys Bay and Holliday Bay Wetlands have only local significance as waterfowl migration stop-over and production areas.

In order to mitigate any direct impact of construction activity on staging waterfowl, TransCanada agreed to specific in-river construction windows. TransCanada asserted that any indirect impact on potential food supplies would be temporary and insignificant when comparing the total biomass available in the Wolfe Island Zone to the area directly affected by construction activity.

The KFN stated that the area around the proposed corridor is unique in Ontario with respect to waterfowl staging. In particular, it offers shelter, waterdepth and easily available food supply to well over one million waterfowl during the migration period. Evidence presented by TransCanada revealed that this critical waterfowl staging area would in fact be crossed by the proposed pipeline but that the areas disturbed during pipeline construction would revegetate themselves within a year's time. The KFN, however, was not convinced that revegetation would occur.

In correspondence with TransCanada, the CWS expressed concern that the proposed route would more severely affect waterfowl resources than would Alternative 3.

Views of the Board

The Board is of the view that with the proper execution of the various mitigative and restorative measures available to TransCanada, in particular, the use of construction timing windows, the overall impact of the proposed project on waterfowl staging and migration would not be significant. That view is based on the assumption that construction would take place within the established time limits. Should pipeline construction extend beyond the commencement of fall migration, the proposed route could have a greater overall impact on waterfowl staging and production than would, for example, Alternative 3, since fewer diving ducks use this area in the spring and fall than the area associated with the proposed route.

6.1.3.3 Rare and Endangered Species

TransCanada acknowledged in its Assessment Reports that construction of the proposed pipeline would have an impact on wildlife, mainly to the extent that wildlife habitat would be modified or reduced. TransCanada stated that, in general, its standard specifications would be sufficient to protect wildlife resources along the proposed route. In its Assessment Reports, TransCanada identified a number of provincially significant species (e.g. the rare red-shouldered hawk) in the area of the proposed pipeline. TransCanada undertook to identify nesting locations and evaluate the potential for disturbance of the red-shouldered hawk.

A number of intervenors, including the KFN, stated that nesting sites for the red-shouldered hawk had been identified on Wolfe Island. The KFN noted that this species is very susceptible to any kind of disturbance and may well abandon its location, if disturbed.

The KFN asserted that the narrowness of the proposed corridor in many locations precluded the possibility of situating the pipe so as not to disrupt wildlife populations and their habitat. They further noted that the rare least bittern had been catalogued in six marshes on the proposed route and that other classified species known to breed in various locations adjacent to the proposed pipeline corridor are the regionally significant Virginia rail and the provincially significant marsh wren, sedge wren and American wigeon. In the view of the KFN, construction along the proposed route would adversely affect the nesting habitat of those species, thereby decreasing their chances of survival in the region.

Views of the Board

The Board notes that, although TransCanada referred to a variety of provincially significant bird species (e.g. the marsh wren, caspian tern and northern harrier) in its Assessment Reports, it only addressed, in any detail, the potential for disruption to the red-shouldered hawk. It was only through the hearing process that other species having similar importance (e.g. the rare least bittern) were identified. As a result, the Board is not persuaded that adequate research was conducted by TransCanada to identify the presence of other species and to determine if appropriate mitigative measures could be implemented to avoid disturbing and/or displacing such rare or significant species. The Board cannot therefore appraise TransCanada's ability to mitigate impacts on those species.

6.1.4 Forested Lands

TransCanada noted that approximately 10 percent of the proposed route is forested and that a portion thereof, consisting of two tracts of land (one in each of Pittsburgh and Wolfe Island Townships), is subject to WIAAs. TransCanada also stated that a number of small woodlots may be affected by the project and that some loss of wooded area would occur in the mature woodlands. However, since woodland vegetation is generally common in the study area, TransCanada was of the opinion that impacts on watershed protection, wildlife populations and aesthetic and scenic values would be minimal. Any potential impact would be associated with right-of-way clearing and the operation of heavy equipment. To minimize impacts, cutting in those areas would be kept to the minimum required for the right-of-way. In addition, compensation would be paid for any tree removal at WIAA sites.

Several intervenors, including B. Chesney, emphasized the importance of preserving the few farm woodlots remaining on Howe and Wolfe Islands because extensive clearing in the past had substantially reduced the number of trees. According to the KFN, the proposed route on Wolfe Island crosses important hardwood stands which, in their view, renders the route unsatisfactory for pipeline construction because of the potential for disturbance to nesting habitat for the red-shouldered hawk. Other intervenors asserted that the impact on the landscape would not be minimal as stated by TransCanada, given that a 20 metre right-of-way cleared through forested land would not go unnoticed.

The Wolfe Island Co-operative Playgroup ("the Playgroup") expressed similar views to many of the other intervenors with regard to the important role that farm woodlots play in providing refuge for wildlife and wind protection for homes and agricultural land, and as an important source of food, fuel and revenue. In its view, to remove whole sections could disrupt the ecology of the region. Some intervenors also expressed concern that the removal of mature hardwood stands from landfall locations, such as Oak Point on the north shore of Wolfe Island, could accelerate the erosive forces of wind and water at such locations.

Views of the Board

The Board notes that the loss of trees associated with forested areas along the proposed route would have some negative visual impact on the natural beauty of this part of the Thousand Islands area. Furthermore, the Board has some concern that the nesting habitat for red-shouldered hawks could be adversely affected by the removal of trees in the proposed corridor.

6.1.5 Landfall Sites

TransCanada indicated that the general corridor of the proposed route through the Townships of Pittsburgh, Howe Island and Wolfe Island had been initially selected based on the available landfall locations on the various channels of the St. Lawrence River. In TransCanada's view, the identification of suitable landfall sites was a critical part of the route selection process.

With respect to the proposed landfall site at Oak Point, TransCanada stated that should blasting occur, it would restore the trenched area with clean broken rock material to the original profile of the river bottom. TransCanada also indicated that sediment occurrence and its extent had been, or would be, delineated at each landfall. In addition, it would consider directionally drilling some of the landfall sites along the proposed route. Another solution suggested by TransCanada with respect to construction at the landfall locations was its purchase of potentially affected waterfront properties.

Several intervenors submitted that Oak Point was an unacceptable landfall site because of the adverse effects that construction in that area would have on fish spawning, waterfowl staging and rare bird habitat.

C.G. Jackson and K.W. Lawless, among others, expressed concern regarding the number of landfall locations given that other alternatives would involve only one Canadian landfall, as opposed to five for the proposed route.

Some intervenors stated that large signs indicating the presence of a pipeline could detract from the aesthetics of the shoreline.

According to F.E. Hogan, TransCanada's contention that there was no shoreline development at the exit point on Wolfe Island was misleading since a home and farm buildings are located there. Other intervenors maintained that the proposed route through the Pittsburgh Township landfall site on K.W. Lawless' property should not have been selected because of the granite rock outcroppings and mature trees located there.

Views of the Board

The Board believes that with any pipeline that crosses a major watercourse, there is always the possibility of noticeable and lasting impacts at each landfall site. For example, large signs indicating the presence of a pipeline could detract from the aesthetics of the shoreline. If the shoreline is forested, the visual impact of a cleared right-of-way is particularly noticeable from the river. Clearing a right-of-way through a largely forested shoreline will increase the landfall site's vulnerability to the erosive forces of wind and water. In addition, shorelines along large rivers are often settled resulting in a potential for incompatibility of existing land uses with a pipeline right-of-way.

The Board agrees with those intervenors who objected to the choice of the landfall site in Pittsburgh Township. The clearing of the necessary right-of-way would create an obvious swath through an otherwise largely forested shoreline. The site is situated on a steep granite outcropping that would have to be removed or modified in order to accommodate the pipeline trench. Both these impacts would detract from the aesthetics of the shoreline. In addition, the Board notes that because of its shallow soil over bedrock, the site is particularly vulnerable to erosion. Removal of trees and subsequent loss of the binding effects of their roots would add to this vulnerability. Furthermore, the trees along the shoreline provide a buffer that protects other nearby trees from being uprooted by the wind, a problem that commonly occurs in shallow soils.

The Board finds the proposed landfall site of limited width on the north shore of Howe Island to be generally unsatisfactory inasmuch as it would necessitate a right-of-way being constructed through either marshland or an orchard.

The Board shares some of the concerns of those intervenors who objected to the proposed landfall site on the north shore of Wolfe Island (Oak Point), an area that harbours rare bird species.

As indicated, the Board has particular concerns with the choice of landfall sites in Pittsburgh Township and on the north shores of Howe Island and Wolfe Island. Furthermore, in view of the potential impacts associated with landfall sites in general, the Board is of the view that it was inappropriate for TransCanada to have chosen a route that involves five Canadian landfalls.

6.1.6 Heritage and Archaeological Resources

TransCanada's review of the proposed route indicated that the potential for archaeological and historical resources along the Gananoque Extension is considered moderate to high. TransCanada indicated in its Assessment Reports that it would conduct a comprehensive archaeological evaluation of the final detailed route and that should any unexpected archaeological "finds" be unearthed during construction, immediate measures would be taken to protect each site.

With regard to the difficulty in identifying native burial sites, coupled with the high potential for their discovery, TransCanada stated that adequate provisions would be made and appropriate action taken. To further address concerns relating to this matter, TransCanada agreed to undertakings requested by the OPCC as listed in Appendix IV.

B. Hogan and other intervenors, in referring to an archaeological study of the proposed route prepared by the Cataraqui Archaeological Research Foundation, stated that ten sites had been documented, two of which - an Indian burial ground and an underwater shipwreck - lie within the proposed route. TransCanada's position was that its undertakings to the OPCC would eliminate any need for concern regarding damage to or loss of archaeological sites. However, B. Hogan stated that the Ontario Ministry of Culture and Communications ("MCC") is not a member of the OPCC and that the MCC and not the OPCC has the responsibility for authorizing and rejecting all excavations. Furthermore, in her view, no information had been introduced during the hearing to indicate that the MCC's approval would be forthcoming. Several intervenors expressed apprehension that should any potential site be discovered during construction, it might not be reported, particularly if a report would result in significant construction delays.

Views of the Board

Based upon its knowledge of TransCanada's construction policies, practices and procedures with regard to archaeological/heritage resources, the Board is of the view that TransCanada would take the measures necessary to identify and protect resources having archaeological or historical significance.

6.1.7 Sediment Quality

As pointed out in its Assessment Reports and through evidence adduced at the Hearing, TransCanada expected construction along the proposed route to cause little degradation of water quality. It stated that trenching and backfilling would cause both uncontaminated deeper sediments as well as contaminated surface sediments to be disturbed. TransCanada suggested that natural wave action would cause similar suspension of the possibly contaminated surface sediments. In TransCanada's view, if contamination exists in the surface sediments, trenching and backfilling would only cause localized, minimal and temporary releases of contaminants. Rapid dispersion by mixing and absorption to ambient or natural levels would be expected to follow. Based upon the low levels of contamination known to occur in the Main Navigation Channel sediments, TransCanada surmised that sediments in the Bateau Channel and Canadian Middle Channel would also be low in contamination. Given the low level of contaminants and the anticipated rapid rate of dispersion, TransCanada argued that there is a low probability that construction would result in any significant bio-concentration of contaminants in fish. TransCanada originally stated that during construction it would be unlikely that

any bio-concentration of chemicals would occur in fish because of the limited time of exposure to chemical pollutants. However, it later stated that suspension times could only be determined by analysis, which had not been conducted.

In order to address the possibility of dredged materials not meeting the open water disposal requirements of the Ontario Ministry of the Environment ("MOE"), TransCanada undertook to place any contaminated material above the high water mark and stabilize that material in order to prevent it from re-entering the water course. Approval of onland disposal sites would fall under the jurisdiction of the MOE.

In response to the various concerns raised by intervenors, TransCanada undertook to conduct further sediment quality studies which would be subject to review by the Board.

A number of intervenors expressed concern that proper studies on river sediment quality had not been completed. Sediment analyses, according to K.W. Lawless and others, should have been conducted much earlier so that the data would have been available for scrutiny by interested parties and by the Board before any decisions were taken. Many intervenors felt that the interpretations placed on the preliminary data by TransCanada were largely speculative.

S.B. Martin stated that regardless of whether the sediments were contaminated or not, spawning beds could be severely affected by construction within the proposed route. She argued that the detrimental effects on fish spawning of sediment drift from blasting had not been properly dealt with by TransCanada during the proceedings.

M. McReynolds and other intervenors contended that given the identification of contaminated silt in the Main Navigation Channel, it would be reasonable to assume that similar contamination exists on the Canadian side of the St. Lawrence River, although sampling had yet to be conducted in both the Bateau and Canadian Middle Channels. The general concern was that the evidence provided by TransCanada regarding river sediments and associated contaminants was selective and inadequate.

Views of the Board

The Board notes that TransCanada, in arriving at its conclusion that there would not be any significant potential for disturbance or release of contaminated sediments during construction, relied on a limited number of studies, including a limited bass spawning survey (conducted by Beak) and data collected on the Main Navigational Channel. The Board is concerned that more information on sediment quality was not available for scrutiny during the hearing.

6.2 Socio-Economic and Land Use Issues

6.2.1 Socio-Economic Benefits

TransCanada testified that significant benefits would accrue to Canada, Ontario and the Townships (i.e. Pittsburgh, Howe Island and Wolfe Island) if the Gananoque Extension project were to proceed. TransCanada further indicated that the sale and delivery of gas from western Canada would generate revenue that would remain in Canada and strengthen the economies of both Canada and Ontario. Construction of the \$29.6 million (Can.) Gananoque Extension would, according to TransCanada,

provide benefits to the local economy through the employment of local labour and an increase in the purchase of goods and services during pipeline construction. TransCanada indicated that construction personnel and inspectors would use local hotels, motels, campsites, restaurants and other services, thereby adding to the normal use of those facilities. It added that most of the materials used in construction of the pipeline would be purchased in Ontario.

Construction of the Gananoque Extension would result in annual taxes being paid by TransCanada to the Townships of Pittsburgh, Howe Island and Wolfe Island and increased payments by TransCanada to the provincial and federal governments. TransCanada stated that the construction and operation of the applied-for facilities would provide net economic benefits to the local economy. In arriving at that conclusion, TransCanada acknowledged that it had not performed any economic study or analysis of the net benefits but, rather, based its comments on its experience in constructing other pipelines in Canada.

Several intervenors argued that the benefits to Canada derived from the sale of gas to Niagara Mohawk would be much the same regardless of the export point. R.G. Deeley submitted that the prospect of supplying customers within Pittsburgh Township with gas from the Gananoque Extension was negligible. He also argued that the possibility of providing such supply played no role in the route selection process.

According to several intervenors, the Thousand Islands contribute significantly to the economy of Eastern Ontario. In their view, construction of the Gananoque Extension could, at best, provide only some short-term employment opportunities in the local communities. Furthermore, J.T. Ellerton and other intervenors noted that U.S. contractors could be awarded the contract to construct the pipeline. According to B. Hogan, the possibility of damage to the recreation and tourism industry might well offset any potential economic benefits. M. McReynolds and others noted that construction activity would take place at a time when accommodations would already be fully booked and, as such, there would be no net gain to the local economy as a result of the project. They added that on Howe and Wolfe Islands, few commercial services would be available for the construction workers and that there would therefore be limited, if any, benefits to those communities.

TransCanada stated that if the Gananoque Extension were built, tax revenues would increase by approximately 0.5 percent, 1.0 percent and 4.7 percent for the Townships of Pittsburgh, Howe Island and Wolfe Island, respectively. The tax revenues received by the three Townships from TransCanada would, in the view of many of the intervenors, be insignificant. G.E. Bisailon testified that, in the case of Pittsburgh Township, approximately 20 ha of land¹ and potentially hundreds of thousands of tax dollars would be lost as a result of the construction of the pipeline. According to G.E. Bisailon, the tax revenue to Pittsburgh Township generated from construction of the Gananoque Extension would be approximately \$26,400 per year but if the same 20 ha were used for housing, \$100,000 to \$125,000 in property taxes could be generated annually. They added that if part of the land were zoned for industrial use, the tax revenue generated would be even higher. Furthermore, G.E. Bisailon argued that any construction-related revenues from the project would only provide windfall benefits during the construction period and would not provide long-term benefits to the local economies.

¹ Corresponds to the 20 m right-of-way through Pittsburgh Township

In the view of several intervenors, the potential loss in tourist dollars and the strain on the local infrastructure and associated facilities would outweigh any benefits that could be realized as a result of the Gananoque Extension.

Views of the Board

The Board acknowledges that producers would derive substantial revenue from TransCanada's sale of natural gas to Niagara Mohawk and that construction of the Gananoque Extension would generate some positive economic spinoffs to Ontario, including employment during the construction phase. However, given the limited availability of services during the summer tourist season, the Board is not persuaded by TransCanada's argument that there would be significant local benefits during construction. The Board agrees with G.E. Bisailon and other intervenors who stated that local tax revenues generated as a result of the project would be relatively small. The Board believes that if the current trend of changing land use from agricultural to residential continues, the presence of a pipeline right-of-way could be a deterrent to future development. In the Board's view, the interference with residential development through the creation of the right-of-way for this project, could result in lower potential tax revenues. The Board also notes that there were no economic studies submitted to demonstrate that there would be a short-term positive impact on the local economy from construction of the Gananoque Extension.

6.2.2 Tourism and Recreation

TransCanada acknowledged that construction activities could create short-term inconvenience to residents and tourists and that there would be some interference with certain recreational activities such as sport fishing, boating and swimming. Furthermore, TransCanada took the position that there was no way to measure the possible impact of the proposed construction on tourism. However, it argued that it was inconceivable that the degree of inconvenience associated with the proposed project would have any lasting impact on tourism in the Kingston area.

TransCanada noted that work within the construction area, which comprises a small proportion of the total area around Howe and Wolfe Islands, would not result in any major disruption to sport fishing activities. TransCanada added that its undertakings to minimize in-water construction time and its intention to advertise project scheduling and location would limit the impact of construction on recreational boating and fishing activities. TransCanada anticipated that its undertakings to the OPCC would address any problems associated with construction impacts on sport fishing.

TransCanada stated that should it be established that there had been a permanent impact on tourism and recreation as a result of pipeline construction, it would consider funding an advertising campaign to attract tourists back to the area. Niagara Mohawk supported TransCanada's view that construction of the facilities would have a minimal impact on the local tourist industry. It further stated that, as construction would be completed during one season, tourists could be expected to return to the area in succeeding years.

Several intervenors argued that it was difficult to accept that there would not be any adverse impact on tourism and recreation, especially with regard to sport fishing, boating, swimming and other water-related activities. In their estimation, the region as a whole is viewed by many people as a

unique international park comprising perhaps the largest freshwater tourist playground in the world. The tourist season occurs primarily in a ninety-day period from the middle of June to the middle of September which coincides with the majority of the proposed construction activity. In the opinion of the Township of Howe Island, any water-related tourist activity within one-half mile of the construction site could be negatively affected.

K. Keyes submitted that the Kingston area has continued to show growth in tourism and that tourism is important not only for the Kingston economy but also for the economy of Eastern Ontario. Mr. Keyes stated that regionally, tourism is an \$815 million industry, creating approximately 55,000 jobs annually. Locally, it is a \$100 million industry, supporting approximately 6,000 jobs.

Several intervenors were of the view that TransCanada's willingness to fund an advertising campaign to attract tourists back to the area would do nothing to offset the negative impacts on small businesses, some of which might not survive a poor year.

Views of the Board

The Board believes that insufficient evidence was adduced to enable it to fully assess the short-term effects that construction of the Gananoque Extension would have on tourism and recreation in the Kingston and the Islands area. However, the Board is of the view that the evidence presented does not indicate that there would be long-term major effects on tourism and recreation as a result of the pipeline construction project.

6.2.3 Health and Public Safety

In the view of TransCanada and Niagara Mohawk, no expert evidence was adduced to prove that the pipeline would pose a health risk. TransCanada noted that its standard construction techniques and practices have been approved by the Board. TransCanada stated that there has never been a serious injury or death to a landowner residing along its pipeline network. Furthermore, it argued that no evidence had been introduced by the landowners to substantiate their claims that there would be a significant safety risk associated with the operation of the pipeline. TransCanada outlined a number of its routine safety-related procedures, such as weekly helicopter inspections of the pipeline route, annual ground inspections of the route and annual leak and corrosion surveys. In summary, TransCanada expressed the view that the pipeline would have no adverse impact on the health and safety of the residents.

Several intervenors, including the Township of Howe Island, disagreed with TransCanada's view that construction and operation of the proposed project would not pose a risk to health and public safety.

P.D. Beseau stated that pipelines should not be constructed in areas that are so isolated that rapid evacuation would not be possible. He noted that although TransCanada stated that there had been no serious injuries or loss of life to landowners, there have been serious injuries and death to other parties, such as contractors. One matter of particular concern to a number of intervenors was the risk of an underwater pipeline gas leak during winter operation of the ferry in the Bateau Channel. They indicated that the leaked gas could be ignited by propane burners used on the Howe Island ferry.

Joe McReynolds expressed the view that some people have a genuine fear of natural gas, and although some of that fear may be irrational, "fear is fear" and would affect individual perception. K.W.

Lawless stated that depending on an individual's proximity to a gas line, a great deal of mental anguish could arise with respect to possible explosions. D. Munroe stated that, for many intervenors, the existence of a gas pipeline would have an adverse psychological effect and that this was evidenced by the high degree of public opposition.

Views of the Board

The Board understands the concerns expressed by intervenors with respect to the issue of health and public safety. The Board, however, believes that the construction and operation of the proposed pipeline would pose no significant risk to health and public safety. Notwithstanding the possibility of an incident occurring, in the Board's view, the probability of such an incident is remote, given the standards set for and by the pipeline industry. Furthermore, the undertakings agreed to by TransCanada and the conditions that would accompany Board approval of any such project would provide adequate safeguards. The Board considers the risk associated with living in proximity to pipelines to be low and has not been convinced that its opinion in this regard should be different with respect to the Gananoque Extension.

6.2.4 Quality of Life

In TransCanada's view, the quality of life issues raised during the proceeding can be divided into both physical and psychological aspects. On the subject of the physical aspects of quality of life, TransCanada contended that the applied-for facilities would cause "no impact beyond the temporary inconvenience associated with construction." Other than minor restrictions on the use of the right-of-way, TransCanada believed that the residents would be able to enjoy their land, the water and the entire area as if the pipeline did not exist. TransCanada further stated that agricultural use of the right-of-way would remain unchanged. In summary, TransCanada did not envision any significant impact on the enjoyment of private property and, although some owners would be affected, TransCanada was of the view that payment for the use of the right-of-way would compensate for any inconvenience.

TransCanada submitted that the psychological component of quality of life is in general, more difficult to assess, but acknowledged that the construction period would cause some temporary psychological inconvenience. In TransCanada's view, this inconvenience should not constitute a just reason to deny certification of the applied-for facilities.

According to TransCanada, once the pipe is in the ground it is matter of "out of sight, out of mind", except for the occasional small sign to indicate its presence. TransCanada found it difficult to comprehend how pipe, once in the ground, could cause any significant psychological anguish. TransCanada further stated that there seemed to be an unreasonable fear of the potential danger associated with the operation of natural gas pipeline facilities.

TransCanada stated that the concerns of the intervenors were legitimately raised but that it felt that those concerns had been, or could be, adequately addressed. In TransCanada's view, no evidence was presented to substantiate the claims made by intervenors that their quality of life would be adversely affected.

Niagara Mohawk stated that TransCanada had agreed to minimize, to the extent possible, the public inconvenience that would be caused by construction of the Gananoque Extension. It believed that through the proper implementation of remedial measures, the long-term impacts would be eliminated, other than some visual effects caused by tree removal and maintenance of the right-of-way. In Niagara Mohawk's view, the numerous undertakings that TransCanada agreed to were proof of its concern and genuine commitment to maintain the quality of life enjoyed in the area.

Several intervenors, including I. Meagher, submitted that a 20 metres wide right-of-way through forested areas, including shorelines, would have a long-term visual impact on the natural beauty of the Thousand Islands and would provide a daily reminder of the changes that would have occurred. The reduction in the number of large trees and the loss of waterfrontage would be long-term. The presence of large warning signs and fenced-in meter station would be very visible. I. Meagher further emphasized that the loss of trees near the shoreline could hasten the onset of erosion.

Several intervenors disagreed with TransCanada's statement that restrictions on the use of the land within the right-of-way would be minor. In their view, depending upon the future plans for any piece of property, a pipeline right-of-way could be a serious impediment to development plans.

P. Chesney and other intervenors expressed concern about the potential for the generation of dust and noise throughout the construction period. They submitted that construction would occur during the busiest time for tourist, recreation and cottage use. J.T. Ellerton described the negative impact that dust generation would have on his apple trees, especially during the flowering and photosynthesis periods (i.e. May to September).

The Township of Howe Island took issue with TransCanada's argument that given appropriate mitigative measures during and after construction, the pipeline's presence would go largely unnoticed. As such, the Township submitted that the pipeline would not be "out of mind". In the Township's view, it would be obvious where the pipeline runs.

K.W. Lawless expressed a deep concern that his enjoyment of his property would be "irrevocably altered" and contended that he would always have to look at a clear-cut path through the bush and see a TransCanada sign, both of which would be a constant source of irritation. With respect to TransCanada's statement that "... the route will certainly have an affect on the extent of enjoyment of private property by some owners. But it will all be compensable by the payment for the right-ofway...", several intervenors adamantly stated that mere monetary payment could not induce them to part with a portion of their land to a pipeline right-of-way nor compensate them for their loss of enjoyment.

Views of the Board

The Board accepts TransCanada's position that the inconvenience to residents from the construction activity would be temporary. The Board believes that although the generation of construction-related dust and noise and the overall increased presence of heavy pipeline machinery and vehicular traffic could either directly or indirectly affect the general quality of life, such impacts would be minor.

The Board finds that it is very difficult to assess the psychological impacts, if any, that an activity such as construction and operation of a gas pipeline would have on affected

landowners. The Board notes that, unlike the residents of many other areas in Canada in which TransCanada and other pipelines have facilities, the landowners who would be affected by construction of the Gananogue Extension have little or no previous experience with gas pipeline construction and operations. The Board is of the opinion that some of the concerns raised by the local intervenors in this regard are not well-founded and that actual impacts on the quality of their lives could be significantly less than they anticipate.

6.2.5 Property Values

TransCanada stated that experience had shown it that pipelines have little impact on property values and that given compensation payments, some landowners actually consider the presence of a pipeline on their property to be a positive thing.

It stated that over 80 percent of the proposed route would traverse agricultural land and that as a result, there should be no significant diminution in land values caused by pipeline installation. TransCanada stated that in its dealings with approximately 7,000 landowners across its system, the matter of individual properties being devalued or of less than fair market value being paid due to the presence of an easement, had not arisen. It indicated that devaluation, if any, would occur with respect to only a small percentage of the land affected by the proposed route. In TransCanada's view, the installation of a pipeline might affect the subdividing of properties for future sale or perhaps interfere with potential development of waterfront properties. However TransCanada stated that in both instances, it would adequately compensate the affected parties.

In Niagara Mohawk's view, no evidence was adduced to substantiate the contention of area residents that their properties would be devalued as a result of the project.

According to G.E. Bisailon and others, TransCanada was incorrect in stating that there was no evidence presented to prove that property values would be negatively affected. In their view, the presence of an 20 metre wide swath of denuded land, industrial valves and fences, warning signs of danger and frequent helicopter overflights would be viewed negatively by prospective buyers. This presence would tend to lessen the value of homes, particularly if the selling period corresponded with the construction period. In support of that view, H.E. Hogan cited the Appraisal Institute of Canada,¹ which states that "an easement of ingress and egress in favour of parties other than the owner tends to lessen the property value." He further quoted that, "an easement, once granted, attaches to the land and binds subsequent owners. It therefore affects an individual's rights of property ownership."

R. Moizer submitted that even the possibility of a pipeline could affect property values. It was also her view that given the choice between two otherwise equivalent lots, a prospective purchaser would probably opt for the unencumbered lot.

Reference was made several times by TransCanada to a 1982 study which concluded that the impact of pipeline installation on agricultural land values in Alberta was negligible. J. Josiak and others contended that certain differences between the land involved in that study and the land involved in the

¹ The Appraisal Institute of Canada sets the standards for land appraisals in Canada. These standards are set out in the Real Estate Appraising in Canada Manual.

instant case made the study of dubious relevance. In describing the study, these intervenors pointed out that it grouped land into two categories by size, namely, 49-69 ha and over 69 ha. More importantly, the study excluded from analysis 10 percent of each grouping because of sales that had a very high per acre price and were located in close proximity to small urban centres. In J. Josiak's view, the high per acre price and the proximity to small urban areas were exactly the major parameters that indicated that the report's findings would not apply to the Kingston area. Many intervenors noted that in respect of physical features and the size of land holdings, there was little similarity between the area where that study took place and the area that was the subject of this application. The intervenors knew of no comparable land studies that had been done in the Kingston area.

H.E. Hogan and other intervenors stated that most land close to the St. Lawrence River was undergoing a change from agricultural to residential use and that a pipeline right-of-way would be a significant factor in lowering values of properties subject to this transition. Several intervenors indicated that they regarded land with a gas pipeline running through it as having a diminished value. S.B. Martin took great exception to TransCanada's statement that if need be, it would pay for such land at full market value. In her view and that of other intervenors, some people have extremely "strong feelings about their territory" and no amount of money could compensate or mitigate the impact of a project such as the Gananoque Extension.

Views of the Board

The Board is not convinced that TransCanada satisfactorily demonstrated that the value of small land holdings traversed by or in close proximity to the pipeline would not be adversely affected, especially in those areas proximate to the landfall sites and in areas of existing and/or proposed residential developments. The Board is of the view that, in some circumstances, a pipeline easement could affect property values. In general, the impact would be proportionally greater on residential or recreational land than on agricultural holdings, particularly on those lands valued for their aesthetic qualities or untouched by commercial or industrial development.

6.2.6 Community Infrastructures

TransCanada stated that by using the right-of-way to gain access to construction sites it would minimize, to the extent possible, the impact that pipeline construction would have on local roads. TransCanada also indicated that after construction it would restore all roads to a condition equal to or better than their pre-construction state. In TransCanada's view, the use of the local roads appeared only to be a concern on Howe Island and in the area adjacent to the Whitmount Estates.

TransCanada stated that to gain access to Howe and Wolfe Islands, it would utilize to some degree the existing ferry services and docking facilities. Furthermore, it stated that if the ferry services were to be used during construction-related operations, it would attempt to limit usage to non-peak hours and ensure that the residents of Howe and Wolfe Islands be given priority. With respect to Wolfe Island, TransCanada stated that it would consider using a winter dock and either a stand-by ferry or private barges to transport equipment and material, thereby limiting the movement of construction vehicles through the town area.

The Township of Howe Island submitted that certain roads on Howe Island that would likely be used by construction vehicles were in marginal condition. Although these roads could be considered

adequate for general use by residents, the Township doubted that they would withstand heavy construction traffic. Furthermore, damage during the construction period would inconvenience residents and limited Township resources would be strained in trying to keep the roads passable.

The Township of Howe Island and others expressed concern that because the ferry service was being utilized to its capacity, TransCanada would be unable to restrict use to off-peak hours or ensure preference of passage to residents. M. McReynolds noted that TransCanada's construction schedule would correspond to the busiest time of year for ferry use and that the additional stress on the ferry service caused by construction-related traffic would result in longer delays and likely result in increased breakdowns. I. Meagher stated that the communities on Howe and Wolfe Islands depend totally upon the ferry service for transportation to the mainland. She pointed out an apparent contradiction regarding the use of the ferry system. On the one hand, TransCanada stated that it was continuing negotiations with the proper authorities to obtain permission to use the ferry, while on the other hand it had agreed to a Board condition to provide a detailed plan indicating how it would avoid using the local ferry services.

With respect to TransCanada's statement that it would limit usage to off-peak hours, G. and I. Metcalfe pointed out that in order not to interfere with heavy traffic flows, TransCanada would be forced to limit its work day from 9:30 a.m. to 3:00 p.m. In their view, such limited work hours would not be feasible considering the time constraints that the tight construction window would impose.

Views of the Board

In the Board's view, TransCanada's commitment to minimize, to the extent possible, the impact on local roads during construction is appropriate. The Board notes TransCanada's commitment to restore all roads to equal or better condition following construction. Furthermore, with respect to Whitmount Estates, the Board notes that TransCanada agreed to a potential certificate condition that would require its contractor to use the right-of-way instead of the subdivision road system. The Board recognizes that there is some merit in the residents' concerns about the potential impact of pipeline construction on the use of the ferry system. The Board is of the view that TransCanada's use of the ferry service during its construction activities could result in disruptions to the service provided to local residents. However, TransCanada was aware of the concerns raised by the intervenors and offered a number of solutions. If those concerns could not be satisfactorily resolved, TransCanada would undertake to use temporary docking facilities, private tugs and barge carriers. The Board, therefore, is satisfied that TransCanada's undertakings would result in an acceptable alleviation of any disruption to ferry service.

6.2.7 Land Use

6.2.7.1 Residential Properties/Subdivisions

In conducting its initial overflights of the study area in search of a viable pipeline corridor, TransCanada stated that it made a conscious attempt to eliminate corridors that transacted developed areas. However, TransCanada also stated that it viewed as a more important consideration, the availability of suitable landfall locations for the crossings of the various channels of the St. Lawrence

River. TransCanada further acknowledged that in selecting its proposed corridor for the general route, it had not considered the future development plans of landowners.

An evaluation by TransCanada of the proposed Pittsburgh Township landfall (located entirely on the property of K.W. Lawless) revealed that it was "ideally located for crossing the Channel" (i.e., the Bateau Channel). In addition, TransCanada stated that the Howe Island landfall on the Bateau Channel appeared to be suitable because a large portion of the immediate surrounding area was not yet developed.

TransCanada stated that it believed it could minimize construction impacts through the proposed Pittsburgh Township landfall site although it argued that any discussion of the specific mitigative measures should be deferred until the detailed routing stage. TransCanada was confident that it could protect all saleable lots and indicated that it would consider as an option, directionally drilling beneath the landfall property to protect the visual beauty of the shoreline. TransCanada would also consider purchasing that property and other landfall properties at fair market value.

The proposed route passes to the west of the Whitmount Estates subdivision in Pittsburgh Township and intersects the extreme east end of the Spithead Estates subdivision on Howe Island (a subdivision that TransCanada was unaware of during its preliminary route selection investigation). TransCanada's evaluation of the potential for disruption to those subdivisions led it to anticipate no significant impacts. In the case of Spithead Estates, TransCanada noted that the width of the proposed corridor permitted sufficient flexibility to limit the extent of disruption to J.T. Ellerton's property at the proposed Howe Island north shore landfall. With respect to Whitmount Estates, pipeline corridor passes some distance to the west and TransCanada argued that the residents' concerns with respect to their water wells, cracks in their foundations (from trench blasting) and heavy traffic through their streets would all be amenable to mitigation.

Regarding potential property development on Howe and Wolfe Islands, TransCanada expressed the view that at the detailed routing stage, it could address the concerns of the individual landowners by agreeing to certain undertakings and conditions that would minimize impacts on the property owners' future plans for those lands.

Several intervenors stated that TransCanada should not have considered a route that would cut through residential properties/subdivisions. The use of riverside properties as staging areas and landing sites, in their view, would have a major permanent impact on the use and value of such properties to their owners. According to S.B. Martin, the unique quality of the proposed Pittsburgh Township landfall should have precluded any thought of routing the pipeline through it.

A number of intervenors raised the point that in selecting the Pittsburgh Township and Howe Island north shore landfall sites, TransCanada had shown complete disregard for the private nature of those lands and their respective owners' plans for their development.

Views of the Board

While the Board understands that TransCanada cannot, in every instance, avoid residential areas/subdivisions when identifying a suitable route, the Board notes with concern that TransCanada, during route selection, seemed to be unaware that its proposed route would intersect the Spithead Estates subdivision. Therefore, the

existence of this subdivision was not properly assessed during the route selection process.

With respect to the landfall properties along the proposed route, the Board is concerned that a pipeline right-of-way could significantly detract from the beauty of these shorelines, the value of which is derived in part from their aesthetic appearance and their particular location. Other concerns on the landfall sites associated with the proposed route may be found in the views of the Board in section 6.1.5.

In view of the restricted width of the general route, particularly the proposed crossing of Howe and Wolfe Islands, the Board does not accept that TransCanada could adequately address the concerns of individual landowners by deferring discussion and resolution of those land use concerns to the detailed routing stage. The Board is of the view that TransCanada should have made a greater effort to conduct a more thorough canvass of the individual property owners to elicit their plans with respect to future development of their properties.

6.2.7.2 Future Looping

TransCanada indicated that in all likelihood it would never have to construct a second line adjacent to the proposed Gananoque Extension. The proposed pipeline was oversized for sound engineering reasons and cost considerations and could therefore accommodate significant future growth in sales volumes. The maximum capacity of the proposed line would be several times greater than the volumes currently licenced for export by WGML/TransCanada to Niagara Mohawk.

A number of intervenors questioned whether TransCanada would come before the Board at a future date to request approval for a second line. Their concerns focussed on the possibility for reintroducing impacts similar to those identified during the current proceedings.

Views of the Board

The Board is of the view that given the design capacity and ultimate capacity potential of the Gananoque Extension, future looping to accommodate market growth would be extremely unlikely.

6.2.8 Water Wells

Beak prepared an assessment of the potential effects of blasting during construction of the Gananoque Extension on well water quality and flow. Based on Beak's findings, TransCanada contended that the chances of construction-related damage to wells and of well water quality diminution were extremely small. TransCanada reasoned that since extensive blasting would not be required and that blast impacts would not radiate more than five metres from the blast site, any impact on water wells would be minimal. TransCanada intended to retain the services of a registered blasting consultant for the duration of the construction project to provide advice on and monitor all activities associated with blasting operations. TransCanada, in an undertaking to the OPCC, agreed to monitor a representative number of water wells within 100 metres of the centre-line of the proposed route. It also undertook to protect all intakes and water supplies and to implement mitigative measures, such as "trucking-in" water, to restore any temporary or permanent disruption to water supplies.

With respect to shore wells, TransCanada submitted that construction should only cause short-term, minor turbidity/sedimentation problems in some wells. TransCanada would correct any such problems by replacing the water supply throughout the period of disruption. TransCanada concluded that once the pipeline had been installed, its maintenance and operation would have no effect on wells or water quality.

Several intervenors were concerned about the potential for damage to their water wells throughout the construction phase of the project. Trench blasting, in their view, could have a permanent effect on wells. P. Chesney and other intervenors testified that wells on Wolfe Island had a low success rate and that very little potable water was available on the Island.

With respect to the Beak assessment of well water quality and flow, I. Meagher and others were concerned that the original assessment had not included a number of wells located in Whitmount Estates. I. Meagher also expressed the concern that Beak had apparently not taken into account the considerable number of shore wells or properties supplied by direct river sources in the vicinity of the proposed route.

On the matter of replacement of water supplies, the Township of Howe Island argued that TransCanada had neglected to indicate details of who would decide when it was necessary to replace water. Other intervenors simply questioned the overall usefulness of a study that had not identified and listed many wells that existed within the study area.

Views of the Board

With regard to blasting and water wells, the Board is of the view that the potential exists for at least temporary minor disturbances to the quantity/quality of water supplies. However, the Board is of the opinion that inconclusive evidence was presented to support the claim that permanent damage would likely occur to some wells.

TransCanada's standard mitigative measures, including strict adherence to certain blasting requirements, have in general prevented any serious or lasting damage to water wells on previous TransCanada projects approved by the Board. The Board notes that TransCanada's undertaking to the OPCC would require TransCanada to monitor a representative number of water wells within 100 metres of the centre-line of the proposed pipeline for both quality and quantity. The Board further notes that TransCanada undertook to protect intakes and water supplies.

However, notwithstanding TransCanada's view that only short-term, minor impacts to water supplies could occur, the Board is left with some concern regarding TransCanada's statement that it would, if necessary, provide alternate sources of water on a continuing basis should existing supplies be permanently disrupted. Although the Board has not been convinced that permanent damage to water wells would result from construction of the applied-for facilities, the Board does not consider the "trucking-in" of potable water in perpetuity to be a practical long-term solution should such damage nonetheless occur.

6.3 Ontario Pipeline Coordination Committee

TransCanada indicated that the OPCC had been involved in an ongoing process of consultation and negotiation with TransCanada in order to identify and resolve a number of issues falling within provincial jurisdiction. As a result of that process, the OPCC presented TransCanada with 16 undertakings (Appendix IV) that were to address Ontario's concerns. These included a number of commitments relating to specific timing, such as windows for in-water construction, monitoring water wells, and notification of provincial authorities. TransCanada further submitted that the undertakings to the OPCC would ensure implementation of any necessary mitigative measures and that supervision by MOE and MNR would ensure that the environment was protected.

Several intervenors expressed the view that the undertakings made to the OPCC did not offer any guarantee that the environment would be adequately protected. Furthermore, the KFN suggested that mitigation would not be possible in certain locations along the route.

Views of the Board

The Board is of the view that the undertakings made to the OPCC would, if properly carried out, provide a high degree of environmental protection in the areas that they address. It is to be noted that the Board would carry out its own environmental inspection of construction to ensure that TransCanada's OPCC undertakings and any other terms and conditions contained in a certificate would be strictly met. However, the Board is of the view that certain components of the proposed route do not easily lend themselves to mitigation. For example, the OPCC undertakings would not alleviate the visual impact due to the removal of trees, particularly at landfall sites. Furthermore, the Board notes that the OPCC undertakings are not directed at mitigating many of the socio-economic and land use impacts associated with the proposed route.

Chapter 7

Engineering Matters

7.1 Appropriateness of the Design

7.1.1 Facilities

TransCanada's proposed facilities consist of a 406 mm O.D. pipeline extending 25.2 km from Compressor Station 142 on its mainline system to a point on the Canada/U.S. border in the St. Lawrence River south of the eastern end of Wolfe Island. TransCanada's proposal also includes the installation of a meter station at the eastern end of Wolfe Island.

TransCanada indicated that the proposed pipe diameter was needed to:

- (i) transport the proposed volumes and accommodate potential future growth;
- (ii) maintain operating flexibility and avoid facilities additions on the Montreal Line and North Bay Shortcut;
- (iii) meet possible increases in delivery pressure; and
- (iv) match the pipe size of the downstream pipeline.

TransCanada indicated that in 1991-92, under winter peak day conditions with a loss of unit at Compressor Station 1217, the inlet pressure to the Gananoque Extension would be 5457 kPa (791.5 psig) and the line would have a capacity of $4.97 \times 10^6 \text{ m}^3/\text{d}$ (175.4 MMcfd). TransCanada also indicated that given the contract delivery pressure of 4000 kPa (580.2 psig), if the inlet pressure were set at the maximum allowable operating pressure of 6450 kPa (935.5 psig), the capacity would increase to $7.98 \times 10^6 \text{ m}^3/\text{d}$ (281.7 MMcfd). TransCanada stated that under the same delivery conditions, a 273.1 mm O.D. pipeline would be sufficient to move the design volume of $1.445 \times 10^3 \text{ m}^3/\text{d}$ (51 MMcfd). However, in order to guarantee the 6450 kPa (935.5 psig) inlet pressure without restricting operation or reducing efficiency on the Montreal Line, a 0.9 MW (1206.4 hp) unit would have to be installed at Compressor Station 142 at a cost of \$4.6 million.

Niagara Mohawk supported TransCanada's proposed pipeline design and indicated that it was justifiable given Niagara Mohawk's estimates of future market growth and bearing in mind the fears of the local residents that TransCanada would be required to loop the Gananoque Extension to meet future export demand. Niagara Mohawk added that the modest increase in cost of using larger diameter pipe is more than offset by the cost savings associated with having to duplicate the proceedings and with TransCanada's construction and restoration measures if additional capacity were required in the future. Niagara Mohawk stated that the design was consistent with its intended long-term use of the Gananoque and TransYork Extensions as a means of transporting up to three times the volume of gas licensed for export on that line. Niagara Mohawk also added that installation of the 406 mm pipe, would result in a take-away capability of $4.249 \times 10^3 \text{ m}^3/\text{d}$ (150 MMcfd) in its northern region.

IPAC stated that it appreciated the environmental and cost advantages of utilizing a single construction program for the proposed St. Lawrence River crossing but that TransCanada had not properly demonstrated the existence of future market demand to justify the excess capacity. In addition, IPAC stated that the mere fact that the applied-for facilities had been designed to accommodate potential volumes in excess of Niagara Mohawk's initial service request was poor justification for overbuilding the facilities. IPAC also noted that the proposed downstream facilities would be unable to accept delivery of the Gananoque Extension's unused capacity.

IPAC took the position that it could not support a facilities expansion in which the facilities were designed to accommodate five times more gas than the demonstrated requirements.

G.P. Arsenault noted that a 323.9 mm O.D. pipeline would be marginally satisfactory for the licensed gas export volume and that a 355.6 mm O.D. pipeline would have had more than adequate capacity. He stated that the TransCanada system did not have the capacity upstream of the Gananoque Extension to deliver firm service gas to Niagara Mohawk in excess of the contracted amount. He further stated that Niagara Mohawk had not yet planned beyond the $1\,445\,10^3\text{m}^3/\text{d}$ stage (51 MMcfd) and that future marketing opportunities might never materialize.

Views of the Board

Although the capacity of the 355.6 mm O.D. pipe proposed by G.P. Arsenault may correspond more closely to the potential for growth in Niagara Mohawk's market, this size is not generally considered standard within the pipeline industry. Therefore, if TransCanada were to use a 355.6 mm O.D. pipe, it would have to purchase special fittings which could negate some of the construction cost advantages of a smaller line. With respect to the concern raised by IPAC and other intervenors, the Board is of the opinion that due to the difficulty of the St. Lawrence River crossing and the fact that the additional construction costs of providing this additional capacity are not excessive, the design of 406 mm O.D. is prudent for this particular project.

7.1.2 Safety

In its initial application, TransCanada indicated that the pipeline would be built using both Class 1 and Class 3 pipe. During the course of the hearing, TransCanada changed its design so that the applied-for facilities would be constructed exclusively with Class 3 pipe to avoid having to interrupt service if it were found necessary to upgrade the facilities due to population growth along the line. TransCanada also pointed out that it had never had a failure of Class 3 pipe on its system. TransCanada stated that the pipeline would be constructed to meet the requirements of the *Onshore Pipeline Regulations* ("the Regulations") and would therefore meet all appropriate CSA standards. TransCanada indicated that although they usually install mainline valves on both sides of large water crossings, they were planning only two or three valves instead of the five they would normally install. At the time of the hearing, TransCanada stated that they would install one valve in both Pittsburgh Township and Wolfe Island and possibly a third on Howe Island.

K.W. Lawless noted that standards represent minimum requirements and that it is unusual for a company or manufacturer to exceed those standards to any great degree. Although TransCanada had not finalized its valve locations, P. Chesney questioned TransCanada regarding the adequacy of the spacing of shut-off valves.

Views of the Board

The Board is of the view that safety is adequately addressed when pipelines are designed, built, and operated in accordance with the Regulations. The Board notes that TransCanada decided to construct the pipeline using Class 3 pipe throughout which has a greater wall thickness than the Class 1 pipe required by the Regulations for much of the Gananoque Extension's proposed route. If it were to certificate the Gananoque Extension, the Board would likely require TransCanada, prior to commencement of construction, to justify the use of the more expensive Class 3 pipe throughout. With respect to mainline valve spacing, the Board notes that there are no minimum valve spacings prescribed in the Regulations for Class 1 locations.

7.2 Alternative River Crossing Techniques

TransCanada's proposed design for crossing the Bateau and Canadian Middle Channels would require installation of the pipeline in a trench through the shore zone to a point where the water depth is five metres. From this point on, the pipe would lay on the river bottom until it intersected the five metre depth on the opposite shore, at which point the pipe would be buried again. TransCanada stated that the threat of anchor damage to the pipeline was remote since commercial vessels with anchors large enough to damage the pipeline did not regularly travel these channels. At the time of the hearing, TransCanada had not obtained leave from the Minister of Transport, pursuant to section 108 of the Act, to build its pipeline across these channels.

TransCanada stated that vessels using the Main Navigation Channel are fairly large and carry heavy anchors that could damage the pipeline should they be dropped directly on the pipeline (whether buried or not). However, should the river bottom consist of rock or glacial till, the anchors would not penetrate or dig in when dragged along the bottom. TransCanada's original design for this crossing involved laying the pipeline on the bottom and constructing a three metre berm over it. However, at the request of the Seaway Authority, this design was changed to a design that required the burial of the pipeline in a three metre trench.

TransCanada suggested in its application that it was considering the utilization of directional drilling to cross the Bateau Channel. As a result of a request from the Board, TransCanada submitted a number of studies that analyzed the feasibility of using various construction techniques at several possible river crossing locations. These studies indicated that directional drilling was technically feasible at a number of sites. The studies also suggested that the technique could be used to cross an entire channel or simply to clear landfall and near shore areas.

TransCanada was concerned with the presence of rock along the route and the possibility that glacial till layers may be present. In TransCanada's view, directional drilling through glacial till is not advisable, as the drill stem could hit a boulder and veer off course. At the time of application, very little information was available with respect to the soil conditions present in the river bottom near the proposed crossings. TransCanada would not commit itself to using directional drilling until detailed geotechnical investigations were completed and soil conditions known. TransCanada also suggested that directional drilling should only be used if there are good environmental reasons for its use.

TransCanada was also concerned that by veering off course, the drill could emerge in some unexpected location. As a result, TransCanada submitted that adequate workroom must be available

on both landfalls for the completion of the crossing using conventional excavation techniques as a necessary fallback alternative.

TransCanada's position in respect of this issue was supported by Niagara Mohawk which added that it was exploring the feasibility of directional drilling at the U.S. landfall of the St. Lawrence River. Niagara Mohawk submitted that the viability of the proposed route should not depend upon the feasibility of directionally drilling the water crossings and that the environmental impact of constructing the pipeline would be minimal and temporary in nature.

A number of intervenors favoured the use of directional drilling as a method of resolving their concerns with respect to the aesthetic, visual, human and environmental impacts of the pipeline on landfall sites and near shore areas. K.W. Lawless indicated that he would have less of an objection to the pipeline if the trees along his shoreline were to remain and he would not have a sign obstructing his view. P. Chesney doubted whether TransCanada was seriously considering directional drilling because of the associated costs and his perception of TransCanada's lack of environmental concern. J.T. Ellerton criticized the absence of detailed geotechnical studies to determine if directional drilling were feasible. He also wondered how a routing decision could be made when important geotechnical and environmental studies would only be undertaken after certification. J.T. Ellerton also expressed concern with respect to TransCanada's ability to repair the pipeline after installation.

Views of the Board

The Board is concerned that prior to the conclusion of the hearing, TransCanada had yet to confirm the acceptability of the proposed crossing of the Bateau Channel and the Canadian Middle Channel with the Minister of Transport. The Board is of the view that the process of obtaining regulatory approvals that may result in substantial design changes should be sufficiently advanced as to allow the Board to determine the reasonableness of cost estimates.

With respect to directional drilling, the Board notes TransCanada's concerns that, if soil consists of glacial till, there is a high probability of the drill stem hitting a boulder and veering off course. The Board also notes that TransCanada had very little evidence supporting its belief that bouldery till could be present at the crossings. While the Board appreciates the problems that can be associated with directional drilling, it has not been persuaded that these problems would be encountered or insurmountable. The Board is of the opinion that while directional drilling may present an additional level of construction risk, it must be seriously considered in situations where the visual impacts of a right of way at a landfall are significant.

7.3 Fire Fighting

A number of intervenors expressed concern respecting the ability of the volunteer fire departments and ambulance services on the islands to respond adequately to a gas fire or explosion. The Township of Howe Island's position was that in order to be prepared for such events, it would require a refurbished fire vehicle, 15 sets of state-of-the-art personal protective clothing and six new self-contained breathing apparatus with spare cylinders. The Township was apprehensive regarding the ability of emergency response vehicles from Pittsburgh Township and Kingston to assist it due to access difficulties associated with the ferry services.

TransCanada's position is that a huge pipeline fire requiring more firefighting ability than is currently present on the islands may be easy to imagine but that it almost certainly would not occur. An explosion would result in an automatic valve shut down and a near immediate burning off of escaped gas without further complications. TransCanada declined the Township's request for funding to purchase new equipment but offered to provide training in the containment of natural gas fires.

Views of the Board

The Board is of the view that, if the Gananoque Extension were built, the chances of a fire fueled by a major break or leak in the pipeline are extremely low. The Board bases this view on the fact that very few incidents of this type have ever occurred on Board-regulated pipelines and the fact that pipeline steels used today are much more resistant to fracture than those installed years ago.

The cost of equipping and training the Howe Island volunteer fire department to fight a major natural gas fire would be considerable. Given the extremely low risk of a major gas fire occurring, the Board is of the opinion that if it were to certificate the Gananoque Extension, it would be unreasonable to make the applied-for certificate subject to the condition that TransCanada equip and train the local fire departments to fight such a fire. In addition, in the unlikely event that a major line break and gas fire did occur, closure of the valves on both sides of the break would be the most efficient way of extinguishing the fire. These valves would close automatically in the event of a major break. The Board acknowledges that before any pipeline fire would be extinguished, it could spread to surrounding brush or homes. However, the Board notes that the fire department on Howe Island is equipped to deal with such situations.

7.4 Cost Estimates

The total capital cost estimates for all the route alternatives studied by TransCanada are contained in Table 7-1, with the exception of those for Alternative 2 which was ascribed a direct pipeline cost of \$31.6 million. TransCanada's cost estimates were based on purchases of materials in recent years and the installation costs of facilities recently completed. For the river crossings, costs were based on consultants' studies of the proposed routes. In arriving at its estimated costs for the river crossings for Alternatives 3A and 3B, TransCanada assumed that the costs of those crossings would be similar to the original cost estimate for the Alternative 3 crossing. This assumption was based upon factors of length, burial requirements and costs associated with each Canadian landfall.

TABLE 7-1

**Total Capital Costs
(\$000)**

Route Selection	Proposed⁶	Alt. 1A⁵	Alt. 1B⁵	Alt. 3⁶	Alt. 3A⁶	Alt. 3B⁶
From Mainline to Water	4,850			4,970	4,100	3,300
Water Crossing						
#1 - Bateau Channel	4,820			-	-	-
#2 - Middle Channel	5,760			-	-	-
#3 - Main Channel	1,480 ¹			11,600 ²	9,265 ³	9,265 ³
Howe Island	1,065			-	-	-
Wolfe Island	7,630			-	-	-
Metering	<u>1,320</u>	<u>1,320</u>	<u>1,320</u>	<u>1,320</u>	<u>1,320</u>	<u>1,320</u>
Direct Cost	26,925	23,223	28,227	17,890	14,685	13,885
Contingency	<u>1,346</u>	<u>1,161</u>	<u>1,411</u>	<u>894</u>	<u>734</u>	<u>694</u>
Sub-Total	28,271	24,384	29,638	18,784	15,419	14,579
Overhead	<u>85</u>	<u>73</u>	<u>89</u>	<u>56</u>	<u>46</u>	<u>44</u>
Sub-Total	28,356	24,457	29,727	18,840	15,465	14,623
AFUDC	<u>1,276</u>	<u>1,101</u>	<u>1,338</u>	<u>848</u>	<u>696</u>	<u>658</u>
Total Cdn. Capital Costs	29,632	25,558	31,065	19,688	16,161	15,281
Water Crossing - U.S. Main Channel	8,380			11,600 ²	9,250 ³	9,250 ³
U.S. Mainland Costs	<u>25,120⁴</u>			<u>38,750⁴</u>	<u>47,250⁴</u>	<u>47,250⁴</u>
Total U.S. Costs	33,500			50,350	56,500	56,500

TOTAL COSTS:	63,132	70,038	72,661	71,781
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NOTES

- All figures quoted are in 000's of Canadian dollars.
 - Total direct and capital costs for proposed route contained in Review Application.
 - Costs of river crossings for various alternatives using various a construction techniques detailed in Board Information Request Nos. 8, 32 and 43.
 - Costs for Bateau, Middle and Main Navigation Channel crossings on the proposed route taken from the Fairn reports and stated in 1990 dollars.
1. Length in Canadian water assumed to be 0.3 km for estimating purposes.
 2. Estimated cost of crossing increased to reflect 10-foot burial requirement of the Seaway Authority (based on cost differences detailed in Fairn report for Main Navigation Channel crossing of the proposed route.)
 3. Estimated cost of crossing assumed to be the same as the original Fairn estimate for crossing #4 (Alternative 3 Main Navigation Channel) due to extra length, burial requirements and costs associated with Canadian landfall. Also assume the border is in the middle of the channel.
 4. U.S. costs based on latest Niagara Mohawk cost estimates.
 5. Costs obtained from TransCanada's Response to Board Information Request #43.
 6. Costs obtained from TransCanada Exhibit B-94.

Some intervenors challenged the reasonableness of TransCanada's cost estimates with respect to the land construction costs of Alternatives 3, 3A and 3B and the river crossing costs of Alternatives 3A and 3B. C.G. Jackson and S.B. Martin were generally of the opinion that the land construction cost savings attributed by TransCanada to the increased length of the proposed route were not reasonable and that the difference in construction costs per km on land between that route and Alternative routes 3, 3A and 3B were exaggerated. R.G. Deeley and S.B. Martin did not accept TransCanada's assumption that the cost of the river crossings for Alternative routes 3A and 3B would be similar to the costs associated with the estimate for the original Alternative 3 crossing provided by C.B. Fairn & Associates ("Fairn"), TransCanada's consultant for the river crossing designs. S.B. Martin was of the opinion that a more reasonable approach would be to use TransCanada's estimate of the cost of crossing the Main Navigation Channel as a basis for estimating costs for Alternatives 3A and 3B. R.G. Deeley was of the opinion that a detailed comparison of crossing 3A with the Canadian Middle Channel and the Main Navigation Channel crossings on the proposed route indicated that in many respects the 3A crossing had fewer difficulties associated with it. C.G. Jackson thought that the cost estimate of the proposed Main Navigational Channel should be increased to make the estimates more fair and equitable.

Views of the Board

From a capital cost perspective, the Board is concerned that TransCanada did not ensure that the design of the Middle Channel crossing was acceptable to the Minister of Transport prior to the end of the hearing. As stated previously, the Board is of the opinion that any concerns of other regulators that may result in substantial design changes or cost increases should be identified prior to the commencement of a certificate hearing.

The capital cost estimates submitted by TransCanada are reasonable given the detail of design performed. However, the extent of design undertaken by TransCanada with respect to the routes does not permit conclusive findings in support of the position that any particular route is superior to the alternatives from a cost perspective.

Chapter 8

Economic Feasibility

Paragraph 52(c) of the Act states that, in considering an application for a certificate, the Board may have regard to the economic feasibility of the pipeline.

No party, other than Niagara Mohawk, specifically submitted argument on the economic feasibility of the applied-for facilities.

Niagara Mohawk noted that in Volume I of the Board's GH-5-89 Reasons for Decision (Tolling and Economic Feasibility), the Board stated that a finding on the economic feasibility of the facilities applied for in that application was most appropriately made through a determination of the likelihood of the applied-for facilities being used at a reasonable level over their economic life and a determination of the likelihood of the demand charges being paid. The Board also set out what it believed to be the criteria to which it should have regard in order to make this determination. Niagara Mohawk provided argument on each of these criteria as they applied, in its view, to the current application.

(1) Evidence on the Availability of Long-Term Gas Supplies

Niagara Mohawk noted that, in assessing the application by WGML/TransCanada for an export licence following the GH-1-89 hearing, the Board concluded that adequate gas supply will be available to support the export licence over the term of the Gas Purchase Contract. Niagara Mohawk argued that, given the reserve base in the Western Sedimentary Basin from which the gas would be drawn, there should also be adequate supply available to support any increase in throughout over the Gananoque Extension beyond the levels included in the initial export licence.

(2) Evidence on the Long-Term Outlook for Gas Demand in the Market to be Served

As summarized in Section 3.1 of these Reasons for Decision, Niagara Mohawk argued that the evidence indicates that there is a firm, long-term demand for gas in its market distribution area and a strong potential for growth in this demand.

(3) Evidence on the Potential Competition to Gas Supplies Delivered via TransCanada's System from (i) Competing Supplies of Natural Gas; (ii) Competing Energy Sources; and (iii) Competing Gas Transportation Systems.

Niagara Mohawk argued that the terms of the Gas Purchase Contract between itself and TransCanada are structured to ensure that the gas to be delivered under this Contract will be competitively priced and will be taken at a high load factor. It also argued that there is no evidence that competition from other energy sources will have a detrimental impact on the volumes proposed to be purchased by Niagara Mohawk from TransCanada. Finally, it argued that the evidence indicates that no alternative transportation path would be viable from either an engineering, economic or environmental perspective.

(4) Evidence on the Individual Gas Contracts Underpinning the Facilities Application

Niagara Mohawk argued that, in its GH-1-90 Reasons for Decision on WGML/TransCanada's export licence application, the Board found all aspects of the export licence to be satisfactory, including assurances that the associated demand charges on TransCanada would be paid.

(5) The Risks Associated with New Gas Sales

Niagara Mohawk submitted that there are no risks associated with the Gas Purchase Contract that underpins the facilities application. It argued that all necessary regulatory approvals are pending or already in place and that the gas is destined for a firm gas market.

(6) The Likelihood of a Toll Increase Caused by the Expansion Resulting in Reduced Demand for Firm Service on a System

Niagara Mohawk noted that the Gananoque extension is a relatively small project when compared to the total TransCanada system and that, following the addition of the Gananoque Extension to TransCanada's rate base, the eastern zone toll will remain unchanged.

In conclusion, Niagara Mohawk argued that each of the Board's criteria with respect to economic feasibility had been satisfied and that the evidence therefore unequivocally supported a finding that the Gananoque Extension is economically feasible.

As stated above, no parties other than Niagara Mohawk submitted arguments on the economic feasibility of the Gananoque Extension, *per se*. However, as discussed in Chapters 2, 3 and 5, parties did submit their views on the need for the applied-for facilities. As summarized in those Chapters, TransCanada argued that there is sufficient gas supply to support the project, that there is a demonstrated long-term market for the gas and that there are no preferable alternatives to the proposed route.

In contrast, Union noted that the gas to be purchased by Niagara Mohawk would only displace existing supplies and that Niagara Mohawk could obtain additional supplies from the southern end of its system. Hence, in Union's view, the applied-for facilities could be considered to be "optional" facilities. IPAC noted that the pipeline would be significantly over-sized relative to the initial export volumes and that, consequently, the applied-for facilities would not likely be fully utilized. IPAC also argued that in light of the fact that Niagara Mohawk could purchase gas from other supply sources, there was a possibility that the Gas Purchase Contract would operate at a low load factor, thereby resulting in the under-use of the facilities.

Finally, many local intervenors who were opposed to the project argued that there is no need for the applied-for facilities because Niagara Mohawk has access to alternative gas supplies and alternative transportation routes are available.

Views of the Board

The Board is of the view that a determination of economic feasibility can properly consist of an assessment of whether or not applied-for pipeline facilities can be expected to be used at a reasonably high level throughout their economic life and an

assessment of whether the associated cost of service is likely to be recovered. In making such a determination, the Board continues to be of the view that it should have regard to any factors that may affect the potential utilization of the subject facilities and the likelihood of the cost of service being recovered, including those factors cited in the GH-5-89 Reasons for Decision and referred to by Niagara Mohawk in its final argument.

As stated in Chapter 2, the Board is satisfied that there will be sufficient gas supply available to keep the pipeline utilized at a reasonably high level throughout its economic life.

The Board notes that the contracted capacity of the proposed line accounts for less than one-third of the design capacity. However, as stated in Chapter 7, the Board notes that the incremental cost of providing the additional capacity is very small and that it would be prudent to provide for some initial excess capacity in the design of the facilities. Therefore, in making a finding on economic feasibility in the context of this application, the Board does not believe that it is necessary to determine that the entire design capacity will be used at a high level. Rather, the Board believes that the more relevant criterion is whether the cost of service can reasonably be expected to be recovered.

As stated in Chapter 3, the Board is satisfied that gas would be taken at a high load factor under the Gas Purchase Contract between Niagara Mohawk and TransCanada. The Board is also satisfied that the FS Contract between WGML and TransCanada and the Gas Purchase Contract between Niagara Mohawk and TransCanada provide adequate assurances that the demand charges associated with the pipeline capacity dedicated to this export sale would be paid over the fifteen year life of these Contracts. Thus, the Board is satisfied that the cost of service would be recovered, at least for the first fifteen years of the useful life of the facilities.

The Board notes, however, that the economic viability of the applied-for facilities is dependent upon the performance of the Gas Purchase Contract. As discussed in Chapter 3, the Board was not persuaded that any potential for market growth in Niagara Mohawk's distribution area has been effectively demonstrated. Thus, although the Board is satisfied that contracted-for gas will be taken at a high load factor, the Board is of the view that the risk of underutilization associated with construction of the proposed facilities is greater than the risk of building facilities that are underpinned by several purchase contracts and that would provide access to several market areas.

The Board is cognizant of the arguments of some intervenors that alternative transportation routes to the proposed facilities exist and that the applied-for facilities are therefore not needed. However, in the context of a finding on economic feasibility, the Board considers that the existence of alternative routes is only relevant to the extent that they may affect the likely utilization of and payment for the applied-for facilities. As stated above, the Board is satisfied that the Gas Purchase Contract that underpins the applied-for facilities will operate at a high load factor. At the same time, the Board is of the view that the existence of alternative delivery routes

to Niagara Mohawk does lessen the probability that the uncontracted capacity would actually be used.

Chapter 9

Disposition

Section 52 of the Act provides that the Board may, subject to the approval of the Governor in Council, issue a certificate in respect of a pipeline if the Board is satisfied that the pipeline is and will be required by the present and future public convenience and necessity. Section 52 further provides that in considering an application for a certificate, the Board shall have regard to all considerations that appear to it to be relevant. In considering TransCanada's application, the Board took into account all such considerations, namely the

- availability of gas to the pipeline,
- existence of markets,
- economic feasibility of the pipeline,
- acceptability of the proposed pipeline route; and
- public interests that, in the Board's opinion, may be affected by the granting or the denying of the application.

The Board is satisfied that adequate gas supply exists to support the long-term use of the applied-for facilities. Furthermore, the Board is satisfied that a viable long-term market exists for WGML/TransCanada's licensed export volumes of $1\,445\,10^3\text{m}^3/\text{d}$ (51 MMcfd). Although the Board is not convinced based upon the evidence adduced in this proceeding, that the market will grow sufficiently to justify the use of a 406 mm O.D. pipe, the Board's concerns in this regard are overridden by the fact that from an engineering and environmental perspective, use of the 406 mm O.D. pipe is justified. The Board is also satisfied that the applied-for facilities would be economically feasible. TransCanada has not, however, convinced the Board that the proposed route of the applied for Gananoque Extension is acceptable.

In considering the acceptability of the proposed route, the Board took into account TransCanada's route selection process, the potential impacts of the proposed route on the environment and on individuals, and the compatibility of the proposed route with current and proposed land uses along and adjacent to the required right-of-way. Although the Board is satisfied that TransCanada could adequately mitigate most of the potentially adverse environmental effects associated with the proposed route and that the pipeline would not pose any unacceptable safety risk, TransCanada's evidence in respect of several environmental and socio-economic matters was incomplete and therefore inconclusive. Furthermore, the Board is not convinced that in selecting its proposed route, TransCanada applied its route selection criteria in a sufficiently rigorous manner or that it adequately assessed potential alternative routes. TransCanada should have exerted greater effort in seeking a suitable river crossing that involves one Canadian landfall as opposed to five. In addition, the Board has concluded that establishment and maintenance of the right-of-way associated with the proposed route would result in a meaningful reduction in the enjoyment that many property owners along the route would derive from their land. Lastly, the Board finds that the use of land as a pipeline right-of-way is incompatible with certain current and intended land uses along the proposed route.

In arriving at its decision, the Board also had regard to the public interests that in its opinion may be affected by granting or by refusing of TransCanada's application. Refusal of the application does not mean *per se* that the gas in question will not be produced and sold, albeit with a delay. Although the Board does not question the genuine and legitimate desire of Niagara Mohawk to become less dependent on a single supplier for the purchase and transportation of natural gas, the Board considers it possible that the sale of Canadian gas to Niagara Mohawk might eventually be accommodated on an economic basis at an alternative delivery point. Notwithstanding the commercial benefits underlying the application, because of both the detrimental effects upon local interests and other considerations as set out above, the Board has concluded that the proposed route is unacceptable.

In conclusion, the Board considers its findings with respect to public interests and the acceptability of the proposed route to be sufficiently compelling to override its findings with respect to gas supply, markets and economic feasibility. The Board therefore remains unsatisfied that the proposed Gananoque Extension is and will be required by the present and future public convenience and necessity. Having reviewed its decision of 20 November 1989 wherein the Board denied TransCanada's application of 29 December 1988 for a certificate in respect of the Gananoque Extension, the Board has decided not to vary or rescind that decision. TransCanada's application of 22 June 1990 entitled "Gananoque Extension Facilities Review Application" is therefore denied.

The foregoing chapters constitute our Reasons for Decision in respect of the matters before us in the GH-4-90 proceedings.

D.B. Smith
Presiding Member

A. Côté-Verhaaf
Member

C. Bélanger
Member

Appendix I

Events Leading up to the GH-4-90 Hearing

28 December 1988	TransCanada files its 1990 Facilities Application which includes the Gananoque Extension facilities.
19 January 1989	Hearing Order GH-1-89 is issued regarding TransCanada's 1990 Facilities Application.
14 February 1989	WGML/TransCanada files its application for a licence to export natural gas to Niagara Mohawk.
28 March 1989	Hearing Order GH-1-89 is amended to include WGML/TransCanada's export licence application.
12 April 1989	GH-1-89 Hearing commences in Calgary.
13 July 1989	GH-1-89 Hearing concludes in Ottawa.
2 August 1989	The Board announces that in the event that it grants WGML/TransCanada's export licence, it will hold a public hearing in the Kingston area to obtain further evidence on the Gananoque Extension.
20 November 1989	GH-1-89 Decisions are released; the Board denies issuance of an export licence to WGML/TransCanada and therefore denies issuance of a certificate to TransCanada in respect of the Gananoque Extension.
18 December 1989	Hearing Order GHW-4-89 is issued regarding a review of certain aspects of the MBP.
6 February 1990	Niagara Mohawk files an application for review of the Board's Decision of 20 November 1990 denying issuance of an export licence to WGML/TransCanada.
2 March 1990	WGML/TransCanada files an application for review of the Board's Decision of 20 November 1990 denying issuance of an export licence to WGML/TransCanada.
9 March 1990	TransCanada files an application for review of the Board's Decision of 20 November 1990 denying issuance of a certificate to TransCanada in respect of the Gananoque Extension.
15 March 1990	GHW-4-89 Decision is released; the Board will no longer use benefit-cost analysis in its export licencing procedures and will only intervene with respect to contractual flexibility in exceptional circumstances.

19 March 1990 The Board grants Niagara Mohawk's application of 6 February 1990 and WGML,TransCanada's application of 2 March 1990 by indicating that in light of changed circumstances arising from the GHW-4-89 Decision, the Board would review its Decision of 20 November 1989 to deny issuance of an export licence to WGML/TransCanada.

20 March 1990 The Board grants TransCanada's application of 9 March 1990 by indicating that in the event that the Board were to issue an export licence to WGML/TransCanada, a further public hearing in respect of the Gananoque Extension would be held.

11 April 1990 Hearing Order GH-1-90 is issued regarding a review of the Board's 20 November 1989 Decision to deny issuance of an export licence to WGML/TransCanada.

12 April 1990 Hearing Order GHW-4-90 is issued regarding an environmental screening of the WGML/TransCanada export project.

23 April 1990 GH-1-90 Hearing commences in Calgary.

24 April 1990 GH-1-90 Hearing concludes in Calgary.

25 April 1990 GH-1-90 Decision is rendered; an export licence would be issued to WGML/TransCanada if the GHW-4-90 environmental screening were to determine that an environmental review of the export project would not be necessary.

19 June 1990 GHW-4-90 environmental screening is completed; an environmental review would not be a necessary prerequisite to issuance of an export licence to WGML/TransCanada but would be a necessary prerequisite to the issuance of a certificate to TransCanada in respect of the Gananoque Extension.

21 June 1990 Export licence issued to WGML/TransCanada.

22 June 1990 TransCanada files an application entitled "Gananoque Extension Facilities Review Application".

12 July 1990 Hearing Order GH-4-90 issued regarding

- a) a review of the Board's 20 November 1990 Decision to deny the issuance of a certificate to TransCanada with respect to the Gananoque Extension;
- b) TransCanada's application of 22 June 1990; and
- c) an environmental review of the Gananoque Extension.

10 September 1990 GH-4-90 Hearing commences in Kingston.

Appendix II

Route Selection Criteria - Onland Pipeline

- location adjacent to existing infrastructure such as highways, roads, railroads, woodlots, natural obstacles, power lines and lot lines;
- minimization of distance through which construction will encounter bedrock;
- avoidance of areas subject to erosion such as long steep slopes;
- minimization of distance through wet/organic/muck soils;
- minimization of the number of sensitive or difficult (from a construction perspective) stream crossings;
- minimization of distance through forest or woodlots;
- avoidance of habitats known for rare and endangered plant or animal species (e.g., designated wetlands known to have such species);
- avoidance of sensitive wetlands;
- avoidance of wildlife management areas and known waterfowl nesting and/or staging habitats;
- avoidance of other environmentally sensitive areas such as deer wintering yards and Areas of Natural and Scientific Interest;
- location of the pipeline in less intensively farmed agricultural land;
- avoidance of national, provincial and local parks;
- avoidance of mineral resource areas;
- avoidance of specialty crop lands;
- minimization of the number of crossings such as roads, highways, railroads;
- compliance with technical connections such as take-off and delivery points; and
- minimization of system costs in terms of construction, operation and maintenance.

Appendix III

Route Selection Criteria - St. Lawrence River Crossing

- river bed bathymetry and avoidance of excessive variability in bed morphology;
- avoidance of steep, abrupt slopes, where possible;
- desirability of stable ground conditions on the landfall and banks;
- avoidance of incompatible land uses at the landfall;
- avoidance of designated anchorage areas and portions of the river intensively used for recreational and commercial boating activities;
- avoidance of river areas known to have high current, ice jamming and ice scouring;
- avoidance of areas with underwater electric and communications cables and ferry crossings;
- avoidance of sensitive biological areas including significant waterfowl nesting and/or staging habitats, important fish spawning/nursery areas, and habitats known for rare and endangered plant or animal species;
- requirement for sufficient vacant land on both sides of the river to accommodate the landfall construction activities; and
- compliance with technical limitations such as connection with the existing TransCanada mainline.

Appendix IV

TransCanada PipeLines Limited Undertakings to the Ontario Pipeline Coordination Committee

1. TransCanada shall provide a list of all stream crossings to the Ontario Ministry of Environment and indicate the sediment type and TransCanada's assessment of the need for sediment analysis as required for open water disposal.
2. Where dredged materials cannot meet the Ontario Ministry of Environment's requirement for open water disposal, the materials are to be placed above the high water mark and stabilized to avoid re-entry into the watercourse. Onland disposal sites should be identified and reviewed by the Ministry.
3. TransCanada shall monitor a representative number of water wells within 100 metres from the centre line of the proposed pipeline for quality and quantity. Water intakes and water supplies are to be protected. Where water supplies are disrupted, alternative temporary or permanent sources are to be supplied by TransCanada.
4. TransCanada shall not conduct in-water work on any onland (including island) stream crossings between March 15 and June 1. In-water work on streams crossings occurring between June 1 and June 30 must include mitigative action to protect fisheries habitat.
5. In the Oak Point area, TransCanada shall restrict construction activity to the July 15 to September 15 period due to the presence of muskellunge and young-of-the-year smallmouth bass.
6. TransCanada will restrict in-water blasting and excavation activity in the St. Lawrence River crossings to the July 15 to September 15 period in areas where the fisheries resource may be adversely affected, and to June 1 to September 15 in other areas. TransCanada shall identify areas of fish habitat, in the vicinity of the St. Lawrence River crossings, potentially impacted by sediment dispersion. TransCanada shall conduct fisheries habitat studies in these areas and meet with Ontario Ministry of Natural Resources District staff to review the construction timing constraints based on the results of the study.
7. TransCanada shall complete in-water backfilling and trench restoration work by October 15.
8. If blasting is required in the Oak Point-Cold Bath Shoal area it shall be completed by August 31.
9. TransCanada shall restore the trenched area of the Oak Point landfall with clean broken rock material to the original profile of the river bottom.
10. TransCanada shall provide the detailed route description for the Cassidys Bay Marsh to the Ministry of Natural Resources, Napanee District at least 90 days prior to construction.
11. A detailed archaeological evaluation of the final route shall be conducted by TransCanada.

12. TransCanada will avoid archaeological sites during construction; or if avoidance is not possible excavate all known sites.
13. TransCanada shall produce a report which documents the results of the detailed archaeological field survey and any excavations undertaken in respect thereto.
14. TransCanada shall advise the Chairman of the Ontario Pipeline Coordination Committee of the name of the Construction Supervisor and the field Environmental Inspector for each construction spread 10 days prior to construction.
15. TransCanada shall notify local Ontario Ministry of Environment, Ministry of Natural Resources and the Chairman of the Ontario Pipeline Coordination Committee of the environmental seminar to be held for construction and supervisory personnel.
16. TransCanada shall provide to the Chairman of the Ontario Pipeline Coordination Committee copies of all Post-Construction and As-Built reports for review.