

IN THE MATTER OF the *Ontario Energy Board Act, 1998*, S.O. 1998, c. 15, (Schedule B);

AND IN THE MATTER OF an Application by Union Gas Limited, pursuant to section 36(1) of the *Ontario Energy Board Act, 1998*, for an order or orders approving or fixing just and reasonable rates and other charges for the sale, distribution, transmission and storage of gas as of January 1, 2013.

**UNION’S 2013 RATE REBASING APPLICATION:
STORAGE AND TRANSPORTATION ISSUES**

EB-2011-0210

Prepared for

Canadian Manufacturers & Exporters (CME)
Consumers Council of Canada (CCC)
The Corporation of the City of Kitchener (CCK)
Federation of Rental-housing Providers of Ontario (FRPO)

By

John A. Rosenkranz

May 16, 2012

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CME, CCC, CCK, and FRPO requested a review of Union's 2013 rate rebasing application as it pertains to Union's allocation of costs for its transportation and storage operations. I was asked to consider whether Union's proposed allocation of Dawn-Trafalgar transmission system costs to in-franchise and ex-franchise services is reasonable given the current characteristics and utilization of these facilities, and whether Union's allocation of revenues and costs between its utility and non-utility storage operations is consistent with Ontario Energy Board decisions. This report describes the results of that investigation. The findings and recommendations address four main topics:

- Union's allocation of Parkway Station costs
- Allocation of costs to Union's non-utility storage operation
- Union's obligation to optimize utility storage assets
- Deferral Account No. 179-70

A. Parkway Station Costs

Cost Allocation

In Union's cost allocation study, the costs of transporting gas on the Dawn-Parkway transmission system are divided into two categories: (1) the cost of the compressors needed to move gas from the Dawn Hub into the Dawn-Parkway system (Dawn Station costs); and (2) all remaining costs (Dawn-Trafalgar Easterly costs). Dawn-Trafalgar Easterly costs include Union's transmission pipelines, the compressors at Lobo, Bright, and Parkway, and the metering facilities at Kirkwall and Parkway. Parkway Station costs are allocated to rate classes based on design day demand, while Dawn-Trafalgar Easterly costs are allocated using a distance-based "commodity-kilometres" methodology.

1 **Recommendation 1: Parkway Station costs should be separated from the other Dawn-**
2 **Trafalgar Easterly transmission costs, and allocated to rate**
3 **classes based on design day flow requirements.**
4

5 Union both delivers gas and receives gas at Parkway, but the predominant direction
6 of physical flow is from Union Gas to TCPL and Enbridge. The metering and compression
7 facilities at Parkway Station are therefore designed to meet Union's design day requirement
8 to export gas from the Union Gas system into the TCPL and Enbridge systems. Metering
9 costs are a function of design day demand, and are not affected by the distance gas travels
10 on the Dawn-Parkway system before reaching the Parkway Station. Compression
11 horsepower at Parkway is determined by Union's peak day requirements to deliver gas into
12 TCPL. Union's metering and compression assets at Parkway are not used to transport or
13 deliver natural gas to any of the upstream in-franchise markets that are connected to the
14 Dawn-Parkway transmission system. For all of these reasons, the Parkway Station costs
15 should be separated from the remaining Dawn-Trafalgar Easterly transmission costs, and
16 allocated to rate classes on the basis of design day requirements. This treatment of Parkway
17 Station costs would better reflect cost causation when compared to Union's existing
18 methodology, and would be consistent with the way that Union Gas currently allocates
19 Dawn Station costs.

20 Allocating Parkway Station costs using the methodology recommended here would
21 lower in-franchise costs by approximately \$1.6 million per year (see Attachment 2).

22 M12 Service Rate Design

23 **Recommendation 2: Parkway costs should be recovered from all services that utilize**
24 **Parkway as a receipt or delivery point.**
25

26 Once Parkway Station costs have been separated in the cost allocation, these costs
27 should be recovered from those services that use the Parkway facilities. The rates for these
28 services should reflect the shipper's maximum daily use of Parkway compression and/or
29 metering.

30 **Recommendation 3: Union should create a non-export M12 service that can be used**
31 **by in-franchise customers to meet an obligated delivery**
32 **requirement at Parkway.**

1
2 The rates for services that do not use Parkway facilities, such as the existing Dawn-
3 Kirkwall service, should not include Parkway Station costs. In addition, if Union continues
4 to require in-franchise customers to make obligated deliveries at Parkway, Union should
5 offer a “non-export” M12 service that Union South customers located upstream of Parkway
6 could use to meet this obligation. This service would be based on the same allocation of
7 Dawn-Trafalgar Easterly Costs as the standard Dawn-Parkway M12 service, but would
8 exclude Parkway Station costs. Shippers would be able to use the non-export service to
9 deliver gas to Union, but would not have rights to deliver gas to TCPL or Enbridge.

10 **B. Non-Utility Storage Costs**

11 In the NGEIR Decision¹, the Board decided to forbear from regulating rates or
12 approving contracts for Union’s ex-franchise storage services.² Union could continue to
13 run an integrated storage operation, but the costs of existing storage assets would be divided
14 between the “utility assets” required to serve in-franchise customers, and “non-utility
15 assets”. Only utility storage asset costs are included in Union’s regulated ratebase and
16 revenue requirement.

17 In the EB-2011-0038 decision, the Board approved Union’s methodology to
18 separate storage plant using storage space and deliverability factors from Union’s 2007 rate
19 case. This one-time separation, which is deemed to have occurred at the end of 2006,
20 removed 37.7% of the existing storage plant from the utility ratebase. Union’s pre-NGEIR
21 “legacy” storage assets include company-owned storage pools, storage lines, compression,
22 the transmission pipelines connecting Union’s storage pools to the Dawn Hub, third party
23 storage service, and third party transportation service to transport gas from third party
24 storage to Dawn.

25 Neither the NGEIR Decision nor the EB-2011-0038 decision defined how additions
26 and retirements of legacy storage assets would affect utility storage plant, or approve a
27 methodology to allocate operating and maintenance costs to non-utility storage. Since this

¹ EB-2005-0551, Decision with Reasons, November 7, 2006.

² NGEIR Decision, p. 74.

is Union's first full cost of service rate case since the NGEIR Decision, these matters need to be addressed in this proceeding.

Capital Projects

Recommendation 4: Union should provide a more detailed description of its proposed methodology for assigning replacement project costs to non-utility storage and utility storage.

In the EB-2010-0039 proceeding, Union described its recommended approach for allocating the costs of post-NGEIR capital projects between utility storage and non-utility storage as follows:³

1. The costs of new storage projects are directly charged 100% to Union's [non-utility] storage operations.
2. For projects replacing existing storage assets, the classification and allocation of the cost of the replacement asset is driven based on the rationale for the project.
 - (a) If the project is a necessary part of normal business operations, then the new asset is split the same way as the existing asset.
 - (b) If the project improves efficiency or provides growth opportunities for the [non-utility] storage business, then the incremental cost of the project beyond the simple replacement is directly assigned to [non-utility] storage.

Union's proposed methodology for allocating costs for replacement projects is ambiguous, since it is not clear what Union means when it says that a replacement asset will be "split the same way as the existing asset". Based on Union's interrogatory response in this proceeding, it appears that Union may plan to continue to use the same allocation factors as were approved for the one-time allocation of storage plant.⁴ This would not be reasonable, since as legacy storage assets are modified to create additional storage capacity and deliverability for Union's non-utility storage operation, the allocation factors used for replacement projects will need to change. Since the NGEIR Decision, nearly half of Union's legacy storage pools have been modified in some way (see Table 1).

For example, if a storage pool that had five injection/withdrawal wells at the time of the NGEIR Decision is expanded to provide high-deliverability storage services by adding

³ EB-2010-0039, Exhibit A, Tab 4, p. 14.

⁴ Exhibit J.B-8-10-2

five new wells, and Union subsequently undertakes a replacement project that upgrades equipment at all ten wells, the replacement plant should not be allocated to non-utility storage using the same 37.7% factor that applies only to facilities that were in place in 2006. The allocation should reflect the fact that the proportions of gross plant, net plant, working storage space, and peak deliverability for this storage pool have been changed. If Union does intend to modify the allocation factor to incorporate non-utility expansions, Union should provide a detailed description of how this will be done.

Table 1
Union Gas Legacy Storage Expansion Projects

Project	OEB Case	Space (10 ³ m ³)	Deliverability (GJ/day)	Storage Pools
Dawn Deliverability	EB-2007-0633 EB-2007-0661		518,000	Dawn 156, Dawn 59-85
Dawn Capacity	EB-2008-0038	56,700		Dow A, Oil Springs East, Payne, Enniskillen 28
Dawn Capacity II	EB-2009-0144	14,700		Bentpath East, Oil City, Bluewater

System Integrity Costs

Recommendation 5: The utility revenue requirement should be credited for system integrity costs associated with Union's non-utility storage space.

Union errs by including the system integrity costs associated with Union's non-utility storage space in the Excess Utility Cross Charge. Of the \$419,000 of system integrity costs that are allocated to the Excess Utility Storage Space, Union reports that \$75,300 is associated with the 13 PJ of Excess Utility Storage Space and \$343,500 is associated with the 66.5 PJ of non-utility storage space.⁵ All of this cost is included in the Excess Utility Cross Charge. However, because the Excess Utility Cross Charge is subtracted from utility storage revenue to calculate the storage margins that will be shared with ratepayers, this charge is borne by the Union's utility customers, not the non-utility storage business. Only the system integrity costs associated with the 13 PJ of Excess

⁵ Exhibit J.D-16-10-1

1 Utility Storage Space should be included in the Excess Utility Cross Charge, and the utility
2 revenue requirement should be reduced by \$343,500.

3 Union's Use of Utility Transmission Assets for Non-Utility Storage

4 In the NGEIR Decision, the Board recognized that because Union owns and
5 operates an integrated gas distribution, transmission and storage business, one consequence
6 of its forbearance decision is the need to ensure access to Union's transportation system on
7 a non-discriminatory basis.⁶ To prevent discriminatory treatment and create a level
8 playing field, affiliated storage operators and Union's own non-utility storage business
9 should have the same access to Union transmission assets, and pay the same costs, as a non-
10 affiliated storage operator.

11 In EB-2011-0038, intervenors and Board Staff raised questions about Union's use of
12 transportation assets by its non-utility storage business. In its Decision, the Board noted
13 that Union had agreed that if a non-utility storage asset is connected to Dawn through a
14 transmission asset, there should be a charge.⁷ More generally, however, the Board found
15 there is not enough evidence in this proceeding to make a determination regarding
16 the use of transportation services for non-utility storage operations. The Board
17 directs Union to include sufficient evidence on this issue in its rebasing application
18 for the Board to make a determination at that time.⁸

19 **Recommendation 6: When utility transmission assets are used for a non-utility**
20 **storage pool within Union's service area, Union should credit the**
21 **utility revenue requirement using the M16 firm service rate.**

22 In this proceeding, Union addresses one situation where utility transmission assets
23 are used to connect a new non-utility storage pool with Dawn. Specifically, Union
24 proposes to credit the utility revenue requirement by \$60,277 for the value of transportation
25 service used for Heritage storage pool, which is connected to Union's Sarnia Industrial
26 Line. This credit is based on the proposed M16 service interruptible transportation rate and
27 an annual storage injection and withdrawal quantity of 900,000 GJ.⁹

⁶ NGEIR Decision (EB-2005-0551), p. 85.

⁷ EB-2011-0038 Decision and Order, p. 16.

⁸ EB-2011-0038 Decision and Order, p. 18.

⁹ Exhibit H3, Tab 8, Schedule 14.

1 According to Union, the M16 interruptible rate is appropriate in this case because
2 “Heritage Storage pool transports gas to and from Dawn on an interruptible basis only”.¹⁰
3 However, unless Union can demonstrate that withdrawals from the Heritage Storage pool
4 are actually subject to curtailment, Union should provide a credit to the utility revenue
5 requirement that is based on the quality of the service being provided, using the M16 firm
6 transportation rate and the Heritage Storage pool’s maximum daily withdrawal capacity of
7 319 10³m³/day.¹¹

8 **Recommendation 7: When utility transmission assets are used to transport gas**
9 **between an off-system third party storage service and Dawn,**
10 **utility ratepayers should receive the same value for the capacity**
11 **that they would receive from an unaffiliated storage operator.**

12 Union’s application does not address the situation where owned or contracted
13 transmission capacity that is paid for by utility ratepayers is used by Union’s non-utility
14 storage business to transport natural gas between a third-party storage service and Dawn.
15 This situation specifically applies to Union’s contracts for Michigan storage. For example,
16 Union previously reported that it entered into a long-term contract with Michigan
17 Consolidated Gas Company (MichCon) for 2.1 PJ of firm storage service. Gas withdrawn
18 from this Michigan storage service was to have been transported between Michigan and
19 Dawn using firm transportation capacity on the Dawn Gateway Pipeline. If Dawn Gateway
20 did not go forward, Union said that it would continue to use “the traditional
21 MichCon/Union Gas path between MichCon and Dawn”.¹² Since Dawn Gateway has been
22 cancelled, Union ratepayers are entitled to know whether Union transmission capacity, or
23 upstream third-party transportation capacity under contract to Union’s utility business, is
24 being used to transport MichCon storage withdrawals to Dawn on behalf of Union’s non-
25 utility storage operation, and if so, how utility ratepayers will be compensated. Under these
26 circumstances, Union should be required to provide evidence about its third party storage
27 contracts and associated transportation arrangements¹³.

¹⁰ Exhibit J.C-6-10-1

¹¹ “During withdrawal operations, gas will flow from the Heritage Pool to the Sarnia Industrial Line Station at a design withdrawal rate of 319 10³m³/day.” (EB-2008-0405 Application, p. 16)

¹² EB-2011-0038, 7/26/2011 Technical Conference Transcript, p. 52.

¹³ “Other third party storage contracts are part of Union’s unregulated business and are not relevant to Union’s 2013 regulated rates.” (Exhibit J.C-6-10-5)

C. Utility Storage Optimization

Before NGEIR, Union's ex-franchise storage services were classified as either short term (terms less than two years) or long term (terms two years or longer). At the time of the NGEIR proceeding, the Board understood that Union's short-term storage services were analogous to Enbridge's Transactional Services storage sales, with both being "sales of services derived from utility assets that are temporarily surplus to in-franchise needs."¹⁴ The NGEIR Decision retained the short-term/long-term distinction. The Board assumed that Union would sell long-term storage services from non-utility storage space and sell short-term storage services using both utility storage and non-utility storage space and deliverability.

During the EB-2011-0038 proceeding, Union identified three types of storage space: (1) utility storage space required for in-franchise services (including system integrity space); (2) Excess Utility Storage Space, defined as the difference between the amount of utility storage space required in any year and the 100 PJ of utility storage space "reserved" under the NGEIR Decision; and (3) non-utility storage space. Non-utility storage space, in turn, includes (a) Union storage; (b) third party storage services; and (c) Optimization Space, which Union creates by buying short-term third party services to support additional sales of long-term firm storage service.

Union's Policies for Storage Service Sales

Recommendation 8: Union should manage utility storage space and deliverability to optimize the value of these assets on behalf of utility ratepayers.

Union's current policy is to sell short-term storage services from Excess Utility Storage Space, and to sell long-term firm storage services from non-utility storage space.¹⁵ Natural gas distribution companies have an obligation to make efficient use of utility assets, including company-owned and third party storage assets. However, Union's policies on short-term and long-term storage sales appear to be based largely on regulatory concerns, which may not result in the best outcome for utility ratepayers. Union should manage utility storage with the objective of optimizing the value of these assets on behalf of utility

¹⁴ NGEIR Decision, p. 100.

¹⁵ Exhibit C1, Tab 7, p.1, line 9.

1 ratepayers. Limiting the sale of utility storage services to a single class of transactions—
2 short-term peak storage services—is inconsistent with this objective. Union should
3 consider all available options for optimizing the value of these storage assets, including
4 third-party asset management arrangements.

5 Proposed Allocation of Short Term Peak Storage Revenue

6 **Recommendation 9: Union’s proposal to allocate Short Term Peak Storage revenue**
7 **between utility storage and non-utility storage should be**
8 **rejected.**
9

10 In its March 27, 2012 update filing, Union included a new proposal to allocate total
11 Short Term Peak Storage revenue between utility storage and non-utility storage on a
12 calendar year basis. Under Union’s proposal, Excess Utility Storage Space would be sold
13 as Short Term Peak Storage and Union would sell additional Short Term Peak Storage from
14 its non-utility storage assets. The total Short Term Peak Storage revenue for each calendar
15 year would be allocated pro-rata between utility storage and non-utility storage.

16 Union’s proposal is seriously flawed. First, it would require all Excess Utility
17 Storage Space to be sold as Short Term Peak Storage, even if this was not the best way to
18 create value for utility ratepayers. Second, even though Union says that the intent of the
19 proposal is to “avoid any opportunity for Union or ratepayers to be advantaged relative to
20 the other due to timing” of storage transactions,¹⁶ this proposal would create a strong
21 incentive for Union to sell additional Short Term Peak Storage service from non-utility
22 assets if the value of storage falls during the year. By selling additional Short Term Peak
23 Storage from non-utility storage space later in the year, when market prices are lower,
24 Union’s non-utility storage business would capture revenue from utility storage by diluting
25 the value of utility storage sales that were made earlier at higher prices.

26 Union’s proposal is also unnecessary. Even though Union’s storage assets are
27 operated on an integrated basis, Union is still able to tie an individual storage transaction to
28 either the utility storage account or the non-utility storage account.¹⁷ Concerns that utility

¹⁶ Exhibit J.DV-1-1-1

¹⁷ “Union is able to trace individual short-term peak storage transactions and could assign the individual storage transactions as utility transactions or non-utility transactions.” (Exhibit J.DV-1-1-1)

ratepayers will be disadvantaged by allowing Union’s non-utility storage business to market utility storage assets can be better addressed by other means.

D. Deferral Account No. 179-70

Recommendation 10: The definition of Deferral Account No. 179-70 should be based on the assets used to create the storage revenue, not the type of transaction.

Union proposes to modify the description of the Short-term Storage and Other Balancing Services Deferral Account. However, the wording proposed by Union is unnecessarily restrictive. In particular, Union would exclude margin sharing on short-term storage revenue obtained from optimizing utility storage space that is not Excess Utility Storage Space.¹⁸ This is the storage that Union plans to use for in-franchise requirements, but which can often be sold as short-term storage and balance services on a seasonal or “as available” basis. Storage and balancing service sales from these “required” utility storage assets are the Union counterparts to Enbridge’s Transactional Services storage sales.

Under the current regulatory regime, what matters is the assets that underpin the storage transaction, not whether the primary term of transaction is greater or less than two years. Net revenues on all storage and balancing transactions that use utility storage assets should be credited to ratepayers. The deferral account definition should not be limited to any specific types of transactions, and should give Union the flexibility to optimize utility storage assets using the best available methods.

Based on these principles, the definition of Deferral Account No. 179-70 should be modified as follows:

1. In the title, change “Short-term Storage” to “Storage”.

2. Substitute the following language:

“To record, as a debit (credit) in Deferral Account No. 179-70 the difference between the actual net revenues for Storage and Other Balancing Services underpinned by utility storage assets including, but not limited to, Short-Term Peak Storage, Off-Peak Short-

¹⁸ “It is only the net revenue earned on the ‘excess’ utility storage assets that are subject to deferral and sharing.” (Exhibit J.DV-4-10-1)

- 1 Term Storage, Gas Loans and Supplemental Balancing Services, and the net revenue
- 2 forecast for these services as approved by the Board for ratemaking purposes.”

Attachment 1

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PROFESSIONAL EXPERIENCE

North Side Energy, LLC, Acton, MA
PRINCIPAL

2006 – Present

Recent Projects:

- Consultant to the Maine Public Advocate for gas utility rate cases and cost of gas proceedings.
- Conducted a gas utility procurement review for Arizona Corporation Commission staff.
- Restructured long-term gas supply, transportation, and energy management contracts for cogeneration plants in Connecticut and Florida.
- Advisor to the Ontario Power Authority on natural gas issues affecting long-term power contracts.
- Assisted Ontario Energy Board staff in developing new gas transmission access and reporting rules.
- Expert witness in the Union Gas 2010 deferral account reconciliation case (EB-2011-0038).

Calpine Corporation, Boston, MA
DIRECTOR, GAS ORIGINATION

2000 – 2006

Developed and implemented fuel supply plans for gas-fired power plants. Negotiated and managed contracts with natural gas suppliers and transporters. Participated in gas pipeline rate cases and other regulatory proceedings.

- Worked with industrial gas users, distribution companies and state agencies to intervene in a natural gas pipeline rate case, leading to over \$2 million in rate discounts for Maine gas consumers.
- Testified on the availability of natural gas supply and pipeline delivery capacity to support the permitting of a gas-fired power plant in Minnesota.
- Member of a commercial and legal team that obtained arbitration decisions enforcing long-term natural gas contracts with over \$50 million in mark-to-market value.

PG&E Gas Transmission, Boston, MA and Portland, OR
DIRECTOR, BUSINESS DEVELOPMENT

1997 – 1999

Identified and managed development projects and investment opportunities involving natural gas pipelines, underground storage and LNG peaking plants.

- Project manager for a \$1.2 million geologic testing program at a potential natural gas storage site.
- Owner representative and management committee member for two interstate pipeline partnerships in the Northeast U.S.

J. Makowski Co. (acquired by U.S. Generating Company), Boston, MA
MANAGER, PROJECT DEVELOPMENT

1992 – 1997

Supervised a team that provided project management and marketing support for natural gas pipeline and storage projects. Conducted regional gas market studies for internal projects and outside clients.

VICE PRESIDENT - EnerPro, Inc., Chicago, IL 1990 – 1992
Consultant to gas distribution companies during post-Order 636 restructuring. Helped clients define gas portfolio objectives, draft requests for proposals, evaluate suppliers, and negotiate long-term contracts.

MANAGER, GAS MODELING GROUP - Planmetrics, Inc., Chicago, IL 1986 – 1990
Developed and implemented gas supply planning systems for gas distribution companies.

ADVISORY ECONOMIST - Chicago Board of Trade, Chicago, IL 1983 – 1986
Researched commodity markets for futures and options trading potential. Prepared a natural gas futures trading proposal that was submitted to the Commodity Futures Trading Commission.

REGULATORY PROCEEDINGS

UNS Gas, Inc. (ACC Docket No. G-04204A-11-0158), October 2011. Testimony on natural gas procurement review, on behalf of the Arizona Corporation Commission Utilities Division Staff.

Northern Utilities, Inc. (MPUC Docket No. 2011-92), August 2011. Testimony on pipeline rate case expenses and peaking facility cost allocation, on behalf of the Maine Public Advocate.

Union Gas Limited (OEB Case No. EB-2011-0038), July 2011. Report on the allocation of costs and margins between utility and non-utility storage operations, on behalf of consumer intervenors.

Portland Natural Gas Transmission (FERC Docket No. RP10-729), January 2011. Rebuttal testimony on market risk, on behalf of the Maine Public Advocate.

Natural Gas Market Review (OEB Case No. EB-2010-0199), September 2010. Evidence on regulatory initiatives to respond to changes in natural gas markets, on behalf of consumer intervenors.

Ontario Power Authority (OEB Case No. EB-2007-0707), May 2008. Report on the implications of the Integrated Power System Plan for the natural gas market, prepared for the Ontario Power Authority.

Maritimes & Northeast Pipeline (FERC Docket No. RP04-360), February 2005. Testimony on distance-based rates, on behalf of Calpine Corporation.

Mankato Energy Center (Minnesota Public Utilities Commission, Case IP-6345/CN-03-1884), 2004. Testimony on the availability of natural gas supplies and transmission capacity for power generation in Minnesota, on behalf of Mankato Energy Center.

Wisconsin Electric Power (Wisconsin Public Service Commission, Case 05-CE-130), 2003. Rebuttal testimony on the availability of natural gas supplies and transmission capacity for power generation in Wisconsin, on behalf of Calpine Corporation.

EDUCATION

Graduate study in Economics - Northwestern University, Evanston, IL
Completed all course and examination requirements for Ph.D.

Bachelor of Arts, Economics - George Washington University, Washington, DC

PRESENTATIONS AND PUBLICATIONS

“North American Gas Supply Developments: Implications for Ontario Consumers” LDC Gas Forum Canada, November 10, 2010

“Cross Border Trade in Gas Storage Services,” Conference Board of Canada Natural Gas Storage 2008 Conference, April 3, 2008

“Natural Gas for Power Generation: Thinking Outside the Hub,” 19th Annual Canadian Power Conference, November 14, 2007

“Natural Gas Electricity Interface Review: A Power Generator’s Perspective,” 18th Annual Canadian Power Conference, November 15, 2006

“Innovation in Salt Bed Storage Development: Avoca Natural Gas Storage,” American Gas Association Operations Conference, May 1997

“Optimization of Purchase, Storage and Transmission Contracts for Natural Gas Utilities,” (with W. Avery, G. Brown, and R. Wood), Operations Research, 40 (1992).

“Price Spikes and Seasonal Spreads: Implications for LDC Storage Planning,” Natural Gas, September, 1990.

Attachment 2

PARKWAY STATION COST SEPARATION EXAMPLE

<u>2013 Revenue Requirement (\$000)</u>			
	<u>Dawn-Trafalgar East</u>	<u>Parkway Station</u>	<u>Total</u>
 <u>Union Application</u>			
1 M12	127,031		127,031
2 In-Franchise	24,659		24,659
3 Total	151,690		151,690
 <u>With Parkway Station Separation</u>			
4 M12	113,285	15,348	128,633
5 In-Franchise	22,096	961	23,057
6 Total	135,381	16,309	151,690
 <u>Difference</u>			
7 M12			1,602
8 In-Franchise			-1,602

Notes

Lines 4 & 5: Dawn-Trafalgar East costs are allocated to M12 and In-franchise services using the DTTRANS allocation factor (Exhibit J.G-1-7-5).

Parkway Station costs are allocated to M12 and In-franchise services using estimated Parkway demand (Exhibit J.G-1-7-5).

Line 6: Parkway Station costs are separated from Dawn-Trafalgar East in proportion to net plant (Exhibit J.G-10-10-4).

Line 7: Line 4 – Line 1

Line 8: Line 5 – Line 2