VINCENT J. DEROSE
T 613.787.3589
vderose@blg.com

Borden Ladner Gervais LLP
World Exchange Plaza
100 Queen St, Suite 1300
Ottawa, ON, Canada K1P 1J9
T 613.237.5160
F 613.230.8842
blg.com

Borden Ladner Gervais

By electronic filing

February 10, 2014

Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street
27th floor
Toronto, ON M4P 1E4

Dear Ms Walli,

Union Gas Limited ("Union")
2014 Rates Application
Board File No.: EB-2013-0365
Our File No.: 339583-000169

Please find attached Intervenor Evidence filed on behalf of the following parties:

- Canadian Manufacturers & Exporters ("CME")
- City of Kitchener ("Kitchener")
- Federation of Rental-housing Providers of Ontario ("FRPO")
- Ontario Greenhouse Vegetable Growers ("OGVG")

Should you have any questions with respect to the above, please do not hesitate to contact me.

Yours very truly,

Vincent J. DeRose

\slc
enclosure
c. Chris Ripley (Union)
Crawford Smith (Torys)
Paul Clipsham (CME)

OTT01: 6158070: v1

Ontario Energy Board
EB-2013-0365 – Union Gas 2014 Rates Application

REVIEW OF DAWN-PARKWAY SYSTEM COST ALLOCATION ISSUES

Prepared by John A. Rosenkranz
February 10, 2014

In the Union Gas 2013 rate rebasing proceeding the Board identified two cost allocation issues that are to be considered in Union's 2014 rate case.[1] These issues concern the methodology Union uses to allocate costs associated with the Kirkwall Station and the Parkway Station on the Dawn-Parkway transmission system. This report reviews the cost study from Union's 2013 rate rebasing proceeding, and recommends changes to Union's current cost allocation and rate design.

Summary of Recommendations

The methods that Union Gas uses to functionalize and allocate Dawn-Parkway system costs, and design ex-franchise transportation rates (Rate M12 and Rate C1), should be modified in three areas to better reflect the use of these facilities. Two additional issues should be reviewed as part of the next Union Gas rate rebasing proceeding.

1. Include all Dawn compression plant and operating and maintenance (O&M) costs that are assigned or allocated to the Dawn-Parkway system in the Dawn-Trafalgar Easterly functional cost category, and include all Dawn measuring and regulating (M&R) plant and O&M costs that are assigned or allocated to the Dawn-Parkway system in the Dawn Station functional cost category.

2. Allocate Kirkwall and Parkway M&R plant and O&M costs to customer classes based on each class' peak demand for firm deliveries to TCPL or Enbridge, and firm receipts from TCPL or Enbridge, at that meter station.

3. Create a reduced M12/C1 rate for non-TCPL deliveries to reflect the avoided cost of Parkway compression.

4. Review the allocation of compression O&M costs to consider whether these costs should be allocated based on projected usage instead of distance-weighted demands.

5. Review the allocation of Parkway compression plant.

The first recommendation will result in a more consistent cost allocation for the transmission-related facilities at Dawn. This allocation will (a) better reflect the relationship

[1] EB-2011-0210 Decision and Order, October 24, 2012.

between Dawn compression and the compression facilities at Lobo and Bright, and (b) recognize that M&R plant and operating costs are not affected by the distance gas is transported upstream or downstream of the meter station.

The second recommendation will cause M&R costs at Kirkwall and Parkway to be allocated to customer classes based on peak demand, without a distance adjustment. This is consistent with the methodology that Union currently uses for Dawn Station costs, and will account for the fact that certain M&R facilities, such as the Enbridge delivery points at Parkway and Lisgar, are only used by ex-franchise transportation customers.

The third recommendation is necessary because Parkway compression costs are currently allocated to all services that use the Dawn-Parkway system, even though Parkway compression is only used to deliver gas into TCPL. Charging a lower rate for contracts with delivery upstream of the Parkway compressors is more consistent with cost causation, and will give Enbridge an incentive to only contract for the amount of M12 service to the Parkway(TCPL) point that is actually needed. This change to the M12/C1 rate design would not affect the rates paid by Union's in-franchise customers.

BACKGROUND

Kirkwall Station

The Kirkwall Station is an interconnection between Union Gas and TCPL located 189 km east of Dawn and 40 km west of Parkway. The Kirkwall interconnect is mainly used to provide M12 Dawn to Kirkwall service for shippers exporting gas to the U.S. at Niagara and Chippawa, although market developments have greatly reduced the demand for this service. Union also delivers gas to TCPL at Kirkwall for redelivery to Union's markets in Hamilton and Nanticoke. The design day requirement for in-franchise deliveries at Kirkwall was estimated to be 140,148 GJ for the 2013 rate rebasing cost study [Exhibit B9.1(c)].

In 2012 Union Gas modified the Kirkwall Station to enable physical gas flows into the Dawn-Parkway system from TCPL. Bidirectional flow capability was required to allow Union Gas to offer new transportation services with firm receipts at Kirkwall. These modifications cost $4.2 million, and added about $0.24 million to the Dawn-Parkway system revenue requirement [Exhibit B9.2(b)].

In the EB-2010-0296 proceeding the Board approved two new transportation services with Kirkwall receipt points: C1 Kirkwall to Dawn and M12-X. The Board also approved Union's request to assign all of the costs of the Kirkwall Station modifications to the C1 Kirkwall to Dawn

service. A new M12 Kirkwall to Parkway transportation service was later authorized in EB-2011-0257.

In both the EB-2010-0296 and EB-2011-0257 decisions the Board directed Union to review the cost allocation and rate design for the new transportation services from Kirkwall at the next rate rebasing. In the cost study used for the 2013 rebasing, Union included all Kirkwall Station plant and operating costs, including the costs of the 2012 modifications, in the Dawn-Trafalgar Easterly transmission functional cost category, and eliminated the direct assignment of the Kirkwall Station modification costs to the C1 Kirkwall to Dawn service.

In the 2013 rate rebasing decision the Board noted that there have been substantial changes in the use of the Kirkwall facilities, and again directed Union to review the allocation of Kirkwall Station costs as part of the updated cost allocation study to be filed with the 2014 rates application. In response to this Board directive, Union is not proposing any changes to the allocation of Kirkwall metering costs. Union says that the current methodology is appropriate because it treats the Kirkwall metering facilities in a manner consistent with other Dawn-Parkway assets [Exh. A, Tab 1, p. 20].

As of November 1, 2013 Union had firm contracts for 586,717 GJ/day of Dawn to Kirkwall service and 300,000 GJ/day of Kirkwall to Parkway service, and had no contracts for Kirkwall to Dawn service.[2] Union has also contracted for 21,101 GJ/day of TCPL FT service from Niagara to Kirkwall to supply Union South sales service customers.

Parkway Station

The Parkway Station includes a bidirectional interconnection with TCPL and two custody transfer meters with Enbridge: Parkway(Consumers) and Lisgar. The Parkway Station also has two compressors. The Parkway compressors are required because Union's minimum contractual delivery pressure into TCPL of 6,450 kPag is 87 percent higher than the minimum pressure of 3,450 kPag that is needed to deliver gas to Enbridge, and actually exceeds maximum operating pressure on the Dawn-Parkway system, which is 6,150 kPag. Union Gas does not use the Parkway compressors to make deliveries to Enbridge at Parkway or Lisgar, or to supply in-franchise markets located upstream of Parkway.

In the 2013 rebasing case, several intervenors and Board staff supported a proposal to separate Parkway Station costs from Dawn-Trafalgar Easterly transmission costs and allocate these costs based on peak demands for gas deliveries into TCPL and Enbridge. The Board

[2] November 2013 Index of Customers

decided not to approve the separation of Parkway Station costs at that time, but said that it would revisit the issue in Union's 2014 rates proceeding.[3]

Most recently Board approved the Parkway West and Brantford-Kirkwall/Parkway D projects.[4] The Parkway West project includes a new compressor to provide loss of critical unit protection at Parkway, and a third connection to Enbridge. The estimated capital cost for the Parkway West project is $219 million, which includes approximately $20 million for the new Enbridge delivery facilities. The Parkway D compressor is part of a larger expansion project that also loops a segment of the Dawn-Parkway system. The estimated capital cost of the Parkway D compressor alone is $108 million. Union proposes to complete both projects by late 2015.

In approving the Parkway West and Brantford-Kirkwall/Parkway D projects, the Board acknowledged that the additional costs would be allocated to customers using Union's existing methodology. While noting that not all Union South customers use the Parkway compression facilities, the Board observed that the need for new facilities should be considered in the context of the system as a whole. The Board declined to consider the rate allocation issues associated with Parkway compression in the leave to construct case, but noted that this issue could be raised in Union's next cost of service proceeding.

UNION GAS COST STUDY

Union Gas uses the cost allocation study as a guide to rate design. Where possible, costs are directly assigned to functions or customer classes. Costs that cannot be directly assigned are allocated based on an assessment of various cost causation factors.

Since Kirkwall Station and Parkway Station are components of the Dawn-Parkway transmission system, the methodology Union uses to allocate Kirkwall and Parkway costs needs to be considered within this broader context. The Dawn-Parkway system includes high pressure transmission lines, compression at Dawn, Lobo, Bright, and Parkway, and measuring and regulating (M&R) facilities at Dawn, Kirkwall, and Parkway.

The Union cost study separates the plant and operating costs related to the Dawn-Parkway system into two categories: Dawn Station costs and Dawn-Trafalgar Easterly costs. Most of the compression and M&R assets located at Dawn that Union uses to provide transmission service on the Dawn-Parkway system are functionalized as Dawn Station costs.

[3] EB-2011-0210 Decision and Order, p.73
[4] EB-2012-0451/EB-2012-0433/EB-2013-0074 Decision and Order, January 30, 2014.

The remaining Dawn transmission costs, and all other Dawn-Parkway System costs, are functionalized as Dawn-Trafalgar Easterly costs.

Functional Separation of Dawn Compression and M&R

Before costs are allocated to customer classes Union separates the costs of facilities at Dawn that support transportation on the Dawn-Parkway system from the costs of the facilities used for underground storage, or for transportation on the Ojibway/St. Clair transmission lines. Union functionalizes the costs of the regulated utility compression and M&R assets located at Dawn as follows:

Compression Plant	Certain Dawn compression plant is directly assigned to transmission. Most of the compression plant that is assigned to the Dawn-Parkway system goes to Dawn Station, but a portion goes to Dawn-Trafalgar Easterly (STORCOMP). The Dawn compression plant that is not directly assigned is allocated between storage and transmission based on an analysis of horsepower requirements (COMPRECL-PT). All of the allocated compression plant goes to Dawn Station.
M&R Plant	Certain Dawn M&R plant is directly assigned to transmission. Most of the M&R plant that is assigned to the Dawn-Parkway system goes to Dawn Station (STORM&R). The Dawn M&R plant that is not directly assigned is allocated between storage and transmission based on forecasted deliveries and receipts into and from the Dawn-Parkway system, Dawn storage, and the Ojibway/St. Clair system (M&RRECL-PT). All of the allocated M&R plant goes to Dawn-Trafalgar Easterly.
Compression O&M	Allocated based on forecast annual compressor fuel requirements (COMPRECL-O&M). All of the compression O&M allocated to the Dawn-Parkway system goes to Dawn Station.
M&R O&M	Allocated based on forecasted deliveries and receipts at Dawn (M&RECL-O&M). This is the same allocation as is used for M&R plant. All of the allocated M&R O&M goes to Dawn-Trafalgar Easterly.

Union's functional separation of gross plant for the Dawn assets that are used for Dawn-Parkway system transportation is shown in Attachment 1.

Cost Allocation

Dawn Station costs are allocated to customer classes based on the estimated demand for Dawn compression, measured by the design day quantities that are estimated to be sourced from Dawn (the DAWNCOMP allocation factor). Dawn-Trafalgar Easterly costs are allocated to customer classes based on distance-weighted demands for transportation on the Dawn-

Parkway System (the DTTRANS allocation factor). The relative allocation of costs between in-franchise and ex-franchise (M12/C1) customers and the two Union market areas for the 2013 rate rebasing is shown in Table 1.

Table 1: Allocation Factors used for Dawn Station and Dawn-Trafalgar Easterly Costs

	DAWNCOMP	DTTRANS
Union South	17.44%	11.30%
Union North/East	4.63%	5.02%
M12/C1 Services	77.93%	83.68%
Total	100.00%	100.00%

Exhibits B9.7 and B9.10

Findings

This review of the 2013 rebasing cost study reveals two concerns. First, it is not clear how Union determines which Dawn costs are functionalized as Dawn Station and which costs are functionalized as Dawn-Trafalgar Easterly costs. For example, most of the Dawn M&R plant that is directly assigned to the Dawn-Parkway system goes to Dawn Station (see Attachment 1, line 7), but all of the MR costs that are allocated go to Dawn-Trafalgar Easterly (Attachment 1, line 8). Given the differences between the DAWNCOMP and DTTRANS allocation factors shown in Table 1, shifting costs between the Dawn Station and Dawn-Trafalgar Easterly functional cost categories can have a material effect on final rates.

Second, Union assumes different cost drivers for the same assets at the functionalization stage and the allocation stage. For example, Dawn compression O&M costs are allocated based on usage for functionalization purposes, but are allocated to customer classes based on design day demand. The use of very different allocation methodologies for the same costs appears to be inconsistent with cost causation principles.

RECOMMENDATIONS

These findings are the basis for the following recommendations:

1. **Functionalize Dawn compression costs as Dawn-Trafalgar Easterly costs, and Dawn M&R costs as Dawn Station costs.**

Dawn compression is required to transport gas on the Dawn-Parkway system and should therefore be treated the same as the compression facilities at Lobo and Bright for cost allocation purposes. The costs of the compressors at Lobo and Bright are included in the Dawn-Trafalgar Easterly cost category, and are allocated using distance-weighted demands.

Union explains that the distance-weighted demand methodology is appropriate because it recognizes that the Dawn-Parkway system is designed to meet easterly peak day requirements [Exhibit A, Tab 1, p. 20]. According to Union, the design of the Dawn-Parkway system is based on gas being compressed at Dawn up to the maximum operating pressure of the Dawn-Parkway system [Exhibit B9.4(d)]. Since Dawn compression is integral to the design and operation of the Dawn-Parkway system, these costs should be included in Dawn-Trafalgar Easterly costs and allocated to customer classes using the distance-weighted demand methodology

Union currently splits the Dawn M&R costs that are related to the Dawn-Parkway system between the Dawn-Trafalgar Easterly and Dawn Station functional cost categories. For the reasons discussed below with respect to the Kirkwall and Parkway M&R costs, these Dawn M&R costs should all be functionalized as Dawn Station and allocated on the basis of design demand.

2. Allocate Kirkwall and Parkway M&R costs based on demand, without a distance adjustment.

M&R facilities must be sized to meet the peak demand to flow gas through the facilities. There is no evidence that M&R plant or M&R operating and maintenance costs are affected by the distance gas is transported either upstream or downstream of the meter station.

Union's current methodology is inconsistent with cost causation. With the existing cost allocation, in-franchise distribution customers pay a portion of the costs of M&R facilities that are only needed to provide gas transportation services for ex-franchise customers, but pay all of the M&R costs on Union Gas delivery laterals and distribution lines. To avoid subsidization of ex-franchise services by in-franchise distribution customers, Union should directly assign the costs of M&R facilities that are only used to provide ex-franchise services, such as the Enbridge delivery facilities at Parkway and Lisgar, to the M12/C1 customer class, and allocate the costs of M&R facilities at Kirkwall and Parkway that are used by both ex-franchise and in-franchise customers based on demand.

Union's current methodology also under-allocates Kirkwall M&R costs to the Kirkwall to Parkway transportation service, even though Union incurred significant capital costs to modify Kirkwall Station to provide this service. With the distance-weighted cost allocation methodology, an additional GJ/day of Kirkwall to Parkway transportation service, which covers 40 km, receives an allocation of Kirkwall M&R costs that is less than one-fifth of the allocation that would go to an additional GJ/day of Dawn to Parkway transportation service, which covers 228

km, despite the fact that the Kirkwall to Parkway service uses the Kirkwall Station facilities and the Dawn to Parkway transportation service does not. A methodology that is based on the peak demand for the M&R facilities would better align cost allocation with cost causation.

Attachment 2 estimates how the first two recommendations would change the allocation of Dawn-Parkway system costs to customer classes. Note that these estimates are based on the numbers from Union's amended evidence in the 2013 rate rebasing proceeding, and do not include any new facilities or proposed changes in Parkway delivery obligations.

3. Create a reduced M12 rate for non-TCPL deliveries to reflect the avoided cost of Parkway compression.

Utility rates should give appropriate price signals to guide the demand for new infrastructure. Rates that are too low create the risk of uneconomic expansions and subsidization of new customers by existing users. Union currently charges the same M12/C1 rate for transportation to all Parkway delivery points, even though deliveries to Parkway(TCPL) require compression facilities that are not needed to deliver gas to Parkway(Consumers) or Lisgar points, which are located on the suction side of the Parkway compressors. Union should modify the rate design for M12/C1 services to take into account the additional costs of the compression facilities that are required to deliver gas into TCPL.

The Brantford-Kirkwall/Parkway D project illustrates the issue. According to Union, Enbridge has contracted for 400,000 GJ/day of additional M12 service from Dawn to Parkway, and has also changed the delivery point for 400,000 GJ/day of existing M12 service from the suction side of the Parkway compressors to the Parkway(TCPL) point on the discharge side of the Parkway compressors [EB-2013-0074 Application, Section 7, p. 12]. With Union's current rate design, shifting 400,000 GJ/day of existing service from Parkway(Consumers) to Parkway(TCPL) has no direct effect on Enbridge's costs, even though it caused the additional demand for Parkway(TCPL) capacity underpinning the need for the new Parkway D compressor to increase from 736,041 GJ/day to 1,136,041 GJ/day, or more than 50 percent.

One way to address this issue would be to reduce the M12/C1 rate for service to Parkway(Consumers) and Lisgar by an amount equal to the incremental cost of Parkway compression. Based on the costs of the Parkway D compressor project, the cost of moving Union's firm delivery obligations from the suction side to the discharge side of the Parkway compressors is estimated to be $0.025 per GJ, or about 30 percent of the current Dawn to Parkway rate (Table 2).

Table 2: Estimated Unit Cost of Parkway Compression

		Units	Quantity	Reference
1	Parkway D Capital Cost	$	108,200,000	EB-2013-0074, Schedule 9-2
2	Revenue Requirement	$	10,261,900	Estimate (Row 1 x 9.5%)
3	Parkway(TCPL) Demand	GJ/day	1,136,041	EB-2013-0074
4	Unit Cost	$/GJ	0.025	Row 2 ÷ Row 3 ÷ 365

A 10 percent rate discount for M12/C1 service to non-TCPL Parkway points would provide a meaningful incentive to avoid unnecessary shifting of contract demands from Parkway(Consumers) to Parkway(TCPL), but would limit the impact of the rate design change on other M12/C1 rates. The estimated impact of implementing a 10 percent rate reduction for non-TCPL M12/C1 transportation services is shown in Table 3.

Table 3: Estimated Impact of a 10 Percent Discount for Non-TCPL M12/C1 Service

	Service	2013 Tolls ($/GJ/Day)	Adjusted Tolls ($/GJ/Day)
1	Dawn-Parkway (TCPL)	0.078	0.082
2	Dawn-Parkway (Non-TCPL)	0.078	0.074
3	Dawn-Kirkwall	0.066	0.063
4	Kirkwall-Parkway (TCPL)	0.012	0.013

The same non-TCPL M12 rate should also be offered to Union in-franchise customers who elect the Billing Contract Demand (BCD) option. The BCD option is available to new large customers that are served by a dedicated lateral from the Dawn-Parkway system in the vicinity of Parkway. BCD customers pay a monthly demand charge that only recovers the cost of the dedicated lateral, and pay a higher variable charge for daily deliveries that exceed the BCD.

Union currently has one BCD customer [Exhibit B7.6]. This customer holds M12 service from Dawn to Parkway, even though the customer only uses the Dawn-Parkway system from Dawn to the head of the customer's delivery lateral. A non-TCPL M12 service would align the rate paid for transportation from Dawn with BCD customer's actual use of the Dawn-Parkway system, and would also eliminate the "phantom" demand for Parkway compression that is currently created by requiring the BCD customer to contract for standard Dawn to Parkway M12 service.

4. Review the allocation of compression O&M costs and Parkway compression plant at the next rate rebasing.

Two additional issues should be addressed at the next rate rebasing. First, Union should consider allocating all transmission compressor O&M costs based on projected usage, as Union now does when functionalizing Dawn compression costs. Second, Union should prepare or sponsor a study of the alternatives for allocating Parkway Station compression plant. Given that Union is expected to more than double the amount of compression horsepower at Parkway by the end of 2015, and additional expansions of the Dawn-Parkway system have been proposed, a comprehensive review of this issue is warranted.

Attachment 1
FUNCTIONALIZATION OF DAWN-PARKWAY TRANSMISSION PLANT AT DAWN
($000)

			Account Total	Factor	Dawn Station	Dawn-Trafalgar Easterly	Dawn-Parkway System Total
			(a)	(b)	(c)	(d)	(e)
1	Land	Assigned	812	STORLAND	-	-	-
2		Allocated	3,003	COMPRECL-PT	1,260	-	1,260
3		Total	3,814		1,260	-	1,260
4	Compression	Assigned	46,619	STORCOMP	27,113	2,989	30,102
5		Allocated	193,420	COMPRECL-PT	81,197	-	81,197
6		Total	240,038		108,310	2,989	111,299
7	M&R	Assigned	38,086	STORM&R	15,401	3,312	18,713
8		Allocated	17,769	M&RRECL-PT	-	13,240	13,240
9		Total	55,855		15,401	16,552	31,953
10	Structures	Assigned	13,961	STORS&I	10,641	655	11,296
11		Allocated	34,882	COMPRECL-PT	14,644	-	14,644
12		Total	48,843		25,285	655	25,940
13	TOTAL				150,256	20,195	170,452

Attachment 2
ESTIMATED CHANGES TO DAWN-PARKWAY SYSTEM COST ALLOCATION
($000)

		2013 Revenue Requirement EB-2011-0210 (2012-07-13 Update)			Move Dawn Compression Costs to Dawn-Trafalgar Easterly and Allocate Dawn-Parkway System M&R Costs Based on Peak Demand				
		Dawn Station	Dawn-Trafalgar Easterly	Dawn-Pkwy System	Dawn Station	Dawn-Trafalgar Easterly	Kirkwall & Parkway M&R	Dawn-Pkwy System	Change
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1	Union South	3,467	16,961	20,428	516	18,579	34	19,129	(1,299)
2	M1	1,758	8,601	10,359	262	9,422	17	9,701	(658)
3	M2	591	2,894	3,485	88	3,170	6	3,264	(221)
4	M4	172	841	1,013	26	921	2	949	(64)
5	M5	2	8	10	0	9	-	9	(1)
6	M7	79	388	467	12	425	1	438	(29)
7	M9	28	139	167	4	152	0	157	(10)
8	M10	1	4	5	0	4	-	5	(1)
9	T1	636	3,110	3,746	95	3,407	6	3,508	(239)
10	T3	200	976	1,176	30	1,069	2	1,101	(75)
11	Union North/East	921	7,528	8,449	137	8,246	-	8,383	(66)
12	R1	688	5,621	6,309	102	6,157	-	6,260	(49)
13	R10	182	1,488	1,670	27	1,630	-	1,657	(13)
14	R20	48	392	440	7	429		437	(4)
15	R100	3	27	30	0	30	-	30	-
16	M12	16,048	126,304	142,352	2,388	138,355	2,973	143,716	1,364
17	Total	20,436	150,793	171,229	3,041	165,181	3,007	171,229	-

JOHN A. ROSENKRANZ

56 Washington Drive
Acton, MA 01720
(617) 755-3622
jrosenkranz@verizon.net

PROFESSIONAL EXPERIENCE

North Side Energy, LLC, Acton, MA 2006 – Present
PRINCIPAL

Recent Projects:

- Consultant to the Maine Public Advocate Office and New Jersey Rate Counsel for cost of gas review proceedings and other natural gas-related matters.
- Developed long-term natural gas avoided cost estimates for a consortium of New England utilities and state efficiency program administrators.
- Advisor to the Ontario Power Authority on natural gas supply issues affecting power generators.

Calpine Corporation, Boston, MA 2000 – 2006
DIRECTOR, GAS ORIGINATION

Developed and implemented fuel supply plans for gas-fired power plants in the Northeast U.S. and Eastern Canada. Negotiated and managed contracts with natural gas suppliers and transporters.

- 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 1997 – 1999
DIRECTOR, BUSINESS DEVELOPMENT

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

- Project manager for a geologic testing program at a potential natural gas storage site.
- Owner representative and management committee member for the Iroquois Gas Transmission and Portland Natural Gas Transmission partnerships.

J. Makowski Co. (acquired by U.S. Generating Company), Boston, MA 1992 – 1997
MANAGER, PROJECT DEVELOPMENT
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

Union Gas Limited (OEB Case No. EB-2011-0210), July 2012. Evidence on transmission and storage cost allocation in Union's 2013 rate case, on behalf of consumer intervenors.

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 appropriate 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 for power generation, 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 for power generation, 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