

12 months  terms

[illegible]

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Northern Utilities, Inc - New Hampshire Division
National Gypsum Company
Marginal Cost / Revenue Analysis

REDACTED
ATTACHMENT 2

Line Description

Notes

1 Marginal Cost

2 Customer Charge

3 Pressure Support

4 Main Reinforcement

5 Main Extension

6

7 Customer Data

8 Annual Usage

9 Design Day - Actual Peak Day

10

11 Marginal Revenue Requirement

12 Customer

13 Pressure Support

14 Main Reinforcement

15 Main Extension

16 Total

17

18 Marginal Cost Floor - All Components

19 Revenue Requirement

20 Customer Charge

21 Remaining Revenue

22 Volumetric Charge

23

24 Marginal Revenue

25 Customer Bills Annual

26 Customer Charge

27 Volumetric Charge

28

29 Marginal Revenue Above Marginal Cost



per month
per design day Dth
per design day Dth
per design day Dth

Dth
Dth

per month
per Dth
per month
per Dth

From DG 13-86
Marginal Cost Study
Escalated to November 2016
Price Level

Billed Usage Sep 15 - Aug 16
Customer contract MDTQ

line 2 * 12 months
line 3 * line 9
line 4 * line 9
line 5 * line 9
sum (line 12 to 15)

line 16
line 2
line 19 - line 12
line 21 / line 8

From Attachment 1
Escalated to November 2016
Price Level

line 27 - line 19

National Gypsum Special Contract
Northern Utilities, Inc. Marginal Cost Estimate template

Escalating Marginal Costs using GDPLEV from Bureau of Economic Analysis data:

- 1) Go to -> <http://www.bea.gov/national/index.htm#gdp> web page;
- 2) Click on the link for *Current-Dollar* and *"Real" Gross Domestic Product*;
- 3) Update annual GDP "current dollars" and "chained 2005 dollars" data in the table below;
- 4) Forward year GDP estimates use EIA Energy Outlook projections (1.9% in early release overview report, Table 20);
 Go to -> <http://www.eia.doe.gov/total/aeo/index.html> web page;
- 5) Update prior to start of each contract year.

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Adjustment escalators to Marginal Costs

	GDP in billions of current dollars	GDP in billions of chained 2009 dollars	% of Chained 2009	GDP-IPD	Marginal Cost Study Escalation Factor Calculation
1993	6,878.7	9,521.0			
1994	7,308.8	9,905.4	0.687	0.7379	
1995	7,864.1	10,174.8	0.7057	0.7532	
1996	8,100.2	10,561.0	0.7325	0.7670	
1997	8,608.5	11,034.9	0.7653	0.7801	
1998	9,089.2	11,525.9	0.7994	0.7886	
1999	9,660.6	12,065.9	0.8368	0.8007	
2000	10,284.8	12,559.7	0.8711	0.8189	
2001	10,621.8	12,682.2	0.8796	0.8375	
2002	10,977.5	12,908.8	0.8953	0.8504	
2003	11,510.7	13,271.1	0.9204	0.8674	
2004	12,274.9	13,773.5	0.9553	0.8912	
2005	13,093.7	14,234.2	0.9872	0.9199	
2006	13,855.9	14,613.8	1.0135	0.9481	
2007	14,477.6	14,873.7	1.0316	0.9734	
2008	14,718.6	14,830.4	1.0286	0.9925	
2009	14,418.7	14,418.7	1.0000	1.0000	
2010	14,964.4	14,783.8	1.0253	1.0122	
2011	15,517.9	15,020.6	1.0417	1.0331	
2012	16,155.3	15,354.6	1.0649	1.0521	
2013	16,691.5	15,612.2	1.0828	1.0691	
2014	17,393.1	15,982.3	1.1084	1.0883	
2015	18,036.6	16,397.2	1.1372	1.1000	
2016	18,536.9	16,612.4	1.1521	1.1158	
2017				1.1420	

Calculation of Escalation Factor ->

Marginal Cost Estimate

A	B	C	D	E	F	G	H
		2012 Compliance Filing MCS	2012 Compliance Filing MCS Adj. (Table 14)	2016 Est			Notes
1	Escalation Factor						
2	Marginal Cost Data						
3	Customer Charge	\$255.81	\$208.31				E3 x F1
4	Pressure Support	\$0.00	\$0.00				E4 x F1
5	Main Reinforcement	\$81.10	\$65.41				E5 x F1
6	Main Extension	\$176.50	\$142.35				E6 x F1
7	Adjusted MCS (Table 14)	-19.35%	(Col. D x D7)				
8							
9	Customer Data						
10	Annual Usage						2016 Annual Usage
11	Design Day Usage						Customer MDTQ
12							
13	Marginal Revenue Requirement						
14	Customer Charge						F3 x 12
15	Pressure Support						F4 x F11
16	Main Reinforcement						F5 x F11
17	Main Extension						F6 x F11
18	Total						Sum(F14..F17)
19							
20	Marginal Cost Floor - All Components						
21	Revenue Requirement						F18
22	Customer Charge						F3 x 12
23	Remaining Revenue						F21 - F22
24	Volumetric Charge						F23 / F10

Note:

All marginal costs adjusted for revenue constraints from Table 14 in Compliance Filing MCS @12/31/2012
 Customer Charge from Table - 11 in Compliance Filing MCS @12/31/2012
 Main Reinforcement Cost from Table - 9 in Compliance Filing MCS @12/31/2012
 Main Extension Cost from Table - 9 in Compliance Filing MCS @12/31/2012
 2017 GDP Chain-type Price Index from EIA Annual Energy Outlook 2016

10/14/2016

Attachment PMN-2G-2
Table-9
Page 1 of 1

Table - 9
Northern Utilities- New Hampshire
Marginal Cost Study (Compliance)
Summary of Marginal Capacity Costs

Line No.	Description		TRANS & DIST		
			Mains Reinforce	Mains Extension	Total Dist
			(3)	(4)	(5)
	PLANT INVESTMENT				
1	Long-Run Unit Costs - \$/Design Day Therms	(1)	\$85.77	\$139.56	\$225.33
2	General Plant Loading Factor		4.44%	4.44%	
3	Unit Costs + Loading Factor	(1)+(1)*(2)	89.57	145.75	\$235.32
4					
5	Fixed Charge Rate		8.36%	8.36%	
6	A & G Exp Plant-Related Loading Factor		0.28%	0.28%	
7	Total Rate	(5)+(6)	8.64%	8.64%	
8					
9	Annualized Cost	(3)*(7)	\$7.74	\$12.59	\$20.33
10					
11	OPERATING EXPENSES				
12					
13	Distribution capacity costs	(2)	\$0.00	\$2.63	\$2.63
14	A&G Exp Non-Plant Loading Factor		64.36%	64.36%	
15	Total O&M Expense	[(12)+(13)]*[1+(14)]	\$0.00	\$4.32	\$4.32
16					
17	WORKING CAPITAL				
18	Materials & Supplies + Prepayments Rate	(3)	1.38%	1.38%	
19	M&S Cost	(3)*(18)	1.23	2.01	\$3.24
20	Working Cash O&M Allowance	(4) [(9)+(15)]*1.26%	0.10	0.21	\$0.31
21	Total Working Capital	(19)+(20)	\$1.33	\$2.22	\$3.55
22					
23	Working Capital Rev. Req'd (5) (21)*10.51%		\$0.14	\$0.23	\$0.37
24					
25	System Seasonal Capacity Related Cost				
26	\$/Design Day Therms	(9)+(15)+(23)	\$7.88	\$17.15	\$25.02
27					
28	Loss Factor	(6)	0.006	0.006	0.006
29	Inflation Adjustment	(7)	2.27%	2.27%	2.27%
30					
31	Seasonal Capacity Cost	(26)/[1-(28)]* [1+(29)]	\$8.11	\$17.65	\$25.75

NOTES:

- Source: Table - 2, page 2.
- Source: Table - 5, page 1.
- Source: Table - 7, page 2.
- Working cash computed on the basis of 5 days.
- Revenue requirement for working cash computed as the after tax cost of capital, i.e. debt costs plus equity costs increased by taxes equals 10.51%.
- Provided by NU Losses Analysis.
- Inflation adjustment to restate marginal costs to rate year dollars.
(1+0.137)^((10/31/2014-12/31/2012)/365)-1

Table - 11
Northern Utilities- New Hampshire
Marginal Cost Study (Compliance)

Summary of Marginal Customer Costs

Line No.	Description	Residential		Small C&I		Medium C&I		Large C&I	
		ResNonH&L R-6&R-11	ResH&L R-5&R-10	SmH&W G-40	SmLoW G-50	MedH&W G-41	MedLoW G-51	LgH&W G-42	LgLoW G-52
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PLANT INVESTMENT									
1	Meters and Regulators (1)	\$453.71	\$453.71	\$602.82	\$602.82	\$2,917.56	\$2,917.56	\$9,764.83	\$9,764.83
2	General Plant Loading Factor (2)	4.44%	4.44%	4.44%	4.44%	4.44%	4.44%	4.44%	4.44%
3	Unit Costs + Loading Factor (1)+(2)*(1)	473.84	473.84	629.56	629.56	3,046.98	3,046.98	10,197.98	10,197.98
4	Fixed Charge Rate (3)	9.79%	9.79%	9.79%	9.79%	9.79%	9.79%	9.79%	9.79%
5	Meters Carrying Costs (3)*(4)	46.38	46.38	61.62	61.62	298.24	298.24	998.18	998.18
6	Services (1)	3,573.95	3,573.95	4,292.70	4,292.70	7,930.10	7,930.10	12,394.87	12,394.87
7	General Plant Loading Factor (2)	4.44%	4.44%	4.44%	4.44%	4.44%	4.44%	4.44%	4.44%
8	Unit Costs + Loading Factor (6)+(7)*(7)	3,732.48	3,732.48	4,483.11	4,483.11	8,281.87	8,281.87	12,944.69	12,944.69
9	Fixed Charge Rate (3)	8.28%	8.28%	8.28%	8.28%	8.28%	8.28%	8.28%	8.28%
10	Services Carrying Costs (8)*(9)	309.04	309.04	371.19	371.19	685.72	685.72	1,071.78	1,071.78
11									
12	Total Plant Carrying Costs (5)+(10)	\$355.42	\$355.42	\$432.81	\$432.81	\$983.95	\$983.95	\$2,069.96	\$2,069.96
13									
14	A & G Exp Plant-Related Loading Factor (4)	0.28%	0.28%	0.28%	0.28%	0.28%	0.28%	0.28%	0.28%
15									
16	Annualized Cost (100%+(14%)*(12)	\$356.41	\$356.41	\$434.02	\$434.02	\$986.70	\$986.70	\$2,075.75	\$2,075.75
17									
18									
OPERATING EXPENSES									
19									
20	Plant Related O&M \$/Customer (5)	\$58.51	\$58.51	\$71.12	\$71.12	\$157.59	\$157.59	\$321.94	\$321.94
21	Customer Assoc & Mktg Expenses (6)	\$39.88	\$39.93	\$53.53	\$55.76	\$104.95	\$107.43	\$161.76	\$218.71
22	A&G Exp Non-Plant Loading Factor (4)	64.36%	64.36%	64.36%	64.36%	64.36%	64.36%	64.36%	64.36%
23	Total O&M Expense (20+21+(20+21)*22)	\$161.72	\$161.80	\$204.88	\$208.54	\$431.53	\$435.60	\$795.02	\$888.62
24									
WORKING CAPITAL - \$/Customer									
25									
26	Materials & Supplies + Prepayments Rate (3)	1.38%	1.38%	1.38%	1.38%	1.38%	1.38%	1.38%	1.38%
27	M&S Cost ((3)+(8))* (26)	\$7.89	\$7.89	\$0.36	\$0.36	\$55.90	\$55.90	\$18.48	\$18.48
28	Working Cash O&M Allowance (7) [(16)+(23)]*1.26%	6.50	6.51	8.02	8.07	17.80	17.85	36.04	37.21
29	Total Working Capital (27)+(28)	\$64.39	\$64.39	\$78.38	\$78.43	\$173.71	\$173.76	\$354.52	\$355.70
30	(8)								
31	Working Capital Rev. Requirement (29)* 10.51%	\$6.77	\$6.77	\$8.24	\$8.24	\$18.26	\$18.26	\$37.26	\$37.39
32									
33	Annual Customer Related Cost \$/Customer (16)+(23)+(31)	\$524.90	\$524.98	\$647.13	\$650.81	\$1,436.49	\$1,440.57	\$2,908.02	\$3,001.75
34									
35	Inflation Adjustment (9)	2.27%	2.27%	2.27%	2.27%	2.27%	2.27%	2.27%	2.27%
36									
37	Annual Customer Related Cost (33)*(1+(35))	\$536.73	\$536.88	\$661.80	\$665.55	\$1,469.04	\$1,473.21	\$2,973.92	\$3,068.77

NOTES:

- 1 Meter Investment from Table - 3, Page 1.
- 2 Source: Table - 7, page 2.
- 3 Source: Table - 8, page 1.
- 4 Source: Table - 7, page 1.
- 5 Source: Table - 6, page 2.
- 6 Source: Table - 6, page 4.
- 7 Working cash computed on the basis of 4.58 days net lag.
- 8 Revenue requirement for working cash computed as tax rate divided by 1 minus tax rate multiplied by the cost of equity all added to the cost of capital.
- 9 Source: Price escalation to mid-point of rate year.

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Table - 14
Northern Utilities- New Hampshire
Marginal Cost Study (Compliance)

Derivation of Marginal Prices Equi-Proportionately Constrained by Embedded Costs

Line No.	Description	Residential		Small C&I		Medium C&I		Large C&I		Total Company
		ResNonHt&LI R-6&R-11	ResHt&LI R-5&R-10	SmHtW G-40	SmLoW G-50	MdHIW G-41	MdLoW G-51	LgHIW G-42	LgLoW G-52	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	Estimated Delivery Revenue Req'm'ts									\$25,594,330
2	Total Marginal Annual Revenue Requirements									31,734,259
3	Difference									(6,139,930)
4	% Difference									-19.35%
5	Equi-proportional Adjustment									(6,139,930)
6	Marginal Cost Constrained to Allowed Revenues									25,594,330
7										
8	Marginal Unit Prices	Unit Costs from								
9	Customer	Table 14 X								
10		[1+ (4)]								
11	WINTER CHARGES									
12	Winter Supply Capacity Cost	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	
13	Winter Delivery Pressure Support	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	
14	Winter Delivery Reinforcements	\$0.0763	\$0.0880	\$0.0924	\$0.0704	\$0.0880	\$0.0580	\$0.0744	\$0.0512	
15	Winter Delivery Main Ext.	\$0.1660	\$0.1915	\$0.2012	\$0.1533	\$0.1917	\$0.1262	\$0.1618	\$0.1114	
16	Winter Supply Commodity	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	
17		\$0.2422	\$0.2794	\$0.2936	\$0.2237	\$0.2797	\$0.1842	\$0.2362	\$0.1626	
18										
19	SUMMER CHARGES									
20	Supply Demand Charge	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	
21	Delivery Demand Charge	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	
22	Commodity Charge \$'s per Therms	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	
23		\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	
24	TOTAL CHARGES									
25	Supply Costs									
26	Customer	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
27	Winter, \$/Therm	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	
28	Summer, \$/Therm	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	
29	Annual Avg. \$/Therm	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	
30										
31										
32	Delivery									
33	Customer Charges	\$37.04	\$37.39	\$45.86	\$46.19	\$101.35	\$101.97	\$201.95	\$206.50	
34	Winter, \$/Therm	\$0.2422	\$0.2794	\$0.2936	\$0.2237	\$0.2797	\$0.1842	\$0.2362	\$0.1626	
35	Summer, \$/Therm	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	
36	Annual Avg. \$/Therm	\$0.1686	\$0.2288	\$0.2522	\$0.1364	\$0.2282	\$0.1105	\$0.1671	\$0.1058	
37	or									
38	Facilities Charge, \$/Month	(6) / Annual bills \$ 40.38	\$ 51.46	\$ 86.74	\$ 72.91	\$ 478.40	\$ 262.26	\$ 2,602.03	\$ 3,988.01	

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ATTACHMENT 5
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Schedule NU-1-2
Page 1 of 9

SPECIAL FIRM TRANSPORTATION AGREEMENT

This Agreement is made and entered into as of this 2nd day of August 1997, by and between Northern Utilities, Inc., a New Hampshire corporation, with headquarters at 300 Friberg Parkway, Westborough, Massachusetts (hereafter called "Northern" or "Company"), and National Gypsum Company with offices at 2001 Rexford Road, Charlotte, NC 28211 (hereafter called "National" or "Customer"), pursuant to the following recitals and representations:

RECITALS

Whereas, Customer desires Northern to transport on a firm basis such volumes of gas procured by Customer from a supplier (hereafter called "Customer's Supplier") for use at Customer's facility located at 1 Succo Drive, Portsmouth, NH (hereafter called "Point of Delivery" or "National Facility"); and

Whereas Northern, subject to the Company's General Terms and Conditions, Transportation Terms and Conditions, and the conditions, limitations and provisions hereof, is willing to transport and deliver to Customer on a firm basis such volumes of third party gas delivered by Granite State Gas Transmission, Inc. (hereafter called "Customer's Transporting Pipeline") to Northern's distribution facilities located at Newington, NH (hereafter called "Point of Receipt"); and

Whereas, Customer has agreed to make minimum payments to Northern during the term of this Agreement; and

Whereas, the parties acknowledge that this Agreement is subject to the prior approval of the New Hampshire Public Utilities Commission ("PUC"); and

Whereas, the parties acknowledge that the Company shall complete distribution system upgrades in order to provide firm service hereunder and that such upgrades shall be undertaken solely in reliance upon Customer's request for service hereunder.

Now, Therefore, in consideration of the premises and mutual covenants contained herein the receipt and sufficiency of which is hereby acknowledged, Northern and Customer agree as follows:

ARTICLE 1: MAXIMUM DAILY TRANSPORTATION QUANTITY

Northern shall be obligated to transport and deliver to Customer from the Point of Receipt to the Point of Delivery during any Gas Day up to a Maximum Daily Transportation Quantity of [REDACTED] therms.

ARTICLE 2: DAILY DELIVERY SERVICE

The Customer elects Daily Delivery Quantities of [REDACTED] therms for the purpose of managing Daily Imbalances.

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ARTICLE 3: RATES AND CHARGES

The special rates and charges for Northern's Firm Transportation Service provided hereunder are set out below. In addition to such rates and charges, Customer shall be subject to all charges and fees set out in the Company's General Terms and Conditions and Transportation Terms and Conditions, as such terms and conditions are in effect from time to time. Customer's payment obligations hereunder shall commence as of the Service Commencement Date, as that term is defined in Article 5.

- Monthly Customer Charge (initial): [REDACTED]
- Special Firm Transportation Rate (initial): [REDACTED] per therm for all volumes delivered to Point of Delivery

In each and every contract year during the initial term or any continuation period (or part thereof) of this Agreement, the Customer shall use and/or pay Northern for transportation services for a minimum of [REDACTED] terms of natural gas, the Minimum Annual Payment Obligation [REDACTED] based upon initial transportation rate, this dollar value will change with application of inflation escalator). In the event Customer fails to meet such annual minimum, the Customer, when billed by the Company, shall pay the Minimum Annual Payment Obligation to the Company based upon the special transportation rate then in effect. The Minimum Annual Payment Obligation shall be calculated by multiplying the difference between [REDACTED] and the actual volume of gas transported during a contract year times the then effective Special Transportation Rate. No refund or credit shall be due Customer for any contract year where it has transported more than the [REDACTED] of natural gas. The provisions of Article 7 hereof will govern the determination of amounts due upon termination of this Agreement. This Article 3 shall be interpreted so as not to double count any amounts due under Article 7 hereof.

Example of Minimum Annual Payment Obligation Calculation:

During each contract year of the Agreement
Customer minimum annual requirement [REDACTED] terms
Actual gas usage during particular contract year [REDACTED] terms (Assumption)
Then current transportation rate [REDACTED] (Assumption)

Required Minimum Annual Payment Obligation Payment
[REDACTED]

For illustrative purposes

Upon completion of the initial term of this Agreement (as defined in Article 4), the Company will determine the cumulative average of gas usage over the initial term. The Customer shall have used and/or paid Northern for transportation services for an annual cumulative average of [REDACTED] terms per year during the initial term of the

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ATTACHMENT 3
Page 3 of 13

Schedule NU-1-2
Page 3 of 9

Agreement. In the event the Customer fails to meet such cumulative average, the Customer, upon presentment of an invoice by the Company, shall pay the "Cumulative Transportation Shortfall Payments" based on the special transportation rate in effect at the close of the initial term. Such shortfall payment shall be calculated by multiplying the difference between [REDACTED] terms and the actual volume of gas transported from the Service Commencement Date times the then effective Special Transportation Rate. No refund or credit shall be due Customer where it has transported more than the [REDACTED] term cumulative requirement hereunder. The provisions of Article 7 hereof will govern the determination of amounts due upon termination of this Agreement. This Article 3 shall be interpreted so as not to double count any amount due under Article 7 hereof.

Example of Cumulative Transportation Shortfall Payment Calculation:

At completion of Initial Term of Agreement - 10 years
Customer cumulative requirement [REDACTED] terms
Actual gas usage over ten year period - [REDACTED] terms
Transportation rate at completion of initial term [REDACTED] (Assumption)

Required Cumulative Transportation Shortfall Payment:

For Illustrative purposes

Either party shall have the right, at its own expense, upon reasonable notice and at reasonable times, to examine the books and records of the other party to the extent reasonably necessary to verify the accuracy of any representation, statement, charge, payment, or computation made under this Agreement. This examination right shall not be available with respect to proprietary information not directly relevant to this Agreement.

The Parties agree that Northern may apply an annual inflation adjustment to the Special Rate and Customer Charge each year beyond the second year of this Agreement and any extension hereof. For example, if the Service Commencement Date occurs in 1999, the first annual CPI-U inflation adjustment shall take place in year 2001. Such adjustment to the initial Special Rate and Customer Charge shall be based upon changes in the "Consumer Price Index for Urban Consumers, U.S. City Average, All items, 1982-84 = 100" published monthly by the Bureau of Labor Statistics of the United States Department of Labor ("CPI-U"). For purposes of this Agreement, the CPI-U is the national index unadjusted for seasonal fluctuations.

Immediately following the second anniversary of the Service Commencement Date and annually thereafter, the Special Rate and the Customer Charge due and payable with respect to the next twelve (12)-month period ("contract year") shall be recalculated by multiplying the then effective Special Rate and Customer Charge by a fraction, the numerator of which shall be the CPI-U for the month of the Service Commencement Date for the then current year, and the denominator of which shall be the CPI-U for the month of the Service Commencement Date for

Schedule NU-1-2
Page 4 of 9

the previous year. However, in no event shall fluctuations in the CPI-U reduce the Special Rate or Customer Charge below the then current Special Rate or Customer Charge. The Special Rate will be recalculated and rounded to the fourth decimal point.

Example of CPI-U Adjustment Calculation:

(For illustrative purposes only- text of Agreement shall control actual calculation of CPI-U adjustment) (Assuming Service Commencement Date in August).

Then effective Special Rate and Customer Charge	X	$\frac{\text{CPI-U for August of Current Year}}{\text{CPI-U for August of previous contract year}}$
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If the CPI-U is no longer published, a comparable index mutually and reasonably agreeable to the parties shall be used or in the event such index ceases to use the 1982-84 average of 100 as the basis of calculation, or if a substantial change is made in the terms or number of items contained in such index, any CPI-U adjustment hereunder shall be modified in order to achieve the inflation adjustments originally intended by the parties hereunder.

ARTICLE 4: TERM

This Agreement shall continue in full force and effect for an initial term of ten (10) years from the Service Commencement Date. This Agreement shall further continue thereafter for successive one-year periods, unless terminated by the Customer or the Company with at least six (6) months written notice to the other party prior to end of the initial term or any applicable renewal period. Such written notice to terminate shall be addressed to (i) Northern at the address noted below, and (ii) the Customer at the National Facility, and mailed by U.S. certified mail, return receipt requested, first class postage pre-paid, or sent by nationally recognized delivery service (e.g. FedEx, UPS, etc.), and must be received by the other party no later than six (6) months prior to the end of the initial term or any applicable continuation period. Notices to the Company must be addressed to Northern Utilities, Inc., c/o Bay State Gas Company, 300 Friberg Parkway, Westborough, MA 01581, Attention: Director of Pricing Services with a copy to Northern Utilities, Inc., 325 West Road, Portsmouth, NH 03801 Attention: Michael Smith.

ARTICLE 5: EFFECTIVE DATE/COMMENCEMENT OF SERVICE

This Agreement shall become effective on the date first written above; provided, however, that Northern shall be under no obligation to render service to Customer hereunder, and Customer shall have no payment obligations hereunder, until the PUC shall have issued a final and non-appealable order approving this Agreement in form and substance acceptable to Northern and National, each in its sole discretion. Northern and the Customer agree to cooperate to obtain such an order as soon as practicable after the date hereof.

Northern's obligation to provide the transportation services contemplated hereby and Customer's obligation to take and pay for such services shall commence upon completion of the necessary distribution upgrade required to supply firm service hereunder; provided, however, if

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Customer is in Material Default or otherwise breaches its obligations hereunder prior to the Service Commencement Date, the Company shall be entitled to the remedies provided for in Article 6 hereof. (The required upgrade consists primarily of replacement of 2,350 feet of 4-inch main with 8-inch main). Service to be provided hereunder shall commence upon the first Calendar Day of the first full month following the PUC's approval hereof and each party's acceptance of same, as set out above and Northern's completion of required upgrades, (the "Service Commencement Date").

ARTICLE 6: MATERIAL DEFAULT

THE FOLLOWING CONSTITUTE EVENTS OF MATERIAL DEFAULT:

(a) Where Customer (i) files for or becomes subject to a proceeding under federal or state bankruptcy or insolvency law seeking liquidation or reorganization, or the readjustment of indebtedness (unless such proceeding shall be dismissed within sixty (60) days from the date it is instituted); (ii) makes an assignment for the benefit of creditors, becomes insolvent, or is unable to pay its debts generally as they become due; (iii) consents to the appointment of any receiver, administrator, liquidator or trustee or its property or any receiver, administrator, liquidator or trustee shall be appointed for all or any part of the property of Customer; or (iv) takes any action for the purpose of effecting any of the foregoing. (b) Where the National Facility is taken by exercise of the right of eminent domain or its equivalent by any person or entity. In any proceeding to determine the condemnation award shall introduce this Agreement as evidence of Customer's damages. (c) Where Customer conveys, loses or relinquishes its right to own or operate or occupy the National Facility to any person. (d) Where Customer abandons ownership, occupancy or operation of the National Facility. (e) Where Customer fails to make all reasonable efforts to restore the National Facility to full or substantially full operating condition following any casualty loss or any other disturbance to operations and such failure continues for at least sixty (60) days. (f) Where Customer transfers ownership, occupancy rights or operational control of the National Facility, to any person or entity. (g) Where Customer fails to perform or advises Company in advance that it shall not perform an obligation under this Agreement including, but not limited to, pay any amount due hereunder.

The Customer shall provide written notice of the occurrence of any event of Material Default immediately upon its initiation or learning of the occurrence of such event; such notice shall be given even if the event of Material Default can be cured or mitigated as described herein.

ARTICLE 7: TERMINATION/ACCELERATION

In addition to, and independent of, the parties' rights specifically provided for elsewhere in this Agreement, in the event of the occurrence of a Material Default, the Company shall have the right, but not the obligation, to terminate this Agreement upon prior written notice to the Customer. Further, in the event of Customer's Material Default as a result of which Northern terminates this Agreement, all amounts (past, current and future) due hereunder, including, but not limited to, all costs associated with the distribution system upgrade (when such termination occurs prior to the Service Commencement Date), all Cumulative Transportation Shortfall Payments and/or Minimum Annual Payment Obligations, which would have been due during the remaining term of this Agreement, shall become immediately due and payable to Northern. Any termination of this Agreement and/or acceleration of amounts due hereunder by Northern

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pursuant to this Article 7 shall not limit Northern's rights or ability to claim or obtain any other remedies it may have under this Agreement or at law or in equity including without limitation, injunctive relief and specific performance.

Example of Early Termination Calculation-Termination during initial term:	
A.	
Initial Term of Agreement - 10 years	
Agreement terminated during year 8 (Assumption)	
Customer cumulative requirement	
Actual gas usage over eight year period	
Transportation rate at termination	
Required Cumulative Transportation Shortfall Payment:	
B.	
Initial Term of Agreement - 10 years	
Agreement terminated during year 8 (Assumption)	
Customer cumulative requirement	
Actual gas usage over eight year period	
Transportation rate at termination	
Required Cumulative Transportation Shortfall Payment:	
For Illustrative purposes	

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Example of Termination Calculation subsequent to initial term:

A.

Contract Year 11

Agreement terminated during contract year 11

Customer minimum annual requirement

Actual gas usage during contract year 11 through termination

(Assumption)

Transportation rate at termination

Required Minimum Annual Payment Obligation:

B.

Contract Year 11

Agreement terminated during contract year 11

Customer minimum annual requirement

Actual gas usage during contract year 11 through termination

(Assumption)

Transportation rate at termination

Required Minimum Annual Payment Obligation:

For illustrative purposes

ARTICLE 8: LIMITATION OF LIABILITY

The Company shall be excused from performing and shall not be liable in damages or otherwise if and to the extent that it shall be unable to do so or prevented from doing so: by law or regulation or tariff or by action or inaction or restraint of any court or public authority having or purporting to have jurisdiction; or by loss, diminution or impairment of gas supply from its suppliers or the systems of others with which it is interconnected; or by a break or fault in its distribution system; or failure or improper operation of equipment necessary for gas distribution; or failure of any supplier to perform; or by reason of storm, flood, fire, earthquake, unusual and severe weather condition, explosion, civil disturbance, labor dispute, act of God or public enemy; or any other cause, whether or not similar thereto; except, to the extent that any such failure to perform or cause is the result of the Company's willful default. The Company's failure to settle or prevent labor disputes shall not constitute willful default.

In no event shall the Company be liable to Customer or any third party for any consequential, indirect, punitive or special damages or lost profits, whether arising in tort, contract or otherwise, by reason of any services performed, or undertaken to be performed, under this Agreement or in accordance with or required by tariff, law or regulation.

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ARTICLE 9: PUBLIC REGULATION

This Agreement and National and the Company shall be subject to Northern's General Terms and Conditions and Transportation Terms and Conditions as same are in effect from time to time and on file with the New Hampshire Public Utilities Commission. Such terms and conditions are made a part of this Agreement to the extent those terms and conditions are not inconsistent with the provisions of this Agreement; in the event of a conflict, the provisions of this Agreement shall govern. Upon Customer's request, Northern shall provide the Customer with copies of Northern's complete filed tariff and terms and conditions.

ARTICLE 10: AGREEMENT IN ITS ENTIRETY/ASSIGNMENT

This Agreement and the materials referenced herein constitute the entire agreement of the parties for transportation service at the Special Rate to the Customer's Facilities, and there are no oral or written understandings or agreements between Northern and Customer relating to the subject matter of this Agreement other than those expressed herein. The parties agree that the Standard Firm Transportation Service Agreement entered into by the parties concerning the National Facility shall terminate upon the later of the Service Commencement Date or Customer's fulfillment of all obligations under the Standard Agreement.

Either party may, without relieving itself of its obligations under this Agreement, assign any of its rights hereunder to an entity with which it is affiliated, but otherwise no assignment of this Agreement or any of the rights and obligations hereunder shall be made unless there first shall have been obtained the written consent of the other party.

ARTICLE 11: OTHER IMPORTANT PROVISIONS

If any provision of this Agreement is found to be invalid, all of the remaining provisions of this Agreement shall nonetheless remain in full force and effect. This Agreement shall not be interpreted either more or less favorably toward any party by virtue of the fact that such party or its counsel was responsible or principally responsible for the drafting of all or a portion hereof. Captions and headings are for convenience only and shall not effect the interpretation hereof. Language contained in Recitals shall have the same contractual significance as any other language in this Agreement. This Agreement is entered into and shall be construed in accordance with the laws of the State of New Hampshire. All claims, suits or actions with respect to this Agreement shall be brought and heard in a state or federal court located in the State of New Hampshire or brought before the PUC, as appropriate.

Provisions of this Agreement shall be modified, waived, discharged or terminated only by a written instrument signed by the authorized officers of both parties. Waiver by the Company or the Customer, in any one or more instances, of any term, condition, or provision of this Agreement shall not be considered a waiver of such provisions in the future or any other term, condition, or provision.

This Agreement is entered into solely for the benefit of the parties and is not intended to confer third party beneficiary status on any other entity or person. This Agreement may be

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executed in counterparts, each of which shall be deemed an original, but which together shall constitute one and the same instrument. This Agreement may be executed by facsimile signatures which the Company and Customer agree shall be as binding as original signatures.

IN WITNESS WHEREOF, the parties hereto have signed this Agreement by their duly authorized officers:

Northern Utilities, Inc.

By: R. P. Cencini

Name: R. P. CENCINI

Title: VP

Date: 8/2/99

National Gypsum Company

By: Garano P. Carroll

Name: Garano P. Carroll

Title: SVP

Date: 7/23/99

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Third Amendment of Agreement

This Third Amendment of Agreement ("Third Amendment") is made and entered into as of the 12th day of October, 2011 by and between Northern Utilities, Inc. ("Northern" or "Company") and National Cryosur Company ("National" or "Customer"), individually "a party" and collectively "the parties."

Whereas, the parties entered into a Special Risk Transportation Agreement dated August 2, 1999 ("the Agreement"), an Amendment of Agreement dated October 30, 1999 ("the First Amendment"), and a Second Amendment of Agreement dated October 16, 2009 ("the Second Amendment");

Whereas, the terms of the Agreement as extended by the Second Amendment will expire on November 30, 2011; and

Whereas, the parties desire to extend the terms and conditions of the Agreement and to modify same to relieve the Customer of certain payment obligations in the event that its wellhead manufacturing plant in Portsmouth, New Hampshire closes;

Now Therefore, pursuant to Article 11 of the Agreement and in consideration of the exchange of mutual promises and mutual benefits to be derived from this Third Amendment, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. Article 4 Term

Article 4 of the Agreement as amended by the First and Second Amendments is revoked and replaced with the following:

"This Agreement shall continue in full force and effect until November 30, 2011. Thereafter, this Agreement shall continue in full force and effect for up to three (3)

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successive one-year periods, unless terminated by the Customer or the Company with at least (6) months written notice to the other party prior to the expiration of any applicable continuation period. Such written notice to terminate shall be addressed to: (i) Northern at the address noted below; and (ii) the Customer at the National Facility, and must be by U.S. certified mail, return receipt requested, first class postage prepaid, or sent by nationally recognized delivery service (e.g., FedEx, UPS, etc.) and must be received by the other party no later than six (6) months prior to any applicable continuation period. Notices to the Company must be addressed to: Northern Utilities, 323 West Road, Portsmouth, NH 03801, Attention: Michael Smith.

2. Commission Approval

The Company and Customer agree and acknowledge that to the extent that this Third Amendment purports to amend the terms of the Agreement, it requires the approval of the New Hampshire Public Utilities Commission ("Commission") in accordance with Order No. 23, 314 dated October 5, 1999, issued in Docket No. DC-99-178. Such approval must be in form and substance acceptable to the Company and Customer, each in its sole discretion.

3. Article 7: Termination/Acceleration

Article 7 of the Agreement is amended by adding the following language:

"Notwithstanding the foregoing provisions of this Article 7, in the event that the National Facility is permanently closed and ceases to operate, and so long as written notice is provided to Northern at least sixty (60) days prior to the Facility's closure/permanent cessation of operations, the Customer shall not be liable for any

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Minimum Annual Payment Obligation incurred during the year of said Facility
closure/permanent cessation of operations."

4. Other Provisions

All undefined capitalized terms included in this Third Amendment have the same meaning as assigned to them in the Agreement. The recitals set forth above are an integral part of this Third Amendment and shall have the same contractual significance as any other language.

This Third Amendment may be executed in one or more counterparts, each of which when so executed and delivered shall be deemed an original, but all of which together shall constitute one instrument. This Third Amendment shall be binding upon its execution by both Northern and the Customer, provided however that Northern shall be under no obligation to render service to the Customer under the Agreement as amended, and the Customer shall have no payment obligations under the Agreement as amended, until the Commission shall have issued a final and non-appealable order approving this Third Amendment to form and substance acceptable to Northern and the Customer, each in its sole discretion. Northern and the Customer agree to cooperate to obtain such an order as soon as practicable after the date hereof.

All other provisions of the Agreement as amended shall remain in full force and effect. The Agreement as hereby amended, constitutes the entire agreement of the parties with respect to transportation service at the Special Rate to the Customer's Facility, and there are no other oral or written understandings or agreements between the parties relating thereto.

REDACTED

IN WITNESS WHEREOF, Northern and the Customer have caused this Third
Amendment to be executed by their duly authorized officers as of the day and year first
written above.

NATIONAL CYPRESS COMPANY

By: [Signature]

Name: JIM G. GIBLER

NORTHERN UTILITIES, INC.

By: [Signature]

By: MARK H. CHASE

Title: DIRECTOR ENERGY PROGRAMS Title: VICE PRES

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