Greater Minnesota Gas, Inc.
A Minnesota Corporation

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March 29, 2018

VIA ELECTRONIC FILING

Mr. Daniel P. Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, Minnesota 55101-2147

RE: Petition for Change in Contract Demand Entitlement
Docket No. ___________________________

Dear Mr. Wolf:

Attached hereto, please find Greater Minnesota Gas, Inc.'s Petition for Change in Contract Demand Entitlement for 2018-2019 Heating Season for filing in a new docket.

All individuals identified on the attached service list have been electronically served with the same.

Thank you for your assistance. Please do not hesitate to contact me should you have any questions or concerns or if you require additional information. My direct dial number is (507) 665-8657 and my email address is kanderson@greatermngas.com.

Sincerely,

GREATER MINNESOTA GAS, INC.

/s/
Kristine A. Anderson
Corporate Attorney

Enclosure

cc: Service List

CERTIFICATE OF SERVICE

I, Kristine Anderson, hereby certify that I have this day served a true and correct copy of the following document to all persons at the addresses indicated on the attached list by electronic filing, electronic mail, or by depositing the same enveloped with postage paid in the United States Mail at Le Sueur, Minnesota:

Greater Minnesota Gas, Inc.'s Petition for Change in Contract Demand Entitlement for 2018-2019 Heating Season
Docket No. __________________

filed this 29th day of March, 2018.

/s/ Kristine A. Anderson
Kristine A. Anderson, Esq.
Corporate Attorney
Greater Minnesota Gas, Inc.

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Kristine	Anderson	kanderson@greatermngas.com	Greater Minnesota Gas, Inc.	202 S. Main Street Le Sueur, MN 56058	Electronic Service	No	GEN_SL_Greater Minnesota Gas, Inc._Official Service List 2017
Generic Notice	Commerce Attorneys	commerce.attorneys@ag.state.mn.us	Office of the Attorney General-DOC	445 Minnesota Street Suite 1800 St. Paul, MN 55101	Electronic Service	No	GEN_SL_Greater Minnesota Gas, Inc._Official Service List 2017
Ian	Dobson	residential.utilities@ag.state.mn.us	Office of the Attorney General-RUD	1400 BRM Tower 445 Minnesota St St. Paul, MN 551012130	Electronic Service	No	GEN_SL_Greater Minnesota Gas, Inc._Official Service List 2017
Sharon	Ferguson	sharon.ferguson@state.mn.us	Department of Commerce	85 7th Place E Ste 280 Saint Paul, MN 551012198	Electronic Service	No	GEN_SL_Greater Minnesota Gas, Inc._Official Service List 2017
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Nicolle	Kupser	nkupser@greatermngas.com	Greater Minnesota Gas, Inc.	202 South Main Street P.O. Box 68 Le Sueur, MN 56058	Electronic Service	No	GEN_SL_Greater Minnesota Gas, Inc._Official Service List 2017
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Daniel P	Wolf	dan.wolf@state.mn.us	Public Utilities Commission	121 7th Place East Suite 350 St. Paul, MN 551012147	Electronic Service	No	GEN_SL_Greater Minnesota Gas, Inc._Official Service List 2017

STATE OF MINNESOTA

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Nancy Lange	Chair
Dan Lipschultz	Commissioner
Matt Schuerger	Commissioner
Katie Sieben	Commissioner
John Tuma	Commissioner

PETITION FOR CHANGE IN CONTRACT DEMAND ENTITLEMENT FOR 2018-2019 HEATING SEASON

MPUC Docket No. ______________

OVERVIEW

Greater Minnesota Gas, Inc. ("GMG") submits this Petition to the Minnesota Public Utilities Commission ("Commission") to notify the Commission of a change in contract demand entitlement for the 2018-2019 heating season. GMG plans to include the rate impact of these changes in GMG's Purchased Gas Adjustments April 1, 2018.

As always, GMG remains committed to ensuring sufficient capacity to serve its firm customers throughout the heating season while simultaneously safeguarding its ratepayers from paying unduly high amounts for maintaining its reserve. As it has in recent years, GMG employed a combined analytical framework that has proven to be sound and to result in appropriate protection for GMG's customers. GMG anticipates that it will informally review its projections, demand entitlement, and reserve margin immediately prior to the heating season to ensure that adequate capacity will be available to meet projected peak day demand and design day conditions. In the event that an adjustment of its contract demand request is necessary in the fall of 2018, GMG will undertake appropriate action to address that scenario at that time.

Minnesota Rule 7825.2910 Subp. 2 requires GMG to assess four areas when requesting a change in demand entitlement, namely: the factors contributing to the need for changing demand; GMG's design day demand analysis; a summary of GMG's customers' winter and summer usage for all customer classes; and, a description of GMG's design day gas supply from all sources under its proposed level. This Petition addresses each of the requisite areas based on GMG's analysis of its current customer usage and patterns, the impact of GMG's current and anticipated growth on the upcoming heating season, and forecasting the size and expected load of new and recently acquired customers.

DISCUSSION

A review of GMG's demand entitlement filings in recent years shows both those that included substantial changes as a direct result of the Company's growth; and, others that reflected minimal change due to utilization of GMG's balanced supply portfolio and proactive actions to protect its customers. In recent history, GMG has successfully addressed both a narrow reserve margin and the uncertainty of predictive modeling for conversion customers by increasing its reserve margin for the 2013-2014 heating season, maintaining it at a similar level for the majority of the 2014-2015 heating season, slightly increasing it for the 2015-2016 and 2016-2017 heating seasons, and adding another small increase for the 2017-2018 heating season. GMG's proactive portfolio management and its increased customer base coupled to prevent any adverse rate impact on GMG's ratepayers despite GMG purchasing increased reserve capability. GMG has continued to leverage its recent growth to successfully employ purchasing strategies that increased its reserve capability without resulting in a substantial rate impact. GMG's reserve margin has consistently been sufficient to ensure that its customers' needs were satisfied through the duration of the heating season, including on unseasonably cold days. GMG's supply portfolio changes assured, and will continue to assure, reliable firm supply for its customer base.

GMG's analysis of its needs for the 2018-2019 heating season is based on its projected demand requirements and its portfolio changes. GMG again employed a combination of analytical tools to balance the competing components of maintaining a sufficient reserve and maintaining reasonable customer rates in assessing its demand entitlement needs for the 2018-2019 heating season.[1] By combining statistical regression analysis based on its existing customer data, a separate mathematical analysis, projected growth information, and budget year analysis, GMG's current proposed demand entitlement is again soundly supported by its supporting data, attached hereto and incorporated by reference.

GMG seeks an adjustment of its total demand entitlement as follows:

Proposed Entitlement for 2017-2018 (Dth)	Proposed Entitelement for 2018-19 (Dth)	Entitlement Change (Dth)	% Change From Previous Year
12,609	14,109	1,500	11.90%

[1] . GMG was ordered to use three years of data and separate its regression analysis by type of customer beginning with its 2016-2017 demand entitlement filing. As discussed in that year's filing, GMG had sparse data from the first year of that regression timeline, and data based on three years was skewed and did not provide a meaningful result. GMG believes that the analysis it relied on herein is appropriate, given the totality of the circumstances. GMG generally relied on three years of data, adjusted as indicated herein, in a separated regression analysis as part of the modeling and analysis underpinning the instant Petition. GMG will continue to expand the data upon which it relies, as it has done in the instant analysis, as its system matures and more meaningful data becomes available.

1. GMG's Proposed Demand Entitlement Reflects Approaching Changes to Its Portfolio, Anticipated Customer Needs, and Assurance of Its Ability to Maintain an Adequate Reserve Margin Throughout the Heating Season Without Adversely Impacting Customer Rates.

A general increase in demand entitlement is requested by GMG to enable it to continue to provide sufficient reserve to meet its customers' needs. GMG's reserve margin levels over the last several years have satisfactorily balanced the necessity of a sufficient reserve margin against protection for its ratepayers from an unreasonable reserve cost. The Department has previously noted that the OES generally uses a gauge of five percent to determine the appropriateness of a company's reserve margin. Nonetheless, the Commission typically approves higher reserve margins for GMG based on the totality of the circumstance. GMG agrees that utilizing a conservative approach when allocating a reserve margin is appropriate. GMG believes that maintaining its reserve margin at a conservative level continues to be prudent; and, it has again utilized its portfolio in a manner that allows its reserve margin to be maintained without undue cost burdening its ratepayers, as well as allowing it to leverage proactive opportunities to protect its ratepayers in the long-term. GMG's proposed demand entitlement results in a slight decrease in demand costs and, hence, in customer rate. GMG's proposed reserve margin for the upcoming heating season is 11.06% and, as further explained herein, provides long-term stability for GMG's customers.

GMG's predictive modeling calculations reflect a need for a change in its design day entitlement. The table below summarizes GMG's design day and reserve calculations:

Planned Customer Base for 2018-2019 Heating Season	
Design Day Requirement (Attachment A, Page 2 of 3, line 9)	12,704
Reserve Margin at 11.06%	1,405
Design Day Requirement With 11.06% Reserve Margin	14,109

The ultimate objective of a design day analysis is to forecast anticipated firm customer demand at design temperatures to predict the necessary level of firm resources to sufficiently serve customers in the unlikely event that design day weather occurs. In order to meet that objective but balance it against the desire to protect ratepayers from paying for too much reserve, an increase in GMG's contract demand entitlement is appropriate.

2. GMG's Design Day Analysis Ensures Viable Forecasting Given Available Customer Data and Appropriate Predictive Information.

GMG's current design day projection is based on a two-stage process whereby it analyzed two separate econometric models to forecast its supply needs for the upcoming heating season: one based on statistical regression and one based solely on mathematics without interpretation. Consistent with previous Commission directives and Department requests, GMG employed both a regression model separating residential and commercial customers' needs and a mathematical model in its design day analysis. As discussed above, GMG was directed to, and agreed to, incorporate three years of data into its regression analysis when such data was available. While GMG was not able to use a full three calendar years of data, it did incorporate data from the bulk of three years of heating seasons into its regression analysis.[2]

Statistical Regression Analysis Based on Historic Data

For its statistical modeling, GMG employed an ordinary least square regression analysis methodology to predict peak day demand, as it has done for several years. As discussed herein, GMG ultimately relied on a regression based on the bulk of three heating seasons of data in its final modeling in order to adhere to the spirit of relying on three full years of data. GMG believes that its complete analysis provides a result that will adequately protect GMG's customers should design day weather conditions occur. GMG's regression analysis is predicated on a 90 heating degree day as its basis, based on an average design day temperature of -25°F. GMG's design day forecast for its existing customers for the 2018-2019 heating season is based on 12,704 Dth, which is an increase of 755 Dth from GMG's 2017-2018 design day requirements. The derivation of the separated class regression design day forecast can be seen in Attachment A, Pages 3 and 4 of 7.

Attachment A details the regression analysis calculations upon which GMG's contract demand entitlement petition is based, insofar as it relates to its existing customers and quantitative historical data. In conducting its least square regression analysis, GMG employed the following methodology:

> Data is provided for residential customers and for commercial customers. Each analysis was completed in the same fashion, by using historical firm sales volume data and actual temperature data for the heating season periods from December 2015 through February 2018 for the reasons discussed above. The firm sales volume data was correlated to geographic weather data for Minneapolis.[3]

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[2]. GMG did not incorporate November usage data into its regression analysis in order to provide the most meaningful result for purposes of predictive demand entitlement modeling. GMG has a substantial amount of grain drying use in November and the grain drying load is unpredictable from year to year. Incorporating the grain drying load into its regression would skew the analysis in such a way that it would result in modeling suggesting that a much higher entitlement and reserve would be necessary to protect customers throughout the heating season. That would result in an unreasonable burden on customer rates by requiring them to pay for far too much reserve than what is actually needed as a practical matter.

[3]. Although GMG historically assigned its town border stations geographically to a variety of weather sites, GMG now has multiple town border stations located in a variety of areas across the state. Consequently, GMG predicated its modeling on weather conditions in Minneapolis. Similar methodology is employed by larger natural gas utilities with service throughout the state. GMG appreciates the Department's Comments last year that encouraged GMG to return to using multiple weather stations; and, GMG agrees that doing so makes sense in the future. GMG's intent is to use multiple weather zones as soon as three solid years of regression data is available

Employing widely-accepted statistical analysis, a linear equation was derived from the linear regression model that was used to calculate the design day usage per customer. For each regression group, the forecasted number of firm customers for the 2018-2019 heating seasons was then multiplied by the design day usage per customer to derive the design day requirements.

The linear regression models the linear relationship between heating degree day data and firm customer natural gas usage by fitting a linear equation to observed data. The linear regression line has an equation of the form:

$$Y = a + b X$$

Where X (Heating Degree Days) is the explanatory variable and Y (Firm Sales Volume) is the dependent variable. The slope of the line is b, and a is the intercept (Firm Non-Temp Sensitive Volume).

The strength of the linear association is quantified by the correlation coefficient. The correlation coefficient takes a positive value between 0 and 1, with 1 indicating perfect correlation (all points would lay along a straight line in this case). A correlation value close to 0 indicates no association between the variables. The formula for computing the correlation coefficient is given by:

$$r = \frac{1}{n-1} \Sigma \left(\frac{x - \bar{x}}{s_x} \right) \left(\frac{y - \bar{y}}{s_y} \right)$$

The reliance on accepted statistical modeling methodology to obtain quantitative data for forecasting purposes is intended to mitigate discrepancies between actual resource utilization and planned supply needs. Hence, GMG has attempted to secure all available information to gauge likely customer sendout during a design day weather occurrence.

GMG attempts to adequately predict growth; however, it does use a conservative approach. Nonetheless, as the GMG's prior demand entitlement submissions have demonstrated, GMG's design day modeling, taken in its entirety, has been appropriate. Empirical evidence suggests that, when GMG brings natural gas to a previously unserved area, many new customers ultimately avail themselves of the benefits that come with converting to gas use. Hence, sometimes actual throughput exceeds forecasted needs. However, when weather is unseasonably warm and/or propane prices are low, both of which occurred during the 2015-2016 and 2016-2017 heating seasons, new customers wait longer to convert to natural gas usage. Since such anomalies are unpredictable, they too can impact actual throughput. Such phenomena support GMG's continued use of a conservative reserve margin.

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in each weather zone, given considerations for new customer lag in conversion and the changing customer mix.

In order to provide a well-rounded analysis and as previously recommended by the Department, GMG also utilized a mutually exclusive mathematical analysis based on actual throughput as a separate modeling tool for a second stage in its design day analysis, which appears below. GMG mathematically examined its peak day sendout from last year.

Mathematical Analysis Based on Prior Heating Season and All-Time Peak

GMG's peak day during the last heating season occurred on January 5, 2017 at 68 HDD and resulted in a firm sales throughput of 9,246 Dth/Day, as shown in Attachment A, Page 3. The firm customer count on that date was 7,378 and the resulting use per customer was 1.253 Dth. GMG's all-time peak day usage was 1.457 per customer on January 6, 2014. GMG applied a mathematical analysis that shows two estimated peak day requirements – one based on last heating season's peak day usage and anticipated customer additions, and one based on GMG's all-time high peak day usage and 2017-2018 anticipated customer additions, as shown below.

Mathematical Peak Day Analysis		
	2018-19 Estimated Peak Day Use	All-Time Peak Day Use
Actual Peak Day Throughput	10,360	
/ Customer Count on Peak Day	7,910	7,378
= Use Per Customer on Peak Day	1.310	
x Adjustment for 90 HDD	90/75	90/82
Estimated Peak Day Usage Per Customer if 90 HDD	1.572*	1.457
Additional Residential Customers	425	705
Additional Commercial Customers	10	30
x Total Anticipated Customer Count	8,345	8,113
= Total Projected Peak Day Requirement	13,118	11,821
Proposed Contract Demend Entitlement	14,109	12,609
Reserve Margin	991	788
Reserve Margin %	7.6%	6.7%

* GMG's historic peak day use per customer was 1.457 Dth per customer during the 2013-14 heating season, based on 82 HDD. Since that time, eight large former firm customers changed to transport customers. For purposes of this analysis and estimate, GMG utilized the calculated design day use.

GMG's mathematical analysis confirms that its requested demand entitlement will provide sufficient reserve to protect its customers if unseasonably cold conditions strike in the coming year.

3. The Summary of Winter Versus Summer Usage for All GMG Customer Classes Supports a Change in Demand Entitlement.

A summary of GMG's customer usage for both the winter and summer seasons is provided below, broken down by customer class. The summary is based on usage for the twelve month period ending December 31, 2017.[4]

Seasonal Customer Usage by Class (Dth)			
	Winter	**Summer**	**Total**
Residential - Firm	438,025	136,931	574,956
Commercial - Firm	18,051	4,996	23,048
Industrial - Firm	256,296	131,055	387,351
Flexible Rate - Firm			
Total Firm	*712,373*	*272,982*	*985,355*
Agricultural - Interruptible	*127,861*	*17,261*	*145,122*
Industrial - Interruptible	40,373	70,546	110,920
Flexible Rate - Interruptible			
Total Interruptible (Non-Ag)	*40,373*	*70,546*	*110,920*
Total	880,607	360,789	1,241,396

GMG's proposed change in its contract demand entitlement will continue to assure sufficient supply and reliability for its customers throughout the heating season. GMG's contract arrangements secure supply for both the summer months and the winter months to sufficiently serve its firm customer base throughout the year. GMG's proposal strikes the ideal balance for both cost and efficiency protections for its customers.

4. The Anticipated Design Day Gas Supply is in the Best Interest of Ratepayers Because it Provides for an Adequate Reserve Margin While Minimizing the Rate Impact.

GMG recognizes that the primary concerns of the Commission and the Department with regard to natural gas suppliers are sufficient assurance of reliability and reasonable rates for customers. It is critical that GMG is fully prepared to provide enough firm supply to meet its customers' needs; and, given GMG's size, long-term planning is vital if it is to meet that objective. In order to assure that it can meet all of its customers' needs throughout the year, GMG's proposal provides a balanced portfolio based on an integrated system. To that end, GMG has secured a variety of gas supply sources. In keeping with its continued commitment to act in its customers' best interests, GMG was able to advance its portfolio development by securing more suitable

[4] . GMG notes that previous demand entitlement dockets filed during the second half of the year incorporated data for the twelve month period ending June 30th of the filing year. However, since this Petition is being submitted prior to June 30th, GMG utilized seasonal customer usage data for the 2017 calendar year.

long-term capacity. GMG's use of proactive, cost-effective options contributes to its ability to protect its customers from potentially volatile and increased gas costs.

A summary of GMG's demand profile shows the changes in GMG's supply sources, as compared to the supply sources for the two previous heating seasons, as seen in Attachment B. GMG is primarily served by the Northern Natural Gas and Viking Gas Transmission pipeline systems. Attachment C identifies the contracts GMG holds with its sources; and, it also specifically notes proposed changes to its contracts for the 2018-2019 heating season and the corresponding change in contract demand costs. As illustrated by Attachments B and C, GMG was able to secure additional long-term capacity from Northern Natural Gas at a cost-effective rate, which capacity is only available on very rare occasions. Due to the Northern Natural Gas change and corresponding changes in the location where gas will be injected into GMG's distribution system, GMG was able to eliminate some of its capacity on Viking in favor of the more suitable Northern Natural Gas capacity. The result is improved capacity and rates for GMG's customers over the long-term. GMG respectfully requests that the Commission approve inclusion of the associated demand entitlement costs effective April 1, 2018. GMG will incorporate the charges in its PGA pending Commission approval.

While GMG's relatively early submission of its Petition herein allows for substantial time to consider its request prior to the heating season, it also necessarily requires GMG to engage in prediction regarding both anticipated customer usage and anticipated customer growth for the remainder of the current year. As such, GMG intends to analyze its demand entitlement needs as the 2018-2019 heating season nears, essentially to true-up its anticipated needs and make any necessary demand adjustments at that time.

GMG's supply contract scheme is designed so that gas can be delivered to alternate points and can be used elsewhere in GMG's integrated system if necessary at any given time. Thus, GMG has the ability to move supply throughout its service area on a day to day basis as market demand and supply options dictate.

Attachment D provides a summary of the rate impact to firm customers with the contract changes. It demonstrates that GMG's customers will again benefit from a reduction in cost due to GMG's supply portfolio changes. Therefore, there is no adverse impact to customer rates as a result of the increased demand entitlement, which further supports its approval.

REQUEST FOR COMMISSION ACTION

GMG's proposed change in contract demand entitlement serves the best interest of its customers. As the supporting information demonstrates, GMG coordinated its gas-supply planning for the 2018-2019 heating season alongside consideration of previous Department and Commission concerns and recommendations and its broader corporate planning. GMG's proposal strikes the appropriate balance between assuring physical reliability with sufficient supply to serve all customers in the event that design day weather occurs with minimizing the rate impact of maintaining a sufficient reserve on GMG customers. Therefore, GMG respectfully requests that the Commission approve its Petition for Change in Contract Demand Entitlement for the 2018-2019 Heating Season.

Dated: March 28, 2018

Respectfully submitted,
/s/
Kristine A. Anderson
Corporate Attorney
Greater Minnesota Gas, Inc.
202 S. Main Street
Le Sueur, MN 56068
Phone: 888-931-3411

ATTACHMENT A
Design Day Regression Analysis Background Information

	Number of Sales Firm Customers			Design Day Requirement			Total Entitlement + Storage + Peak Shaving			Reserve Margin
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Heating Season	Number of Customers	Change from Pervious Year	% Change from Previous Year	Design Day (Dth)	Change from Pervious Year	% Change from Previous Year	Total Entitlement (Dth) 1/	Change from Pervious Year	% Change from Previous Year	% of Reserve Margin [(7)-(4)]/(4)]
2018-2019 Est(12/31/18)	8,410	500	6.32%	12,704	755	6.32%	14,109	1,500	11.90%	11.06%
2017-2018 (12/31/17)	7,910	532	7.21%	11,949	1,131	10.45%	12,609	(750)	-5.61%	5.52%
2016-2017 (1/31/17)	7,378	735	11.06%	10,818	-308	-2.77%	13,359	850	6.80%	23.49%
2015-2016 (1/31/16)	6,643	791	13.52%	11,126	2,157	24.05%	12,509	2,850	29.51%	12.43%
2014-2015 (2/28/15)	5,852	547	10.31%	8,969	904	11.21%	9,659	300	3.21%	7.69%
2013-2014 (1/31/14)	5,305	531	11.12%	8,065	3,101	62.47%	9,359	4,150	79.67%	16.04%
2012-2013	4,774	558	13.24%	4,964	273	5.83%	5,209	165	3.27%	4.94%
2011-2012	4,216	319	8.19%	4,691	241	5.41%	5,044	-	0.00%	7.54%
2010-2011	3,897	175	4.70%	4,450 2/	239	5.66%	5,044	500	11.00%	13.35%
2009-2010	3,722	162	4.55%	4,211	(71)	-1.65%	4,544	300	7.07%	7.90%
2008-2009	3,560	182	5.39%	4,282	566	15.23%	4,244 3/	244	6.10%	-0.89%
2007-2008	3,378	170	5.30%	3,716	166	4.68%	4,000	350	9.59%	7.64%
2006-2007	3,208	237	7.98%	3,550	583	19.65%	3,650	350	10.61%	2.82%
2005-2006	2,971	290	10.82%	2,967	271	10.05%	3,300	300	10.00%	11.22%
2004-2005	2,681	336	14.33%	2,696	696	34.80%	3,000	600	25.00%	11.28%
2003-2004	2,345	181	8.36%	2,000	(200)	-9.09%	2,400	(200)	-7.69%	20.00%
2002-2003	2,164	300	16.09%	2,200	400	22.22%	2,600	400	18.18%	18.18%
2001-2002	1,864	301	19.26%	1,800	400	28.57%	2,200	500	29.41%	22.22%
2000-2001	1,563	393	33.59%	1,400	300	27.27%	1,700	300	21.43%	21.43%
1999-2000	1,170	279	31.31%	1,100	250	29.41%	1,400	150	12.00%	27.27%
1998-1999	891	289	48.01%	850	350	70.00%	1,250	750	150.00%	47.06%
1997-1998	602	339	128.90%	500	200	66.67%	500	200	66.67%	0.00%
1996-1997	263	263		300			300			
Average per Year:	3,686	366	19.07%	4,753	564	20.29%	5,304	628	22.64%	13.55%

	Firm Peak Day Send out						
	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Heating Season	Firm Peak Day Send out (Dth)	Change from Pervious Year	% Change from Previous Year	Excess per Customer [(7)-(4)]/(1)	Design Day per Customer (4)/(1)	Entitlement per Customer (7)/(1)	Peak Day Send out per Customer (11)/(1)
2018-2019	*Unknown*			*0.167*	*1.5106*	*1.6776*	*Unknown*
2017-2018 (12/31/17)	10,360	1114	11.73%	0.083	1.5106	1.5941	1.3097
2016-2017 (1/5/17)	9,246	(249)	-2.98%	0.344	1.4663	1.8107	1.2532
2015-2016 (1/17/16)	9,495	1126	13.45%	0.208	1.6748	1.8830	1.4293
2014-2015 (2/18/15)	8,369	489	6.21%	0.118	1.5326	1.6505	1.4301
2013-2014 (1/6/14)	7,880	2855	56.82%	0.244	1.5203	1.7642	1.4854
2012-2013	5,025	1368	37.41%	0.051	1.0398	1.0911	1.0526
2011-2012	3,657	(248)	-6.35%	0.084	1.1126	1.1964	0.8674
2010-2011	3,905	251	6.87%	0.152	1.1419	1.2943	1.0021
2009-2010	3,654	(374)	-9.29%	0.089	1.1315	1.2208	0.9817
2008-2009	4,028	(72)	-1.76%	(0.011)	1.2028	1.1921	1.1315
2007-2008	4,100	550	15.49%	0.084	1.1001	1.1841	1.2137
2006-2007	3,550	738	26.24%	0.031	1.1066	1.1378	1.1066
2005-2006	2,812	285	11.28%	0.112	0.9987	1.1107	0.9465
2004-2005	2,527	185	7.90%	0.113	1.0056	1.1190	0.9426
2003-2004	2,342	587	33.45%	0.171	0.8529	1.0235	0.9987
2002-2003	1,755	747	74.11%	0.185	1.0166	1.2015	0.8110
2001-2002	1,008	(180)	-15.15%	0.215	0.9657	1.1803	0.5408
2000-2001	1,188	291	32.44%	0.192	0.8957	1.0877	0.7601
1999-2000	897	95	11.85%	0.256	0.9402	1.1966	0.7667
1998-1999	802	397	98.02%	0.449	0.9540	1.4029	0.9001
1997-1998	405	233	135.47%	-	0.8306	0.8306	0.6728
1996-1997	172	(3791)					
Average per Year:	3,963	291	25.87%	0.151	1.1429	1.2939	1.0287

Notes:
1/ Total Entitlement = Total Contract Entitlement - Non-Recallable Capacity Release
2/ Reflects design day forecast method change to linear regression model.
3/ Adjusted to reflect 300 Dth not contracted as originally planned in Docket No. G022/M-08-1327.
4/ Reflects extraordinary send out due to temporary construction heat load.

Greater Minnesota Gas, Inc.
Design Day: Heating Season 2018 - 2019
Derivation of Design Day Use Per Customer

Linear Regression Analysis Period: December 2015 thru February 2018

Line No.	Customer Type	Weather Area	Non- Heat Sensitive (Y Intercept)	Use Per HDD (Slope)	Design HDD	Estimated Design Dths	Regression Coefficient	Equation
1	Residential	Minneapolis MN	-43.58	74.07	90	6,623	0.9293	Y Inter + Slope x Design HDD = Estimated Design Dth
2	Firm Commercial	Minneapolis MN	251.61	56.39	90	5,326	0.9452	
			208.03	130.46				
3				**Total Design Dths**		**11,949**		Line 1 + Line 2
4			**Estimated Interruptible Load**			**0**		
5				**Net Design Dths**		**11,949**		Line 3 - Line 5
6				**Customer Count 12/31/2017**		**7,910**		
7				**Design Dths/Customer**		**1.5106**		Line 5 / Line 6
8			**Estimated Firm Customers for 2018/2019**			**8,410**		
9				**Design Dths 2018/2019**		**12,704**		Line 7 x Line 8

Greater Minnesota Gas, Inc.
Design Day: Heating Season 2018 - 2019
Derivation of Design Day Use Per Residential Customer

Linear Regression Analysis Period: December 2015 thru February 2018

Line No.	Customer Type	Weather Area	Non- Heat Sensitive (Y Intercept)	Use Per HDD (Slope)	Design HDD	Estimated Design Dths	Regression Coefficient	Equation
1	Residential	Minneapolis MN	-43.58	74.07	90	6,623	0.9293	Y Inter + Slope x Design HDD = Estimated Design Dth
3				**Total Design Dths**		**6,623**		
4				**Estimated Interruptible Load**		**0**		
5				**Net Design Dths**		**6,623**		Line 3 - Line 4
6				**Customer Count 12/31/2017**		**7,187**		
7				**Design Dths/Customer**		**0.9215**		Line 5 / Line 6
8				**Estimated Firm Customers for 2018/2019**		**7,637**		
9				**Design Dths 2018/2019**		**7,037**		Line 7 x Line 8

	Greater Minnesota Gas, Inc.							
	Design Day: Heating Season 2018 - 2019							
	Derivation of Design Day Use Per Firm Commercial Customer							
	Linear Regression Analysis Period: December 2015 thru February 2018							
Line No.	**Customer Type**	**Weather Area**	**Non- Heat Sensitive (Y Intercept)**	**Use Per HDD (Slope)**	**Design HDD**	**Estimated Design Dths**	**Regression Coefficient**	**Equation**
2	Firm Commercial	Minneapolis MN	251.61	56.39	90	5,326	0.9452	
3				**Total Design Dths**		**5,326**		
4			**Estimated Interruptible Load**			**0**		
5				**Net Design Dths**		**5,326**		Line 3 - Line 4
6				**Customer Count 12/31/2017**		**723**		
7				**Design Dths/Customer**		**7.3671**		Line 5 / Line 6
8			**Estimated Firm Customers for 2018/2019**			**773**		
9				**Design Dths 2018/2019**		**5,695**		Line 7 x Line 8

Greater Minnesota Gas, Inc.
Peak Day Analysis

Line No.	Description	Design Day Calculation	Peak Day 2017 -18	Peak Day 2016 -17	Peak Day 2015 -16	Peak Day 2014 -15
1	Date of Peak Day		12/31/2017	1/5/2017	1/17/2016	2/18/2015
2	Day of the Week		Sunday	Thursday	Sunday	Wednesday
3	Total Throughput (Dth)	12704	10360	9495	9495	8464
4	Interruptible Customer Usage (Dth)	0	0	0	0	95
5	Firm Transportation Usage (Dth)	0	0	0	0	0
6	Firm Sales Throughput (Dth)	12704	10360	9495	9495	8369
7	Average Actual Gas Day Temperature (Deg. F)	-25	-10	-8	-8	-5
8	Heating Degree Days (HDD) 65 degree base	90	75	73	73	70
9	Non-HDD Sensitive Base (Dth)	208	407	839	839	321
10	Total HDD Sensitive Firm Throughput (Dth)	12496	9953	8656	8656	8048
11	Actual Firm Peak Day Dth/HDD (Dth)	139	133	119	119	115
12	Base + (Actual Dth/HDD * HDDs) (Dth)	12704	10360	9495	9495	8369
13	Peak Month Firm Customers	8410	7910	7378	7378	5852
14	Peak Day Use per Firm Customer	1.511	1.310	1.287	1.287	1.430

Greater Minnesota Gas, Inc.
Residential Peak Day Analysis

Line No.	Description	Design Day Calculation	Peak Day 2017 -18	Peak Day 2016 -17	Peak Day 2015 -16
1	Date of Peak Day		12/31/2017	1/5/2017	1/17/2016
2	Day of the Week		Sunday	Thursday	Sunday
3	Total Throughput (Dth)	7037	5776	5140	4783
4	Interruptible Customer Usage (Dth)	0	0	0	0
5	Firm Transportation Usage (Dth)	0	0	0	0
6	Firm Sales Throughput (Dth)	7037	5776	5140	4783
7	Average Actual Gas Day Temperature (Deg. F)	-25	-10	-3	-8
8	Heating Degree Days (HDD) 65 degree base	90	75	68	73
9	Non-HDD Sensitive Base (Dth)	-44	-44	90	134
10	Total HDD Sensitive Firm Throughput (Dth)	7081	5820	5050	4649
11	Actual Firm Peak Day Dth/HDD (Dth)	79	78	74	64
12	Base + (Actual Dth/HDD * HDDs) (Dth)	7037	5776	5140	4783
13	Peak Month Firm Customers	7637	7187	6700	6063
14	Peak Day Use per Residential Customer	0.921	0.804	0.767	0.789

Greater Minnesota Gas, Inc.
Firm Commercial Peak Day Analysis

Line No.	Description	Design Day Calculation	Peak Day 2017 -18	Peak Day 2016 -17	Peak Day 2015 -16
1	Date of Peak Day		12/31/2017	1/5/2017	1/17/2016
2	Day of the Week		Sunday	Thursday	Sunday
3	Total Throughput (Dth)	5695	4584	4106	4712
4	Interruptible Customer Usage (Dth)	0	0	0	0
5	Firm Transportation Usage (Dth)	0	0	0	0
6	Firm Sales Throughput (Dth)	5695	4584	4106	4712
7	Average Actual Gas Day Temperature (Deg. F)	-25	-10	-3	-8
8	Heating Degree Days (HDD) 65 degree base	90	75	68	73
9	Non-HDD Sensitive Base (Dth)	252	252	90	273
10	Total HDD Sensitive Firm Throughput (Dth)	5443	4332	4016	4439
11	Actual Firm Peak Day Dth/HDD (Dth)	60	58	59	61
12	Base + (Actual Dth/HDD * HDDs) (Dth)	5695	4584	4106	4712
13	Peak Month Firm Customers	773	723	678	580
14	Peak Day Use per Firm Commercial Customer	7.367	6.340	6.056	8.124

ATTACHMENT B
Demand Profile and Supply Comparison

2016 - 2017 Heating Season	Quantity (Dth)		2017 - 2018 Heating Season	Quantity (Dth)	Change in Quantity (Dth)		2018 - 2019 Heating Season	Quantity (Dth)	Change in Quantity (Dth)
TF 12 (Nov. - Oct.)	**210**		**TF 12 (Nov. - Oct.)**	**210**	**-**		**TF 12 (Nov. - Oct.)**	**210**	**-**
TFX-7 (Oct. - Apr.)	**665**		**TFX-7 (Oct. - Apr.)**	**665**	**-**		**TFX-7 (Oct. - Apr.)**	**665**	**-**
TFX-5 (Nov. - Mar.)	**6,344**		**TFX-5 (Nov. - Mar.)**	**6,344**	**-**		**TFX-5 (Nov. - Mar.)**	**6,344**	**-**
TFX-5 (Nov. - Mar.)	**90**		**TFX-5 (Nov. - Mar.)**	**90**	**-**		**TFX-5 (Nov. - Mar.)**	**90**	**-**
TF 12 (Nov. - Oct.)	**500**	**(5)**	**TF 12 (Nov. - Oct.)**	**500**	**-**		**TF 12 (Nov. - Oct.)**	**500**	**-**
						(5)	**TF 12 (Nov. - Oct.)**	**500**	**500**
Viking Forward Haul/Emerson	**1,400**	**(3)**	**Viking Forward Haul/Emerson**	**1,400**	**-**	**(3)**	**Viking Forward Haul/Emerson**	**1,400**	**-**
Viking Forward Haul/Emerson	**1,200**	**(4)**	**Viking Forward Haul/Emerson**	**1,200**	**-**	**(4)**	**Viking Forward Haul/Emerson**	**1,200**	**-**
FT-A Capacity Release - Non-recallable	**2,600**		**FT-A Capacity Release - Non-recallable**	**-**	**(2,600)**		**FT-A Capacity Release - Non-recallabl**	**-**	**-**
			FT-A Viking	**2,200**	**2,200**		**FT-A Viking**	**2,200**	**-**
							FT-A Viking	**1,000**	**1,000**
Viking Zone 1	2,000	**(2)**	Viking Zone 1	2,000		**(2)**	Viking Zone 1	-	**(2,000)**
SMS	2,000		SMS	2,000	**-**		SMS	2,500	**500**
Heating Season Total Capacity	13,009		Heating Season Total Capacity	12,609	(400)		Heating Season Total Capacity	14,109	1,500
Non-Heating Season Total Capacity	210		Non-Heating Season Total Capacity	210	-		Non-Heating Season Total Capacity	210	-
Total Entitlement @ Peak	13,009		Total Entitlement @ Peak	12,609	(400)		Total Entitlement @ Peak	14,109	1,500
Total Annual Transportation	-		Total Annual Transportation	-	-		Total Annual Transportation	-	-
Total Season Transportation	13,009		Total Season Transportation	12,609	(400)		Total Season Transportation	14,109	1,500
Total Percent Summer Vs. Winter	1.6%		Total Percent Summer Vs. Winter	1.7%			Total Percent Summer Vs. Winter	1.5%	
Total Percent Seasonal	100.0%		Total Percent Seasonal	100.0%			Total Percent Seasonal	100.0%	

Notes:
1/ Only items in bold affect capacity entitlement level.

2/ Was transport only and did not increase peak day entitlement. 1000 Dth of contract was realigned to Emerson receipt point and can now be used to meet peak entitlement.

3/ 1,400 Dth disrupted in October, 2014 only due to Viking Force Majeur

4/ 1,200 Dth of FT-A purchased during Viking open season beginning February 1, 2015.

5/ Company has secured 500 Dth of release capacity in Northern Natural Gas Zone E-F effective April 1, 2018. The capacity is permanately released to GMG and non recallable.
The capacity was available at Northern's existing tariff rate. Company received quotes for new incremental capacity on Northern which was substantially more expensive than the released capacity.

ATTACHMENT C
Contract Entitlement Changes

Greater Minnesota Gas, Inc.
Natural Gas Contract Summary
Contract Entitlement Changes as of April 1, 2018

Contract Entitlements 2017-18

Contract No.	Service Type	Rate Schedule	Months	Entitlement (Dth)	Expiration Date
102985	NNG Firm Throughput	TFX - 5	Nov-Mar	3,000	3/31/2022
102985	NNG Firm Throughput	TFX - 5	Nov-Mar	500	3/31/2023
102985	NNG Firm Throughput	TFX - 5	Nov-Mar	500	3/31/2019
102985	NNG Firm Throughput	TFX - 5	Nov-Mar	2,100	3/31/2020
102985	NNG Firm Throughput	TFX - 5	Nov-Mar	244	3/31/2020
121534	NNG Firm Throughput	TFX - 7	Oct-Apr	665	10/31/2020
120579	NNG Firm Throughput	TF - 12	Oct-Sep	181	9/30/2022
120579	NNG Firm Throughput	TF - 12	Oct-Sep	29	9/30/2022
120579	NNG Firm Throughput	TFX - 5	Nov-Mar	90	9/30/2022
130797	NNG Firm Throughput	TF - 12	Oct-Sep	500	10/31/2019
AFO216	Viking Forward Haul	FT-A	Nov-Oct	1,400	10/31/2023
AFO220	Viking Forward Haul	FT-A	Nov-Oct	1,200	10/31/2018
AFO300	Viking Forward Haul	FT-A	Nov-Oct	2,200	11/30/2022
		2017-18 Heating Season Total Capacity		12,609	
		2017-18 Design Day Demand		11,949	
		Reserve Margin		660	5.5%

Proposed Contract Entitlement Changes for 2018-19

Start Date	Contract No.	Service Type	Rate Schedule	Months	Entitlement (Dth)	Expiration Date
11/1/2018	AFO299	Viking Forward Haul	FT-A	Nov-Oct	1,000	10/31/2023
4/1/2018	132592	NNG Firm Throughput	TF - 12	Apr-Mar	500	10/31/2024
					1,500	
			2018-19 Heating Season Total Capacity		14,109	
			2018-19 Design Day Demand		12,704	
			Reserve Margin		1,405	11.1%

Proposed Change in Contract Demand Costs

Contract No.		Rate Schedule	Volume Dth / Day	No. of Months	Monthly Demand Rates	Total Annual Cost
AFO299		FT-A	1,000	12	$ 4.3706	$ 52,447.20
132592		TF - 12	500	5	$ 10.2300	$ 25,575.00
132592		TF - 12	500	7	$ 5.6830	$ 19,890.50
AF0200	1)	FT-A	(2,000)	12	$ 4.7507	$ (114,016.80)
						$ (16,104.10)

1) Transport only. Does not increase peak day entitlement.

ATTACHMENT D
Rate Impact of Proposed Contract Demand Entitlement

Greater Minnesota Gas, Inc.
Contract Demand Entitlement Filing
Rate Impact - November 2018

	Annualized Impact									
Residential	Last Rate Case 1/	Last Demand Change 2/	*Current PGA w/o Demand Entitlement Change (March 1, 2018)*	Proposed Demand Entitlement Change	Change from Last Rate Case	% Change from Last Rate Case	Change from Last Demand Change	% Change from Last Demand Change	Change from Most Recent PGA	% Change from Most Recent PGA
Commodity Cost of Gas (WACOG)	$ 5.8801	$ 2.6198	$ 2.6198	$ 2.6198	$ (3.2603)	-55.45%	$ -	0.00%	$ -	0.00%
Demand Cost of Gas	$ 0.8293	$ 0.8191	$ 0.8191	$ 0.7888	$ (0.0405)	-4.88%	$ (0.0303)	-3.69%	$ (0.0303)	-3.69%
Total Cost of Gas	$ 6.7094	$ 3.4389	$ 3.4389	$ 3.4086	$ (3.3008)	-49.20%	$ (0.0303)	-0.88%	$ (0.0303)	-0.88%
Average Annual Usage (Dth)	80.0	80.0	80.0	80.0						
Average Annual Total Cost of Gas	$ 536.75	$ 275.11	$ 275.11	$ 272.69	$ (264.06)	-49.20%	$ (2.42)	-0.88%	$ (2.42)	-0.88%

	Annualized Impact									
Commercial & Industrial Firm	Last Rate Case 1/	Last Demand Change 2/	Current PGA w/o Demand Entitlement Change (March 1, 2018)	Proposed Demand Entitlement Change	Change from Last Rate Case	% Change from Last Rate Case	Change from Last Demand Change	% Change from Last Demand Change	Change from Most Recent PGA	% Change from Most Recent PGA
Commodity Cost of Gas (WACOG)	$ 5.8801	$ 2.6198	$ 2.6198	$ 2.6198	$ (3.26)	-55.45%	$ -	0.00%	$ -	0.00%
Demand Cost of Gas	$ 0.8293	$ 0.8191	$ 0.8191	$ 0.7888	$ (0.04)	-4.88%	$ (0.0303)	-3.69%	$ (0.0303)	-3.69%
Total Cost of Gas	$ 6.7094	$ 3.4389	$ 3.4389	$ 3.4086	$ (3.30)	-49.20%	$ (0.0303)	-0.88%	$ (0.0303)	-0.88%
Average Annual Usage (Dth)	567.6	567.6	567.6	567.6						
Average Annual Total Cost of Gas	$ 3,808.49	$ 1,952.03	$ 1,952.03	$ 1,934.86	$ (1,873.63)	-49.20%	$ (17.18)	-0.88%	$ (17.18)	-0.88%

Notes:
1/ Docket Nos. G022/GR-09-962 & G022/MR-10-949
2/ Docket No. G022/M-10-1165 & G022/AA-10-1186

Greater Minnesota Gas, Inc.
Purchased Gas Adjustment (PGA) Calculation

Effective date of implementation: Natural gas usage on and after **March 1, 2018**

Reason for change: Change in cost of gas due to an estimated decrease in the market price of natural gas from February 2018.

This PGA is based on the following Northern Natural Gas Tariffs:
12th Revised Sheet No. 50
Issued: 7/11/2017
Effective: 8/11/2017
13th Revised Sheet No. 51
Issued: 7/11/2017
Effective: 8/11/17
1st Revised Sheet No. 55
Issued: 6/30/14
Effective: 9/30/14

This PGA is based on the following Viking Gas Transmission Co. Tariffs:
v.27.0.0 superseding v.26.0.0
Issued: 9/1/2017
Effective: 11/1/2017

I. Greater Minnesota Gas, Inc. - Base Cost of Gas **November 1, 2010**
Approved in Docket No. G022/MR-10-949

		MCF	x Months	x Tariff Rate	Equals	Rate/CCF Firm	Rate/CCF Interruptible
All Customer Sales Rate Classes - Demand							
	TFX - 7	300	7	$5.6830	11,934	$0.002773	
	TFX-5	4,244	5	$15.1530	321,547	$0.074711	
	SMS Demand	50	7	$2.1800	763	$0.000177	
		1,300	8	$2.1800	22,672	$0.005268	
	Total Capacity Cost				$356,916		
	Rate Case 2009 Firm Sales Service Volume - CCF			4,303,890			
	Demand Base Cost of Gas / CCF					**$0.082929**	**$0.000000**
All Customer Sales Rate Classes - Commodity							
	All Classes Commodity				$ 2,808,142		
	Rate Case Total Sales Service Volume - CCF			4,775,650			
	Commodity Base Cost of Gas/CCF					**$0.588013**	**$0.588013**
	Total Base Cost of Gas/CCF				$3,165,058	**$0.670942**	**$0.588013**

Annual Sales Volume - 2009 Rate Case Sales Service Volume - CCF		**4,775,650**
Sales Service Volume - CCF	4,303,890	
Interruptible Service Volume - CCF	471,760	

II. Greater Minnesota Gas, Inc. Rates - Current Cost of Gas Effective **March 1, 2018**

Commodity Cost of Gas $0.261980 WACOG

III. Annual Sales Volume - 2017-2018 Budget (September - August)		**13,858,850**
Sales Service Volume - CCF	**11,683,600**	
Interruptible Service Volume - CCF	**2,175,250**	

IV. Greater Minnesota Gas, Inc.'s -- Current Cost of Gas Effective **March 1, 2018**

All Customer Sales Rate Classes	MCF	x Months	x Tariff Rate		Equals	Rate/CCF Firm	Rate/CCF Ag Interr	Rate/CCF Gen Interr
Viking Zone 1	2,000	12	$4.3706		104,894	$0.008978		
Viking Zone 1	1,400	12	$4.3706		73,426	$0.006285		
Viking Zone 1	1,200	12	$4.3706		62,937	$0.005387		
Viking Zone 1	2,200	11	$4.3706		105,769	$0.009053		
TFX - 5	6,344	5	$15.1530		480,653	$0.041139		
TF - 12	210	5	$10.2300		10,742	$0.000919		
TF - 12	210	7	$5.6830		8,354	$0.000715		
TF - 12	500	5	$10.2300		25,575	$0.002189		
TF - 12	500	7	$5.6830		19,891	$0.001702		
TF - 5	90	5	$15.1530		6,819	$0.000584		
TFX - 7	665	5	$15.1530		50,384	$0.004312		
TFX - 7	665	2	$5.6830		7,558	$0.000647		
					0	$0.000000		
Current Demand Cost of Gas					$957,001	**$0.081910**	**$0.000000**	**$0.000000**
Current Commodity Cost of Gas/CCF			% of Total	79%	**$3,630,742**	**$0.261980**	**$0.261980**	**$0.261980**
Total Cost of Gas/CCF					**$4,587,742**	**$0.343890**	**$0.261980**	**$0.261980**

Summary of Cost
All Customer Sales Rate Classes (/CCF)

	Firm Sales				Agricultural Interruptible				General Interruptible			
	Total Demand	Total Commodity	True-up	**Total**	Total Demand	Total Commodity	True-up	**Total**	Total Demand	Total Commodity	True-up	**Total**
1) Base Rate	$0.082929	$0.588013	$0.000000	**$0.670942**	$0.000000	$0.588013	$0.000000	**$0.588013**	$0.000000	$0.588013	$0.000000	**$0.588013**
2) Prior PGA	($0.001019)	($0.208373)	$0.002070	**($0.207322)**	$0.000000	($0.208373)	$0.005120	**($0.203253)**	$0.000000	($0.208373)	$0.005490	**($0.202883)**
3) Current Adj	$0.000000	($0.117660)	$0.000000	**($0.117660)**	$0.000000	($0.117660)	$0.000000	**($0.117660)**	$0.000000	($0.117660)	$0.000000	**($0.117660)**
4) PGA Billed (2+3)	($0.001019)	($0.326033)	$0.002070	**($0.324982)**	$0.000000	($0.326033)	$0.005120	**($0.320913)**	$0.000000	($0.326033)	$0.005490	**($0.320543)**
5) Average Cost of Gas	$0.081910	$0.261980	$0.002070	**$0.345960**	$0.000000	$0.261980	$0.005120	**$0.267100**	$0.000000	$0.261980	$0.005490	**$0.267470**

	Prior Cumulative Adjustments	Demand & Commodity Change Filed Herein	True-up Adjustment Factor Change Eff. September 1, 2017 (G022/AA-17-___)	Current PGA Adjustment
All Firm Sales Rate Classes (/CCF)	($0.209392)	($0.117660)	$0.002070	**($0.324982)**
Ag Inter. Sales Rate Classes (/CCF)	($0.208373)	($0.117660)	$0.005120	**($0.320913)**
Gen. Inter. Sales Rate Classes (/CCF)	($0.208373)	($0.117660)	$0.005490	**($0.320543)**

		1	2	3	4	5	7
March 1, 2018	Tariff Rate Designation	Non-gas Commodity Margin ($/CCF)	Commodity Cost ($/CCF)	Demand Other PGA Expenses ($/CCF)	Total Cost of Gas ($/CCF) (2)+(3)+(4)	True-up Factor ($/CCF)	Total Billing Rate ($/CCF)
Rate Class							
Residential	RS1	$0.444330	$0.261980	$0.081910	$0.343890	$0.002070	$0.790290
Small Commercial CS1	SCS1	$0.426330	$0.261980	$0.081910	$0.343890	$0.002070	$0.772290
Commercial CS1	CS1	$0.396330	$0.261980	$0.081910	$0.343890	$0.002070	$0.742290
Commercial/Industrial MS1	MS1	$0.376330	$0.261980	$0.081910	$0.343890	$0.002070	$0.722290
Commercial/Industrial LS1	LS1	$0.361330	$0.261980	$0.081910	$0.343890	$0.002070	$0.707290
Agricultural - Interruptible	AG1	$0.231310	$0.261980	$0.000000	$0.261980	$0.005120	$0.498410
General Interruptible	IND1	$0.251310	$0.261980	$0.000000	$0.261980	$0.005490	$0.518780
General Interruptible - Flex	IND1 - FL	$0.030000	$0.261980	$0.000000	$0.261980	$0.005490	$0.297470

Estimated Gas Volumes March 2018 1,495,470 Ccf

FOR ILLUSTRATIVE PURPOSES ONLY

Greater Minnesota Gas, Inc.
Purchased Gas Adjustment (PGA) Calculation

Effective date of implementation: Natural gas usage on and after **March 1, 2018**

Reason for change: Change in cost of gas due to an estimated decrease in the market price of natural gas from February 2018.

This PGA is based on the following Northern Natural Gas Tariffs:	This PGA is based on the following Viking Gas Transmission Co. Tariffs:
12th Revised Sheet No. 50	v.27.0.0 superseding v.26.0.0
Issued: 7/11/2017	Issued: 9/1/2017
Effective: 8/11/2017	Effective: 11/1/2017
13th Revised Sheet No. 51	
Issued: 7/11/2017	
Effective: 8/11/17	
1st Revised Sheet No. 55	
Issued: 6/30/14	
Effective: 9/30/14	

I. Greater Minnesota Gas, Inc. - Base Cost of Gas — **November 1, 2010**
Approved in Docket No. G022/MR-10-949

		MCF	x Months	x Tariff Rate	Equals	Rate/CCF Firm	Rate/CCF Interruptible
All Customer Sales Rate Classes - Demand							
	TFX - 7	300	7	$5.6830	11,934	$0.002773	
	TFX-5	4,244	5	$15.1530	321,547	$0.074711	
	SMS Demand	50	7	$2.1800	763	$0.000177	
		1,300	8	$2.1800	22,672	$0.005268	
	Total Capacity Cost				$356,916		
	Rate Case 2009 Firm Sales Service Volume - CCF			4,303,890			
	Demand Base Cost of Gas / CCF					**$0.082929**	**$0.000000**
All Customer Sales Rate Classes - Commodity							
	All Classes Commodity				$ 2,808,142		
	Rate Case Total Sales Service Volume - CCF			4,775,650			
	Commodity Base Cost of Gas/CCF					**$0.588013**	**$0.588013**
	Total Base Cost of Gas/CCF				$3,165,058	**$0.670942**	**$0.588013**

Annual Sales Volume - 2009 Rate Case Sales Service Volume - CCF		**4,775,650**
Sales Service Volume - CCF	4,303,890	
Interruptible Service Volume - CCF	471,760	

II. Greater Minnesota Gas, Inc. Rates - Current Cost of Gas Effective — **March 1, 2018**

Commodity Cost of Gas	$0.261980	WACOG

III. Annual Sales Volume - 2018-2019 Budget (September - August)		**14,503,850**
Sales Service Volume - CCF	**12,043,600**	
Interruptible Service Volume - CCF	**2,460,250**	

IV. Greater Minnesota Gas, Inc.'s -- Current Cost of Gas Effective — **November 1, 2018**

All Customer Sales Rate Classes		MCF	x Months	x Tariff Rate		Equals	Rate/CCF Firm	Rate/CCF Ag Interr	Rate/CCF Gen Interr
	Viking Zone 1	1,000	12	$4.3706		52,447	$0.004355		
	Viking Zone 1	1,400	12	$4.3706		73,426	$0.006097		
	Viking Zone 1	1,200	12	$4.3706		62,937	$0.005226		
	Viking Zone 1	2,200	11	$4.3706		105,769	$0.008782		
	TFX - 5	6,344	5	$15.1530		480,653	$0.039909		
	TF - 12	210	5	$10.2300		10,742	$0.000892		
	TF - 12	210	7	$5.6830		8,354	$0.000694		
	TF - 12	500	5	$10.2300		25,575	$0.002124		
	TF - 12	500	7	$5.6830		19,891	$0.001652		
	TF - 5	90	5	$15.1530		6,819	$0.000566		
	TFX - 7	665	5	$15.1530		50,384	$0.004183		
	TFX - 7	665	2	$5.6830		7,558	$0.000628		
	TF - 12	500	5	$10.2300		25,575	$0.002124		
	TF - 12	500	7	$5.6830		19,891	$0.001652		
	Current Demand Cost of Gas					$950,019	**$0.078884**	**$0.000000**	**$0.000000**
	Current Commodity Cost of Gas/CCF			% of Total	80%	**$3,799,719**	**$0.261980**	**$0.261980**	**$0.261980**
	Total Cost of Gas/CCF					**$4,749,738**	**$0.340864**	**$0.261980**	**$0.261980**

FOR ILLUSTRATIVE PURPOSES ONLY

Summary of Cost
All Customer Sales Rate Classes (/CCF)

	Firm Sales				Agricultural Interruptible				General Interruptible			
	Total Demand	Total Commodity	True-up	**Total**	Total Demand	Total Commodity	True-up	**Total**	Total Demand	Total Commodity	True-up	**Total**
1) Base Rate	$0.082929	$0.588013	$0.000000	**$0.670942**	$0.000000	$0.588013	$0.000000	**$0.588013**	$0.000000	$0.588013	$0.000000	**$0.588013**
2) Prior PGA	($0.001019)	($0.208373)	$0.002070	**($0.207322)**	$0.000000	($0.208373)	$0.005120	**($0.203253)**	$0.000000	($0.208373)	$0.005490	**($0.202883)**
3) Current Adj	($0.003026)	($0.117660)	$0.000000	**($0.120686)**	$0.000000	($0.117660)	$0.000000	**($0.117660)**	$0.000000	($0.117660)	$0.000000	**($0.117660)**
4) PGA Billed (2+3)	($0.004045)	($0.326033)	$0.002070	**($0.328008)**	$0.000000	($0.326033)	$0.005120	**($0.320913)**	$0.000000	($0.326033)	$0.005490	**($0.320543)**
5) Average Cost of Gas	$0.078884	$0.261980	$0.002070	**$0.342934**	$0.000000	$0.261980	$0.005120	**$0.267100**	$0.000000	$0.261980	$0.005490	**$0.267470**

	Prior Cumulative Adjustments	Demand & Commodity Change Filed Herein	True-up Adjustment Factor Change Eff. September 1, 2017 (G022/AA-17-___)	Current PGA Adjustment
All Firm Sales Rate Classes (/CCF)	($0.209392)	($0.120686)	$0.002070	**($0.328008)**
Ag Inter. Sales Rate Classes (/CCF)	($0.208373)	($0.117660)	$0.005120	**($0.320913)**
Gen. Inter. Sales Rate Classes (/CCF)	($0.208373)	($0.117660)	$0.005490	**($0.320543)**

		1	2	3	4	5		7
March 1, 2018	Tariff Rate Designation	Non-gas Commodity Margin ($/CCF)	Commodity Cost ($/CCF)	Demand Other PGA Expenses ($/CCF)	Total Cost of Gas ($/CCF) (2)+(3)+(4)	True-up Factor ($/CCF)		Total Billing Rate ($/CCF)
Rate Class								
Residential	RS1	$0.444330	$0.261980	$0.078884	$0.340864	$0.002070		$0.787264
Small Commercial CS1	SCS1	$0.426330	$0.261980	$0.078884	$0.340864	$0.002070		$0.769264
Commercial CS1	CS1	$0.396330	$0.261980	$0.078884	$0.340864	$0.002070		$0.739264
Commercial/Industrial MS1	MS1	$0.376330	$0.261980	$0.078884	$0.340864	$0.002070		$0.719264
Commercial/Industrial LS1	LS1	$0.361330	$0.261980	$0.078884	$0.340864	$0.002070		$0.704264
Agricultural - Interruptible	AG1	$0.231310	$0.261980	$0.000000	$0.261980	$0.005120		$0.498410
General Interruptible	IND1	$0.251310	$0.261980	$0.000000	$0.261980	$0.005490		$0.518780
General Interruptible - Flex	IND1 - FL	$0.030000	$0.261980	$0.000000	$0.261980	$0.005490		$0.297470

Estimated Gas Volumes March 2018 1,495,470 Ccf