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May 13, 2019

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 2019-2020 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 2019-2020 Heating Season
Docket No. __________________

filed this 13th day of May, 2019.

/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 2019
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 2019
Ian	Dobson	residential.utilities@ag.state.mn.us	Office of the Attorney General-RUD	1400 BRM Tower 445 Minnesota St St. Paul, MN 551012131	Electronic Service	No	GEN_SL_Greater Minnesota Gas, Inc._Official Service List 2019
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 2019
Brian	Gardow	bgardow@greatermngas.com	Greater Minnesota Gas, Inc.	PO Box 68 Le Sueur, MN 56058	Electronic Service	No	GEN_SL_Greater Minnesota Gas, Inc._Official Service List 2019
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 2019
Greg	Palmer	gpalmer@greatermngas.com	Greater Minnesota Gas, Inc.	PO Box 68 202 South Main Street Le Sueur, MN 56058	Electronic Service	No	GEN_SL_Greater Minnesota Gas, Inc._Official Service List 2019
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 2019

STATE OF MINNESOTA

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Katie Sieben	Chair
Dan Lipschultz	Commissioner
Valerie Means	Commissioner
Matt Schuerger	Commissioner
John Tuma	Commissioner

PETITION FOR CHANGE IN CONTRACT DEMAND ENTITLEMENT FOR 2019-2020 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 2019-2020 heating season. GMG plans to include the rate impact of these changes in GMG's Purchased Gas Adjustments November 1, 2019.

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 2019, 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 adjusting its reserve margin accordingly. GMG's proactive portfolio management and its increased customer base coupled to prevent adverse rate impacts 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 and during the severe weather event in January and February of 2019 that was virtually unprecedented in recent decades. 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 2019-2020 heating season is based on its projected demand requirements and its portfolio changes; and, it is informed by lessons gleaned during the recent severe weather event. 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 2019-2020 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 2018-2019 (Dth)	Proposed Entitlement for 2019-2020 (Dth)	Entitlement Change (Dth)	% Change From Previous Year
14,109	15,275	1,166	7.24%

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

[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.

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 circumstances. 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 nominal increase in demand costs and, hence, in customer rate; but, the impact is not substantial on individual customers. GMG's proposed reserve margin for the upcoming heating season is 7.24%; and, as further explained herein, it 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 2019-2020 Heating Season	
Design Day Requirement (Attachment A, Page 2 of 3, line 10)	14,244
Reserve Margin of 7.24%	1,031
Design Day Requirement With 7.24% Reserve Margin	15,275

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. GMG incorporated three years of heating season data into its regression analysis.[2]

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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

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. 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 2019-2020 heating season is based on 14,244 Dth, which is an increase of 1,540 Dth from GMG's 2018-2019 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 2016 through February 2018 for the reasons discussed above. The firm sales volume data was correlated to geographic weather data for each of GMG's three service territories, separating regression data for its northern, central, and southern districts.
>
> 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 2019-2020 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:

$$\boldsymbol{Y = a + b\,X}$$

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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.

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:

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

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. Conversely, when the weather is very cold, such as the recent severe weather event, customer usage patterns can be erratic and may vary from traditional usage patterns. Since such anomalies are unpredictable, they too can impact actual throughput. Such phenomena support GMG's continued use of a conservative reserve margin.

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 29, 2019 at 88 HDD and resulted in a firm sales throughput of 13,323 Dth/Day, as shown in Attachment A. The firm customer count on that date was 8,501 and the resulting use per customer was 1.567 Dth. That same date also became GMG's all-time peak day. Hence, while GMG traditionally applies a mathematical analysis that shows two estimated peak day requirements – one based on the prior season's peak day usage and anticipated customer additions and one based on GMG's all-time high peak day usage and anticipated customer additions – GMG's current mathematical analysis is based on only one date, since both events occurred on January 29, 2019. GMG's mathematical analysis is shown below.

Mathematical Peak Day Analysis	
	2019-2020 Estimated Peak Day Use
Actual Peak Day Throughput	13,323
/ Customer Count on Peak Day	8,501
= Use Per Customer on Peak Day	1.567
x Adjustment for 90 HDD	90/88
Estimated Peak Day Usage Per Customer if 90 HDD	1.603
Additional Residential Customers	519
Additional Commercial Customers	70
x Total Anticipated Customer Count	9,090
= Total Projected Peak Day Requirement	14,570
Proposed Contract Demend Entitlement	15,275
Reserve Margin	705
Reserve Margin %	4.8%

GMG's mathematical analysis confirms that its requested demand entitlement should provide sufficient reserve to protect its customers if unseasonably cold conditions strike again 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.[3]

[3] . GMG notes that some 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, in keeping with its recent practice, since this Petition is being submitted prior to June 30th, GMG utilized seasonal customer usage data for the 2018 calendar year.

Seasonal Customer Usage by Class (Dth)			
	Winter	**Summer**	**Total**
Residential - Firm	559,581	192,754	752,336
Commercial - Firm	28,206	8,805	37,010
Industrial - Firm	300,796	138,496	439,292
Flexible Rate - Firm			
Total Firm	*888,583*	*340,055*	*1,228,637*
Agricultural - Interruptible	*72,546*	*63,459*	*136,005*
Industrial - Interruptible	33,295	104,045	137,340
Flexible Rate - Interruptible			
Total Interruptible	*33,295*	*104,045*	*137,340*
Total	994,423	507,559	1,501,982

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 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 2019-2020 heating season and the corresponding change in contract demand costs. As illustrated by Attachments B and C, GMG was able to secure additional permanent, non-recallable release capacity from Northern Natural Gas at a cost-effective rate, which capacity is only available on very rare occasions. The released capacity was available at a substantially lower rate than new incremental capacity would have been. 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 November 1, 2019. 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 2019-2020 heating season nears, essentially to true-up its anticipated needs. If GMG's customer growth exceeds its projections, GMG will notify the Commission of its plan to obtain any necessary additional capacity. In the event that the Commission believes that GMG should release some of its capacity, GMG respectfully requests that the Commission issue an order to that effect prior to September 30, 2019. While GMG does not believe that releasing capacity is necessary, it will need time to do so before the beginning of the heating season if the Commission take a different view.

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, while GMG's customers will experience a slight increase in cost due to GMG's supply portfolio changes, the change does not result in a substantial impact. The lack of a significant adverse impact to customer rates as a result of the increased demand entitlement 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 2019-2020 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 2019-2020 Heating Season. Additionally, if the Commission requests that GMG release some of its capacity despite its calculations set forth herein, GMG respectfully requests that any such order be issued by September 30, 2019.

Dated: May 13, 2019

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)]
2019-2020 Est(12/31/19)	9,090	589	6.93%	14,244	1,540	12.12%	15,275	1,166	8.26%	7.24%
2018-2019 (1/29/19)	8,501	591	7.47%	12,704 2/	755	6.32%	14,109	1,500	11.90%	11.06% 3/
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	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	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:	3,915	379	18.59%	5,148	606	19.94%	5,719	651	22.02%	13.28%

	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)
2019-2020	*Unknown*			*0.113*	*1.5670*	*1.6804*	*Unknown*
2018-2019 (1/29/19)	13,323	2,963	28.60%	0.165	1.4944	1.6597	1.5672
2017-2018 (12/31/17)	10,360	1,114	12.05%	0.083	1.5106	1.5941	1.3097
2016-2017 (1/5/17)	9,246	(249)	-2.62%	0.344	1.4663	1.8107	1.2532
2015-2016 (1/17/16)	9,495	1,126	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	2,855	56.82%	0.244	1.5203	1.7642	1.4854
2012-2013	5,025	1,368	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	(4,198)					
Average per Year:	4,370	389	26.02%	0.152	1.1588	1.3105	1.0532

Notes:
1/ Total Entitlement = Total Contract Entitlement - Non-Recallable Capacity Release
2/ Actual Peak Day was 13,323 on 1/29/19 and actual use design day was 13,627 (8,501 customers x 1.603 actual use).
3/ Based on actual use on 1/29/19 the actual Reserve Margin was 5.9% (14,109 - 13,323 = 786 / 13,323).

Greater Minnesota Gas, Inc.
Design Day: Heating Season 2019 - 2020
Derivation of Design Day Use Per Customer

Linear Regression Analysis Period: December 2016 thru March 2019
Whole System

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	All Areas	66.13	80.01	90	7,267	0.9160	Y Inter + Slope x Design HDD = Estimated Design Dth
2	Firm Commercial	All Areas	198.58	58.82	90	5,492	0.9291	
			264.71	138.83				
3					**Total Design Dths**	**12,759**		Line 1 + Line 2
4					**Estimated Interruptible Load**	**<u>0</u>**		
5					**Net Design Dths**	**12,759**		Line 3 - Line 5
6					**Customer Count 1/29/2019**	**<u>8,501</u>**		
7					**Design Dths/Customer**	**1.5009**		Line 5 / Line 6
8					**Actual Results Design Dths/Customer**	**1.5670**		
9					**Estimated Firm Customers for 2019/2020**	**<u>9,090</u>**		
10					**Design Dths 2019/2020**	**14,244**		Line 8 x Line 9

	Greater Minnesota Gas, Inc.							
	Design Day: Heating Season 2019 - 2020							
	Derivation of Design Day Use Per Residential Customer							
Linear Regression Analysis Period: December 2016 thru March 2019								
Southern Territory								
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	Southern MN	-28.45	63.57	90	5,693	0.9295	Y Inter + Slope x Design HDD = Estimated Design Dth
2	Firm Commercial	Southern MN	-83.07	31.42	90	2,745	0.8607	
			-111.52	94.99				
3				**Total Design Dths**		**8,437**		Line 1 + Line 2
4			**Estimated Interruptible Load**			**0**		
5				**Net Design Dths**		**8,437**		Line 3 - Line 5
6				**Customer Count 1/29/2019**		**6,330**		
7				**Design Dths/Customer**		**1.3329**		Line 5 / Line 6
8			**Estimated Firm Customers for 2019/2020**			**6,694**		
9				**Design Dths 2019/2020**		**8,923**		Line 7 x Line 8

Design Day: Heating Season 2019 - 2020
Derivation of Design Day Use Per Residential Customer

Linear Regression Analysis Period: December 2016 thru March 2019
Central Territory

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	Central MN	15.52	5.63	90	522	0.8785	Y Inter + Slope x Design HDD = Estimated Design Dth
2	Firm Commercial	Central MN	313.37	20.86	90	2,191	0.8651	
			328.89	26.49				
3				**Total Design Dths**		**2,713**		Line 1 + Line 2
4			**Estimated Interruptible Load**			**0**		
5				**Net Design Dths**		**2,713**		Line 3 - Line 5
6				**Customer Count 1/29/2019**		**791**		
7				**Design Dths/Customer**		**3.4299**		Line 5 / Line 6
8			**Estimated Firm Customers for 2019/2020**			**866**		
9				**Design Dths 2019/2020**		**2,970**		Line 7 x Line 8

Greater Minnesota Gas, Inc.
Design Day: Heating Season 2019 - 2020
Derivation of Design Day Use Per Residential Customer

Linear Regression Analysis Period: December 2016 thru March 2019
Northern Territory

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	Northern MN	-112.02	10.60	90	842	0.7866	Y Inter + Slope x Design HDD = Estimated Design Dth
2	Firm Commercial	Northern MN	-13.56	2.14	90	179	0.8638	
			-125.58	12.75				
3				**Total Design Dths**		**1,022**		Line 1 + Line 2
4			**Estimated Interruptible Load**			**0**		
5				**Net Design Dths**		**1,022**		Line 3 - Line 5
6				**Customer Count 1/29/2019**		**1,380**		
7				**Design Dths/Customer**		**0.7404**		Line 5 / Line 6
8			**Estimated Firm Customers for 2019/2020**			**1,530**		
9				**Design Dths 2019/2020**		**1,133**		Line 7 x Line 8

Greater Minnesota Gas, Inc.
Peak Day Analysis

Line No.	Description	Design Day Calculation	Peak Day 2018 -19	Peak Day 2017 -18	Peak Day 2016 -17	Peak Day 2015 -16
1	Date of Peak Day		1/29/2019	12/31/2017	1/5/2017	1/17/2016
2	Day of the Week		Tuesday	Sunday	Thursday	Sunday
3	Total Throughput (Dth)	14244	13323	10360	9246	9495
4	Interruptible Customer Usage (Dth)	0	0	0	0	0
5	Firm Transportation Usage (Dth)	0	0	0	0	0
6	Firm Sales Throughput (Dth)	14244	13323	10360	9246	9495
7	Average Actual Gas Day Temperature (Deg. F)	-25	-24	-10	-3	-8
8	Heating Degree Days (HDD) 65 degree base	90	89	75	68	73
9	Non-HDD Sensitive Base (Dth)	265	208	839	407	682
10	Total HDD Sensitive Firm Throughput (Dth)	13979	13115	9521	8839	8813
11	Actual Firm Peak Day Dth/HDD (Dth)	155	147	127	130	121
12	Base + (Actual Dth/HDD * HDDs) (Dth)	14244	13323	10360	9246	9495
13	Peak Month Firm Customers	9090	8501	7910	7378	6643
14	Peak Day Use per Firm Customer	1.567	1.567	1.310	1.253	1.429

Greater Minnesota Gas, Inc.
Residential Peak Day Analysis

Line No.	Description	Design Day Calculation	Peak Day 2018 -19	Peak Day 2017 -18	Peak Day 2016 -17	Peak Day 2015 -16
1	Date of Peak Day		1/29/2019	12/31/2017	1/5/2017	1/17/2016
2	Day of the Week		Tuesday	Sunday	Thursday	Sunday
3	Total Throughput (Dth)	8923	7481	5776	5140	4783
4	Interruptible Customer Usage (Dth)	0	0	0	0	0
5	Firm Transportation Usage (Dth)	0	0	0	0	0
6	Firm Sales Throughput (Dth)	8923	7481	5776	5140	4783
7	Average Actual Gas Day Temperature (Deg. F)	-25	-24	-10	-3	-8
8	Heating Degree Days (HDD) 65 degree base	90	89	75	68	73
9	Non-HDD Sensitive Base (Dth)	66	-43	343	134	152
10	Total HDD Sensitive Firm Throughput (Dth)	8857	7524	5433	5006	4631
11	Actual Firm Peak Day Dth/HDD (Dth)	98	85	72	74	63
12	Base + (Actual Dth/HDD * HDDs) (Dth)	8923	7481	5776	5140	4783
13	Peak Month Firm Customers	7637	7726	7187	6700	6063
14	Peak Day Use per Residential Customer	1.168	0.968	0.804	0.767	0.789

Greater Minnesota Gas, Inc.						
Firm Commercial Peak Day Analysis						
Line No.	Description	Design Day Calculation	Peak Day 2018 -19	Peak Day 2017 -18	Peak Day 2016 -17	Peak Day 2015 -16
1	Date of Peak Day		1/29/2019	12/31/2017	1/5/2017	1/17/2016
2	Day of the Week		Tuesday	Sunday	Thursday	Sunday
3	Total Throughput (Dth)	866	4584	4584	4106	4712
4	Interruptible Customer Usage (Dth)	0	0	0	0	0
5	Firm Transportation Usage (Dth)	0	0	0	0	0
6	Firm Sales Throughput (Dth)	866	4584	4584	4106	4712
7	Average Actual Gas Day Temperature (Deg. F)	-25	-10	-10	-3	-8
8	Heating Degree Days (HDD) 65 degree base	90	75	75	68	73
9	Non-HDD Sensitive Base (Dth)	313	252	495	273	530
10	Total HDD Sensitive Firm Throughput (Dth)	553	4332	4089	3833	4182
11	Actual Firm Peak Day Dth/HDD (Dth)	6	58	55	56	57
12	Base + (Actual Dth/HDD * HDDs) (Dth)	866	4584	4584	4106	4712
13	Peak Month Firm Customers	815	775	723	678	580
14	Peak Day Use per Firm Commercial Customer	1.063	5.915	6.340	6.056	8.124

ATTACHMENT B
Demand Profile and Supply Comparison

2017 - 2018 Heating Season	Quantity (Dth)	2018 - 2019 Heating Season	Quantity (Dth)	Change in Quantity (Dth)		2019 - 2020 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	TF 12 (Nov. - Oct.)	500	-		TF 12 (Nov. - Oct.)	500	-
		TF 12 (Nov. - Oct.)	500	500		TF 12 (Nov. - Oct.)	500	-
					1	TFX-5 (Nov. - Mar.)	349	349
					1	TF 12 (Nov. - Oct.)	817	817
								-
Viking Forward Haul/Emerson	1,400	Viking Forward Haul/Emerson	1,400	-		Viking Forward Haul/Emerson	1,400	-
Viking Forward Haul/Emerson	1,200	Viking Forward Haul/Emerson	1,200	-		Viking Forward Haul/Emerson	1,200	-
FT-A Capacity Release - Non-recallable	-	FT-A Capacity Release - Non-recallable	-	-		FT-A Capacity Release - Non-recallable	-	-
FT-A Viking	2,200	FT-A Viking	2,200	-		FT-A Viking	2,200	-
		FT-A Viking	1,000	1,000		FT-A Viking	1,000	-
Viking Zone 1	2,000	Viking Zone 1	-				-	-
SMS	2,000	SMS	2,500	500		SMS	2,500	**-**
Heating Season Total Capacity	12,609	Heating Season Total Capacity	14,109	1,500		Heating Season Total Capacity	15,275	1,166
Non-Heating Season Total Capacity	210	Non-Heating Season Total Capacity	210	-		Non-Heating Season Total Capacity	210	-
Total Entitlement @ Peak	12,609	Total Entitlement @ Peak	14,109	1,500		Total Entitlement @ Peak	15,275	1,166
Total Annual Transportation	-	Total Annual Transportation	-	-		Total Annual Transportation	-	-
Total Season Transportation	12,609	Total Season Transportation	14,109	1,500		Total Season Transportation	15,275	1,166
Total Percent Summer Vs. Winter	1.7%	Total Percent Summer Vs. Winter	1.5%			Total Percent Summer Vs. Winter	1.4%	
Total Percent Seasonal	100.0%	Total Percent Seasonal	100.0%			Total Percent Seasonal	100.0%	

Notes:

1/ Company has secured 1,166 Dth of release capacity in Northern Natural Gas Zone E-F effective November 1, 2019. 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
132592	NNG Firm Throughput	TF - 12	Apr-Mar	500	10/31/2024
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	10/31/2022
AFO299	Viking Forward Haul	FT-A	Nov-Oct	1,000	10/31/2023
		2018-19 Heating Season Total Capacity		14,109	
		2018-19 Design Day Demand		12,759	
		Reserve Margin		1,350	10.6%

Proposed Contract Entitlement Changes for 2018-19

Start Date	Contract No.	Service Type	Rate Schedule	Months	Entitlement (Dth)	Expiration Date
11/1/2019	120579	NNG Firm Throughput	TFX - 5	Nov-Mar	349	10/31/2022
11/1/2019	120579	NNG Firm Throughput	TF - 12	Nov-Oct	817	10/31/2022
					1,166	
			2019-20 Heating Season Total Capacity		15,275	
			2019-20 Design Day Demand		14,244	
			Reserve Margin		1,031	7.2%

Proposed Change in Contract Demand Costs

Contract No.	Rate Schedule	Volume Dth / Day	No. of Months	Monthly Demand Rates	Total Annual Cost
120579	TFX - 5	349	5	$ 15.1530	$ 26,441.99
120579	TF - 12	817	5	$ 10.2300	$ 41,789.55
120579	TF - 12	817	7	$ 5.6830	$ 32,501.08
					$ 100,732.61

ATTACHMENT D
Rate Impact of Proposed Contract Demand Entitlement

Residential	Last Rate Case 1/	Last Demand Change 2/	*Current PGA w/o Demand Entitlement Change (April 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	$ 2.6119	$ 2.6119	$ 2.6119	$ (3.27)	-55.58%	$ -	0.00%	$ -	0.00%
Demand Cost of Gas	$ 0.8293	$ 0.7922	$ 0.7922	$ 0.8336	$ 0.0043	0.52%	$ 0.0415	5.23%	$ 0.0415	5.23%
Total Cost of Gas	$ 6.7094	$ 3.4041	$ 3.4041	$ 3.4455	$ (3.2639)	-48.65%	$ 0.0415	1.22%	$ 0.0415	1.22%
Average Annual Usage (Dth)	104.7	104.7	104.7	104.7						
Average Annual Total Cost of Gas	$ 702.34	$ 356.34	$ 356.34	$ 360.68	$ (341.67)	-48.65%	$ 4.34	1.22%	$ 4.34	1.22%

Annualized Impact

Commercial & Industrial Firm	Last Rate Case 1/	Last Demand Change 2/	Current PGA w/o Demand Entitlement Change (April 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	$ 2.6119	$ 2.6119	$ 2.6119	$ (3.27)	-55.58%	$ -	0.00%	$ -	0.00%
Demand Cost of Gas	$ 0.8293	$ 0.7922	$ 0.7922	$ 0.8336	$ 0.00	0.52%	$ 0.0415	5.23%	$ 0.0415	5.23%
Total Cost of Gas	$ 6.7094	$ 3.4041	$ 3.4041	$ 3.4455	$ (3.26)	-48.65%	$ 0.0415	1.22%	$ 0.0415	1.22%
Average Annual Usage (Dth)	658.8	658.8	658.8	658.8						
Average Annual Total Cost of Gas	$ 4,420.07	$ 2,242.54	$ 2,242.54	$ 2,269.85	$ (2,150.22)	-48.65%	$ 27.31	1.22%	$ 27.31	1.22%

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 **April 1, 2019**

Reason for change: Change in cost of gas due to an estimated decrease in the market price of natural gas from March 2019.

This PGA is based on the following Northern Natural Gas Tariffs:
14th Revised Sheet No. 50
Issued: 2/1/2019
Effective: 4/1/2019
17th Revised Sheet No. 51
Issued: 2/1/2019
Effective: 4/1/19
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.31.0.0 superseding v.30.0.0
Issued: 9/28/2018
Effective: 11/1/2018

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

						Rate/CCF	
All Customer Sales Rate Classes - Demand		MCF	x Months	x Tariff Rate	Equals	Firm	Interruptible
	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 **April 1, 2019**

Commodity Cost of Gas	$0.261190	WACOG

III. Annual Sales Volume - 2018-2019 Budget (September - August)		**14,226,500**
Sales Service Volume - CCF	**12,114,400**	
Interruptible Service Volume - CCF	**2,112,100**	

IV. Greater Minnesota Gas, Inc.'s -- Current Cost of Gas Effective **April 1, 2019**

							Rate/CCF	
All Customer Sales Rate Classes		MCF	x Months	x Tariff Rate		Equals	Firm	Ag Interr	Gen Interr
	Viking Zone 1	1,000	12	$4.3706		52,447	$0.004329		
	Viking Zone 1	1,400	12	$4.3706		73,426	$0.006061		
	Viking Zone 1	1,200	12	$4.3706		62,937	$0.005195		
	Viking Zone 1	2,200	12	$4.3706		115,384	$0.009525		
	TFX - 5	6,344	5	$15.1530		480,653	$0.039676		
	TF - 12	210	5	$10.2300		10,742	$0.000887		
	TF - 12	210	7	$5.6830		8,354	$0.000690		
	TF - 12	1000	5	$10.2300		51,150	$0.004222		
	TF - 12	1000	7	$5.6830		39,781	$0.003284		
	TF - 5	90	5	$15.1530		6,819	$0.000563		
	TFX - 7	665	5	$15.1530		50,384	$0.004159		
	TFX - 7	665	2	$5.6830		7,558	$0.000624		
						0	$0.000000		
	Current Demand Cost of Gas					$959,634	**$0.079215**	**$0.000000**	**$0.000000**
	Current Commodity Cost of Gas/CCF			% of Total	79%	**$3,715,820**	**$0.261190**	**$0.261190**	**$0.261190**
	Total Cost of Gas/CCF					**$4,675,454**	**$0.340405**	**$0.261190**	**$0.261190**

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	($0.003714)	($0.276293)	$0.010760	**($0.269247)**	$0.000000	($0.276293)	$0.019760	**($0.256533)**	$0.000000	($0.276293)	$0.002560	**($0.273733)**
3) Current Adj	$0.000000	($0.050530)	$0.000000	**($0.050530)**	$0.000000	($0.050530)	$0.000000	**($0.050530)**	$0.000000	($0.050530)	$0.000000	**($0.050530)**
4) PGA Billed (2+3)	($0.003714)	($0.326823)	$0.010760	**($0.319777)**	$0.000000	($0.326823)	$0.019760	**($0.307063)**	$0.000000	($0.326823)	$0.002560	**($0.324263)**
5) Average Cost of Gas	$0.079215	$0.261190	$0.010760	**$0.351165**	$0.000000	$0.261190	$0.019760	**$0.280950**	$0.000000	$0.261190	$0.002560	**$0.263750**

	Prior Cumulative Adjustments	Demand & Commodity Change Filed Herein	True-up Adjustment Factor Change Eff. September 1, 2018 (G022/AA-18-___)	Current PGA Adjustment
All Firm Sales Rate Classes (/CCF)	($0.280007)	($0.050530)	$0.010760	**($0.319777)**
Ag Inter. Sales Rate Classes (/CCF)	($0.276293)	($0.050530)	$0.019760	**($0.307063)**
Gen. Inter. Sales Rate Classes (/CCF)	($0.276293)	($0.050530)	$0.002560	**($0.324263)**

		1	2	3	4	5	7
April 1, 2019	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	$0.261190	$0.079215	$0.340405	$0.010760	$0.795495
Small Commercial CS1	SCS1	$0.426330	$0.261190	$0.079215	$0.340405	$0.010760	$0.777495
Commercial CS1	CS1	$0.396330	$0.261190	$0.079215	$0.340405	$0.010760	$0.747495
Commercial/Industrial MS1	MS1	$0.376330	$0.261190	$0.079215	$0.340405	$0.010760	$0.727495
Commercial/Industrial LS1	LS1	$0.361330	$0.261190	$0.079215	$0.340405	$0.010760	$0.712495
Agricultural - Interruptible	AG1	$0.231310	$0.261190	$0.000000	$0.261190	$0.019760	$0.512260
General Interruptible	IND1	$0.251310	$0.261190	$0.000000	$0.261190	$0.002560	$0.515060

Estimated Gas Volumes March 2019 1,105,300 Ccf

FOR ILLUSTRATIVE PURPOSES ONLY

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

Effective date of implementation: Natural gas usage on and after **April 1, 2019**

Reason for change: Change in cost of gas due to an estimated decrease in the market price of natural gas from March 2019.

This PGA is based on the following Northern Natural Gas Tariffs:
14th Revised Sheet No. 50
Issued: 2/1/2019
Effective: 4/1/2019
17th Revised Sheet No. 51
Issued: 2/1/2019
Effective: 4/1/19
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.31.0.0 superseding v.30.0.0
Issued: 9/28/2018
Effective: 11/1/2018

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 **April 1, 2019**

Commodity Cost of Gas	$0.261190	WACOG

III. Annual Sales Volume - 2019-2020 Budget (September - August)		**14,937,830**
Sales Service Volume - CCF	**12,720,120**	
Interruptible Service Volume - CCF	**2,217,710**	

IV. Greater Minnesota Gas, Inc.'s -- Current Cost of Gas Effective **April 1, 2019**

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	$0.004123		
Viking Zone 1	1,400	12	$4.3706		73,426	$0.005772		
Viking Zone 1	1,200	12	$4.3706		62,937	$0.004948		
Viking Zone 1	2,200	12	$4.3706		115,384	$0.009071		
TFX - 5	6,344	5	$15.1530		480,653	$0.037787		
TF - 12	210	5	$10.2300		10,742	$0.000844		
TF - 12	210	7	$5.6830		8,354	$0.000657		
TF - 12	1000	5	$10.2300		51,150	$0.004021		
TF - 12	1000	7	$5.6830		39,781	$0.003127		
TF - 5	90	5	$15.1530		6,819	$0.000536		
TFX - 7	665	5	$15.1530		50,384	$0.003961		
TFX - 7	665	2	$5.6830		7,558	$0.000594		
TFX - 5	349	5	$15.1530		26,442	$0.002079		
TF - 12	817	5	$10.2300		41,790	$0.003285		
TF - 12	817	7	$5.6830		32,501	$0.002555		
Current Demand Cost of Gas					$1,060,367	**$0.083360**	**$0.000000**	**$0.000000**
Current Commodity Cost of Gas/CCF			% of Total	79%	**$3,901,612**	**$0.261190**	**$0.261190**	**$0.261190**
Total Cost of Gas/CCF					**$4,961,979**	**$0.344550**	**$0.261190**	**$0.261190**

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	($0.003714)	($0.276293)	$0.010760	**($0.269247)**	$0.000000	($0.276293)	$0.019760	**($0.256533)**	$0.000000	($0.276293)	$0.002560	**($0.273733)**
3) Current Adj	$0.004145	($0.050530)	$0.000000	**($0.046385)**	$0.000000	($0.050530)	$0.000000	**($0.050530)**	$0.000000	($0.050530)	$0.000000	**($0.050530)**
4) PGA Billed (2+3)	$0.000431	($0.326823)	$0.010760	**($0.315632)**	$0.000000	($0.326823)	$0.019760	**($0.307063)**	$0.000000	($0.326823)	$0.002560	**($0.324263)**
5) Average Cost of Gas	$0.083360	$0.261190	$0.010760	**$0.355310**	$0.000000	$0.261190	$0.019760	**$0.280950**	$0.000000	$0.261190	$0.002560	**$0.263750**

	Prior Cumulative Adjustments	Demand & Commodity Change Filed Herein	True-up Adjustment Factor Change Eff. September 1, 2018 (G022/AA-18-___)	Current PGA Adjustment
All Firm Sales Rate Classes (/CCF)	($0.280007)	($0.046385)	$0.010760	**($0.315632)**
Ag Inter. Sales Rate Classes (/CCF)	($0.276293)	($0.050530)	$0.019760	**($0.307063)**
Gen. Inter. Sales Rate Classes (/CCF)	($0.276293)	($0.050530)	$0.002560	**($0.324263)**

		1	2	3	4	5	7
April 1, 2019	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	$0.261190	$0.083360	$0.344550	$0.010760	$0.799640
Small Commercial CS1	SCS1	$0.426330	$0.261190	$0.083360	$0.344550	$0.010760	$0.781640
Commercial CS1	CS1	$0.396330	$0.261190	$0.083360	$0.344550	$0.010760	$0.751640
Commercial/Industrial MS1	MS1	$0.376330	$0.261190	$0.083360	$0.344550	$0.010760	$0.731640
Commercial/Industrial LS1	LS1	$0.361330	$0.261190	$0.083360	$0.344550	$0.010760	$0.716640
Agricultural - Interruptible	AG1	$0.231310	$0.261190	$0.000000	$0.261190	$0.019760	$0.512260
General Interruptible	IND1	$0.251310	$0.261190	$0.000000	$0.261190	$0.002560	$0.515060