GREATER MINNESOTA GAS

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March 30, 2020

VIA ELECTRONIC FILING

Mr. William Seuffert
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. G022/_____

Dear Mr. Seuffert:

Attached hereto, please find Greater Minnesota Gas, Inc.'s Petition for Change in Contract Demand Entitlement for 2020-2021 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) 209-2110 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 and service or by depositing the same enveloped with postage paid in the United States Mail at Faribault, Minnesota, each as shown on the attached list:

Greater Minnesota Gas, Inc.'s Petition for Change in Contract Demand Entitlement for 2020-2021 Heating Season
Docket No. G022/_____

filed this 30th day of March, 2020.

/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.& Greater MN Transmission, LLC	1900 Cardinal Lane PO Box 798 Faribault, MN 55021	Electronic Service	No	GEN_SL_Greater Minnesota Gas, Inc._Official Service List 2020
Cody	Chilson	cchilson@greatermngas.com	Greater Minnesota Gas, Inc. & Greater MN Transmission, LLC	1900 Cardinal Ln PO Box 798 Faribault, MN 55021	Electronic Service	No	GEN_SL_Greater Minnesota Gas, Inc._Official Service List 2020
Generic Notice	Commerce Attorneys	commerce.attorneys@ag.state.mn.us	Office of the Attorney General-DOC	445 Minnesota Street Suite 1400 St. Paul, MN 55101	Electronic Service	No	GEN_SL_Greater Minnesota Gas, Inc._Official Service List 2020
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 2020
Brian	Gardow	bgardow@greatermngas.com	Greater Minnesota Gas, Inc. & Greater MN Transmission, LLC	1900 Cardinal Ln PO Box 798 Faribault, MN 55021	Electronic Service	No	GEN_SL_Greater Minnesota Gas, Inc._Official Service List 2020
Nicolle	Kupser	nkupser@greatermngas.com	Greater Minnesota Gas, Inc. & Greater MN Transmission, LLC	1900 Cardinal Ln PO Box 798 Faribault, MN 55021	Electronic Service	No	GEN_SL_Greater Minnesota Gas, Inc._Official Service List 2020
Greg	Palmer	gpalmer@greatermngas.com	Greater Minnesota Gas, Inc. & Greater MN Transmission, LLC	1900 Cardinal Ln PO Box 798 Faribault, MN 55021	Electronic Service	No	GEN_SL_Greater Minnesota Gas, Inc._Official Service List 2020
Generic Notice	Residential Utilities Division	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 2020
Will	Seuffert	Will.Seuffert@state.mn.us	Public Utilities Commission	121 7th Pl E Ste 350 Saint Paul, MN 55101	Electronic Service	No	GEN_SL_Greater Minnesota Gas, Inc._Official Service List 2020

STATE OF MINNESOTA

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Katie Sieben	Chair
Valerie Means	Commissioner
Matt Schuerger	Commissioner
Joseph Sullivan	Commissioner
John Tuma	Commissioner

PETITION FOR CHANGE IN CONTRACT DEMAND ENTITLEMENT FOR 2020-2021 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 2020-2021 heating season. GMG plans to include the rate impact of these changes in GMG's Purchased Gas Adjustments April 1, 2020.

As always, GMG remains committed to ensuring that it secures 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. In keeping with its practice, GMG employed a combined analytical framework methodology to assess its contract demand entitlement needs 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 as the heating season approaches 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 later in 2020, GMG will undertake appropriate action to address that scenario at that time; and, if necessary, GMG will amend its request herein.

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 a severe weather event in early 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. Similarly, GMG's holistic and proactive approach to securing available capacity at reasonable rates supports those assurances.

GMG's analysis of its needs for the 2020-2021 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 2020-2021 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:

Entitlement for 2019-2020 (Dth)	Proposed Entitlement for 2020-2021 (Dth)	Entitlement Change (Dth)	% Change From Previous Year
15,275	15,608	333	2.18%

[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. While the data becomes more solid each year, GMG continues a relatively aggressive growth pattern that changes among its districts and customer types. 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 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.

A small 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. Historically, the Commission has approved 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 may well return to suggesting more conservative levels in the future. At the time of this filing, however, GMG recognizes that its ratepayers are facing particularly uncertain and challenging times. GMG has once 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. Hence, GMG is proposing a slightly smaller reserve margin this year. GMG's proposed demand entitlement results in a nominal decrease in demand costs and, thus, in customer rates; but, the impact is not substantial on individual customers. GMG's proposed reserve margin for the upcoming heating season is 3.65%; and, as further explained herein, it provides additional 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 2020-2021 Heating Season	
Design Day Requirement (Attachment A, Page 2 of 3, line 10)	15,059
Reserve Margin of 3.65%	549
Design Day Requirement With 3.65% Reserve Margin	15,608

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]

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 2020-2021 heating season is based 15,059 Dth, which is an increase of 815 Dth from GMG's 2019-2020 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 2017 through February 2020 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

[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 ultimately 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.

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 2020-2021 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:

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

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 some recent heating seasons, new customers wait longer to convert to natural gas usage. Conversely, when the weather is very cold, such as during early 2019, 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 its proven approach.

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 all-time peak day sendout.

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

GMG's peak day during the last heating season occurred on February 13, 2020 at 75 HDD and resulted in a firm sales throughput of 11,689 Dth/Day, as shown in Attachment A, Page 3. The firm customer count on that date was 9,063 and the resulting use per customer was 1.253 Dth. GMG's all-time peak day usage of 1.567 Dth per customer on January 29, 2019. 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 2020-2021 customer additions, as shown below.

Mathematical Peak Day Analysis		
	2020-2021 Estimated Peak Day Use	**All-Time Peak Day Use**
Actual Peak Day Throughput	11,689	
/ Customer Count on Peak Day	9,063	
= Use Per Customer on Peak Day	1.290	1.567
x Adjustment for 90 HDD	90/75	90/88
Estimated Peak Day Usage Per Customer if 90 HDD	1.548	1.603
Additional Residential Customers	560	560
Additional Commercial Customers	105	105
x Total Anticipated Customer Count	9,728	9,728
= Total Projected Peak Day Requirement	15,056	15,590
Proposed Contract Demend Entitlement	15,608	15,608
Reserve Margin	552	18
Reserve Margin %	3.7%	0.1%

GMG recognizes that a pure mathematical analysis based on its all-time peak day use suggests that, in the extraordinary event that peak day conditions repeated themselves during the 2020-2021 heating season, GMG may not have sufficient reserve margin. That is precisely the rationale for GMG's use of multiple analytical frameworks when calculating its contract demand. Both the mathematical analysis based on empirical data from the last heating season and regression models that factor in weather conditions and customer use patterns support GMG's proposed contract demand entitlement. Additionally, GMG notes that it anticipates a lower peak day usage per customer in the coming heating season because, since GMG's peak date was reached, the bulk of GMG's new customers have been and are anticipated to be residential. Relying solely on mere numbers, without considering the character of the customers, based on a once-in-decades weather event is not prudent given the totality of the circumstances.

GMG's proposal strikes the optimal balance between securing sufficient reserve and protecting customers from unnecessary rate impacts.

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, 2019.[3]

Seasonal Customer Usage by Class (Dth)			
	Winter	**Summer**	**Total**
Residential - Firm	620,852	194,284	815,136
Commercial - Firm	36,755	10,734	47,489
Industrial - Firm	305,497	132,661	438,158
Flexible Rate - Firm			
Total Firm	*963,104*	*337,679*	*1,300,783*
Agricultural - Interruptible	*159,850*	*30,527*	*190,377*
Industrial - Interruptible	39,113	80,457	119,570
Flexible Rate - Interruptible			
Total Interruptible	*39,113*	*80,457*	*119,570*
Total	1,162,067	448,663	1,610,730

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

[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 2019 calendar year.

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 additional 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 2020-2021 heating season and the corresponding change in contract demand costs. As illustrated by Attachments B and C, GMG was able to secure additional permanent capacity from Northern Natural Gas at a cost-effective rate. 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, 2020. 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 2020-2021 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.

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 experience a slight decrease in cost due to GMG's supply portfolio changes; however, the change does not result in a substantial impact. The lack of an 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 2020-2021 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 2020-2021 Heating Season.

Dated: March 30, 2020

Respectfully submitted,
/s/
Kristine A. Anderson
Corporate Attorney
Greater Minnesota Gas, Inc.
1900 Cardinal Lane
P.O. Box 798
Faribault, MN 55021
Phone: 888-931-3411

ATTACHMENT A
Design Day Regression Analysis Background Information

Greater Minnesota Gas, Inc.
Contract Demand Entitlement Filing 2020 - 2021 Heating Season
Design Day 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)]
2020-2021 Est	9,728	665	7.34%	15,059	815	5.72%	15,608	333	2.18%	3.65%
2019-2020 (2/13/20)	9,063	562	7.10%	14,244 2/	1,540	12.12%	15,275	1,166	8.26%	7.24% 3/
2018-2019 (1/29/19)	8,501	591	7.47%	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	796	21.79%	5,044	500	11.00%	13.35%
2009-2010	3,722	162	4.55%	3,654	(628)	-14.67%	4,544	300	7.07%	24.36%
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	750	26.79%	3,650	350	10.61%	2.82%
2005-2006	2,971	290	10.82%	2,800	255	10.02%	3,300	300	10.00%	17.86%
2004-2005	2,681	336	14.33%	2,545	545	27.25%	3,000	600	25.00%	17.88%
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:	4,146	389	18.13%	5,509	615	19.46%	6,115	638	21.19%	14.12%

	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)
2020-2021	*Unknown*			*0.056*	*1.5480*	*1.6044*	*Unknown*
2019-2020 (2/13/20)	11,689	(1,634)	-12.26%	0.114	1.5717	1.6854	1.2897
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%	0.239	0.9817	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%	0.168	0.9424	1.1107	0.9465
2004-2005	2,527	185	7.90%	0.170	0.9493	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	172					
Average per Year:	4,870	501	24.36%	0.161	1.1654	1.3268	1.0635

Notes:
1/ Total Entitlement = Total Contract Entitlement - Non-Recallable Capacity Release
2/ Actual Peak Day was 11,689 on 2/13/20 and actual use design day was 14,030 (9,063 customers x 1.548 actual use).
3/ Based on actual use on 2/13/20 the actual Reserve Margin was 8.2% (15,275 - 14,030 = 1,245 / 15,275)

Greater Minnesota Gas, Inc.
Design Day: Heating Season 2020 - 2021
Derivation of Design Day Use Per Customer
Total Company

Linear Regression Analysis Period: December 2017 thru February 2020

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	134.12	82.11	90	7,524	0.8825	Y Inter + Slope x Design HDD = Estimated Design Dth
2	Firm Commercial	All Areas	221.89	59.42	90	5,569	0.9168	
			356.01	141.52				
3				**Total Design Dths**		**13,093**		Line 1 + Line 2
4				**Estimated Interruptible Load**		**0**		
5				**Net Design Dths**		**13,093**		Line 3 - Line 5
6				**Customer Count 2/13/2020**		**9,063**		
7				**Design Dths/Customer**		**1.4447**		Line 5 / Line 6
8				**Actual Results Design Dths/Customer**		**1.5480**		
9				**Estimated Firm Customers for 2020/2021**		**9,728**		
10				**Design Dths 2020/2021**		**15,059**		Line 8 x Line 9

Greater Minnesota Gas, Inc.
Design Day: Heating Season 2020 - 2021
Derivation of Design Day Use Per Residential Customer
Southern District

Linear Regression Analysis Period: December 2017 thru February 2020

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	140.91	63.94	90	5,895	0.9023	Y Inter + Slope x Design HDD = Estimated Design Dth
2	Firm Commercial	Southern MN	68.41	30.75	90	2,836	0.8319	
			209.32	94.69				
3				**Total Design Dths**		**8,731**		Line 1 + Line 2
4				**Estimated Interruptible Load**		**0**		
5				**Net Design Dths**		**8,731**		Line 3 - Line 5
6				**Customer Count 2/13/2020**		**6,661**		
7				**Design Dths/Customer**		**1.3108**		Line 5 / Line 6
8				**Actual Results Design Dths/Customer**		**1.5480**		
9				**Estimated Firm Customers for 2020/2021**		**7,094**		
10				**Design Dths 2020/2021**		**10,982**		Line 8 x Line 9

Greater Minnesota Gas, Inc.
Design Day: Heating Season 2020 - 2021
Derivation of Design Day Use Per Residential Customer
Central District

Linear Regression Analysis Period: December 2017 thru February 2020

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	37.34	5.84	90	563	0.8233	Y Inter + Slope x Design HDD = Estimated Design Dth
2	Firm Commercial	Central MN	251.98	20.87	90	2,130	0.8609	
			289.33	26.71				
3				**Total Design Dths**		**2,693**		Line 1 + Line 2
4				**Estimated Interruptible Load**		**0**		
5				**Net Design Dths**		**2,693**		Line 3 - Line 5
6				**Customer Count 2/13/2020**		**916**		
7				**Design Dths/Customer**		**2.9402**		Line 5 / Line 6
8				**Actual Results Design Dths/Customer**		**1.5480**		
9				**Estimated Firm Customers for 2020/2021**		**948**		
10				**Design Dths 2020/2021**		**1,468**		Line 8 x Line 9

Greater Minnesota Gas, Inc.
Design Day: Heating Season 2020 - 2021
Derivation of Design Day Use Per Residential Customer
Northern District

Linear Regression Analysis Period: December 2017 thru February 2020

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	-50.66	11.52	90	987	0.7821	Y Inter + Slope x Design HDD = Estimated Design Dth
2	Firm Commercial	Northern MN	-8.20	2.23	90	193	0.8602	
			-58.86	13.76				
3				**Total Design Dths**		**1,179**		Line 1 + Line 2
4				**Estimated Interruptible Load**		**0**		
5				**Net Design Dths**		**1,179**		Line 3 - Line 5
6				**Customer Count 2/13/2020**		**1,486**		
7				**Design Dths/Customer**		**0.7935**		Line 5 / Line 6
8				**Actual Results Design Dths/Customer**		**1.5480**		
9				**Estimated Firm Customers for 2020/2021**		**1,686**		
10				**Design Dths 2020/2021**		**2,610**		Line 8 x Line 9

Greater Minnesota Gas, Inc.

Peak Day Analysis

Line No.	Description	Design Day Calculation	Peak Day 2019 - 20	Peak Day 2018 - 19	Peak Day 2017 - 18	Peak Day 2016 - 17
1	Date of Peak Day		2/13/2020	1/29/2019	12/31/2017	1/5/2017
2	Day of the Week		Thursday	Tuesday	Sunday	Thursday
3	Total Throughput (Dth)	15059	11689	13323	10360	9246
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)	15059	11689	13323	10360	9246
7	Average Actual Gas Day Temperature (Deg. F)	-25	-10	-24	-10	-3
8	Heating Degree Days (HDD) 65 degree base	90	*75*	89	75	68
9	Non-HDD Sensitive Base (Dth)	356	333	208	839	407
10	Total HDD Sensitive Firm Throughput (Dth)	14703	11356	13115	9521	8839
11	Actual Firm Peak Day Dth/HDD (Dth)	163	151	147	127	130
12	Base + (Actual Dth/HDD * HDDs) (Dth)	15059	11689	13323	10360	9246
13	Peak Month Firm Customers	9728	9063	8501	7910	7378
14	Peak Day Use per Firm Customer	1.548	1.290	1.567	1.310	1.253

Greater Minnesota Gas, Inc.
Residential Peak Day Analysis

Line No.	Description	Design Day Calculation	Peak Day 2019 - 20	Peak Day 2018 - 19	Peak Day 2017 - 18	Peak Day 2016 - 17
1	Date of Peak Day		2/13/2020	1/29/2019	12/31/2017	1/5/2017
2	Day of the Week		Thursday	Tuesday	Sunday	Thursday
3	Total Throughput (Dth)	7524	7052	7481	5776	5140
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)	7524	7052	7481	5776	5140
7	Average Actual Gas Day Temperature (Deg. F)	-25	-10	-24	-10	-3
8	Heating Degree Days (HDD) 65 degree base	90	75	89	75	68
9	Non-HDD Sensitive Base (Dth)	134	134	-43	343	134
10	Total HDD Sensitive Firm Throughput (Dth)	7390	6918	7524	5433	5006
11	Actual Firm Peak Day Dth/HDD (Dth)	82	92	85	72	74
12	Base + (Actual Dth/HDD * HDDs) (Dth)	7524	7052	7481	5776	5140
13	Peak Month Firm Residential Customers	8789	8229	7726	7187	6700
14	Peak Day Use per Residential Customer	0.856	0.857	0.968	0.804	0.767

Greater Minnesota Gas, Inc.
Firm Commercial Peak Day Analysis

Line No.	Description	Design Day Calculation	Peak Day 2019 - 20	Peak Day 2018 - 19	Peak Day 2017 - 18	Peak Day 2016 - 17
1	Date of Peak Day		2/13/2020	1/29/2019	12/31/2017	1/5/2017
2	Day of the Week		Thursday	Tuesday	Sunday	Thursday
3	Total Throughput (Dth)	5569	4637	5842	4584	4106
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)	5569	4637	5842	4584	4106
7	Average Actual Gas Day Temperature (Deg. F)	-25	-10	-24	-10	-3
8	Heating Degree Days (HDD) 65 degree base	90	75	89	75	68
9	Non-HDD Sensitive Base (Dth)	222	222	252	495	273
10	Total HDD Sensitive Firm Throughput (Dth)	5348	4415	5590	4089	3833
11	Actual Firm Peak Day Dth/HDD (Dth)	59	59	63	55	56
12	Base + (Actual Dth/HDD * HDDs) (Dth)	5569	4637	5842	4584	4106
13	Peak Month Firm Customers	1044	939	775	723	678
14	Peak Day Use per Firm Commercial Customer	5.335	4.938	7.538	6.340	6.056

ATTACHMENT B
Demand Profile and Supply Comparison

2018 - 2019 Heating Season	Quantity (Dth)	Change in Quantity (Dth)		2019 - 2020 Heating Season	Quantity (Dth)	Change in Quantity (Dth)		2020 - 2021 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	-		TF 12 (Nov. - Oct.)	500	-
			1	TFX-5 (Nov. - Mar.)	349	349		TFX-5 (Nov. - Mar.)	349	-
			1	TF 12 (Nov. - Oct.)	817	817		TF 12 (Nov. - Oct.)	817	-
						-		TF 12 (Nov. - Oct.)	333	333
FT-A Viking	1,400	-		FT-A Viking	1,400	-		FT-A Viking	1,400	-
FT-A Viking	1,200	-		FT-A Viking	1,200	-		FT-A Viking	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	-		FT-A Viking	1,000	-
Viking Zone 1	-				-	-			-	-
SMS	2,500	500		SMS	3,500	1,000		SMS	3,500	-
Heating Season Total Capacity	14,109	1,500		Heating Season Total Capacity	15,275	1,166		Heating Season Total Capacity	15,608	333
Non-Heating Season Total Capacity	7,010	6,800		Non-Heating Season Total Capacity	7,827	817		Non-Heating Season Total Capacity	8,160	333
Total Entitlement @ Peak	14,109	1,500		Total Entitlement @ Peak	15,275	1,166		Total Entitlement @ Peak	15,608	333
Total Annual Transportation	-	-		Total Annual Transportation	-	-		Total Annual Transportation	-	-
Total Season Transportation	14,109	1,500		Total Season Transportation	15,275	1,166		Total Season Transportation	15,608	333
Total Percent Summer Vs. Winter	49.7%			Total Percent Summer Vs. Winter	51.2%			Total Percent Summer Vs. Winter	52.3%	
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, 2020

Contract Entitlements 2019-20

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	3/31/2024
102985	NNG Firm Throughput	TFX - 5	Nov-Mar	2,100	3/31/2025
102985	NNG Firm Throughput	TFX - 5	Nov-Mar	244	3/31/2025
121534	NNG Firm Throughput	TFX - 7	Oct-Apr	665	10/31/2025
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	10/31/2024
132592	NNG Firm Throughput	TF - 12	Apr-Mar	500	10/31/2024
120579	NNG Firm Throughput	TFX - 5	Nov-Mar	349	10/31/2022
120579	NNG Firm Throughput	TF - 12	Nov-Oct	817	10/31/2022
AFO216	Viking Forward Haul	FT-A	Nov-Oct	1,400	10/31/2023
AFO220	Viking Forward Haul	FT-A	Nov-Oct	1,200	10/31/2023
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
		2019-20 Heating Season Total Capacity		15,275	
		2019-20 Design Day Demand		14,244	
		Reserve Margin		1,031	7.2%

Proposed Contract Entitlement Changes for 2020-21

Start Date	Contract No.	Service Type	Rate Schedule	Months	Entitlement (Dth)	Expiration Date
4/1/2020	135921	NNG Firm Throughput	TF - 12	Nov-Oct	333	10/31/2040
					333	
			2020-21 Heating Season Total Capacity		15,608	
			2020-21 Design Day Demand		15,059	
			Reserve Margin		549	3.6%

Proposed Change in Contract Demand Costs

Contract No.	Rate Schedule	Volume Dth / Day	No. of Months	Monthly Demand Rates	Total Annual Cost
135921	TF - 12	333	5	$ 18.1050	$ 30,144.83
135921	TF - 12	333	7	$ 10.0580	$ 23,445.20
					$ 53,590.02

ATTACHMENT D
Rate Impact of Proposed Contract Demand Entitlement

	Annualized Impact									
Residential	Last Rate Case 1/	Last Demand Change 2/	Current PGA w/o Demand Entitlement Change (March 1, 2020)	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	$ 3.1828	$ 3.1828	$ 3.1828	$ (2.70)	-45.87%	$ -	0.00%	$ -	0.00%
Demand Cost of Gas	$ 0.8293	$ 1.3297	$ 1.3297	$ 1.2964	$ 0.4671	56.32%	$ (0.0334)	-2.51%	$ (0.0334)	-2.51%
Total Cost of Gas	$ 6.7094	$ 4.5125	$ 4.5125	$ 4.4792	$ (2.2303)	-33.24%	$ (0.0333)	-0.74%	$ (0.0333)	-0.74%
Average Annual Usage (Dth)	**80.0**	80.0	80.0	80.0						
Average Annual Total Cost of Gas	$ 536.75	$ 361.00	$ 361.00	$ 358.33	$ (178.42)	-33.24%	$ (2.67)	-0.74%	$ (2.67)	-0.74%

	Annualized Impact									
Commercial & Industrial Firm	Last Rate Case 1/	Last Demand Change 2/	Current PGA w/o Demand Entitlement Change (March 1, 2020)	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	$ 3.1828	$ 3.1828	$ 3.1828	$ (2.70)	-45.87%	$ -	0.00%	$ -	0.00%
Demand Cost of Gas	$ 0.8293	$ 1.3297	$ 1.3297	$ 1.2964	$ 0.47	56.32%	$ (0.0334)	-2.51%	$ (0.0334)	-2.51%
Total Cost of Gas	$ 6.7094	$ 4.5125	$ 4.5125	$ 4.4792	$ (2.23)	-33.24%	$ (0.0333)	-0.74%	$ (0.0333)	-0.74%
Average Annual Usage (Dth)	**567.6**	567.6	567.6	567.6						
Average Annual Total Cost of Gas	$ 3,808.27	$ 2,561.30	$ 2,561.30	$ 2,542.37	$ (1,265.90)	-33.24%	$ (18.93)	-0.74%	$ (18.93)	-0.74%

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, 2020**							
Reason for change:	Change in cost of gas due to an estimated increase in the market price of natural gas from February 2020.								
This PGA is based on the following Northern Natural Gas Tariffs:		This PGA is based on the following Viking Gas Transmission Co. Tariffs:							
16th Revised Sheet No. 50		v.39.0.0 superseding v.37.0.0							
Issued: 12/18/2019		Issued: 2/19/2020							
Effective: 1/1/2020		Effective: 3/1/2020							
19th Revised Sheet No. 51									
Issued: 12/18/2019									
Effective: 1/1/2020									
3rd Revised Sheet No. 55									
Issued: 12/18/2019									
Effective: 1/1/2020									
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					**March 1, 2020**				
	Commodity Cost of Gas					$0.318280	WACOG		
III. Annual Sales Volume - 2019-2020 Budget (September - August)				**14,153,500**					
Sales Service Volume - CCF			**12,057,900**						
Interruptible Service Volume - CCF			**2,095,600**						
IV. Greater Minnesota Gas, Inc.'s -- Current Cost of Gas Effective					**March 1, 2020**				
							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	$3.8060		45,672	$0.003788		
	Viking Zone 1	1,400	12	$3.8060		63,941	$0.005303		
	Viking Zone 1	1,200	12	$3.8060		54,806	$0.004545		
	Viking Zone 1	2,200	12	$3.8060		100,478	$0.008333		
	TFX - 5	6,344	5	$26.8220		850,794	$0.070559		
	TF - 12	1027	5	$18.1050		92,969	$0.007710		
	TF - 12	1027	7	$10.0580		72,307	$0.005997		
	TF - 12	1000	5	$18.1050		90,525	$0.007508		
	TF - 12	1000	7	$10.0580		70,406	$0.005839		
	TF - 5	439	5	$26.8220		58,874	$0.004883		
	TFX - 7	665	5	$26.8220		89,183	$0.007396		
	TFX - 7	665	2	$10.0580		13,377	$0.001109		
						0	$0.000000		
	Current Demand Cost of Gas					$1,603,333	**$0.132970**	**$0.000000**	**$0.000000**
	Current Commodity Cost of Gas/CCF			% of Total	74%	**$4,504,776**	**$0.318280**	**$0.318280**	**$0.318280**
	Total Cost of Gas/CCF					**$6,108,109**	**$0.451250**	**$0.318280**	**$0.318280**

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	$0.054800	($0.289773)	($0.009260)	**($0.244233)**	$0.000000	($0.289773)	$0.005820	**($0.283953)**	$0.000000	($0.289773)	$0.022730	**($0.267043)**
3) Current Adj	($0.004759)	$0.020040	$0.000000	**$0.015281**	$0.000000	$0.020040	$0.000000	**$0.020040**	$0.000000	$0.020040	$0.000000	**$0.020040**
4) PGA Billed (2+3)	$0.050041	($0.269733)	($0.009260)	**($0.228952)**	$0.000000	($0.269733)	$0.005820	**($0.263913)**	$0.000000	($0.269733)	$0.022730	**($0.247003)**
5) Average Cost of Gas	$0.132970	$0.318280	($0.009260)	**$0.441990**	$0.000000	$0.318280	$0.005820	**$0.324100**	$0.000000	$0.318280	$0.022730	**$0.341010**

	Prior Cumulative Adjustments	Demand & Commodity Change Filed Herein	True-up Adjustment Factor Change Eff. September 1, 2019 (G022/AA-19-___)	Current PGA Adjustment
All Firm Sales Rate Classes (/CCF)	($0.234973)	$0.015281	($0.009260)	**($0.228952)**
Ag Inter. Sales Rate Classes (/CCF)	($0.289773)	$0.020040	$0.005820	**($0.263913)**
Gen. Inter. Sales Rate Classes (/CCF)	($0.289773)	$0.020040	$0.022730	**($0.247003)**

		1	2	3	4	5	7
March 1, 2020	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	$0.441646	$0.318280	$0.132970	$0.451250	($0.009260)	$0.883636
Small Commercial CS1	SCS1	$0.423646	$0.318280	$0.132970	$0.451250	($0.009260)	$0.865636
Commercial CS1	CS1	$0.393646	$0.318280	$0.132970	$0.451250	($0.009260)	$0.835636
Commercial/Industrial MS1	MS1	$0.373646	$0.318280	$0.132970	$0.451250	($0.009260)	$0.815636
Commercial/Industrial LS1	LS1	$0.358646	$0.318280	$0.132970	$0.451250	($0.009260)	$0.800636
Agricultural - Interruptible	AG1	$0.228626	$0.318280	$0.000000	$0.318280	$0.005820	$0.552726
General Interruptible	IND1	$0.248626	$0.318280	$0.000000	$0.318280	$0.022730	$0.589636

Estimated Gas Volumes March 2020 1,591,070 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, 2020**

Reason for change: Change in cost of gas due to an estimated increase in the market price of natural gas from February 2020.

This PGA is based on the following Northern Natural Gas Tariffs:
16th Revised Sheet No. 50
Issued: 12/18/2019
Effective: 1/1/2020
19th Revised Sheet No. 51
Issued: 12/18/2019
Effective: 1/1/2020
3rd Revised Sheet No. 55
Issued: 12/18/2019
Effective: 1/1/2020

This PGA is based on the following Viking Gas Transmission Co. Tariffs:
v.39.0.0 superseding v.37.0.0
Issued: 2/19/2020
Effective: 3/1/2020

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, 2020**

	Commodity Cost of Gas					$0.318280	WACOG	

III. Annual Sales Volume - 2020-2021 Budget (September - August) — **15,002,700**

Sales Service Volume - CCF	**12,781,400**	
Interruptible Service Volume - CCF	**2,221,300**	

IV. Greater Minnesota Gas, Inc.'s -- Current Cost of Gas Effective — **March 1, 2020**

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	$3.8060		45,672	$0.003573		
	Viking Zone 1	1,400	12	$3.8060		63,941	$0.005003		
	Viking Zone 1	1,200	12	$3.8060		54,806	$0.004288		
	Viking Zone 1	2,200	12	$3.8060		100,478	$0.007861		
	TFX - 5	6,344	5	$26.8220		850,794	$0.066565		
	TF - 12	1027	5	$18.1050		92,969	$0.007274		
	TF - 12	1027	7	$10.0580		72,307	$0.005657		
	TF - 12	1000	5	$18.1050		90,525	$0.007083		
	TF - 12	1000	7	$10.0580		70,406	$0.005508		
	TF - 5	439	5	$26.8220		58,874	$0.004606		
	TFX - 7	665	5	$26.8220		89,183	$0.006978		
	TFX - 7	665	2	$10.0580		13,377	$0.001047		
	TF - 12	333	5	$18.1050		30,145	$0.002358		
	TF - 12	333	7	$10.0580		23,445	$0.001834		
						0	$0.000000		
	Current Demand Cost of Gas					$1,656,923	**$0.129635**	**$0.000000**	**$0.000000**
	Current Commodity Cost of Gas/CCF			% of Total	74%	**$4,775,059**	**$0.318280**	**$0.318280**	**$0.318280**
	Total Cost of Gas/CCF					**$6,431,983**	**$0.447915**	**$0.318280**	**$0.318280**

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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	$0.054800	($0.289773)	($0.009260)	**($0.244233)**	$0.000000	($0.289773)	$0.005820	**($0.283953)**	$0.000000	($0.289773)	$0.022730	**($0.267043)**
3) Current Adj	($0.008094)	$0.020040	$0.000000	**$0.011946**	$0.000000	$0.020040	$0.000000	**$0.020040**	$0.000000	$0.020040	$0.000000	**$0.020040**
4) PGA Billed (2+3)	$0.046706	($0.269733)	($0.009260)	**($0.232287)**	$0.000000	($0.269733)	$0.005820	**($0.263913)**	$0.000000	($0.269733)	$0.022730	**($0.247003)**
5) Average Cost of Gas	$0.129635	$0.318280	($0.009260)	**$0.438655**	$0.000000	$0.318280	$0.005820	**$0.324100**	$0.000000	$0.318280	$0.022730	**$0.341010**

	Prior Cumulative Adjustments	Demand & Commodity Change Filed Herein	True-up Adjustment Factor Change Eff. September 1, 2019 (G022/AA-19-___)	Current PGA Adjustment
All Firm Sales Rate Classes (/CCF)	($0.234973)	$0.011946	($0.009260)	**($0.232287)**
Ag Inter. Sales Rate Classes (/CCF)	($0.289773)	$0.020040	$0.005820	**($0.263913)**
Gen. Inter. Sales Rate Classes (/CCF)	($0.289773)	$0.020040	$0.022730	**($0.247003)**

		1	2	3	4	5	7
March 1, 2020	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	$0.441646	$0.318280	$0.129635	$0.447915	($0.009260)	$0.880301
Small Commercial CS1	SCS1	$0.423646	$0.318280	$0.129635	$0.447915	($0.009260)	$0.862301
Commercial CS1	CS1	$0.393646	$0.318280	$0.129635	$0.447915	($0.009260)	$0.832301
Commercial/Industrial MS1	MS1	$0.373646	$0.318280	$0.129635	$0.447915	($0.009260)	$0.812301
Commercial/Industrial LS1	LS1	$0.358646	$0.318280	$0.129635	$0.447915	($0.009260)	$0.797301
Agricultural - Interruptible	AG1	$0.228626	$0.318280	$0.000000	$0.318280	$0.005820	$0.552726
General Interruptible	IND1	$0.248626	$0.318280	$0.000000	$0.318280	$0.022730	$0.589636