

STATE OF NORTH DAKOTA  
BEFORE THE NORTH DAKOTA PUBLIC SERVICE COMMISSION

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IN THE MATTER OF THE APPLICATION OF  
MONTANA-DAKOTA UTILITIES CO. FOR  
AUTHORITY TO INCREASE RATES FOR  
NATURAL GAS SERVICE IN NORTH DAKOTA

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Case No. PU-23-341

**DIRECT TESTIMONY OF  
KARL R. PAVLOVIC**

**Submitted on Behalf of  
the Advocacy Staff of the  
North Dakota Public Service Commission**

July 31, 2024

1 **DIRECT TESTIMONY OF**  
2 **KARL R. PAVLOVIC**

3 **I. QUALIFICATIONS**

4 **Q. PLEASE STATE YOUR NAME, POSITION AND BUSINESS ADDRESS.**

5 A. My name is Karl Richard Pavlovic. My business address is 22 Brookes Avenue,  
6 Gaithersburg, MD 20877. I am a Senior Consultant with and the Managing Director of  
7 PCMG and Associates LLC.

8 **Q. PLEASE DESCRIBE PCMG.**

9 A. PCMG and Associates LLC (PCMG) is an association of experts in economics, accounting,  
10 finance, and utility regulation and policy, with over 75 years collective experience  
11 providing assistance to counsel and expert testimony regarding the regulation of electric,  
12 gas, water, and wastewater utilities. PCMG began operation on January 1, 2015. During  
13 its most recent year of operation, PCMG has provided assistance to counsel and/or  
14 testimony in regulatory proceedings before Federal Energy Regulatory Commission, the  
15 Pennsylvania Public Service Commission, the Maine Public Utilities Commission, the  
16 Massachusetts Department of Public Utilities, the New Jersey Board of Public Utilities,  
17 and the Hawaii Public Utilities Commission. PCMG is currently providing assistance to  
18 the Hawaii Division of Consumer Advocate, the Maine Office of the Public Advocate, the  
19 Massachusetts Office of the Attorney General, the New Jersey Division of Rate Counsel,  
20 and the Pennsylvania Office of Consumer Advocate.

1 **Q. HAVE YOU PREPARED A SUMMARY OF YOUR QUALIFICATIONS AND**  
2 **EXPERIENCE?**

3 A. Yes. Exhibit KRP-1 to my testimony summarizes my qualifications and experience.

4 **Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY IN REGULATORY**  
5 **PROCEEDINGS?**

6 A. Yes. Exhibit KRP-1 also contains a complete list of my engagements as an expert and/or  
7 expert witness in matters before state and federal regulatory agencies. I have submitted  
8 testimony to the Federal Communications Commission, the Federal Energy Regulatory  
9 Commission, the Alaska Public Utilities Commission, the Alberta Utilities Commission,  
10 the California Public Utilities Commission, the Delaware Public Service Commission, the  
11 Public Service Commission of the District of Columbia, the Hawaii Public Utilities  
12 Commission, the Illinois Commerce Commission, the Kansas Corporation Commission,  
13 the Maine Public Utilities Commission, the Maryland Public Service Commission, the  
14 Massachusetts Department of Public Utilities, the Missouri Public Service Commission,  
15 and the North Dakota Public Service Commission.

16 **Q. IN WHICH PROCEEDINGS HAVE YOU PREVIOUSLY APPEARED BEFORE**  
17 **THIS COMMISSION?**

18 A. I appeared on behalf of the North Dakota Public Service Commission Advocacy Staff in  
19 Case No. PU-12-813 Application of Northern States Power Company for Authority to  
20 Increase Rates for Electric Service in North Dakota, in Case No. PU-17-295 Montana-  
21 Dakota Utilities Co. for Authority to Establish Increased Rates for Natural Gas Service,  
22 in Case PU-20-441 Application of Northern States Power Company for Authority to

1 Increase Rates for Electric Service in North Dakota, and in Case No. PU-21-381  
2 Application of Northern States Power Company for Authority to Increase Rates for  
3 Natural Gas Service in North Dakota.

4 **Q. PLEASE SUMMARIZE YOUR QUALIFICATIONS?**

5 A. I received undergraduate and graduate degrees in Philosophy from Yale College and  
6 Purdue University. By education and professional experience I have expertise in formal  
7 and mathematical logic, statistics, economics, financial analysis, econometrics, and  
8 computer modeling. I have knowledge and experience in the areas of commercial and  
9 industrial operations in the energy, transportation, and telecommunications industries and  
10 am familiar with a wide range of experimental and investigative methods in science and  
11 engineering.

12 **Q. PLEASE SUMMARIZE YOUR ELECTRIC AND GAS REGULATORY**  
13 **EXPERIENCE.**

14 For most of my career I have performed analyses and submitted testimony regarding  
15 electric and gas utility least-cost planning, reliability, cost of service, rate design, and  
16 weather-emergency response. Specifically regarding gas utilities, I have testified on: (a)  
17 integrated resource planning, (b) class cost of service and rate design, and (c) various  
18 infrastructure operating expense and investment recovery mechanisms.

19 **I. PURPOSE AND ORGANIZATION**

20 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

21 A. I have been asked by the Commission's Advocacy Staff to address Montana-Dakota Utilities  
22 (“MDU”) assertions and proposals in this proceeding regarding (1) its North Dakota class

1 cost of service study, (2) its North Dakota class revenue responsibility distribution, and (3)  
2 its North Dakota rate design.

3 **Q. HAVE YOU PREPARED ANY EXHIBITS IN SUPPORT OF YOUR**  
4 **RECOMMENDATIONS?**

5 A. Yes. I have included the following four exhibits:

6 Exhibit KRP-1: Qualifications

7 Exhibit KRP-2: MDU Statement K without minimum system classification

8 Exhibit KRP-3: MDU Statement L without minimum system classification Class  
9 Revenues

10 Exhibit KRP-4: MDU Statement L without minimum system classification  
11 Recommended Class Revenues

12 Exhibit KRP-5: Recommended Tariff Charges

13  
14 **II. SUMMARY OF TESTIMONY AND CONCLUSIONS**

15 **Q. PLEASE SUMMARIZE YOUR TESTIMONY.**

16 A. My testimony finds the following.

- 17 • The MDU COSS's use of a minimum size study to classify a portion of  
18 distribution mains as customer-related is inconsistent with the principle of cost  
19 causation.
- 20 • The MDU COSS's use of customer and demand allocators to allocate mains is  
21 inconsistent with the principle of cost causation.
- 22 • MDU's COSS without minimum-size classification and allocation of distribution  
23 mains is a guide to rate design that is consistent with the principle of cost causation.

1 I recommend that the Commission:

- 2 • Direct that MDU's distribution mains be classified as wholly demand-related with  
3 no customer-related component, consistent with the COSS's classification of  
4 transmission plant and regulator stations as only demand-related.
- 5 • Direct that MDU derive class tariff rates from Advocacy Staff's recommended class  
6 revenue requirements.

7 **III. DISCUSSION**

8 **A. NORTH DAKOTA COST OF SERVICE AND RATE DESIGN**

9 **Q. PLEASE SUMMARIZE MDU'S NORTH DAKOTA COST OF SERVICE AND**  
10 **RATE DESIGN PROPOSALS.**

11 A. Based on a forecasted 2024 Test Year class cost of service study<sup>1</sup> and a revenue requirement  
12 distribution to classes based on cost of service, class contribution to present revenue levels  
13 and customer impact,<sup>2</sup> and the cost study's class customer cost results, MDU proposes the  
14 following changes in customer rates in Table 1.

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<sup>1</sup> Direct Testimony of Ronald J. Amen (Amen Direct), pages 5-27 and Statement K.

<sup>2</sup> Amen Direct, pages 27-49 and Statement L.

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**Table 1: MDU Rate Design Proposals<sup>3</sup>**

<b>Residential Service (Sch. 60 &amp; (90)):</b> <sup>4</sup> (a) proposes small basic service: \$28.01/month (\$0.921/day) and large \$32.70/month (\$1.075/day) and (b) proposes a distribution delivery charge of \$0.438/dk.
<b>Small Firm General Service (Sch. 70, 72, 74 &amp; 92):</b> <sup>5</sup> increases the basic service charge from \$0.75 to \$0.88 and the distribution delivery charge from \$1.174/dk to \$1.382/dk.
<b>Large Firm General Service (Sch. 70, 72, 74 &amp; 92):</b> <sup>6</sup> increases the basic service charge from \$2.13 to \$2.35 and the distribution delivery charge from \$0.917/dk to \$1.266/dk.
<b>Minot AFB (Sch. 64):</b> <sup>7</sup> (a) increases the firm basic service charge from \$175.00 to \$1000.00 and the distribution delivery charge from \$0.449/dk to \$1.355/dk and (b) increases the interruptible basic service charge from \$2,000.00 to \$4,000.00 and the distribution delivery charge from \$0.255/dk to \$0.991/dk
<b>Small Interruptible Sales &amp; Transportation (Sch.71 &amp;81):</b> <sup>8</sup> (a) leaves the basic service charge at \$450.00 and increases the distribution delivery charge from \$0.566/dk to \$0.659/dk and (b) increases the Wahpeton basic service charge from \$180.00 to \$450.00 and decreases the Whapeton distribution delivery charge at \$0.669/dk to \$0.659/dk
<b>Large Interruptible Sales &amp; Transportation (Sch.85 &amp; 82):</b> <sup>9</sup> (a) increases the sales basic service charge from \$1,600.00 to \$2,400.00 and the distribution delivery charge from \$0.237/dk to \$0.241/dk and (b) increases the transport basic service charge from \$1,600.00 to \$2,400.00 and the distribution delivery charge from \$0.237/dk to \$0.241/dk
<b>Wahpeton Firm Rates (GPNG 65):</b> <sup>10</sup> proposed Phase 1 Rates - increase basic service charge from \$0.25 to \$0.50 and decrease distribution delivery charge from \$0.922/dk to \$0.555

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**B. NORTH DAKOTA CLASS COST OF SERVICE STUDY**

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**Q. HAVE YOU EXAMINED MDU’S NORTH DAKOTA CLASS COST OF SERVICE**

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**STUDY (CCOSS)?**

<sup>3</sup> Amen Direct, pages 38-49 and Stephanie Bosch (Bosch Direct), pages 3-24.

<sup>4</sup> Statement L, page 4.

<sup>5</sup> Statement L, pages 7-8.

<sup>6</sup> Statement L, pages 7-8

<sup>7</sup> Statement L, Pages 5-6.

<sup>8</sup> Statement L, pages 7 and 9

<sup>9</sup> Statement L, pages 10-11

<sup>10</sup> Statement L, pages 12-13.

1 A. Yes. The testimony and exhibits of Ronald J. Amen<sup>11</sup> present MDU’s proposed  
2 embedded cost of service study and proposed class revenue responsibility.

3  
4 MDU’s cost of service study (“COSS”) is an embedded cost of service study for  
5 projected 2024.<sup>12</sup> The COSS follows the standard approach of functionalizing,  
6 classifying, and then directly assigning or allocating the costs to MDU’s rate classes. The  
7 cost study’s functionalization of costs is per the FERC Uniform System of Accounts.  
8 Regarding the classification of gas plant costs, costs are classified as demand-related  
9 and/or customer-related. For mains plant costs, which are classified as both demand- and  
10 customer-related, the demand/customer percentage split 70/30 is presented as supported  
11 by the results of both zero-intercept and minimum size system analyses of MDU’s mains  
12 facilities.<sup>13</sup> The customer allocator used for customer-related plant costs is class number  
13 of customers; the demand allocator used for demand-related plant costs is class design  
14 day demand.<sup>14</sup>

15 **Q. HAVE YOU FOUND ANY ERRORS IN THE COSS’ FUNCTIONALIZATION OF**  
16 **MDU’S GAS COSTS?**

17 A. No. The COSS properly functionalizes MDU’s gas costs using the FERC Gas Uniform  
18 System of Accounts (USoA).

19 **Q. HAVE YOU FOUND ANY ERRORS IN THE COSS’ CLASSIFICATION OF**  
20 **MDU’S FUNCTIONALIZED GAS COSTS?**

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<sup>11</sup> Amen Direct, pages 14-27 and Statement K Schedules.  
<sup>12</sup> Amen Direct, Statement K, Schedule K-2; see also ND Gas Embedded CCOS - Statement K and Stmt K Workpapers.xlsx, Stmt K, Sch. K-2 tab.  
<sup>13</sup> Amen Direct, page 17, lines 13-14.  
<sup>14</sup> Amen Direct, page 17 lines 14-19.

1 A. Yes. As I just noted the COSS employs a 30/70 split to classify 30% of mains costs as  
2 customer-related and 70% of mains costs as demand-related. Witness Amen states that  
3 this 30/70 split to classify is supported by results of zero-intercept and minimum-size  
4 studies of MDU's mains (zero-intercept: 32.2% customer-related; minimum-size: 30.7%  
5 customer-related).<sup>15</sup> In support of MDU's use of the zero-intercept and minimum-size  
6 approaches to mains classification, Witness Amen references the NARUC Electric Utility  
7 Cost Allocation Manual, the Naruc Gas Rate Design Manual and the AGA Gas Rate  
8 Fundamentals.<sup>16</sup> While these methods of distribution mains classification are often still  
9 used, there is, from the perspective of cost causation, no theoretical or practical  
10 justification for zero-intercept and/or minimum-size mains classification.

11 **Q. WHAT IS THE COST CAUSATION THAT DEFINES THE CLASSIFICATION**  
12 **OF GAS DISTRIBUTION ACCOUNTS AS CUSTOMER-RELATED?**

13 A. As clearly articulated in Bonbright's Principles of Public Utility Rates,<sup>17</sup> under the  
14 principle of cost causation, customer-related costs are "those operating and capital costs  
15 found to vary with number of customers."<sup>18</sup> Operationally defined, customer-related  
16 costs are the "costs of connecting another customer or the savings in costs of not  
17 connecting the customer."<sup>19</sup> Per the NARUC Gas Manual, customer costs are those  
18 operating capital costs found to vary directly with the number of customers served rather  
19 than with the amount of utility service supplied ... [t]hey include the expenses of  
20 metering, reading, billing, collecting, and accounting, as well as those cost associated

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<sup>15</sup> Amen Direct, page 20 line 7 to page 22 line 7.

<sup>16</sup> Amen Direct, page 19 lines 13-23.

<sup>17</sup> Bonbright et al, Principles of Public Utility Rates, 1988.

<sup>18</sup> Bonbright, page 490; also see NARUC Manual Electric Utility Cost Allocation Manual, 1992, page 90, "The customer component of distribution facilities is the portion of costs which varies with the number of customers."

<sup>19</sup> Bonbright, page 490.

1 with the capital investment in metering and in customers' service connections."<sup>20</sup>

2 MDU's COSS properly classifies the costs of services, meters and house regulators as  
3 customer-related. The COSS errs only in classifying a portion of the distribution mains  
4 costs as customer-related, rather than properly as demand-related.

5 **Q. WHAT IS THE COST CAUSATION THAT DEFINES THE CLASSIFICATION**  
6 **OF GAS DISTRIBUTION ACCOUNTS AS DEMAND-RELATED?**

7 A. As Bonbright also explains, it is theoretically impossible for the capital costs of  
8 distribution system facilities upstream of the facilities to be classified as customer-related  
9 because the connection of a new customer (or disconnection of an existing customer) has  
10 no measurable impact on the costs of those facilities.<sup>21</sup> Since the costs of the distribution  
11 facilities upstream of customer-related facilities do not and cannot vary with the number  
12 of customers connected to the distribution system, for the purposes of embedded cost  
13 analysis, those costs are properly classified as demand-related, because those costs do  
14 "var[y] continuously (and, perhaps, even more or less directly) with the maximum  
15 demand imposed on this system as measured by peak load."<sup>22</sup> Per the NARUC Gas  
16 Manual, demand related costs "are related to maximum system requirements which the  
17 system is designed to serve during short intervals and do not directly vary with the  
18 number of customers or their annual usage."<sup>23</sup> MDU's COSS properly classifies the costs  
19 of production plant, storage plant, transmission plant and regulator stations as demand-

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<sup>20</sup> NARUC Gas Manual, page 22; see also page 23 "only facilities, such as meters, regulators and service taps, are considered to be customer related, as they vary directly with the number of customers on the system."

<sup>21</sup> Bonbright, page 491.

<sup>22</sup> Bonbright, page 492; see also NARUC Electric Manual, page 90, "Classifying distribution plant as a demand cost assigns investment ... based upon its contribution to some total peak load ,, [because] costs are incurred to serve area load, rather than a specific number of customers."

<sup>23</sup> NARUC Gas Manual, pages 23 and 24.

1 related. The COSS errs only in classifying a portion of the distribution mains costs as  
2 customer-related, rather than properly as demand-related.

3 **Q. WHAT IS YOUR RECOMMENDATION REGARDING THE CLASSIFICATION**  
4 **OF DISTRIBUTION MAINS IN MDU'S COSS?**

5 A. For reasons given above I recommend that MDU's distribution mains be classified as  
6 wholly demand-related with no customer-related component, consistent with the COSS'  
7 classification of transmission mains and regulator stations as demand-related.

8 **Q. HAVE YOU FOUND ANY ERRORS IN THE COSS' ALLOCATION OF MDU'S**  
9 **CLASSIFIED AND FUNCTIONALIZED GAS COSTS?**

10 A. No, except for the allocation error that results from the erroneous classification of a portion  
11 of distribution mains as customer-related and the allocation of that portion using a customer  
12 allocator.

13 **Q. WHAT IS YOUR RECOMMENDATION REGARDING THE ALLOCATION OF**  
14 **MDU'S MAINS COSTS?**

15 A. For the reasons given above I recommend that MDU's distribution mains costs be  
16 classified as only demand-related and allocated using the design day demand allocator  
17 consistent with the demand allocator applied to transmission and regulator station costs.

18 **Q. WHAT IS THE IMPACT OF YOUR RECOMMENDATIONS REGARDING THE**  
19 **CLASSIFICATION AND ALLOCATION OF MDU'S GAS COSTS?**

20 A. Regarding distribution mains classification, MDU's residential rate class has  
21 proportionately more customers (85%) than its commercial rate classes and significantly  
22 less aggregate demand (46%) than the commercial classes. Consequently, the COSS'  
23 class customer allocation of distribution mains costs that the COSS erroneously classifies

1 as customer-related results in an unsupported and unjustified over allocation of  
 2 distribution costs to MDU's residential rate class, which constitutes a interclass  
 3 subsidization of the commercial classes. Classifying the entirety of MDU's distribution  
 4 mains costs as demand-related corrects the over allocation.

5 **Q. HAVE YOU QUANTIFIED THE IMPACT OF YOUR RECOMMENDATION?**

6 A. Yes. MDU's COSS calculates the customer class total operating income and rate of return  
 7 under current rates as shown in columns B and C of Table 2 below. My correction of the  
 8 minimum-size classification and allocation error in MDU's CCOSS described above results  
 9 in the customer class costs of service shown in columns D and E of Table 2.

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	MDU COSS <sup>24</sup>			MDU COSS w/o Minimum Size <sup>25</sup>			
Rate Class	Operating Income	Rate of Return	Relative Rate of Return	Operating Income	Rate of Return	Relative Rate of Return	Operating Income Increase (Decrease)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Residential	\$3,334,183	2.51%	0.714	\$4,767,407	4.00%	1.140	\$1,433,224
Small Firm General	\$1,303,548	5.73%	1.633	\$1,249,963	5.37%	1.531	(\$53,585)
Large Firm General	\$2,417,701	4.96%	1.413	\$1,268,191	2.12%	0.604	(\$1,149,510)
Air Force Delivery (Rate 64)	(\$254,842)	-24.69%	-7.036	(\$254,843)	-24.69%	-7.036	(\$1)
Small Interruptible & Transportation	\$424,782	7.07%	2.014	\$244,783	3.16%	0.900	(\$179,999)
Large Interruptible Sales & Transportation	\$185,980	4.56%	1.298	\$135,855	2.98%	0.848	(\$50,125)
Minot Air Force Base Distribution (Rate 65)	\$202,572	15.05%	4.289	\$202,573	15.05%	4.289	\$1
<b>Total</b>	<b>\$7,613,924</b>	<b>3.51%</b>	<b>1.000</b>	<b>\$7,613,922</b>	<b>3.51%</b>	<b>1.000</b>	<b>\$0</b>

<sup>24</sup> Statement K.

<sup>25</sup> Exhibit KRP-2.

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As can be readily seen in Table 2, the net impact of correcting the classification and allocation errors and resulting interclass subsidizations is a significant increase in the residential class and decrease in the operating income of the commercial classes.

**NORTH DAKOTA CLASS REVENUE REQUIREMENTS**

**Q. WHAT IS MDU’S PROPOSAL REGARDING CLASS REVENUE REQUIREMENTS?**

A. The testimony and exhibits of Ronald J. Amen<sup>26</sup> also present MDU’s proposed class revenue responsibility. .MDU proposes to apportion or distribute the overall revenue requirement to customer classes based on cost of service, class contribution to present revenue levels and customer impact.<sup>27</sup> MDU’s proposed class revenues are developed in Statement L with the class rate base and operating income from the COSS.<sup>28</sup> Table 3 shows for each class Minimum System COSS relative rate of return (RROR), current revenue, proposed revenue, proposed revenue increase or decrease, percent increase or decrease, and the RROR resulting from the proposed revenue increase of decrease. Measured by the RRORs for each class, the proposed revenue increases move the residential, general, small interruptible and Minot distribution classes towards cost parity in a non-uniform manner. The Air Force delivery class is moved from significantly below cost

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<sup>26</sup> Amen Direct, pages 34-38, Exhibit RJA-1 and Statement L..  
<sup>27</sup>Amen Direct, page 34 lines 5-10.  
<sup>28</sup> Statement K.

1 parity to significantly over cost parity. The large interruptible class is moved from  
 2 significantly over cost parity to significantly below cost parity.

**Table 3: MDU Class Revenue Requirements<sup>29</sup>**

Rate Class	COSS Current Rates RROR	Current Revenue	Proposed Revenue	Increase (Decrease)	Percent Increase (Decrease)	Proposed Revenue RROR
(A)	(B)	(C)	(D)	(E)	(F)	(G)
Residential	0.937	\$76,256,119	\$83,756,193	\$7,500,074	9.84%	0.968
Small Firm General	2.141	\$16,136,051	\$17,108,936	\$972,885	6.03%	1.189
Large Firm General	1.853	\$57,431,482	\$60,001,187	\$2,569,705	4.47%	1.215
Air Force Delivery (Rate 64)	(9.227)	\$1,810,639	\$2,180,934	\$370,295	20.45%	1.329
Small Interruptible & Transportation	2.641	\$3,635,345	\$3,792,073	\$156,728	4.31%	1.149
Large Interruptible Sales & Transportation	1.703	\$1,001,374	\$1,071,697	\$70,323	7.02%	0.746
Minot Air Force Base Distribution (Rate 65)	5.624	\$198,127	\$451,493	\$253,366	127.88%	4.025
Total	1.000	\$156,271,010	\$167,911,020	\$11,640,010	7.45%	4.701

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4 **Q. DO YOU FIND ANY ERRORS IN MDU’S PROPOSED CLASS REVENUE**  
 5 **REQUIREMENT APPORTIONMENT?**

6 A. Yes, in that it is based on the results of MDU’s COSS with minimum-size classification of  
 7 distribution mains. Table 4 below compares MDU’s proposed class revenue requirements  
 8 and class revenue increases to the class revenue requirements and increases based on the  
 9 results from the COSS without minimum-size classification of distribution mains. The  
 10 revenue increases in Table 4 were developed by first moving all classes 50% percent to cost

<sup>29</sup> Statement L.

1 parity, then adjusting the Air Force delivery class to approximately a 20% revenue increase  
 2 and, finally distributing the difference proportionally to the other classes.

**Table 4: MDU Class Revenue Requirements - Non-Min-Sys COSS<sup>30</sup>**

Rate Class	COSS Current Rates RROR	Current Revenue	Class Revenue	Increase (Decrease)	Percent Increase (Decrease)	Class Revenue RROR
(A)	(B)	(C)	(D)	(E)	(F)	(G)
Residential	1.140	\$76,256,119	\$82,743,611	\$6,487,492	8.51%	1.050
Small Firm General	1.531	\$16,136,051	\$17,489,438	\$1,353,387	8.39%	1.245
Large Firm General	0.604	\$57,431,482	\$60,382,856	\$2,951,374	5.14%	0.784
Air Force Delivery (Rate 64)	(7.036)	\$1,810,639	\$2,158,239	\$347,600	19.20%	1.000
Small Interruptible & Transportation	0.900	\$3,635,345	\$4,039,344	\$403,999	11.11%	0.931
Large Interruptible Sales & Transportation	0.848	\$1,001,374	\$1,237,135	\$235,761	23.54%	0.906
Minot Air Force Base Distribution (Rate 65)	4.289	\$198,127	\$311,889	\$113,762	57.42%	2.614
Total	1.000	\$156,271,010	\$167,911,020	\$11,640,010	7.45%	1.000

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 4 **Q. HAVE YOU DEVELOPED A CLASS REVENUE RESPONSIBILITY BASED ON**  
 5 **THE COSS WITHOUT MINIMUM-SIZE CLASSIFICATION OF DISTRIBUTION**  
 6 **MAINS AND ADVOCACY STAFF WITNESS MUGRACE’S PROPOSED**  
 7 **OVERALL REVENUE REQUIREMENT?**

8 A. Yes. I have developed class revenue requirements based on the COSS without minimum-  
 9 size classification of distribution mains and Staff Witness Mugrace’s recommended revenue  
 10 requirement.<sup>31</sup> Table 5 presents those class revenues and compares those class revenue

<sup>30</sup> Exhibit KRP-3.

<sup>31</sup> Direct Testimony of Dante Mugrace, Schedule DM-1.

1 requirements to MDU’s proposed class revenue requirements in the same format as Tables 3  
 2 and 4.

**Table 5: Advocacy Staff Class Revenue Requirements – Recommended Revenue Requirement and Non-Min-Sys COSS<sup>32</sup>**

Rate Class	COSS Current Rates RROR	Current Revenue	Recommended Revenue	Increase (Decrease)	Percent Increase (Decrease)	Recommended Revenue RROR
(A)	(B)	(C)	(D)	(E)	(F)	(G)
Residential	1.140	\$57,431,482	\$78,010,843	\$1,754,724	2.30%	1.050
Small Firm General	1.531	\$1,810,639	\$16,502,112	\$366,061	2.27%	1.245
Large Firm General	0.604	\$3,635,345	\$58,229,764	\$798,282	1.39%	0.784
Air Force Delivery (Rate 64)	(7.036)	\$1,001,374	\$1,904,657	\$94,018	5.19%	1.000
Small Interruptible & Transportation	0.900	\$198,127	\$3,744,618	\$109,273	3.01%	0.931
Large Interruptible Sales & Transportation	0.848	\$156,271,010	\$1,065,142	\$63,768	6.37%	0.906
Minot Air Force Base Distribution (Rate 65)	4.289	\$0	\$228,897	\$30,770	15.53%	2.614
Total	1.000	\$0	\$159,487,906	\$3,216,896	2.06%	1.000

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**C. NORTH DAKOTA TARIFF RATE DESIGN**

5 **Q. WHAT ARE MDU’S RATE DESIGN PROPOSALS?**

6 A. The testimony and exhibits of both Stephanie Bosch<sup>33</sup> and witness Amen<sup>34</sup> present MDU’s  
 7 proposed rate designs. Regarding rate design, witness Bosch proposes (1) a two-phase  
 8 integration of Great Plains’ Wahpeton customers under MDU’s gas tariff, (2) Small and

<sup>32</sup> Exhibit KRP-4

<sup>33</sup> Bosch Direct, pages 4-18, Exhibits SB-1 thru SB-4 and Statement F schedules.

<sup>34</sup> Amen Direct, pages 38-51, Exhibits RJA-2 thru RJA-5 and Statement L

1 Large Basic Service Charges for residential customers, (3) a volumetric Distribution  
2 Delivery Charge for residential customers and (4) a Distribution Stabilization Mechanism  
3 Rate 87 corresponding to the residential volumetric Distribution Delivery Charge. Witness  
4 Amen supports and provides the proposed Basic Service Charge Rates, Distribution  
5 Delivery Charge Rates and Wahepton Integration Rates.  
6 Regarding both class rate structures and class tariff charges proposals see Table 1 above.

7 **Q. DO YOU HAVE ANY CRITICISMS OF THE PROPOSED RATE DESIGNS?**

8 A. My only criticism is that MDU's proposed class tariff charges are derived from MDU's  
9 proposed class revenue requirements. Table 6 shows my recommended class tariff charges  
10 based on Advocacy Staff's overall recommended revenue requirement.

11

<b>Table 6: Recommended Class Tariff Rates<sup>35</sup></b>
<b>Residential Service (Sch. 60 &amp; (90):<sup>36</sup></b> (a) small basic service: \$26.40/month (\$0.868/day) and large \$26.63/month (\$0.875/day) and (b) a distribution delivery charge of \$0.021/dk.
<b>Small Firm General Service (Sch. 70, 72, 74 &amp; 92):<sup>37</sup></b> increase the basic service charge from \$0.75 to \$0.80 and the distribution delivery charge from \$1.174/dk to \$1.253/dk.
<b>Large Firm General Service (Sch. 70, 72, 74 &amp; 92):<sup>38</sup></b> increases the basic service charge from \$2.13 to \$2.31 and the distribution delivery charge from \$0.917/dk to \$1.005 /dk.
<b>Minot AFB (Sch. 64):<sup>39</sup></b> (a) increase the firm basic service charge from \$175.00 to \$196 and the distribution delivery charge from \$0.449/dk to \$0.478/dk and (b) increase the interruptible basic service charge from \$2,000.00 to \$2,642.00 and the distribution delivery charge from \$0.255/dk to \$0.414/dk
<b>Small Interruptible Sales &amp; Transportation (Sch.71 &amp;81):<sup>40</sup></b> (a) leave the basic service charge at \$450.00 and increase the distribution delivery charge from \$0.566/dk to \$0.631/dk and (b) increase the Wahpeton basic service charge from \$180.00 to \$450.00 and decrease the Whapeton distribution delivery charge from \$0.669/dk to \$0.662/dk
<b>Large Interruptible Sales &amp; Transportation (Sch.85 &amp; 82):<sup>41</sup></b> (a) increase the sales basic service charge from \$1,600.00 to \$2,598.00 and the distribution delivery charge from \$0.237/dk to \$0.242/dk and (b) increase the transport basic service charge from \$1,600.00 to \$2,598.00 and the distribution delivery charge from \$0.237/dk to \$0.242/dk
<b>Wahpeton Firm Rates (GPNG 65):<sup>42</sup></b> proposed Phase 1 Rates - increase basic service charge from \$0.25 to \$0.27 and increase distribution delivery charge from \$0.922/dk to \$0.949

1

2 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

3 A. Yes, but I reserve the right to submit supplemental direct testimony in response to

4 additional information and data provided by MDU.

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<sup>35</sup> Exhibit KRP-5.

<sup>36</sup> Exhibit KRP-5, page 1.

<sup>37</sup> Exhibit KRP-5, page 2.

<sup>38</sup> Exhibit KRP-5, page 2.

<sup>39</sup> Exhibit KRP-5, Pages 3-4.

<sup>40</sup> Exhibit KRP-5, page 5.

<sup>41</sup> Exhibit KRP-5, page 6.

<sup>42</sup> Exhibit KRP-5, page 7

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**KARL RICHARD PAVLOVIC, Ph.D.**

*Education*

Purdue University – MA and Ph.D. in Philosophy

Karl-Ruprecht Universität, Heidelberg, Germany – graduate study

Yale University – BA in Philosophy

*Positions*

Senior Consultant – PCMG and Associates	2015-Present
Senior Consultant – Snavelly King Majoros and Associates	2010-2014
Director – FTI Consulting	2008-2010
President – DOXA, Inc	1994-2008
Partner – Snavelly King and Associates	1983-1994
Assistant Professor – University of Florida-Gainesville	1978-1983

*Professional Experience*

Dr. Pavlovic provides clients with economic and policy analyses of commercial operations and expert testimony in support of litigation, negotiation and strategic planning. His analyses and testimony are distinguished by systematic articulation and testing of assumptions, thorough evaluation of data, innovative application of statistical tools and economic principles, and clarity and precision of presentation. Dr. Pavlovic has provided expert testimony on the operations, costs and revenues of gas and electric utilities, the impacts of restructuring wholesale and retail electric markets, effects of mergers, the operation and competitiveness of petroleum and electric markets, the market valuation of crude oil, electric and gas reliability, and the performance of energy efficiency, renewable energy, and peak reduction programs.

Major projects directed by Dr. Pavlovic have included: analytical assistance to counsel and testimony on all aspects of the restructuring of wholesale and retail electric markets in the Eastern Interconnection; technical representation of the District of Columbia People’s Counsel on the DC PSC’s Pepco Productivity Improvement Working Group and various PJM working groups; impact evaluation study of pilot energy efficiency and renewable energy programs in the District of Columbia; analysis of petroleum markets, expert testimony, and coordination of technical testimony in the Trans-Alaska Pipeline quality bank litigation; Independent Technical Review of the economic models used by the US Army Corps of Engineers for the Ohio River System Investment Plan; assistance to a major independent telephone company in the formulation and implementation of corporate strategic plans, applications for long-distance authority, and settlement negotiations with major domestic and foreign carriers.

By education and professional experience Dr. Pavlovic has expertise in formal and mathematical logic, statistics, economics, financial analysis, econometrics, and computer modeling. With 33 years’ experience as a consultant and expert witness, Dr. Pavlovic has in-depth knowledge of

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commercial and industrial operations in the energy, transportation, and telecommunications industries and is familiar with a wide range of experimental and investigative methods in science and engineering.

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***Regulatory Projects and Appearances***

1. In re: the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Utility Service in North Dakota (2024) - (Appearance: cost of service and rate design on behalf of the North Dakota Public Service Commission Advocacy Staff)  
ND PSC Case No. PU-20-441
2. In re: 2023 Gas System Enhancement Program Plan Filings for the Commonwealth's Natural Gas Distribution Companies (2024) - (Appearance: cost and project compliance with tariff on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket Nos. D.P.U. 23-GSEP-01 to 23-GSEP-06
3. In re: the Application of Northern States Power Company for Advance Determination of Prudence – 345kV Big Stone to Sherburne (2024) - (Appearance: need, necessity and conformance with North Dakota Statutes and Regulation on behalf of the North Dakota Public Service Commission Advocacy Staff)  
ND PSC Case No. PU-23-329
4. Pennsylvania Office of Consumer Advocate: Monitor, Review and Report on Electric and Natural Gas Filings to the FERC (2024)  
Federal Energy Regulatory Agency Dockets
5. In re: Petition of Veolia Water New Jersey, Inc. for an Increase in Rates for Water Service and Other Tariff Changes (2023) - (Appearance: cost of service and rate design on behalf of the New Jersey Rate Counsel)  
NJ BPU Docket No. WR23110790
6. In re: the Application of Northern States Power Company for Advance Determination of Prudence – Brookings County to Lyon County and Helena to Hampton 345 kV Second Circuit (2023) - (Appearance: need, necessity and conformance with North Dakota Statutes and Regulation on behalf of the North Dakota Public Service Commission Advocacy Staff)  
ND PSC Case No. PU-23-295
7. In re: the Application of Northern States Power Company for Advance Determination of Prudence - Sherburne County 345 kV Transmission Line (2023) - (Appearance: need, necessity and conformance with North Dakota Statutes and Regulation on behalf of the North Dakota Public Service Commission Advocacy Staff)  
ND PSC Case No. PU-23-142
8. In re: Petition of Middlesex Water Company for an Increase in Rates for Water Service and Other Tariff Changes (2023) - (Appearance: cost of service and rate design on behalf of the Township of East Brunswick, New Jersey)  
NJ BPU Docket No. WR23050292

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9. In re: Petition of NSTAR Gas Company d/b/a Eversource Energy for Approval of its 2022 Gas System Enhancement Plan Reconciliation Filing (2023) - (Appearance: prudence/used and useful, accounting, cost of service and rate design on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 23-GREC-06
10. In re: Petition of Eversource Gas Company of Massachusetts d/b/a Eversource Energy for Approval of its 2022 Gas System Enhancement Plan Reconciliation Filing (2023) - (Appearance: prudence/used and useful, accounting, cost of service and rate design on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 23-GREC-05
11. In re: Petition of Berkshire Gas Company for Approval of its 2022 Gas System Enhancement Plan Reconciliation Filing (2023) - (Appearance: prudence/used and useful, accounting, cost of service and rate design on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 23-GREC-02
12. In re: Pittsburgh Water and Sewer Authority General Base Rate Increase Filing (2023) – (Appearance: gas and electric cost of service and rate design on behalf of the Pennsylvania Office of Consumer Advocate)  
PA Public Utility Commission Docket Nos. R-2023-3039920 et al
13. In re: UGI Electric Company General Base Rate Increase Filing (2023) – (Appearance: electric cost of service and rate design on behalf of the Pennsylvania Office of Consumer Advocate)  
PA Public Utility Commission Docket Nos. R-2022-3037368
14. In re: Application of Hawaii Water Service Company, Inc. for Approval of a General Rate Increase for its Pukalani Wastewater Division and Certain Tariff Changes (2023) – (Appearance: cost of service and rate design on behalf of the Hawaii Division of Consumer Advocacy)  
HI Public Utilities Commission Docket No. 2022-0186
15. In re: Application of Lanai Water Company, Inc. for Review and Approval of Rate Increases; Revised Rate Schedules; and Changes to its Tariff (2023) – (Appearance: cost of service and rate design on behalf of the Hawaii Division of Consumer Advocacy)  
HI Public Utilities Commission Docket No. 2022-0233

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16. In re: Application of Southern Maryland Electric Cooperative, Inc., for Authority to Revise Its Rates and Charges for Electric Service and Certain Rate Design Changes (2023) – (Appearance: cost of service and rate design on behalf of the Maryland Office of the People’s Counsel)  
MD PSC Case No. 9688
17. In re: Application of San Diego Gas & Electric Company for Authority to Establish Its Authorized Cost of Capital for Utility Operations for 2023 (2022) – (Appearance: business risk and cost of equity on behalf of Utility Consumers’ Action Network)  
CA Public Utilities Commission Application 22-04-012
18. In re: Valley Energy, Inc. General Base Rate Increase Filing (2022) – (Appearance: gas cost of service and rate design on behalf of the Pennsylvania Office of Consumer Advocate)  
PA Public Utility Commission Docket Nos. R-2022-3032300
19. In re: Citizens’ Electric Company General Base Rate Increase Filing (2022) – (Appearance: electric cost of service and rate design on behalf of the Pennsylvania Office of Consumer Advocate)  
PA Public Utility Commission Docket Nos. R-2022-3032369
20. In re: PECO Energy Company (Gas Division) General Base Rate Increase Filing (2022) – (Appearance: gas and electric cost of service and rate design on behalf of the Pennsylvania Office of Consumer Advocate)  
PA Public Utility Commission Docket Nos. R-2022-3031113
21. In re: Petition of Eversource Gas Company of Massachusetts d/b/a Eversource Energy for Approval of its 2021 Gas System Enhancement Plan Reconciliation Filing (2022) - (Appearance: prudence/used and useful, accounting, cost of service and rate design on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 22-GREC-05
22. In re: Petition of Liberty Utilities (New England Natural Gas Company Corp.) d/b/a Liberty for Approval of its 2021 Gas System Enhancement Plan Reconciliation Filing (2022) - (Appearance: prudence/used and useful, accounting, cost of service and rate design on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 22-GREC-04
23. In re: Petition of Berkshire Gas Company for Approval of its 2021 Gas System Enhancement Plan Reconciliation Filing (2022) - (Appearance: prudence/used and useful, accounting, cost of service and rate design on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 22-GREC-02

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24. In re: Nova Scotia Power 2022-2024 General Rate Application (2022) - (Appearance: cost of service on behalf of the Nova Scotia Utility and Review Board)  
NS UARB M10431
25. In re: the Application of Northern States Power Company for Authority to Increase Rates for Natural Gas Service in North Dakota (2021) - (Appearance: cost of service and rate design on behalf of the North Dakota Public Service Commission Advocacy Staff)  
ND PSC Case No. PU-20-441
26. In re: Application of San Diego Gas & Electric Company for Authority to Establish Its Authorized Cost of Capital for Utility Operations for 2022 and to Reset the Annual Cost of Capital Mechanism (2021) – (Appearance: wildfire risk accounting and ratemaking on behalf of Utility Consumers’ Action Network)  
CA Public Utilities Commission Application 21-08-014
27. In re: Petition of HPBS, Inc. for review and approval of Central Scheduling System (CSS) charge increase and revised CSS schedule (2021) – (Appearance: rate design on behalf of the Hawaii Department of Commerce and Consumer Affairs)  
HI DCCA Docket No. PTP-2021-001
28. In re: Petition of NSTAR Gas Company d/b/a Eversource Energy for Approval of its 2020 Gas System Enhancement Plan Reconciliation Filing (2021) - (Assistance to Counsel: prudence/used and useful, accounting, cost of service and rate design on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 21-GREC-06
29. In re: Petition of Eversource Gas Company of Massachusetts d/b/a Eversource Energy for Approval of its 2020 Gas System Enhancement Plan Reconciliation Filing (2021) - (Assistance to Counsel: prudence/used and useful, accounting, cost of service and rate design on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 21-GREC-05
30. In re: Petition of Berkshire Gas Company for Approval of its 2020 Gas System Enhancement Plan Reconciliation Filing (2021) - (Assistance to Counsel: prudence/used and useful, accounting, cost of service and rate design on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 20-GREC-02
31. In re: the Application of Northern States Power Company for Authority to Increase Rates for Electric Service in North Dakota (2021) - (Appearance: cost of service and rate design on behalf of the North Dakota Public Service Commission Advocacy Staff)  
ND PSC Case No. PU-20-441

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32. In re: Pike County Light & Power Company 2020 General Base Rate Increase Filing – (Appearance: gas and electric cost of service and rate design on behalf of the Pennsylvania Office of Consumer Advocate)  
PA Public Utility Commission Docket Nos. R-2020-3022134 and R-2020-3022135
33. In re: Young Brothers LLC’s Application for Approval of a New Cost of Service Model (2020) – (Appearance: cost of service on behalf of the Hawaii Division of Consumer Advocacy)  
HI Public Utilities Commission Docket No. 2020-0135
34. In re: Petition of NSTAR Gas Company d/b/a Eversource Energy for Approval of its 2019 Gas System Enhancement Plan Reconciliation Filing (2020) - (Assistance to Counsel: prudence/used and useful, accounting, cost of service and rate design on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 20-GREC-06
35. In re: Petition of Bay State Gas Company d/b/a Columbia Gas of Massachusetts for Approval of its 2019 Gas System Enhancement Plan Reconciliation Filing (2020) - (Assistance to Counsel: prudence/used and useful, accounting, cost of service and rate design on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 20-GREC-05
36. In re: Petition of Berkshire Gas Company for Approval of its 2019 Gas System Enhancement Plan Reconciliation Filing (2020) - (Assistance to Counsel: prudence/used and useful, accounting, cost of service and rate design on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 20-GREC-02
37. In re: Pittsburgh Water and Sewer Authority 2020 General Base Rate Increases 2020 – (Appearance: multi-year rate plan and performance-based ratemaking on behalf of the Pennsylvania Office of Consumer Advocate)  
PA Public Utility Commission Docket Nos. R-2020-3017970 and R-2020-3017951
38. In re: Commonwealth Edison Company Petition for approval of a Revision to Integrated Distribution Company Implementation Plan Creation of Rate Residential Time of Use Pricing Pilot (“Rate RTOUP”) – On Rehearing (2020) – (Appearance: price signal and customer response on behalf of the Illinois Attorney General)  
IL Commerce Commission Docket Nos. 18-1725/18-1824
39. In re: Hawaii Electric Company, Inc. Application for Approval of a General Rate Increase and Revised Rate Schedules and Rules (2019) - (Appearance: cost of service and rate design on behalf of the Hawaii Division of Consumer Advocacy)  
HI Public Utilities Commission Docket No. 2019-0085

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40. In re: Application of San Diego Gas & Electric Company for Authority to: (i) Adjust its Authorized Return on Common Equity, (ii) Adjust its Authorized Embedded Costs of Debt and Preferred Stock, (iii) Adjust its Authorized Capital Structure; (iv) Increase its Overall Rate of Return, (v) Modify its Adopted Cost of Capital Mechanism Structure, and (vi) Revise its Electric Distribution and Gas Rates Accordingly, and for Related Substantive and Procedural Relief (2019) – (Appearance: wildfire risk accounting and ratemaking on behalf of Utility Consumers’ Action Network)  
CA Public Utilities Commission Application 19-04-017
41. In re: Proposed Amendments to N.J.A.C. 14:9 Adoption of Water and Sewer Uniform System of Accounts (2019) – (Assistance to counsel: water and sewer accounting on behalf of the Division of Rate Counsel)  
NJ Board of Public Utilities Docket Nos. WX19050612 and WX19050613
42. In re: Petition of Public Service Electric and Gas Company for Approval of Gas Base Rate Adjustments Pursuant to its Gas System Modernization Program (2019) – (Assistance to Counsel: infrastructure replacement accounting)  
NJ Board of Public Utilities Docket No. GE19040522
43. In re: Petition of NSTAR Gas Company d/b/a Eversource Energy for Approval of its 2018 Gas System Enhancement Plan Reconciliation Filing (2019) - (Assistance to Counsel: prudence/used and useful, accounting, cost of service and rate design on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 19-GREC-06
44. In re: Petition of Bay State Gas Company d/b/a Columbia Gas of Massachusetts for Approval of its 2018 Gas System Enhancement Plan Reconciliation Filing (2019) - (Assistance to Counsel: prudence/used and useful, accounting, cost of service and rate design on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 19-GREC-05
45. In re: The Application of Potomac Electric Power Company for Adjustments to Its Retail Rates for the Distribution of Electric Energy (2019) – (Appearance: cost of service and rate design on behalf of the Maryland Office of People’s Counsel)  
MD Public Service Commission Case No. 9602
46. In re: PECO Energy Company Non-Bypassable Transmission Service Charge (NBT) Semiannual Adjustment (2019) - (Appearance: accounting, cost of service and rate design on behalf of the Pennsylvania Office of Consumer Advocate)  
PA Public Utility Commission Docket No. M-2018-3005860

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47. In re: PECO Energy Company Transmission Formula Rate Application (2018) - (Appearance: accounting, cost of service and rate design on behalf of the Pennsylvania Office of Consumer Advocate)  
Federal Energy Regulatory Commission Docket ER17-1519-000
48. In re: Petition of NSTAR Gas Company d/b/a Eversource Energy for Approval of its 2017 Gas System Enhancement Plan Reconciliation Filing (2018) - (Appearance: prudence/used and useful, accounting, cost of service and rate design on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 18-GREC-06
49. In re: Petition of Bay State Gas Company d/b/a Columbia Gas of Massachusetts for Approval of its 2017 Gas System Enhancement Plan Reconciliation Filing (2018) - (Appearance: prudence/used and useful, accounting, cost of service and rate design on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 18-GREC-05
50. In re: The Application of the Potomac Edison Company for Adjustments to Its Retail Rates for the Distribution of Electric Energy (2018) – (Appearance: cost of service and rate design on behalf of the Maryland Office of People’s Counsel)  
MD Public Service Commission Case No. 9490
51. In re: Rate Applications of Kansas City Power & Light – Missouri and Kansas City Power & Light – Greater Missouri Operations (2018) – (Appearance: consolidated operations, cost of service and rate design on behalf of the Missouri Office of Public Counsel)  
MO Public Service Commission Case Nos. ER-2018-0145 and ER-2018-0146
52. In re: The Application of Potomac Electric Power Company for Adjustments to Its Retail Rates for the Distribution of Electric Energy (2018) – (Appearance: cost of service and rate design on behalf of the Maryland Office of People’s Counsel)  
MD Public Service Commission Case No. 9472
53. In re: Mid-Atlantic Interstate Transmission, L.L.C. 2018 Transmission Formula Rate Protocol Filings (2018) - (Analysis and Advice to Counsel: accounting)  
Federal Energy Regulatory Commission Docket ER17-211-000
54. In re: The Gas Company d/b/a Hawaii Gas Application for Approval of Rate Increases and Revised Rate Schedules and Rules (2017) - (Appearance: cost of service and rate design on behalf of the Hawaii Division of Consumer Advocacy)  
HI Public Utilities Commission Docket No. 2017-0105
55. In re: Montana-Dakota Utilities Co., Application to Increase Natural Gas Rates (2017) - (Appearance: cost of service and rate design on behalf of the North Dakota Public Service Commission Staff)  
ND Public Service Commission Case No. PU-12-813

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56. In re: The Application of Delmarva Power and Light Company for Adjustments to Its Retail Rates for the Distribution of Electric Energy (2017) – (Appearance: cost of service and rate design on behalf of the Maryland Office of People’s Counsel)  
MD Public Service Commission Case No. 9455
57. In re: Petition of NSTAR Gas Company d/b/a Eversource Energy for Approval of its 2016 Gas System Enhancement Plan Reconciliation Filing (2017) - (Appearance: prudence/used and useful and plant accounting on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 17-GREC-06
58. In re: Petition of Bay State Gas Company d/b/a Columbia Gas of Massachusetts for Approval of its 2016 Gas System Enhancement Plan Reconciliation Filing (2017) - (Appearance: prudence/used and useful and plant accounting on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 17-GREC-05
59. In re: In the matter of the application of Columbia Gas of Maryland, Inc. for Authority to Increase Rates and Charges (2017) - (Appearance: cost of service and rate design on behalf of the Maryland Office of People’s Counsel)  
MD Public Service Commission Case No. 9447
60. In re: PJM Interconnection, L.L.C. - PECO Energy Company Transmission Formula Rate Application (2017) - (Analysis and Advice to Counsel: accounting, cost of service and rate design)  
Federal Energy Regulatory Commission Docket ER17-1519-000
61. In re: Northern Illinois Gas Company d/b/a Nicor Gas Company Proposed General Increase in Gas Rates (2017) - (Appearance: prudence/used and useful and plant accounting re. accelerated asset replacement program on behalf of the Illinois Citizens Utility Board)  
IL Commerce Commission Docket No. 17-0124
62. In re: The Application of Potomac Electric Power Company for Adjustments to Its Retail Rates for the Distribution of Electric Energy (2017) - (Appearance: cost of service and rate design on behalf of the Maryland Office of People’s Counsel)  
MD Public Service Commission Case No. 9443
63. In re: PJM Interconnection, L.L.C. - Rockland Electric Company Transmission Rate Application (2017) (Analysis and Advice to Counsel: accounting, cost of service and rate design on behalf of the New Jersey Division of Rate Counsel)  
Federal Energy Regulatory Commission Docket ER17-856-000

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64. In re: PJM Interconnection, L.L.C. - Mid-Atlantic Interstate Transmission, L.L.C. Transmission Formula Rate Application (2016) - (Analysis and Advice to Counsel: accounting, cost of service and rate design on behalf of the Pennsylvania Office of Consumer Advocate)  
Federal Energy Regulatory Commission Docket ER17-211-000
65. In re: The Application of Delmarva Power and Light Company for Adjustments to Its Retail Rates for the Distribution of Electric Energy (2016) – (Appearance: cost of service and rate design on behalf of the Maryland Office of People’s Counsel)  
MD Public Service Commission Case No. 9424
66. In re: The Application of Potomac Electric Power Company for Adjustments to Its Retail Rates for the Distribution of Electric Energy (2016) – (Appearance: cost of service and rate design on behalf of the Maryland Office of People’s Counsel)  
MD Public Service Commission Case No. 9418
67. In re: Petition of Fitchburg Gas and Electric Light Company d/b/a Unitil for Approval of its 2015 Gas System Enhancement Plan Reconciliation Filing (2016) - (Analysis and Advice to Counsel: prudence/used and useful and plant accounting on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 16-GREC-01
68. In re: Petition of Bay State Gas Company d/b/a Columbia Gas of Massachusetts for Approval of its 2015 Gas System Enhancement Plan Reconciliation Filing (2016) - (Appearance: prudence/used and useful and plant accounting on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 16-GREC-05
69. In re: Petition for Approval of Gas Infrastructure Contract Between Public Service Company of New Hampshire d/b/a Eversource Energy and Algonquin Gas Transmission, LLC (2016) - (Appearance: compliance with statutes and regulations, prudence, cost/benefit, and ratemaking on behalf of the New Hampshire Office of Consumer Advocate)  
NH Public Utilities Commission Docket No. DE 16-241
70. In re: Central Maine Power Company, Annual Compliance Filing and Price Change (2016) - (Analysis and Advice to Counsel: tax normalization regulatory asset on behalf of the Maine Office of the Public Advocate)  
ME Public Service Commission Docket No. 2016-00035
71. In re: Bulletin 2015-10 Generic Proceeding to Establish Parameters for the Next Generation PBR Plans (2016) - (Appearance: productivity adjustments/performance based ratemaking on behalf of the Alberta Utilities Consumer Advocate)  
Alberta Utilities Commission Proceeding 20414

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72. In re: Emera Maine, Proposed Rate Increase in Rates (2016) - (Analysis and Advice to to Counsel: evaluation of management audit of implementation of Customer Information System on behalf of the Maine Office of the Public Advocate)  
ME Public Service Commission Docket No. 2015-00360
73. In re: The Merger of the Southern Company and AGL Resources Inc. - Joint Application of the Southern Company, AGL Resources Inc., and Pivotal Utility Holdings, Inc., d/b/a Elkton Gas (2015-2016) - (Appearance: earnings, synergy savings, rates, operations, supply procurement, safety, and reliability on behalf of the Maryland Office of People's Counsel)  
MD Public Service Commission Case No. 9404
74. In re: Petition of Bay State Gas Company d/b/a Columbia Gas of Massachusetts for Approval of Firm Transportation Agreements with Millennium Pipeline Company, LLC (2015-2016) - (Analysis, Advice to Counsel, and Assistance on Brief: compliance with gas supply plan, rates, and reliability on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 15-142
75. In re: Petition of Boston Gas Company and Colonial Gas Company d/b/a National Grid for Approval of Precedent Agreements with Millennium Pipeline Company, LLC (2015-2016)  
- (Analysis, Advice to Counsel, and Assistance on Brief: compliance with gas supply plan, rates, and reliability on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 15-130
76. In re: Petition of Boston Gas Company and Colonial Gas Company d/b/a National Grid for Approval of Agreements for LNG or Liquefaction Services with GDF Suez Gas NA, LLC; Northeast Energy Center, LLC; Gaz Metro LNG, L.P.; and National Grid LNG (2015- 2016) - (Analysis and Advice to Counsel: compliance with gas supply plan, rates, and reliability on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 15-129
77. In re: Columbia Gas of Massachusetts CY2014 Targeted Infrastructure Reinvestment Factor Compliance Filing (2015) - (Appearance: PBR tracker design/rates, prudence/used and useful, plant accounting on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 15-55
78. ENMAX Energy Corporation (EEC) 2015-2016 Regulated Rate Option Non-Energy Tariff Application (2015-2016) - (Appearance: cost allocation, rate design, non-energy risk on behalf of the Alberta Utilities Consumer Advocate)  
Alberta Utilities Commission Proceeding 20480

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79. In the Matter of the Merger of Exelon Corporation and Pepco Holdings, Inc. (2014) - (Advice to Counsel: impact on customers on behalf of the New Jersey Division of Rate Counsel)  
NJ Board of Public Utilities BPU Docket No. EM1406
80. In re: Application of Baltimore Gas and Electric Company For Adjustments To Its Electric and Gas Base Rates (2014) (Analysis and Advice to Counsel in Settlement: earnings, investment tracker, cost allocation and rate design on behalf of the Maryland Office of People's Counsel)  
MD Public Service Commission Case No. 9355
81. In re: Columbia Gas of Massachusetts CY2013 Targeted Infrastructure Reinvestment Factor Compliance Filing (2014) - (Appearance: PBR tracker design/rates, prudence/used and useful, plant accounting on behalf of the Massachusetts Attorney General Office of Ratepayer Advocacy)  
MA Department of Public Utilities Docket No. D.P.U. 14-83
82. In re: Potential Business Combination of Entergy Louisiana, LLC and Entergy Gulf States Louisiana, L.L.C. (2014-2015) - (Analysis and Advice to Counsel: impact on rates and consolidation of rates on behalf of the Louisiana Public Service Commission Staff)  
LA Public Service Commission Docket No.U-33244
83. In the Matter of the Application of Ohio Power Company to Adopt a Final Implementation Plan for the Retail Stability Rider (2014) - (Analysis and Advice to Counsel: rate design)  
OH Public Utilities Commission Case No. 14-1186-EL-RDR
84. In re: Examination of Long-Term Natural Gas Hedging Proposals (2014-2015 ) - (Analysis and Advice to Counsel: natural gas procurement on behalf of the Louisiana Public Service Commission Staff)  
LA Public Service Commission Docket No.R-32975-LPSC, ex parte
85. In re: 2013 Integrated Resource Planning Process for Southwestern Electric Power Company Pursuant to General Order Dated April, 20, 2012 (2014-2015 - (Analysis and Advice to Counsel: IRP design and evaluation on behalf of the Louisiana Public Service Commission Staff)  
LA Public Service Commission Docket No. I-33013 SWEPCO, ex parte
86. In the Matter of the Application of Columbia Gas of Maryland, Inc. for Authority to Adopt an Infrastructure Replacement Surcharge Mechanism (2013-2014) - (Appearance: PBR tracker design/rates, prudence/used and useful, plant accounting on behalf of the Maryland Office of People's Counsel)  
MD Public Service Commission Case No. 9332

**PCMG and Associates LLC**

87. In the Matter of the Application of Baltimore Gas and Electric Company for Approval of a Gas System Strategic Infrastructure Development and Enhancement Plan and Accompanying Cost Recovery Mechanism (2013-2014) - (Appearance: PBR tracker design/rates, prudence/used and useful, plant accounting on behalf of the Maryland Office of People's Counsel)  
MD Public Service Commission Case No. 9331
88. In the Matter of the Application of Delmarva Power & Light Company for an Increase in Electric Base Rates and Miscellaneous Tariff Changes (2013-2014) - (Appearance: earnings, investment tracker design/rates, cost allocation and rate design on behalf of the Delaware Public Service Commission Staff)  
DE Public Service Commission Docket No. 13-115
89. In the Matter of the Application of Northern States Power Company for Authority to Increase Rates for Electric Service in North Dakota (2013) - (Appearance: cost allocation and rate design on behalf of the North Dakota Public Service Commission Staff)  
ND Public Service Commission Case No. PU-12-813
90. In the Matter of the Application of Columbia Gas of Maryland, Inc. for Authority to Increase Rates and Charges (2013) - (Appearance: expense tracker design/rates and evaluation on behalf of the Maryland Office of People's Counsel)  
MD Public Service Commission Case No. 9316

**MONTANA-DAKOTA UTILITIES CO.**  
**GAS UTILITY - NORTH DAKOTA**  
**Embedded Class Cost of Service Study**  
**Twelve Months Ended December 31, 2022**  
**Projected 2024**

PU-23-341  
Exhibit KRP-2

	Allocation Factor	Total North Dakota	Residential			Total Residential	Firm General-Meter < 500 cubic feet			Firm General > 500 cubic feet			Total Large Firm General	
			Demand	Energy	Customer		Demand	Energy	Customer	Total Small Firm General	Demand	Energy		Customer
<b>Rate Base-Projected</b>														
<b>Gas Plant in Service</b>														
Transmission Plant	2	2,015,856	931,440	0	0	931,440	232,622	0	0	232,622	722,730	0	0	722,730
Land	13	922,302	415,931	0	0	415,931	103,876	0	0	103,876	333,169	0	0	333,169
Heskett Pipeline	2	45,000	20,792	0	0	20,792	5,193	0	0	5,193	16,134	0	0	16,134
Rights of Way	13	324,782	146,470	0	(2)	146,468	36,579	0	0	36,579	117,323	0	0	117,323
Structures & Improvements	13	598,058	269,705	0	0	269,705	67,358	0	0	67,358	216,041	0	0	216,041
Directly Assigned	Direct	91,040	0	0	0	0	0	0	0	0	28,791	0	0	28,791
Heskett Pipeline	2	232,262	107,318	0	0	107,318	26,802	0	0	26,802	83,271	0	0	83,271
Mains														
Demand Related 70%	2	139,646,234	64,524,512	0	0	64,524,512	16,114,635	0	0	16,114,635	50,066,343	0	0	50,066,343
Customer Related 30%	8	0	0	0	0	0	0	0	0	0	0	0	0	0
Directly Assigned Demand Related 70%	Direct	4,337,493	0	0	0	0	0	0	0	0	1,619,143	0	0	1,619,143
Directly Assigned Customer Related 30%	Direct	0	0	0	0	0	0	0	0	0	0	0	0	0
Heskett Pipeline	2	20,642,641	9,538,075	0	0	9,538,075	2,382,081	0	0	2,382,081	7,400,855	0	0	7,400,855
Meas. & Reg. Equip. - General	13	3,461,365	1,560,970	0	1	1,560,971	389,844	0	0	389,844	1,250,371	0	0	1,250,371
Directly Assigned	Direct	828,504	0	0	0	0	0	0	0	0	401,819	0	0	401,819
Meas. & Reg. Equip. - City Gate	13	8,109,316	3,657,058	0	0	3,657,058	913,330	0	0	913,330	2,929,380	0	0	2,929,380
Directly Assigned	Direct	881,089	0	0	0	0	0	0	0	0	0	0	0	0
Heskett Pipeline	2	865,332	399,832	0	0	399,832	99,856	0	0	99,856	310,241	0	0	310,241
Services	37	75,085,021	0	0	61,039,479	61,039,479	0	0	8,143,947	8,143,947	0	0	5,525,945	5,525,945
Directly Assigned	Direct	510,729	0	0	0	0	0	0	0	0	0	0	0	0
Meters	5	40,455,502	0	0	28,198,341	28,198,341	0	0	3,662,563	3,662,563	0	0	7,686,469	7,686,469
Directly Assigned	Direct	54,980	0	0	0	0	0	0	0	0	0	0	0	0
Service Regulators	9	5,777,558	0	0	4,029,984	4,029,984	0	0	523,438	523,438	0	0	1,096,638	1,096,638
Directly Assigned	Direct	14,733	0	0	0	0	0	0	0	0	0	0	0	0
Ind. Meas. & Reg. Station Equipment	44	912,757	0	0	0	0	0	0	0	0	774,457	0	0	774,457
Directly Assigned	Direct	544,029	0	0	0	0	0	0	0	0	0	0	0	0
Heskett Pipeline	2	1,470,694	679,545	0	0	679,545	169,712	0	0	169,712	527,277	0	0	527,277
Property on Customer Premise	13	1,680	757	0	0	757	189	0	0	189	607	0	0	607
Other Equipment	40	1,755,672	465,482	0	537,720	1,003,202	116,252	0	71,087	187,339	378,257	0	82,497	460,754
Distribution Plant - includes Heskett		307,568,773	81,786,447	0	93,805,523	175,591,970	20,425,707	0	12,401,035	32,826,742	66,453,479	0	14,391,549	80,845,028
Distribution Plant - Heskett Pipeline Plant		23,255,929	10,745,562	0	0	10,745,562	2,683,644	0	0	2,683,644	8,337,778	0	0	8,337,778
Distribution Plant Excluding Direct Assignments		300,306,176	81,786,447	0	93,805,523	175,591,970	20,425,707	0	12,401,035	32,826,742	64,403,726	0	14,391,549	78,795,275
General Plant	38	20,853,706	5,679,372	0	6,513,994	12,193,366	1,418,391	0	861,146	2,279,537	4,472,290	0	999,370	5,471,660
Directly Assigned - MAFB	Direct	16,876	0	0	0	0	0	0	0	0	0	0	0	0
Intangible Plant - General	15	7,228,050	1,806,064	0	2,384,805	4,190,869	451,054	0	315,270	766,324	1,477,468	0	365,875	1,843,343
Directly Assigned	Direct	3,130,428	0	0	0	0	0	0	0	0	954,882	0	0	954,882
Common Plant	15	20,290,652	5,069,999	0	6,694,653	11,764,652	1,266,204	0	885,029	2,151,233	4,147,563	0	1,027,087	5,174,650
Intangible Common (Excluding CC&B & PCA)	15	7,544,723	1,885,190	0	2,489,288	4,374,478	470,816	0	329,082	799,898	1,542,199	0	381,904	1,924,103
Intangible Common (CC&B & PCAD)	4	9,599,169	0	0	8,190,909	8,190,909	0	0	967,144	967,144	0	0	429,370	429,370
Acquisition Adjustment	15	97,266	24,304	0	32,092	56,396	6,070	0	4,243	10,313	19,882	0	4,923	24,805
<b>Total Gas Plant in Service including Heskett</b>		<b>378,345,499</b>	<b>97,182,816</b>	<b>0</b>	<b>120,111,264</b>	<b>217,294,080</b>	<b>24,270,864</b>	<b>0</b>	<b>15,762,949</b>	<b>40,033,813</b>	<b>79,790,493</b>	<b>0</b>	<b>17,600,078</b>	<b>97,390,571</b>
<b>Less: Accumulated Depreciation</b>														
Transmission Plant	2	698,986	322,972	0	0	322,972	80,660	0	0	80,660	250,602	0	0	250,602
Distribution Plant														
Rights of Way	13	112,872	50,902	0	0	50,902	12,712	0	0	12,712	40,773	0	0	40,773
Structures & Improvements	23	266,164	104,172	0	2	104,174	26,017	0	0	26,017	94,566	0	0	94,566
Heskett Pipeline	2	48,192	22,268	0	0	22,268	5,561	0	0	5,561	17,278	0	0	17,278
Mains	13	51,139,124	23,062,209	0	0	23,062,209	5,759,657	0	0	5,759,657	18,473,313	0	0	18,473,313
Directly Assigned	Direct	145,754	0	0	0	0	0	0	0	0	31,735	0	13,601	45,336
Heskett Pipeline	2	4,819,471	2,226,870	0	0	2,226,870	556,148	0	0	556,148	1,727,890	0	0	1,727,890
Meas. & Reg. Equip. - General	18	881,380	320,712	0	0	320,712	80,096	0	0	80,096	339,453	0	0	339,453
Directly Assigned	Direct	8,381	0	0	0	0	0	0	0	0	5,867	0	2,514	8,381
Meas. & Reg. Equip. - City Gate	19	1,672,939	680,508	0	0	680,508	169,953	0	0	169,953	545,100	0	0	545,100
Heskett Pipeline	2	162,328	75,005	0	0	75,005	18,732	0	0	18,732	58,198	0	0	58,198
Services	37	46,934,611	0	0	38,154,936	38,154,936	0	0	5,090,669	5,090,669	0	0	3,454,192	3,454,192
Directly Assigned	Direct	118,288	0	0	0	0	0	0	0	0	0	0	0	0
Meters	5	15,006,987	0	0	10,460,188	10,460,188	0	0	1,358,630	1,358,630	0	0	2,851,299	2,851,299
Directly Assigned	Direct	22,692	0	0	0	0	0	0	0	0	0	0	0	0
Service Regulators	9	1,481,063	0	0	1,033,076	1,033,076	0	0	134,182	134,182	0	0	281,121	281,121
Directly Assigned	Direct	3,002	0	0	0	0	0	0	0	0	0	0	0	0

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**Projected 2024**

PU-23-341  
 Exhibit KRP-2

	Allocation Factor	Residential				Firm General-Meter < 500 cubic feet				Firm General > 500 cubic feet				Total Large Firm General
		Total North Dakota	Demand	Energy	Customer	Total Residential	Demand	Energy	Customer	Total Small Firm General	Demand	Energy	Customer	
Ind. Meas. & Reg. Station Equipment	21	484,863	0	0	0	0	0	0	0	0	257,764	0	0	257,764
Heskett Pipeline	2	201,254	92,991	0	0	92,991	23,224	0	0	23,224	72,154	0	0	72,154
Property on Customer Premise	13	1,680	757	0	0	757	189	0	0	189	607	0	0	607
Other Equipment	40	370,828	98,319	0	113,574	211,893	24,554	0	15,015	39,569	79,894	0	17,425	97,319
Distribution Plant		123,881,873	26,734,713	0	49,761,776	76,496,489	6,676,843	0	6,598,496	13,275,339	21,744,592	0	6,620,152	28,364,744
General Plant	38	5,431,470	1,479,226	0	1,696,609	3,175,835	369,428	0	224,291	593,719	1,164,834	0	260,292	1,425,126
Directly Assigned	Direct	8,734	0	0	0	0	0	0	0	0	0	0	0	0
Intangible Plant - General	15	2,493,682	623,093	0	822,760	1,445,853	155,614	0	108,768	264,382	509,728	0	126,227	635,955
Directly Assigned	Direct	913,718	0	0	0	0	0	0	0	0	25,066	0	10,742	35,808
Common Plant	15	7,617,822	1,903,455	0	2,513,406	4,416,861	475,377	0	332,271	807,648	1,557,141	0	385,604	1,942,745
Intangible Plant - Common	15	4,311,952	1,077,422	0	1,422,676	2,500,098	269,080	0	188,077	457,157	881,396	0	218,265	1,099,661
Intangible Plant - Common-CC&B & PCAD	4	7,214,511	0	0	6,156,095	6,156,095	0	0	726,883	726,883	0	0	322,705	322,705
Acquisition Adjustment	15	87,645	21,900	0	28,918	50,818	5,469	0	3,823	9,292	17,915	0	4,436	22,351
Less: Total Accumulated Reserve for Depreciation		152,660,393	32,162,781	0	62,402,240	94,565,021	8,032,471	0	8,182,609	16,215,080	26,151,274	0	7,948,423	34,099,697
Net Gas Plant in Service including Heskett		223,685,106	65,020,035	0	57,709,024	122,729,059	16,238,393	0	7,580,340	23,818,733	53,639,219	0	9,651,655	63,290,874
<b>Additions</b>														
Materials & Supplies	15	2,463,479	615,546	0	812,794	1,428,340	153,729	0	107,451	261,180	503,554	0	124,698	628,252
Fuel Stocks	10	26,293	0	9,894	0	9,894	0	6,513	0	6,513	0	9,886	0	9,886
Prepayments	25	415,793	106,802	0	132,002	238,804	26,673	0	17,323	43,996	87,688	0	19,342	107,030
Unamortized Loss on Debt	24	120,097	34,600	0	30,711	65,311	8,641	0	4,034	12,675	28,544	0	5,136	33,680
Unamortized Redemption Cost of Preferred Stock	24	35,472	10,220	0	9,068	19,288	2,552	0	1,191	3,743	8,431	0	1,517	9,948
Gain/Loss on Sale	24	400,639	115,424	0	102,445	217,869	28,827	0	13,457	42,284	95,221	0	17,134	112,355
Provision for Pension & Benefits	24	18,273,074	5,264,485	0	4,672,533	9,937,018	1,314,776	0	613,758	1,928,534	4,343,013	0	781,467	5,124,480
Provision for Post Retirement	24	4,511,690	1,299,821	0	1,153,665	2,453,486	324,623	0	151,539	476,162	1,072,306	0	192,947	1,265,253
Total Additions		26,246,537	7,446,898	9,894	6,913,218	14,370,010	1,859,821	6,513	908,753	2,775,087	6,138,757	9,886	1,142,241	7,260,884
Total Before Deductions		251,931,643	72,466,933	9,894	64,622,242	137,099,069	18,098,214	6,513	8,489,093	26,593,820	59,777,976	9,886	10,793,896	70,581,758
<b>Deductions</b>														
Accumulated Deferred Income Tax	24	(28,799,456)	(8,297,143)	0	(7,364,193)	(15,661,336)	(2,072,165)	0	(967,320)	(3,039,485)	(6,844,848)	0	(1,231,638)	(8,076,486)
Accumulated Investment Tax Credit	24	0	0	0	0	0	0	0	0	0	0	0	0	0
Customer Advances For Construction	Direct	(6,162,084)	(1,586,922)	0	(680,109)	(2,267,031)	(203,164)	0	(87,070)	(290,234)	(1,862,120)	0	(798,052)	(2,660,172)
Total Deductions		(34,961,540)	(9,884,065)	0	(8,044,302)	(17,928,367)	(2,275,329)	0	(1,054,390)	(3,329,719)	(8,706,968)	0	(2,029,690)	(10,736,658)
<b>Total Rate Base</b>		<b>216,970,103</b>	<b>62,582,868</b>	<b>9,894</b>	<b>56,577,940</b>	<b>119,170,702</b>	<b>15,822,885</b>	<b>6,513</b>	<b>7,434,703</b>	<b>23,264,101</b>	<b>51,071,008</b>	<b>9,886</b>	<b>8,764,206</b>	<b>59,845,100</b>
<b>Min-Sys Total Rate Base</b>		<b>216,970,104</b>	<b>46,054,588</b>	<b>9,894</b>	<b>86,931,799</b>	<b>132,996,281</b>	<b>11,717,017</b>	<b>6,513</b>	<b>11,023,880</b>	<b>22,747,410</b>	<b>37,405,035</b>	<b>9,886</b>	<b>11,341,367</b>	<b>48,756,288</b>
<b>Income Statement</b>														
<b>Gas Operating Revenues</b>														
Retail Sales & Transportation														
Residential	Direct	76,256,119	17,474,280	28,829,305	29,952,534	76,256,119	0	0	0	0	0	0	0	0
Firm General	Direct	73,567,533	0	0	0	0	4,364,103	6,212,425	5,559,523	16,136,051	13,558,775	32,651,458	11,221,249	57,431,482
Air Force Delivery	Direct	1,810,639	0	0	0	0	0	0	0	0	0	0	0	0
Small Interruptible	Direct	3,635,345	0	0	0	0	0	0	0	0	0	0	0	0
Large Interruptible	Direct	1,001,374	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Sales &amp; Transportation Revenues</b>		<b>156,271,010</b>	<b>17,474,280</b>	<b>28,829,305</b>	<b>29,952,534</b>	<b>76,256,119</b>	<b>4,364,103</b>	<b>6,212,425</b>	<b>5,559,523</b>	<b>16,136,051</b>	<b>13,558,775</b>	<b>32,651,458</b>	<b>11,221,249</b>	<b>57,431,482</b>
<b>Other Operating Revenue</b>														
Miscellaneous														
Reconnect Fees	6	44,354	0	0	37,894	37,894	0	0	4,474	4,474	0	0	1,986	1,986
Minot Maintenance Fee Rate 65	Direct	456,000	0	0	0	0	0	0	0	0	0	0	0	0
NSF Check Fees & Other	6	35,085	0	0	29,975	29,975	0	0	3,539	3,539	0	0	1,571	1,571
Miscellaneous	41	2,799	811	0	733	1,544	203	0	95	298	669	0	120	789

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	Allocation Factor	Residential				Firm General-Meter < 500 cubic feet				Firm General > 500 cubic feet				Total Large Firm General
		Total		Demand	Energy	Total		Demand	Energy	Customer	Total Small Firm General		Customer	
		North Dakota	Customer			Residential	Customer				Demand	Energy		
Rent From Gas Property	41	668,010	193,625	0	171,853	365,478	48,357	0	22,574	70,931	159,733	0	28,742	188,475
Other Gas Revenues														
Miscellaneous	42	355,763	62,018	2,410	142,776	207,204	15,489	549	18,465	34,503	60,548	2,617	24,851	88,016
Heskett Pipeline	2	1,940,754	896,739	0	0	896,739	223,956	0	0	223,956	695,804	0	0	695,804
Transport and Penalty Revenue - Net	41	73,902	21,421	0	19,012	40,433	5,350	0	2,497	7,847	17,671	0	3,180	20,851
Total Other Operating Revenue		3,576,667	1,174,614	2,410	402,243	1,579,267	293,355	549	51,644	345,548	934,425	2,617	60,450	997,492
Total Other Operating Revenue Excl. Direct Assigned		3,120,667	1,174,614	2,410	402,243	1,579,267	293,355	549	51,644	345,548	934,425	2,617	60,450	997,492
<b>Total Operating Revenues</b>		<b>159,847,677</b>	<b>18,648,894</b>	<b>28,831,715</b>	<b>30,354,777</b>	<b>77,835,386</b>	<b>4,657,458</b>	<b>6,212,974</b>	<b>5,611,167</b>	<b>16,481,599</b>	<b>14,493,200</b>	<b>32,654,075</b>	<b>11,281,699</b>	<b>58,428,974</b>
Min-SYS Total Operating Revenue		159,847,677	18,575,039	28,831,715	30,491,184	77,897,938	4,639,011	6,212,974	5,627,274	16,479,259	14,428,928	32,654,075	11,295,803	58,378,806
Operation & Maintenance Expenses														
Cost of Purchased Gas	Direct	106,767,865	17,474,280	28,829,305	0	46,303,585	4,364,103	6,212,425	0	10,576,528	13,558,775	32,676,473	0	46,235,248
Transmission Expenses	3	11,371	0	4,690	0	4,690	0	1,068	0	5,094	0	0	0	5,094
Other Gas Supply Expenses	3	320,085	0	132,024	0	132,024	0	30,069	0	30,069	0	143,402	0	143,402
Distribution Expenses														
Operation														
Load Dispatch	1	44,585	0	14,618	0	14,618	0	3,329	0	3,329	0	15,878	0	15,878
Mains and Services	22	2,676,743	791,676	0	748,917	1,540,593	197,717	0	99,921	297,638	634,149	0	67,800	701,949
Measuring Stations - General	18	271,446	98,772	0	0	98,772	24,668	0	0	24,668	104,544	0	0	104,544
Measuring Stations - Industrial	21	170,473	0	0	0	0	0	0	0	0	90,627	0	0	90,627
Measuring Stations - City Gate	19	327,834	133,354	0	(1)	133,353	33,304	0	0	33,304	106,819	0	0	106,819
Meters & House Regulators	16	355,372	0	0	247,723	247,723	0	0	32,176	32,176	0	0	67,512	67,512
Customer Installations	5	877,283	0	0	611,485	611,485	0	0	79,423	79,423	0	0	166,682	166,682
Other Gas Distribution	27	3,140,645	680,690	9,719	1,069,186	1,759,595	169,999	2,213	140,632	312,844	622,406	10,557	200,785	833,748
Rents	27	51,142	11,084	158	17,411	28,653	2,768	36	2,290	5,094	10,135	172	3,270	13,577
Supervision & Engineering	27	2,117,805	459,004	6,554	720,975	1,186,533	114,634	1,493	94,831	210,958	419,702	7,119	135,394	562,215
Direct -Minot AFB Distribution System	Direct	46,899	0	0	0	0	0	0	0	0	0	0	0	0
Total Operation Expense		10,080,227	2,174,580	31,049	3,415,696	5,621,325	543,090	7,071	449,273	999,434	1,988,382	33,726	641,443	2,663,551
Maintenance														
Structures & Improvements	13	10,491	4,731	0	0	4,731	1,182	0	0	1,182	3,790	0	0	3,790
Mains	13	181,967	82,061	0	0	82,061	20,494	0	0	20,494	65,733	0	0	65,733
Measuring Stations - General	18	205,880	74,914	0	0	74,914	18,709	0	0	18,709	79,292	0	0	79,292
Measuring Stations - Industrial	21	163,917	0	0	0	0	0	0	0	0	87,143	0	0	87,143
Measuring Stations - City Gate	19	154,737	62,944	0	(1)	62,943	15,720	0	0	15,720	50,419	0	0	50,419
Services	5	241,286	0	0	168,181	168,181	0	0	21,844	21,844	0	0	45,844	45,844
Meters & House Regulators	16	548,138	0	0	382,099	382,099	0	0	49,629	49,629	0	0	104,132	104,132
Other Equipment	28	579,610	86,436	0	211,725	298,161	21,587	0	27,500	49,087	110,186	0	57,705	167,891
Supervision & Engineering	28	938,916	140,019	0	342,976	482,995	34,969	0	44,547	79,516	178,492	0	93,477	271,969
Direct -Minot AFB Distribution System	Direct	8,177	0	0	0	0	0	0	0	0	0	0	0	0
Total Maintenance Expense		3,033,119	451,105	0	1,104,980	1,556,085	112,661	0	143,520	256,181	575,055	0	301,158	876,213
Min-Sys Total Maintenance Expense		3,033,119	315,775	0	1,354,931	1,670,706	78,864	0	173,034	251,898	402,537	0	381,744	784,281
Total Distribution Expenses		13,113,346	2,625,685	31,049	4,520,676	7,177,410	655,751	7,071	592,793	1,255,615	2,563,437	33,726	942,601	3,539,764
Customer Accounts	4	60,918	0	0	51,980	51,980	0	0	6,138	6,138	0	0	7,225	7,225
Meter Reading	5	299,437	0	0	208,715	208,715	0	0	27,109	27,109	0	0	56,892	56,892
Customer Records & Collection	43	2,011,504	0	0	1,687,617	1,687,617	0	0	214,176	214,176	0	0	99,604	99,604
Uncollectible Accounts	6	547,958	0	0	468,142	468,142	0	0	55,276	55,276	0	0	24,540	24,540
Miscellaneous Customer Accounts	4	110,925	0	0	94,651	94,651	0	0	11,176	11,176	0	0	4,962	4,962
Customer Service & Information	4	358,394	0	0	305,816	305,816	0	0	36,109	36,109	0	0	16,031	16,031
Sales Expenses	4	139,303	0	0	118,866	118,866	0	0	14,035	14,035	0	0	6,231	6,231
Administration & General Expenses	30	12,145,856	2,431,964	28,758	4,187,145	6,647,867	607,370	6,549	549,057	1,162,976	2,374,309	31,238	873,057	3,278,604
Total Gas O&M Expenses		135,886,962	22,531,929	29,025,826	11,643,608	63,201,363	5,627,224	6,257,182	1,505,869	13,390,275	18,496,521	32,889,933	2,026,643	53,413,097
Min-Sys Total Gas O&M Expenses		135,886,962	21,014,638	29,025,826	14,445,951	64,486,415	5,248,288	6,257,182	1,836,759	13,342,229	17,015,195	32,889,933	2,477,298	52,382,426
O&M Excl. Cost of Gas and A&G		16,973,241	2,625,685	167,763	7,456,463	10,249,911	655,751	38,208	956,812	1,650,771	2,563,437	182,222	1,153,586	3,899,245
O&M Excl. Cost of Gas		29,119,097	5,057,649	196,521	11,643,608	16,897,778	1,263,121	44,757	1,505,869	2,813,747	4,937,746	213,460	2,026,643	7,177,849
Depreciation Expense														
Transmission Plant	2	38,157	17,631	0	0	17,631	4,403	0	0	4,403	13,680	0	0	13,680
Distribution Plant														
Rights of Way	13	4,742	2,137	0	0	2,137	534	0	0	534	1,713	0	0	1,713
Structures & Improvements	23	8,890	3,479	0	(2)	3,477	869	0	0	869	3,159	0	1	3,160
Heskett Pipeline - Demand Related	2	2,996	1,383	0	0	1,383	346	0	0	346	1,074	0	1	1,075
Mains	13	3,963,507	1,787,422	0	0	1,787,422	446,399	0	0	446,399	1,431,763	0	0	1,431,763
Directly Assigned	Direct	68,037	0	0	0	0	0	0	0	0	31,735	0	13,601	45,336

**MONTANA-DAKOTA UTILITIES CO.**  
**GAS UTILITY - NORTH DAKOTA**  
**Embedded Class Cost of Service Study**  
**Twelve Months Ended December 31, 2022**  
**Projected 2024**

PU-23-341  
Exhibit KRP-2

	Allocation Factor	Residential				Firm General-Meter < 500 cubic feet				Firm General > 500 cubic feet				Total Large Firm General
		Total North Dakota	Demand	Energy	Customer	Total Residential	Demand	Energy	Customer	Total Small Firm General	Demand	Energy	Customer	
Heskett Pipeline	2	577,994	267,067	0	0	267,067	66,698	0	0	66,698	207,224	0	0	207,224
Meas. & Reg. Equip. - General	18	92,431	33,633	0	0	33,633	8,400	0	0	8,400	35,599	0	0	35,599
Directly Assigned	Direct	8,381	0	0	0	0	0	0	0	0	5,867	0	2,514	8,381
Meas. & Reg. Equip. - City Gate	19	192,395	78,260	0	0	78,260	19,545	0	0	19,545	62,689	0	0	62,689
Heskett Pipeline - Demand Related	2	18,518	8,557	0	0	8,557	2,137	0	0	2,137	6,639	0	0	6,639
Services	37	2,258,268	0	0	1,835,832	1,835,832	0	0	244,939	244,939	0	0	166,199	166,199
Directly Assigned	Direct	32,283	0	0	0	0	0	0	0	0	0	0	0	0
Meters	5	2,197,844	0	0	1,531,944	1,531,944	0	0	198,978	198,978	0	0	417,586	417,586
Directly Assigned	Direct	1,875	0	0	0	0	0	0	0	0	0	0	0	0
Service Regulators	20	98,252	0	0	68,359	68,359	0	0	8,879	8,879	0	0	18,602	18,602
Directly Assigned	Direct	217	0	0	0	0	0	0	0	0	0	0	0	0
Ind. Meas. & Reg. Station Equipment	21	36,129	0	0	0	0	0	0	0	0	19,207	0	0	19,207
Heskett Pipeline - Demand Related	2	36,473	16,853	0	0	16,853	4,209	0	0	4,209	13,076	0	0	13,076
Other Equipment	40	43,716	11,590	0	13,389	24,979	2,895	0	1,770	4,665	9,419	0	2,054	11,473
Total Distribution Plant		9,642,948	2,210,381	0	3,449,522	5,659,903	552,032	0	454,566	1,006,598	1,829,164	0	620,558	2,449,722
General Plant	38	468,189	127,508	0	146,245	273,753	31,844	0	19,334	51,178	100,408	0	22,437	122,845
Directly Assigned	Direct	4,335	0	0	0	0	0	0	0	0	0	0	0	0
Amort. of Intangible Plant - General	15	488,320	122,016	0	161,115	283,131	30,473	0	21,299	51,772	99,816	0	24,718	124,534
Directly Assigned	Direct	78,261	0	0	0	0	0	0	0	0	16,710	0	7,162	23,872
Common Plant	15	894,295	223,456	0	295,063	518,519	55,807	0	39,007	94,814	182,801	0	45,268	228,069
Intangible Plant - Common (Excluding CC&B)	15	715,457	178,770	0	236,056	414,826	44,647	0	31,206	75,853	146,245	0	36,216	182,461
Intangible Plant - Common (CC&B)	4	717,058	0	0	611,861	611,861	0	0	72,246	72,246	0	0	32,074	32,074
Amortization of Gain/Preferred Stock	15	26,421	6,602	0	8,715	15,317	1,649	0	1,152	2,801	5,401	0	1,337	6,738
Acquisition Adjustment	15	2,821	705	0	939	1,644	176	0	123	299	577	0	143	720
Total Depreciation Expense		13,076,262	2,887,069	0	4,909,516	7,796,585	721,031	0	638,933	1,359,964	2,394,802	0	789,913	3,184,715
Min-Sys Total Depreciation Expense		13,076,262	2,120,053	0	6,326,150	8,446,203	529,472	0	806,203	1,335,675	1,769,550	0	894,145	2,663,695
Taxes Other Than Income														
Ad Valorem Taxes-Transmission	2	12,527	5,788	0	0	5,788	1,446	0	0	1,446	4,491	0	0	4,491
Ad Valorem Taxes-Heskett Pipeline	2	132,178	61,073	0	0	61,073	15,253	0	0	15,253	47,389	0	0	47,389
Ad Valorem Taxes-Other	15	1,885,607	471,154	0	622,134	1,093,288	117,668	0	82,246	199,914	385,432	0	95,447	480,879
Other Taxes - Payroll, Franchise	31	1,041,112	180,829	7,026	416,302	604,157	45,161	1,600	53,840	100,601	176,542	7,632	72,460	256,634
Other Taxes - Minot AFB Distribution- Direct	Direct	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Taxes - Revenue	26	1,765	197	326	339	862	49	70	63	182	153	369	127	649
Total Taxes Other Than Income Taxes		3,073,189	719,041	7,352	1,038,775	1,765,168	179,577	1,670	136,149	317,396	614,007	8,001	168,034	790,042
Total Operating Expense		152,036,413	26,138,039	29,033,178	17,591,899	72,763,116	6,527,832	6,258,852	2,280,951	15,067,635	21,505,330	32,897,934	2,984,590	57,387,854
Min-Sys Total Operating Expense		152,036,413	23,658,260	29,033,178	22,171,900	74,863,338	5,908,519	6,258,852	2,821,739	14,989,110	19,230,255	32,897,934	3,575,194	55,703,383
Interest Expense/AFUDC Equity Add Back/Perm Adds	36	4,533,874	1,314,156	0	1,166,388	2,480,544	328,203	0	153,210	481,413	1,084,132	0	195,075	1,279,207
Direct -Minot AFB Distribution System	Direct	0	0	0	0	0	0	0	0	0	0	0	0	0
Taxable Income		3,277,390	(8,803,301)	(201,463)	11,596,490	2,591,726	(2,198,577)	(45,878)	3,177,006	932,551	(8,096,262)	(243,859)	8,102,034	(238,087)
Min-Sys Taxable Income		3,277,390	(6,061,007)	(201,463)	6,531,644	269,174	(1,513,705)	(45,878)	2,578,970	1,019,387	(5,604,748)	(243,859)	7,473,311	1,624,704
Income Taxes	24.4049%	799,848	(2,148,437)	(49,167)	2,830,113	632,509	(536,561)	(11,196)	775,346	227,589	(1,975,885)	(59,513)	1,977,293	(58,105)
Full Normalization/ARAM	24	(602,506)	(173,582)	0	(154,064)	(327,646)	(43,351)	0	(20,237)	(63,588)	(143,199)	0	(25,767)	(168,966)
Total Income Taxes		197,342	(2,322,019)	(49,167)	2,676,049	304,863	(579,912)	(11,196)	755,109	164,001	(2,119,084)	(59,513)	1,951,526	(227,071)
Total Operating Expense		152,233,755	23,816,020	28,984,011	20,267,948	73,067,979	5,947,920	6,247,656	3,036,060	15,231,636	19,386,246	32,838,421	4,936,116	57,160,783
Min-Sys Total Operating Expense		152,233,753	22,049,925	28,984,011	23,529,819	74,563,755	5,506,846	6,247,656	3,421,209	15,175,711	17,756,301	32,838,421	5,368,383	55,961,105
Operating Income:		7,613,922	(5,167,126)	(152,296)	10,086,829	4,767,407	(1,290,462)	(34,682)	2,575,107	1,249,963	(4,893,046)	(184,346)	6,345,583	1,268,191
Min-Sys Operating Income:		7,613,924	(3,474,886)	(152,296)	6,961,365	3,334,183	(867,835)	(34,682)	2,206,065	1,303,548	(3,327,373)	(184,346)	5,929,420	2,417,701
Rate of Return		3.51%				4.00%				5.37%				2.12%
Relative Rate of Return		1.000				1.140				1.531				0.604
Min-Sys Rate of Return		3.51%				2.51%				5.73%				4.96%
Min-Sys Relative Rate of Return		1.000				0.714				1.633				1.413

**MONTANA-DAKOTA UTILITIES CO.**  
**GAS UTILITY - NORTH DAKOTA**  
**Embedded Class Cost of Service Study**  
**Twelve Months Ended December 31, 2022**  
**Projected 2024**

PU-23-341  
Exhibit KRP-2

	Allocation Factor	Total North Dakota	Air Force Delivery			Total Air Force Delivery	Small Interruptible			Total Small Interruptible	Large Interruptible			Total Large Interruptible	Minot Air Force Base Distribution			Total Minot Air Force
			Demand	Energy	Customer		Demand	Energy	Customer		Demand	Energy	Customer		Demand	Energy	Customer	
<b>Rate Base-Projected</b>																		
<b>Gas Plant in Service</b>																		
Transmission Plant	2	2,015,856	0	0	0	0	101,371	0	0	101,371	27,693	0	0	27,693	0	0	0	0
Land	13	922,302	0	0	0	0	45,267	0	0	45,267	24,059	0	0	24,059	0	0	0	0
Heskett Pipeline	2	45,000	0	0	0	0	2,263	0	0	2,263	618	0	0	618	0	0	0	0
Rights of Way	13	324,782	0	0	0	0	15,940	0	0	15,940	8,472	0	0	8,472	0	0	0	0
Structures & Improvements	13	598,058	0	0	0	0	29,353	0	0	29,353	15,601	0	0	15,601	0	0	0	0
Directly Assigned	Direct	91,040	16,899	0	0	16,899	0	0	0	0	45,350	0	0	45,350	0	0	0	0
Heskett Pipeline	2	232,262	0	0	0	0	11,680	0	0	11,680	3,191	0	0	3,191	0	0	0	0
Mains	2	139,646,234	0	0	0	0	7,022,351	0	0	7,022,351	1,918,393	0	0	1,918,393	0	0	0	0
Demand Related 70%	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Customer Related 30%	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Directly Assigned Demand Related 70%	Direct	4,337,493	0	0	0	0	0	0	0	0	1,814,022	0	0	1,814,022	904,328	0	0	904,328
Directly Assigned Customer Related 30%	Direct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heskett Pipeline	2	20,642,641	0	0	0	0	1,038,051	0	0	1,038,051	283,579	0	0	283,579	0	0	0	0
Meas. & Reg. Equip. - General	13	3,461,365	0	0	0	0	169,884	0	0	169,884	90,294	0	0	90,294	0	0	0	0
Directly Assigned	Direct	828,504	65,191	0	0	65,191	79,067	0	0	79,067	282,426	0	0	282,426	0	0	0	0
Meas. & Reg. Equip. - City Gate	13	8,109,316	0	0	0	0	398,006	0	0	398,006	211,542	0	0	211,542	0	0	0	0
Directly Assigned	Direct	881,089	881,089	0	0	881,089	0	0	0	0	0	0	0	0	0	0	0	0
Heskett Pipeline	2	865,332	0	0	0	0	43,515	0	0	43,515	11,888	0	0	11,888	0	0	0	0
Services	37	75,085,021	0	0	0	0	0	358,630	358,630	0	0	17,020	17,020	0	0	0	0	0
Directly Assigned	Direct	510,729	0	0	0	0	0	0	0	0	0	0	0	0	0	0	510,729	510,729
Meters	5	40,455,502	0	0	24,430	24,430	0	771,376	771,376	0	0	112,323	112,323	0	0	0	0	0
Directly Assigned	Direct	54,980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54,980	54,980
Service Regulators	9	5,777,558	0	0	3,491	3,491	0	110,242	110,242	0	0	13,765	13,765	0	0	0	0	0
Directly Assigned	Direct	14,733	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14,733	14,733
Ind. Meas. & Reg. Station Equipment	44	912,757	0	0	0	0	108,626	0	0	108,626	29,675	0	0	29,675	0	0	0	0
Directly Assigned	Direct	544,029	227,282	0	0	227,282	162,538	0	0	162,538	154,209	0	0	154,209	0	0	0	0
Heskett Pipeline	2	1,470,694	0	0	0	0	73,956	0	0	73,956	20,204	0	0	20,204	0	0	0	0
Property on Customer Premise	13	1,680	0	0	0	0	82	0	0	82	44	0	0	44	0	0	0	0
Other Equipment	40	1,755,672	6,863	0	161	7,024	52,679	0	7,150	59,829	28,137	0	825	28,962	5,214	0	3,346	8,560
Distribution Plant - includes Heskett		307,568,773	#####	0	28,082	1,225,406	9,253,258	0	1,247,398	10,500,656	4,941,704	0	143,933	5,085,637	909,542	0	583,788	1,493,330
Distribution Plant - Heskett Pipeline Plant		23,255,929	0	0	0	1,169,465	0	0	1,169,465	319,480	0	0	0	319,480	0	0	0	0
Distribution Plant Excluding Direct Assignments		300,306,176	6,863	0	28,082	34,945	9,011,653	0	1,247,398	10,259,051	2,645,697	0	143,933	2,789,630	5,214	0	3,346	8,560
General Plant	38	20,853,706	477	0	1,950	2,427	625,783	0	86,621	712,404	183,721	0	9,995	193,716	362	0	232	594
Directly Assigned - MAFB	Direct	16,876	0	0	0	0	0	0	0	0	0	0	0	0	16,875	0	1	16,876
Intangible Plant - General	15	7,228,050	30,439	0	714	31,153	205,513	0	31,712	237,225	117,510	0	3,659	121,169	23,123	0	14,842	37,965
Directly Assigned	Direct	3,130,428	0	0	0	195,798	0	0	195,798	1,979,747	0	0	1,979,747	0	0	0	0	0
Common Plant	15	20,290,652	85,450	0	2,004	87,454	576,919	0	89,023	665,942	329,876	0	10,272	340,148	64,912	0	41,663	106,575
Intangible Common (Excluding CC&B & PCA)	15	7,544,723	31,773	0	745	32,518	214,517	0	33,102	247,619	122,659	0	3,820	126,479	24,136	0	15,492	39,628
Intangible Common (CC&B & PCAD)	4	9,599,169	0	0	245	245	0	0	10,930	10,930	0	0	571	571	0	0	0	0
Acquisition Adjustment	15	97,266	410	0	10	420	2,766	0	427	3,193	1,581	0	49	1,630	311	0	200	511
Total Gas Plant in Service including Heskett		378,345,499	#####	0	33,750	1,379,623	11,175,925	0	1,499,213	12,675,138	7,704,491	0	172,299	7,876,790	#####	0	656,218	1,695,479
<b>Less: Accumulated Depreciation</b>																		
Transmission Plant	2	698,986	0	0	0	0	35,150	0	0	35,150	9,602	0	0	9,602	0	0	0	0
Distribution Plant																		
Rights of Way	13	112,872	0	0	0	0	5,540	0	0	5,540	2,944	0	0	2,944	0	0	0	0
Structures & Improvements	23	266,164	6,527	0	0	6,527	11,338	0	0	11,338	23,542	0	0	23,542	0	0	0	0
Heskett Pipeline	2	48,192	0	0	0	0	2,423	0	0	2,423	662	0	0	662	0	0	0	0
Mains	13	51,139,124	0	0	0	0	2,509,913	0	0	2,509,913	1,334,032	0	0	1,334,032	0	0	0	0
Directly Assigned	Direct	145,754	0	0	0	0	0	0	0	0	0	0	0	0	100,419	0	(1)	100,418
Heskett Pipeline	2	4,819,471	0	0	0	0	242,355	0	0	242,355	66,208	0	0	66,208	0	0	0	0
Meas. & Reg. Equip. - General	18	881,380	13,394	0	13,394	51,149	0	0	51,149	76,578	0	0	0	76,578	0	0	0	0
Directly Assigned	Direct	8,381	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meas. & Reg. Equip. - City Gate	19	1,672,939	163,953	0	0	163,953	74,061	0	0	74,061	39,364	0	0	39,364	0	0	0	0
Heskett Pipeline	2	162,328	0	0	0	0	8,163	0	0	8,163	2,230	0	0	2,230	0	0	0	0
Services	37	46,934,611	0	0	0	0	0	224,175	224,175	0	0	10,639	10,639	0	0	0	0	0
Directly Assigned	Direct	118,288	0	0	0	0	0	0	0	0	0	0	0	0	0	0	118,288	118,288
Meters	5	15,006,987	0	0	9,062	9,062	0	286,142	286,142	0	0	41,666	41,666	0	0	0	0	0
Directly Assigned	Direct	22,692	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22,692	22,692
Service Regulators	9	1,481,063	0	0	895	895	0	28,260	28,260	0	0	3,529	3,529	0	0	0	0	0
Directly Assigned	Direct	3,002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,002	3,002

**MONTANA-DAKOTA UTILITIES CO.**  
**GAS UTILITY - NORTH DAKOTA**  
**Embedded Class Cost of Service Study**  
**Twelve Months Ended December 31, 2022**  
**Projected 2024**

PU-23-341  
Exhibit KRP-2

	Allocation Factor	Air Force Delivery				Small Interruptible				Large Interruptible				Minot Air Force Base Distribution			Total Minot Air Force	
		Total North Dakota	Demand	Energy	Customer	Total Air Force Delivery	Demand	Energy	Customer	Total Small Interruptible	Demand	Energy	Customer	Total Large Interruptible	Demand	Energy		Customer
Ind. Meas. & Reg. Station Equipment	21	484,863	75,646	0	0	75,646	90,252	0	0	90,252	61,202	0	0	61,202	0	0	0	0
Heskett Pipeline	2	201,254	0	0	0	0	10,120	0	0	10,120	2,765	0	0	2,765	0	0	0	0
Property on Customer Premise	13	1,680	0	0	0	0	82	0	0	82	44	0	0	44	0	0	0	0
Other Equipment	40	370,828	1,450	0	34	1,484	11,127	0	1,510	12,637	5,943	0	174	6,117	1,101	0	707	1,808
Distribution Plant		123,881,873	260,970	0	9,991	270,961	3,016,523	0	540,087	3,556,610	1,615,514	0	56,008	1,671,522	101,520	0	144,688	246,208
General Plant	38	5,431,470	124	0	508	632	162,989	0	22,561	185,550	47,851	0	2,603	50,454	94	0	61	155
Directly Assigned	Direct	8,734	0	0	0	0	0	0	0	0	0	0	0	8,734	0	0	0	8,734
Intangible Plant - General	15	2,493,682	10,502	0	246	10,748	70,902	0	10,941	81,843	40,541	0	1,262	41,803	7,978	0	5,120	13,098
Directly Assigned	Direct	913,718	0	0	0	0	116,762	0	50,041	166,803	497,775	0	213,332	711,107	0	0	0	0
Common Plant	15	7,617,822	32,081	0	752	32,833	216,596	0	33,423	250,019	123,847	0	3,857	127,704	24,370	0	15,642	40,012
Intangible Plant - Common	15	4,311,952	18,159	0	426	18,585	122,601	0	18,918	141,519	70,102	0	2,183	72,285	13,794	0	8,854	22,648
Intangible Plant - Common-CC&B & PCAD	4	7,214,511	0	0	184	184	0	0	8,215	8,215	0	0	429	429	0	0	0	0
Acquisition Adjustment	15	87,645	369	0	9	378	2,492	0	385	2,877	1,425	0	44	1,469	280	0	180	460
Less: Total Accumulated Reserve for Depreciation		152,660,393	322,205	0	12,116	334,321	3,744,015	0	684,571	4,428,586	2,406,657	0	279,718	2,686,375	156,770	0	174,545	331,315
Net Gas Plant in Service including Heskett		225,685,106	#####	0	21,634	1,045,302	7,431,910	0	814,642	8,246,552	5,297,834	0	(107,419)	5,190,415	882,491	0	481,673	1,364,164
<b>Additions</b>																		
Materials & Supplies	15	2,463,479	10,374	0	243	10,617	70,043	0	10,808	80,851	40,050	0	1,247	41,297	7,881	0	5,058	12,939
Fuel Stocks	10	26,293	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prepayments	25	415,793	1,479	0	37	1,516	12,282	0	1,648	13,930	8,467	0	189	8,656	1,142	0	721	1,863
Unamortized Loss on Debt	24	120,097	545	0	12	557	3,955	0	434	4,389	2,819	0	(57)	2,762	471	0	256	726
Unamortized Redemption Cost of Preferred Stock	24	35,472	161	0	3	164	1,168	0	128	1,296	833	0	(17)	816	139	0	76	215
Gain/Loss on Sale	24	400,639	1,817	0	38	1,855	13,193	0	1,446	14,639	9,405	0	(191)	9,214	1,567	0	855	2,422
Provision for Pension & Benefits	24	18,273,074	82,883	0	1,752	84,635	601,740	0	65,959	667,699	428,950	0	(8,697)	420,253	71,453	0	39,000	110,453
Provision for Post Retirement	24	4,511,690	20,464	0	432	20,896	148,572	0	16,286	164,858	105,909	0	(2,147)	103,762	17,642	0	9,629	27,271
Total Additions		26,246,537	117,723	0	2,517	120,240	850,953	0	96,709	947,662	596,433	0	(9,673)	586,760	100,294	0	55,595	155,889
Total Before Deductions		251,931,643	#####	0	24,151	1,165,542	8,282,863	0	911,351	9,194,214	5,894,267	0	(117,092)	5,777,175	982,785	0	537,268	1,520,053
<b>Deductions</b>																		
Accumulated Deferred Income Tax	24	(28,799,456)	(130,629)	0	(2,761)	(133,390)	(948,379)	0	(103,956)	(1,052,335)	(676,051)	0	13,708	(662,343)	(112,614)	0	(61,466)	(174,080)
Accumulated Investment Tax Credit	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Customer Advances For Construction	Direct	(6,162,084)	0	0	0	0	(276,493)	0	(118,497)	(394,990)	(385,192)	0	(165,082)	(550,274)	0	0	0	0
Total Deductions		(34,961,540)	(130,629)	0	(2,761)	(133,390)	(1,224,872)	0	(222,453)	(1,447,325)	(1,061,243)	0	(151,374)	(1,212,617)	(112,614)	0	(61,466)	(174,080)
<b>Total Rate Base</b>		<b>216,970,103</b>	<b>#####</b>	<b>0</b>	<b>21,390</b>	<b>1,032,152</b>	<b>7,057,991</b>	<b>0</b>	<b>688,898</b>	<b>7,746,889</b>	<b>4,833,024</b>	<b>0</b>	<b>(268,466)</b>	<b>4,564,558</b>	<b>870,171</b>	<b>0</b>	<b>475,802</b>	<b>1,345,973</b>
<b>Min-Sys Total Rate Base</b>		<b>216,970,104</b>	<b>707,533</b>	<b>0</b>	<b>324,622</b>	<b>1,032,155</b>	<b>5,137,537</b>	<b>0</b>	<b>872,919</b>	<b>6,010,456</b>	<b>3,208,064</b>	<b>0</b>	<b>873,476</b>	<b>4,081,540</b>	<b>609,117</b>	<b>0</b>	<b>736,857</b>	<b>1,345,974</b>
<b>Income Statement</b>																		
<b>Gas Operating Revenues</b>																		
Retail Sales & Transportation																		
Residential	Direct	76,256,119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Firm General	Direct	73,567,533	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Air Force Delivery	Direct	1,810,639	210,855	1,453,454	146,330	1,810,639	0	0	0	0	0	0	0	0	0	0	0	0
Small Interruptible	Direct	3,635,345	0	0	0	0	262,861	1,750,349	1,622,135	3,635,345	0	0	0	0	0	0	0	0
Large Interruptible	Direct	1,001,374	0	0	0	0	0	0	0	0	0	0	0	1,001,374	1,001,374	0	0	0
Total Sales & Transportation Revenues		<b>156,271,010</b>	<b>210,855</b>	<b>1,453,454</b>	<b>146,330</b>	<b>1,810,639</b>	<b>262,861</b>	<b>1,750,349</b>	<b>1,622,135</b>	<b>3,635,345</b>	<b>0</b>	<b>0</b>	<b>1,001,374</b>	<b>1,001,374</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Other Operating Revenue</b>																		
Miscellaneous																		
Reconnect Fees	6	44,354	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minot Maintenance Fee Rate 65	Direct	456,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	456,000	456,000
NSF Check Fees & Other	6	35,085	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	41	2,799	0	0	0	0	93	0	10	103	66	0	(1)	65	0	0	0	0

**MONTANA-DAKOTA UTILITIES CO.**  
**GAS UTILITY - NORTH DAKOTA**  
**Embedded Class Cost of Service Study**  
**Twelve Months Ended December 31, 2022**  
**Projected 2024**

PU-23-341  
 Exhibit KRP-2

	Allocation Factor	Air Force Delivery				Total Small Interruptible				Total Large Interruptible				Minot Air Force Base Distribution			Total Minot Air Force	
		North Dakota	Demand	Energy	Customer	Air Force Delivery	Demand	Energy	Customer	Small Interruptible	Demand	Energy	Customer	Large Interruptible	Demand	Energy		Customer
Rent From Gas Property	41	668,010	3,048	0	64	3,112	22,132	0	2,426	24,558	15,777	0	(320)	15,457	0	0	0	0
Other Gas Revenues																		
Miscellaneous	42	355,763	5,234	119	67	5,420	10,220	236	2,302	12,758	7,188	370	305	7,863	0	0	0	0
Heskett Pipeline	2	1,940,754	0	0	0	0	97,594	0	0	97,594	26,661	0	0	26,661	0	0	0	0
Transport and Penalty Revenue - Net	41	73,902	337	0	7	344	2,448	0	268	2,716	1,745	0	(35)	1,710	0	0	0	0
Total Other Operating Revenue		3,576,667	8,619	119	138	8,876	132,487	236	5,006	137,729	51,437	370	(51)	51,756	0	0	456,000	456,000
Total Other Operating Revenue Excl. Direct Assigned		3,120,667	8,619	119	138	8,876	132,487	236	5,006	137,729	51,437	370	(51)	51,756	0	0	0	0
<b>Total Operating Revenues</b>		<b>159,847,677</b>	<b>219,474</b>	<b>1,453,573</b>	<b>146,468</b>	<b>1,819,515</b>	<b>395,348</b>	<b>1,750,585</b>	<b>1,627,141</b>	<b>3,773,074</b>	<b>51,437</b>	<b>370</b>	<b>1,001,323</b>	<b>1,053,130</b>	<b>0</b>	<b>0</b>	<b>456,000</b>	<b>456,000</b>
<b>Min-Sys Total Operating Revenue</b>		<b>159,847,677</b>	<b>216,889</b>	<b>1,453,573</b>	<b>149,054</b>	<b>1,819,516</b>	<b>385,798</b>	<b>1,750,585</b>	<b>1,628,834</b>	<b>3,765,217</b>	<b>43,790</b>	<b>370</b>	<b>1,006,781</b>	<b>1,050,941</b>	<b>0</b>	<b>0</b>	<b>456,000</b>	<b>456,000</b>
Operation & Maintenance Expenses																		
Cost of Purchased Gas	Direct	106,767,865	210,855	1,453,454	0	1,664,309	262,861	1,725,334	0	1,988,195	0	0	0	0	0	0	0	0
Transmission Expenses	3	11,371	0	231	0	231	0	288	0	288	0	0	0	288	0	0	0	0
Other Gas Supply Expenses	3	320,085	0	6,493	0	6,493	0	8,097	0	8,097	0	0	0	8,097	0	0	0	0
Distribution Expenses																		
Operation																		
Load Dispatch	1	44,585	0	719	0	719	0	2,657	0	2,657	0	7,384	0	7,384	0	0	0	0
Mains and Services	22	2,676,743	0	0	0	0	86,160	0	4,400	90,560	45,794	0	209	46,003	0	0	0	0
Measuring Stations - General	18	271,446	4,125	0	0	4,125	15,753	0	0	15,753	23,584	0	0	23,584	0	0	0	0
Measuring Stations - Industrial	21	170,473	26,597	0	0	26,597	31,732	0	0	31,732	21,518	0	0	21,518	0	0	0	0
Measuring Stations - City Gate	19	327,834	32,129	0	0	32,129	14,513	0	0	14,513	7,714	0	0	7,714	0	0	0	0
Meters & House Regulators	16	355,372	0	0	215	215	0	0	6,777	6,777	0	0	969	969	0	0	0	0
Customer Installations	5	877,283	0	0	530	530	0	0	16,727	16,727	0	0	2,436	2,436	0	0	0	0
Other Gas Distribution	27	3,140,645	41,787	478	495	42,760	98,505	1,767	18,552	118,824	65,562	4,909	2,403	72,874	0	0	0	0
Rents	27	51,142	680	8	8	696	1,604	29	302	1,935	1,068	80	39	1,187	0	0	0	0
Supervision & Engineering	27	2,117,805	28,178	322	334	28,834	66,424	1,191	12,510	80,125	44,210	3,310	1,620	49,140	0	0	0	0
Direct -Minot AFB Distribution System	Direct	46,899	0	0	0	0	0	0	0	0	0	0	0	0	46,899	0	0	46,899
Total Operation Expense		10,080,227	133,496	1,527	1,582	136,605	314,691	5,644	59,268	379,603	209,450	15,683	7,676	232,809	46,899	0	0	46,899
Maintenance																		
Structures & Improvements	13	10,491	0	0	0	0	515	0	0	515	274	0	0	274	0	0	0	0
Mains	13	181,967	0	0	0	0	8,931	0	0	8,931	4,747	0	0	4,747	0	0	0	0
Measuring Stations - General	18	205,880	3,129	0	0	3,129	11,948	0	0	11,948	17,888	0	0	17,888	0	0	0	0
Measuring Stations - Industrial	21	163,917	25,574	0	0	25,574	30,511	0	0	30,511	20,691	0	0	20,691	0	0	0	0
Measuring Stations - City Gate	19	154,737	15,165	0	0	15,165	6,850	0	0	6,850	3,641	0	0	3,641	0	0	0	0
Services	5	241,286	0	0	146	146	0	0	4,601	4,601	0	0	670	670	0	0	0	0
Meters & House Regulators	16	548,138	0	0	331	331	0	0	10,452	10,452	0	0	1,495	1,495	0	0	0	0
Other Equipment	28	579,610	16,879	0	184	17,063	22,607	0	5,792	28,399	18,176	0	833	19,009	0	0	0	0
Supervision & Engineering	28	938,916	27,342	0	297	27,639	36,621	0	9,382	46,003	29,444	0	1,349	30,793	0	0	0	0
Direct -Minot AFB Distribution System	Direct	8,177	0	0	0	0	0	0	0	0	0	0	0	0	8,177	0	0	8,177
Total Maintenance Expense		3,033,119	88,089	0	958	89,047	117,983	0	30,227	148,210	94,861	0	4,347	99,208	8,177	0	0	8,177
<b>Min-Sys Total Maintenance Expense</b>		<b>3,033,119</b>	<b>61,661</b>	<b>0</b>	<b>27,384</b>	<b>89,045</b>	<b>82,586</b>	<b>0</b>	<b>51,227</b>	<b>133,813</b>	<b>66,402</b>	<b>0</b>	<b>28,797</b>	<b>95,199</b>	<b>8,177</b>	<b>0</b>	<b>0</b>	<b>8,177</b>
Total Distribution Expenses		13,113,346	221,585	1,527	2,540	225,652	432,674	5,644	89,495	527,813	304,311	15,683	12,023	332,017	55,076	0	0	55,076
Customer Accounts	4	60,918	0	0	2	2	0	0	69	69	0	0	4	4	0	0	0	0
Meter Reading	5	299,437	0	0	181	181	0	0	5,709	5,709	0	0	831	831	0	0	0	0
Customer Records & Collection	43	2,011,504	0	0	401	401	0	0	8,837	8,837	0	0	869	869	0	0	0	0
Uncollectible Accounts	6	547,958	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous Customer Accounts	4	110,925	0	0	3	3	0	0	126	126	0	0	7	7	0	0	0	0
Customer Service & Information	4	358,394	0	0	9	9	0	0	408	408	0	0	21	21	0	0	0	0
Sales Expenses	4	139,303	0	0	4	4	0	0	159	159	0	0	8	8	0	0	0	0
Administration & General Expenses	30	12,145,856	205,237	1,414	2,353	209,004	400,752	5,228	82,882	488,872	281,859	14,526	11,136	307,521	51,013	0	0	51,013
Total Gas O&M Expenses		135,886,962	637,677	1,463,119	5,493	2,106,289	1,096,287	1,744,591	187,695	3,028,573	586,170	30,209	24,899	641,278	106,089	0	0	106,089
<b>Min-Sys Total Gas O&amp;M Expenses</b>		<b>135,886,962</b>	<b>509,629</b>	<b>1,463,119</b>	<b>133,536</b>	<b>2,106,284</b>	<b>846,254</b>	<b>1,744,591</b>	<b>276,336</b>	<b>2,867,181</b>	<b>410,322</b>	<b>30,209</b>	<b>155,807</b>	<b>596,338</b>	<b>106,089</b>	<b>0</b>	<b>0</b>	<b>106,089</b>
O&M Excl. Cost of Gas and A&G		16,973,241	221,585	8,251	3,140	232,976	432,674	14,029	104,803	551,506	304,311	15,683	13,763	333,757	55,076	0	0	55,076
O&M Excl. Cost of Gas		29,119,097	426,822	9,665	5,493	441,980	833,426	19,257	187,695	1,040,378	586,170	30,209	24,899	641,278	106,089	0	0	106,089
Depreciation Expense																		
Transmission Plant	2	38,157	0	0	0	0	1,919	0	0	1,919	524	0	0	524	0	0	0	0
Distribution Plant																		
Rights of Way	13	4,742	0	0	0	0	233	0	0	233	124	0	0	124	0	0	0	0
Structures & Improvements	23	8,890	218	0	0	218	379	0	0	379	786	0	0	786	0	0	0	0
Heskett Pipeline - Demand Related	2	2,996	0	0	0	0	151	0	0	151	41	0	0	41	0	0	0	0
Mains	13	3,963,507	0	0	0	0	194,529	0	0	194,529	103,393	0	0	103,393	0	0	0	0
Directly Assigned	Direct	68,037	0	0	0	0	0	0	0	0	0	0	0	0	22,701	0	0	22,701

**MONTANA-DAKOTA UTILITIES CO.**  
**GAS UTILITY - NORTH DAKOTA**  
**Embedded Class Cost of Service Study**  
**Twelve Months Ended December 31, 2022**  
**Projected 2024**

PU-23-341  
Exhibit KRP-2

	Allocation Factor	Total North Dakota	Air Force Delivery			Total Air Force Delivery	Small Interruptible			Total Small Interruptible	Large Interruptible			Total Large Interruptible	Minot Air Force Base Distribution			Total Minot Air Force
			Demand	Energy	Customer		Demand	Energy	Customer		Demand	Energy	Customer		Demand	Energy	Customer	
Heskett Pipeline	2	577,994	0	0	0	0	29,065	0	0	29,065	7,940	0	0	7,940	0	0	0	0
Meas. & Reg. Equip. - General	18	92,431	1,405	0	0	1,405	5,364	0	0	5,364	8,031	0	0	8,031	0	0	0	0
Directly Assigned	Direct	8,381	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meas. & Reg. Equip. - City Gate	19	192,395	18,855	0	0	18,855	8,517	0	0	8,517	4,527	0	0	4,527	0	0	0	0
Heskett Pipeline - Demand Related	2	18,518	0	0	0	0	931	0	0	931	254	0	0	254	0	0	0	0
Services	37	2,258,268	0	0	0	0	0	0	10,786	10,786	0	0	512	512	0	0	0	0
Directly Assigned	Direct	32,283	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32,283	32,283
Meters	5	2,197,844	0	0	1,327	1,327	0	0	41,907	41,907	0	0	6,102	6,102	0	0	0	0
Directly Assigned	Direct	1,875	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,875	1,875
Service Regulators	20	98,252	0	0	59	59	0	0	1,870	1,870	0	0	233	233	0	0	250	250
Directly Assigned	Direct	217	0	0	0	0	0	0	0	0	0	0	0	0	0	0	217	217
Ind. Meas. & Reg. Station Equipment	21	36,129	5,637	0	0	5,637	6,725	0	0	6,725	4,560	0	0	4,560	0	0	0	0
Heskett Pipeline - Demand Related	2	36,473	0	0	0	0	1,834	0	0	1,834	501	0	0	501	0	0	0	0
Other Equipment	40	43,716	171	0	4	175	1,312	0	178	1,490	701	0	21	722	130	0	83	213
Total Distribution Plant		9,642,948	26,286	0	1,390	27,676	249,040	0	54,741	303,781	130,858	0	6,868	137,726	22,831	0	34,708	57,539
General Plant	38	468,189	11	0	44	55	14,050	0	1,945	15,995	4,125	0	224	4,349	8	0	5	13
Directly Assigned	Direct	4,335	0	0	0	0	0	0	0	0	0	0	0	0	4,334	0	0	4,334
Amort. of Intangible Plant - General	15	488,320	2,056	0	48	2,104	13,884	0	2,142	16,026	7,939	0	247	8,186	1,562	0	1,003	2,565
Directly Assigned	Direct	78,261	0	0	0	0	3,427	0	1,468	4,895	34,646	0	14,848	49,494	0	0	0	0
Common Plant	15	894,295	3,766	0	88	3,854	25,427	0	3,924	29,351	14,539	0	453	14,992	2,861	0	1,836	4,697
Intangible Plant - Common (Excluding CC&B)	15	715,457	3,013	0	71	3,084	20,342	0	3,139	23,481	11,632	0	362	11,994	2,289	0	1,469	3,758
Intangible Plant - Common (CC&B)	4	717,058	0	0	18	18	0	0	816	816	0	0	43	43	0	0	0	0
Amortization of Gain/Preferred Stock	15	26,421	111	0	3	114	751	0	116	867	430	0	13	443	85	0	54	139
Acquisition Adjustment	15	2,821	1	0	1	80	0	0	12	92	46	0	1	47	9	0	6	15
Total Depreciation Expense		13,076,262	35,244	0	1,662	36,906	328,920	0	68,303	397,223	204,739	0	23,059	227,798	33,979	0	39,081	73,060
Min-Sys Total Depreciation Expense		13,076,262	24,672	0	1,238	36,910	242,058	0	73,581	315,639	156,656	0	48,422	205,078	23,786	0	49,276	73,062
Taxes Other Than Income																		
Ad Valorem Taxes-Transmission	2	12,527	0	0	0	0	630	0	0	630	172	0	0	172	0	0	0	0
Ad Valorem Taxes-Heskett Pipeline	2	132,178	0	0	0	0	6,647	0	0	6,647	1,816	0	0	1,816	0	0	0	0
Ad Valorem Taxes-Other	15	1,885,607	7,941	0	186	8,127	53,613	0	8,273	61,886	30,655	0	955	31,610	6,032	0	3,872	9,904
Other Taxes - Payroll, Franchise	31	1,041,112	15,260	346	196	15,802	29,798	689	6,711	37,198	20,958	1,080	890	22,928	3,793	0	0	3,793
Other Taxes - Minot AFB Distribution- Direct	Direct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Taxes - Revenue	26	1,765	2	16	2	20	3	20	18	41	0	0	11	11	0	0	0	0
Total Taxes Other Than Income Taxes		3,073,189	23,203	362	384	23,949	90,691	709	15,002	106,402	53,601	1,080	1,856	56,537	9,825	0	3,872	13,697
Total Operating Expense		152,036,413	696,124	1,463,481	7,539	2,167,144	1,515,898	1,745,300	271,000	3,532,198	844,510	31,289	49,814	925,613	149,893	0	42,953	192,846
Min-Sys Total Operating Expense		152,036,413	550,544	1,463,481	153,118	2,167,143	1,153,992	1,745,300	369,137	3,268,429	605,098	31,289	215,775	852,162	137,891	0	54,957	192,848
Interest Expense/AFUDC Equity Add Back/Perm Add	36	4,533,874	20,690	0	437	21,127	150,210	0	16,465	166,675	107,077	0	(2,171)	104,906	0	0	0	0
Direct - Minot AFB Distribution System	Direct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taxable Income		3,277,390	(497,340)	(9,908)	138,492	(368,756)	(1,270,760)	5,285	1,339,676	74,201	(900,150)	(30,919)	953,680	22,611	(149,893)	0	413,047	263,154
Min-Sys Taxable Income		3,277,390	(348,138)	(9,908)	(10,708)	(368,754)	(878,932)	5,285	1,239,538	365,891	(634,965)	(30,919)	769,720	103,836	(137,891)	0	401,043	263,152
Income Taxes	24.4049%	799,848	(121,375)	(2,418)	33,799	(89,995)	(310,128)	1,290	326,947	18,109	(219,681)	(7,546)	232,745	5,518	(36,581)	0	100,804	64,223
Full Normalization/ARAM	24	(602,506)	(2,733)	0	(58)	(2,791)	(19,841)	0	(2,175)	(22,016)	(14,143)	0	287	(13,856)	(2,356)	0	(1,286)	(3,642)
Total Income Taxes		197,342	(124,108)	(2,418)	33,741	(92,786)	(329,969)	1,290	324,772	(3,907)	(233,824)	(7,546)	233,032	(8,338)	(36,937)	0	99,518	60,581
Total Operating Expense		152,233,755	572,016	1,461,063	41,280	2,074,358	1,185,929	1,746,590	595,772	3,528,291	610,686	23,743	282,846	917,275	110,956	0	142,471	253,427
Min-Sys Total Operating Expense		152,233,753	463,668	1,461,063	149,627	2,074,358	924,863	1,746,590	668,982	3,340,435	440,406	23,743	400,812	864,961	102,590	0	150,838	253,428
Operating Income:		7,613,922	(352,542)	(7,490)	105,188	(254,843)	(790,581)	3,995	1,031,369	244,783	(569,249)	(23,373)	718,477	135,855	(110,956)	0	313,529	202,573
Min-Sys Operating Income:		7,613,924	(246,779)	(7,490)	(573)	(254,842)	(539,065)	3,995	959,852	424,782	(396,616)	(23,373)	605,969	185,980	(102,590)	0	305,162	202,572
Rate of Return		3.51%				-24.69%				3.16%			2.98%					15.05%
Relative Rate of Return		1.000				(7.036)				0.900			0.848					4.289
Min-Sys Rate of Return		3.51%				-24.69%				7.07%			4.56%					15.05%
Min-Sys Relative Rate of Return		1.000				(7.036)				2.014			1.298					4.289

Montana-Dakota Utilities Co.  
Gas Utility - North Dakota  
Revenues Under Current and Proposed Rates  
Projected 2024

Customer Class/Rate	Projected 2024 @ Current Rates 1/		Proposed			Rate Base	Current Rates Operating Income	Proposed Rates Operating Income	Proposed Rate of Return	Proposed Relative Rate of Return	Current Rate of Return	Current Relative Rate of Return	Uniform Percent to Cost Parity 50.00%	Percent To Parity Return	Total Return	Unadjusted Revenue Increase	Adjusted Revenue Increase	Adjusted Total Return	Adjusted Rate of Return	Adjusted Relative Rate of Return	
	Customers	Dk	Revenue	Total Revenue	Revenue Increase																Percent Increase
Residential - Rate 60	98,475	8,689,660	\$75,121,886	\$82,501,660	\$7,379,774	9.82%	119,170,702	4,767,409	12,267,483	10.29%	1.145	4.00%	1.140	1.070	9.62%	11,464,385	6,696,976	6,487,492	11,254,901	9.44%	1.050
Residential Wahpeton - Rate 63	1,944	155,559	1,134,233	1,254,533	120,300	10.61%															
<b>Total Residential</b>	100,419	8,845,219	76,256,119	83,756,193	7,500,074	9.84%															
Firm General - Rate 70	16,699	11,381,497	72,214,794	75,717,428	3,502,634	4.85%															
Firm General - Wahpeton - Rate 73	422	240,630	1,352,739	1,392,695	39,956	2.95%															
<b>Total Firm General</b>	17,121	11,622,127	73,567,533	77,110,123	3,542,590	4.82%															
<b>Small Firm General</b>				17,108,936	972,885		23,264,101	1,249,963	2,222,848	9.55%	1.063	5.37%	1.531	1.266	11.38%	2,647,052	1,397,089	1,353,387	2,603,350	11.19%	1.245
<b>Large Firm General</b>				60,001,187	2,569,705		59,845,100	1,268,191	3,837,896	6.41%	0.713	2.12%	0.604	0.802	7.21%	4,314,866	3,046,675	2,951,374	4,219,565	7.05%	0.784
Air Force - Rate 64																					
Firm	1	37,082	212,652	256,148	43,496	20.45%															
Interruptible	2	397,961	1,597,987	1,924,786	326,799	20.45%															
<b>Total Air Force</b>	3	435,043	1,810,639	2,180,934	370,295	20.45%	1,032,152	(254,843)	115,452	11.19%	1.244	-24.69%	(7.036)	(3.018)	-27.13%	(280,061)	(25,218)	347,600	92,757	8.99%	1.000
Small Interruptible																					
Sales - Rate 71	71	518,363	2,596,388																		
Sales - Wahpeton - Rate 76	3	24,135	112,191																		
Transport - Rate 81	60	1,064,957	926,766																		
<b>Total Small Interruptible</b>	134	1,607,455	3,635,345	3,792,073	156,728	4.31%	7,746,889	244,783	401,511	5.18%	0.576	3.16%	0.900	0.950	8.54%	661,828	417,045	403,999	648,782	8.37%	0.931
Large Interruptible																					
Sales - Rate 85	0	0	0																		
Sales - Wahpeton - Rate 86	0	0	0																		
Transport - Rate 82	7	4,468,293	1,001,374																		
<b>Total Large Interruptible</b>	7	4,468,293	1,001,374	1,071,697	70,323	7.02%	4,564,558	135,855	206,178	4.52%	0.502	2.98%	0.848	0.924	8.31%	379,229	243,374	235,761	371,616	8.14%	0.906
<b>MAFB Distribution Rate 65</b>			198,127	451,493	253,366	127.88%	1,345,973	202,573	455,939	33.87%	3.768	15.05%	4.289	2.644	23.78%	320,008	117,435	113,762	316,335	23.50%	2.614
<b>Total North Dakota</b>	117,684	26,978,137	\$156,469,137	\$168,362,513	\$11,893,376	7.60%	\$216,969,475	\$7,613,931	\$19,507,307	8.99%	1.000	3.51%	1.000	1.000	8.99%	19,507,307	11,893,376	11,893,376	19,507,307	8.99%	1.000

1/ Statement L, Page 2.

Montana-Dakota Utilities Co.  
Gas Utility - North Dakota  
Revenues Under Current and Proposed Rates  
Projected 2024

Customer Class/Rate	Projected 2024 @ Current Rates 1/ Customers Dk Revenue			Proposed Total Revenue Revenue Increase Percent Increase			Rate Base	Current Rates Operating Income	Proposed Rates Operating Income	Proposer Proposed Rate of Return	Relative Rate of Return	Current Rate of Return	Relative Rate of Return	Uniform Percent to Cost Parity 50.00%	Percent To Parity Rate of Return	Total Return	Unadjusted Revenue Increase	Adjusted Revenue Increase	Adjusted Total Return	Adjusted Rate of Return	Relative Rate of Return	Adjusted Revenue Increase	Percent AS Rec Revenue Increase
	Projected 2024 @ Current Rates 1/ Customers Dk Revenue	Total Revenue	Revenue Increase	Percent Increase																			
Residential - Rate 60	98,475	8,689,660	\$75,121,886	\$82,501,660	\$7,379,774	9.82%	119,170,702	4,767,409	12,267,483	10.29%	1.145	4.00%	1.140	1.070	9.62%	11,464,385	6,696,976	6,487,492	11,254,901	9.44%	1.050	54.55%	1,754,724
Residential Wahpeton - Rate 63	1,944	155,559	1,134,233	1,254,533	120,300	10.61%																	
<b>Total Residential</b>	100,419	8,845,219	76,256,119	83,756,193	7,500,074	9.84%																	
Firm General - Rate 70	16,699	11,381,497	72,214,794	75,717,428	3,502,634	4.85%																	
Firm General - Wahpeton - Rate 73	422	240,630	1,352,739	1,392,695	39,956	2.95%																	
<b>Total Firm General</b>	17,121	11,622,127	73,567,533	77,110,123	3,542,590	4.82%																	
<b>Small Firm General</b>				17,108,936	972,885		23,264,101	1,249,963	2,222,848	9.55%	1.063	5.37%	1.531	1.266	11.38%	2,647,052	1,397,089	1,353,387	2,603,350	11.19%	1.245	11.38%	366,061
<b>Large Firm General</b>				60,001,187	2,569,705		59,845,100	1,268,191	3,837,896	6.41%	0.713	2.12%	0.604	0.802	7.21%	4,314,866	3,046,675	2,951,374	4,219,565	7.05%	0.784	24.82%	798,282
Air Force - Rate 64																							
Firm	1	37,082	212,652	256,148	43,496	20.45%																	
Interruptible	2	397,961	1,597,987	1,924,786	326,799	20.45%																	
<b>Total Air Force</b>	3	435,043	1,810,639	2,180,934	370,295	20.45%	1,032,152	(254,843)	115,452	11.19%	1.244	-24.69%	(7.036)	(3.018)	-27.13%	(280,061)	(25,218)	347,600	92,757	8.99%	1.000	2.92%	94,018
Small Interruptible																							
Sales - Rate 71	71	518,363	2,596,388																				
Sales - Wahpeton - Rate 76	3	24,135	112,191																				
Transport - Rate 81	60	1,064,957	926,766																				
<b>Total Small Interruptible</b>	134	1,607,455	3,635,345	3,792,073	156,728	4.31%	7,746,889	244,783	401,511	5.18%	0.576	3.16%	0.900	0.950	8.54%	661,828	417,045	403,999	648,782	8.37%	0.931	3.40%	109,273
Large Interruptible																							
Sales - Rate 85	0	0	0																				
Sales - Wahpeton - Rate 86	0	0	0																				
Transport - Rate 82	7	4,468,293	1,001,374																				
<b>Total Large Interruptible</b>	7	4,468,293	1,001,374	1,071,697	70,323	7.02%	4,564,558	135,855	206,178	4.52%	0.502	2.98%	0.848	0.924	8.31%	379,229	243,374	235,761	371,616	8.14%	0.906	1.98%	63,768
<b>MAFB DistributionRate 65</b>			198,127	451,493	253,366	127.88%	1,345,973	202,573	455,939	33.87%	3.768	15.05%	4.289	2.644	23.78%	320,008	117,435	113,762	316,335	23.50%	2.614	0.96%	30,770
<b>Total North Dakota</b>	117,684	26,978,137	\$156,469,137	\$168,362,513	\$11,893,376	7.60%	\$216,969,475	\$7,613,931	\$19,507,307	8.99%	1.000	3.51%	1.000	1.000	8.99%	19,507,307	11,893,376	11,893,376	19,507,307	8.99%	1.000	100.00%	3,216,896
1/ Statement L, Page 2.																							

Montana-Dakota Utilities Co.  
Gas Utility - North Dakota  
Rate Reconciliation  
Residential Gas Service - Rates 60 & 90  
Projected 2024

Residential Rates	Billing Units	Current		Proposed		Recommended Revenue and Rates			
		Rate	Amount	Rate	Amount	BSC/DDC Splits	Revenue Rate		
Basic Service Charge (60) Small	96,398 Customers	\$0.8244	\$29,006,737	\$0.921	\$32,405,634	97.59%	1,536,359	0.868	26.4036
Basic Service Charge (60) Large	1,807 Customers	0.8244	543,737	\$1.075	709,022	2.14%	33,615	0.875	26.6257
Basic Service Charge (90) Small	270 Customers	\$0.8244	81,245	\$0.921	90,765	0.27%	4,303	0.868	26.4038
	98,475		29,631,719		33,205,421	89.72%			
Distribution Delivery Charge-Sm	8,355,773 dk	\$0.000	0	\$0.438	3,659,829	96.16%	173,513	0.021	
Distribution Delivery Charge-Lg	333,887 dk	\$0.000	0	\$0.438	146,243	3.84%	6,933	0.021	
	8,689,660		0		3,806,072	10.28%			
Cost of Gas (60)	8,672,377 dk	\$5.229	45,347,859	\$5.229	45,347,859				
Cost of Gas (90)	17,283 dk	\$8.234	142,308	\$8.234	142,308				
	8,689,660		\$45,490,167		\$45,490,167		1,754,724		
Total Revenue Rates 60 & 90			\$75,121,886		\$82,501,660				7,379,774

Total Distribution Revenues Per Design  
Target Distribution Revenues  
Difference

\$37,011,493  
37,008,474  
\$3,019

Derivation of Rates

Current Non-Gas Revenues	\$29,631,719
Proposed Revenue Increase	7,376,755
Total Revenue Requirement	\$37,008,474
Less: Proposed Basic Service Charge Revenues	33,205,421
Remaining Revenues To Be Collected	\$3,803,053
Total Rates 60 and 90 Consumption	8,689,660
Distribution Delivery Charge	\$0.438



Montana-Dakota Utilities Co.  
Gas Utility - North Dakota  
Rate Reconciliation  
Air Force Firm Service - Rate 64  
Projected 2024

Air Force Rate 64 - Firm	Billing Units	Current		Proposed		Recommended Revenue and Rates			
		Rate	Amount	Rate	Amount	BSC/DDC Splits	Revenue	Rate	
Basic Service Charge	1 Customer	\$175.00	\$2,100	\$1,000.00	\$12,000	2.32%	\$12,000	256	196
Distribution Delivery Charge	37,082 dk	\$0.449	16,650	\$1.355	50,246	9.73%	50,246	1,074	0.478
Cost of Gas	37,082 dk	\$5.229	193,902	\$5.229	193,902				11,042
Total Revenue Rate 64			<u>\$212,652</u>		<u>\$256,148</u>				
Total Distribution Revenues Per Design			\$62,246		\$62,246	12.05%	\$62,246		11,328
Target Distribution Revenues			62,232		454,379	87.95%	454,379		82,690
Difference			<u>\$14</u>		<u>\$516,625</u>	100.00%	\$516,625		94,018

**Derivation of Rates**

Air Force Firm Revenue Requirement	\$18,750	
Proposed Revenue Increase	43,482	11.74%
Total Revenue Requirement	62,232	
Less: Proposed Basic Service Charge Revenues	12,000	
Remaining Revenues To Be Collected	<u>\$50,232</u>	
Total Rate 64 Firm Consumption	37,082	
Non-Gas Commodity Charge	\$1.355	

Montana-Dakota Utilities Co.  
Gas Utility - North Dakota  
Rate Reconciliation  
Air Force Interruptible Service - Rate 64  
Projected 2024

Air Force Rate 64 - Interruptible	Billing Units	Current		Proposed		Recommended Revenue and Rates BSC/DDC Splits	Revenue	Rate
		Rate	Amount	Rate	Amount			
Basic Service Charge								
Minot Air Force Base	1 Customer	\$2,000.00	\$24,000	\$4,000.00	\$48,000	80.00%	7,709	2,642
PAR Site	1 Customer	\$175.00	2,100	\$1,000.00	12,000	20.00%	1,927	336
	<u>2</u>		<u>26,100</u>		<u>60,000</u>	11.61%	<u>9,637</u>	
Distribution Delivery Charge	397,961 dk	\$0.255	101,480	\$0.991	394,379	76.34%	63,342	0.414
Cost of Gas								
Minot Air Force Base	378,032 dk	\$3.694	1,396,450	\$3.694	1,396,450			
PAR Site	19,929 dk	\$3.711	73,957	\$3.711	73,957			
	<u>397,961</u>		<u>1,470,407</u>					
Total Revenue			<u>\$1,597,987</u>		<u>\$1,924,786</u>			
Total Distribution Revenues Per Design			\$454,379		\$454,379	87.95%	\$454,379	82,690
Target Distribution Revenue			454,331		62,246	12.05%	62,246	11,328
Difference			<u>\$48</u>		<u>\$516,625</u>	100.00%	\$516,625	94,018
<b>Derivation of Rates</b>								
Air Force Interruptible Revenue Requirement			\$127,580					
Proposed Revenue Increase			326,751					
Total Revenue Requirement			<u>454,331</u>					
Less: Base Service Charge Revenues			60,000					
Remaining Revenues To Be Collected			<u>\$394,331</u>					
Total Rate 64 IT Consumption			397,961					
Non-Gas Commodity Charge			\$0.991					





Montana-Dakota Utilities Co.  
Gas Utility - North Dakota  
Rate Reconciliation  
Firm Gas Service - GPNG Rate 65  
Projected 2024

Wahpeton Firm Rates	Prior to Wahpeton Expansion		Projected 2024 @ Current Rates After Expansion		Proposed - Phase 1		Recommended Revenue and Rates BSC/DDC Split: Revenue Rate
	Billing Units	GPNG Rate 65 Rate	Amount	Billing Units	GPNG Rate 65 Rate	MDU Rate 62 Rate	
Basic Service Charge							
Residential Firm General	1,944 Customers	\$0.25	\$177,390	1,944 Customers	\$0.25	\$0.50	\$354,780
Small < 500 CFH	266 Customers	\$0.25	24,272	266 Customers	\$0.25	\$0.50	48,544
Large > 500 CFH	154 Customers	\$0.25	14,053	154 Customers	\$0.25	\$0.50	28,105
Large > 500 CFH (Wahp Rate 71)	2,364		215,715	2 Customers	\$180.00	\$2.35	1,716
Distribution Delivery Charge							431,429
Residential Firm General	155,559 dk	\$0.922	143,425	155,559 dk	\$0.922	\$0.555	86,335
Small < 500 CFH	36,151 dk	\$0.922	33,331	36,151 dk	\$0.922	\$0.555	20,064
Large > 500 CFH	108,476 dk	\$0.922	100,015	108,476 dk	\$0.922	\$0.555	60,204
Large > 500 CFH (Wahp Rate 71)	144,627		133,346	96,003 dk	\$0.669	\$1.266	121,540
				240,630			201,808
Cost of Gas (Residential)	155,559 dk	\$5.229	813,418	155,559 dk	\$5.229	\$5.229	813,418
Cost of Gas (Firm General Small)	36,151 dk	\$5.229	189,034	36,151 dk	\$5.229	\$5.229	189,034
Cost of Gas (Firm General Large)	108,476 dk	\$5.229	567,221	108,476 dk	\$5.229	\$5.229	567,221
Cost of Gas (Firm Gen Lg-Wahp Rate 71)	300,186		1,569,673	96,003 dk	\$3.711	\$3.711	356,267
				396,189			1,925,940
Residential Firm General Small			\$1,134,233				\$1,254,533
Residential Firm General Large			246,637				257,642
Total Revenue GPNG Firm			661,289				1,135,053
			\$2,062,159				\$2,647,228

Phase 1

	Residential	Firm-Small	Firm - Large	Total
Total Distribution Revenues Per Design	\$441,115	\$68,608	\$211,565	\$721,288
Target Distribution Revenues	432,194	72,519	218,415	723,128
Difference	\$8,921	(\$3,911)	(\$6,850)	(\$1,840)

Derivation of Rates

	Residential	Firm-Small	Firm - Large	Total
Current Non-Gas Revenues	\$320,815	\$57,603	\$182,614	\$561,032
Proposed Revenue Increase	111,379	14,916	35,801	162,096
Total Revenue Requirement	\$432,194	\$72,519	\$218,415	\$723,128
Less Basic Service Charge Revenue	354,780	48,544	29,821	433,145
Less Wahp Rate 71 Non-gas Revenues	0	0	123,256	123,256
Remaining Revenues To Be Collected	77,414	23,975	65,338	166,727
Total Wahpeton Firm Consumption	155,559	36,151	108,476	300,186
Distribution Delivery Charge	\$0.498	\$0.663	\$0.602	\$0.555

Firm General Customers	Per Books 2022	Projected 2024
Small	278	63.221%
Large	138	36.779%
	416	100.000%

Firm General Dk	Per Books 2022	Projected 2024
Small	81,479	24.996%
Large	82,152	75.004%
	163,631	100.000%

