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Public Counsel
GR-2021-0108

DIRECT TESTIMONY

OF

LENA M. MANTLE

Submitted on Behalf of the Office of the Public Counsel

SPIRE MISSOURI, INC.

CASE NO. GR-2021-0108

May 12, 2021

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DIRECT TESTIMONY

OF

LENA M. MANTLE

SPIRE MISSOURI, INC.

d/b/a SPIRE MISSOURI EAST & SPIRE MISSOURI WEST

CASE NO. GR-2021-0108

1 **Q. Would you state your name and business address?**

2 A. My name is Lena M. Mantle and my business address is P.O. Box 2230, Jefferson
3 City, Missouri 65102. I am a Senior Analyst for the Office of the Public Counsel
4 (“OPC”).

5 **Q. Would you describe your experience and your qualifications?**

6 A. I started working for the OPC in my current position, as a Senior Analyst in August
7 2014. In this position, I advise the Public Counsel and provide expert testimony on
8 a variety of topics including the implementation of interim rate mechanisms. Prior
9 to working for the OPC, I worked for the Missouri Public Service Commission
10 Staff (“Staff”) from August 1983 until I retired in December 2012. During my
11 employment on the Commission Staff, I worked as an Economist, Engineer,
12 Engineering Supervisor, and Manager of the Energy Department.

13 Attached as Schedule LMM-D-2 is a brief summary of my experience with
14 OPC and Staff along with a list of the Commission cases in which I filed testimony,
15 Commission rulemakings in which I participated, and Commission reports to which
16 I contributed. I am a Registered Professional Engineer in the State of Missouri.

17 **Q. What is the purpose of your direct testimony?**

18 A. Section 386.266.3 RSMo. allows Spire, Inc. (“Spire”) as a gas corporation to make
19 an application to the Commission to request an adjustment to rates, outside of a
20 general rate proceeding, to account for the impact on utility revenues due to
21 variation in weather, conservation, or both. The purpose of this testimony is to

1 explain OPC’s position that the Commission reject Spire’s proposed weather
2 normalization adjustment rider.

3 **Q. What recommendations do you make in this testimony?**

4 A. I recommend the Commission not approve any interim rate mechanism to account
5 for the impact of weather and conservation.

6 If Spire provides information that the Commission believes justifies the
7 imposition of an interim rate mechanism on its smallest customers, then I
8 recommend the Commission: (1) change the interest charged in the current weather
9 normalization adjustment rider (“WNAR”) to be consistent with § 386.266; (2)
10 update certain components of the WNAR; and (3) modify the current WNAR as
11 described in this testimony.

12 **An Interim Rate Mechanism for Weather and Conservation Should Be Rejected**

13 **Q. Did Spire provide testimony that describes why the Commission should grant**
14 **Spire an interim rate mechanism that accounts for the impact of weather and**
15 **conservation?**

16 A. No. One witness, Mr. Wes Selinger, provided testimony proposing the
17 Commission replace its current Weather Normalization Adjustment Rider
18 (“WNAR”) with a Rate Normalization Adjustment (“RNA”). No witness describes
19 why it is necessary for the Commission to grant Spire either the WNAR or the RNA
20 proposed by Mr. Selinger. It seems that it is Spire’s position that once the
21 Commission grants Spire an interim rate adjustment mechanism under this statute,
22 Spire need not ever again explain to the Commission why it should approve a rate
23 adjustment mechanism to account for fluctuations in revenues due to weather or
24 conservation.

1 **Q. Why should Spire have to justify its need for a rate mechanism for weather if**
2 **an interim mechanism is allowed by statute?**

3 A. While an interim rate mechanism that accounts for the impact of weather,
4 conservation, or both is allowed by statute, it is a privilege, not a right guaranteed
5 by statute. While I am not an attorney, I have spent considerable time reviewing
6 § 386.266. This state statute gives the Commission the “power to *approve, modify,*
7 *or reject*” (emphasis added) such a mechanism.¹ This means the Commission has
8 discretion regarding the mechanism requested by Spire.

9 **Q. What should Spire show to justify an interim mechanism to account for**
10 **weather and conservation?**

11 A. In a rate case, billing determinants and revenue requirement are used to establish
12 non-gas volumetric rates. The billing determinants used to calculate these non-gas
13 volumetric rates are normalized for weather in the rate case resulting in rates that
14 will provide the revenues set by the Commission if normal weather occurs.

15 The one thing that is certain about Missouri is that the weather is never
16 normal. It is warmer than normal and cooler than normal but never normal. When
17 the weather is warmer than normal, then natural gas usage is lower meaning that,
18 everything else being constant, Spire will not collect as much revenue from the non-
19 gas volumetric rate. If the weather is cooler than normal, everything else being
20 constant, then Spire will collect more revenue than what was used to set the non-
21 gas volumetric rates.

22 Likewise, if its customers conserve their natural gas usage, Spire does not
23 receive the revenue requirement from its non-gas volumetric rates as set by the
24 Commission.

25 Absent an interim rate mechanism for weather and conservation, Spire
26 absorbs all the risk associated with weather and conservation. If actual usage is

¹ Section 386.266.5 RSMo.

1 below the billing determinants set in the rate case, there is no way for Spire to
2 recover the revenues that it did not receive. Likewise, when actual usage is above
3 the billing determinants, the revenues Spire receives exceed the normalized
4 revenues set in the rate case resulting in increased earnings for Spire.

5 When the weather is warmer than the normal used to set rates, customers
6 enjoy lower bills because their usage was lower and Spire's earnings suffer. On
7 the other hand, if usage is higher, customers suffer higher bills because the weather
8 resulted in higher usage and Spire retains the extra revenue from these non-gas
9 volumetric rates as earnings.

10 An interim rate mechanism that accounts for volatility due to weather and
11 conservation moves the risk of fluctuations of weather from Spire to its customers.
12 Such a mechanism assures Spire that it will get to collect extra revenues if the
13 weather is warmer than normal or customers work to conserve usage. If weather is
14 cooler than normal, customers will be returned the excess they paid.

15 To justify the Commission's approval of such a mechanism, Spire should
16 justify to the Commission why the customers should take on this risk and what the
17 customers receive in return for taking on this risk.

18 **Q. Are you aware of any information that you would like to point out to the**
19 **Commission that shows Spire does not need the mechanism?**

20 A. Yes. It seems Spire's need for the revenues collected through this mechanism are
21 not great enough for Spire to make sure that it is actually collecting the revenues
22 the Commission has said that it could.

23 **Q. Would you explain your basis for this statement?**

24 A. As Spire prepared a summary file for its most recent request to change its WNAR
25 rates,² it discovered in February 2021 that it had failed to change in its billing

² Case GR-2021-0280, In the Matter of the Spire Missouri Inc.'s d/b/a Spire Missouri East and Spire Missouri West filing of its Proposed Weather Normalization Adjustment Rider Tariff Sheets.

1 system the WNAR rate approved by the Commission effective October 1, 2020.
2 Spire, of its own accord, had been giving customers a credit through the WNAR
3 when it should have been collecting additional revenue. It seems that the revenue
4 that Spire had requested and the Commission approved for collection was not great
5 enough for Spire to make sure that the revenues were actually being collected.

6 **Q. Do you recommend the Commission approve any interim rate mechanism to**
7 **adjust rates to account for fluctuations in revenues due to weather and**
8 **conservation?**

9 A. No. I recommend the Commission reject Spire's request for such a mechanism.
10 Spire has not shown a need for the rate mechanism and seems to take for granted
11 this shifting of risk to its customers. This is demonstrated by Spire's lack of
12 testimony providing justification for the Commission to grant it an interim
13 mechanism in this case and not making sure a rate change approved by the
14 Commission was implemented.

15 For these reasons, I recommend the Commission reject any mechanism for
16 interim rates to account for fluctuations in weather and/or conservation for Spire.

17 **Appropriate Mechanism if Adequate Justification for Interim Rate Mechanism is**
18 **Provided**

19 **Q. If Spire provides testimony regarding its need for an interim rate mechanism**
20 **to account for the impact of weather and conservation, and the Commission**
21 **determines Spire has justified its need for such a mechanism, what type of**
22 **interim mechanism should the Commission approve?**

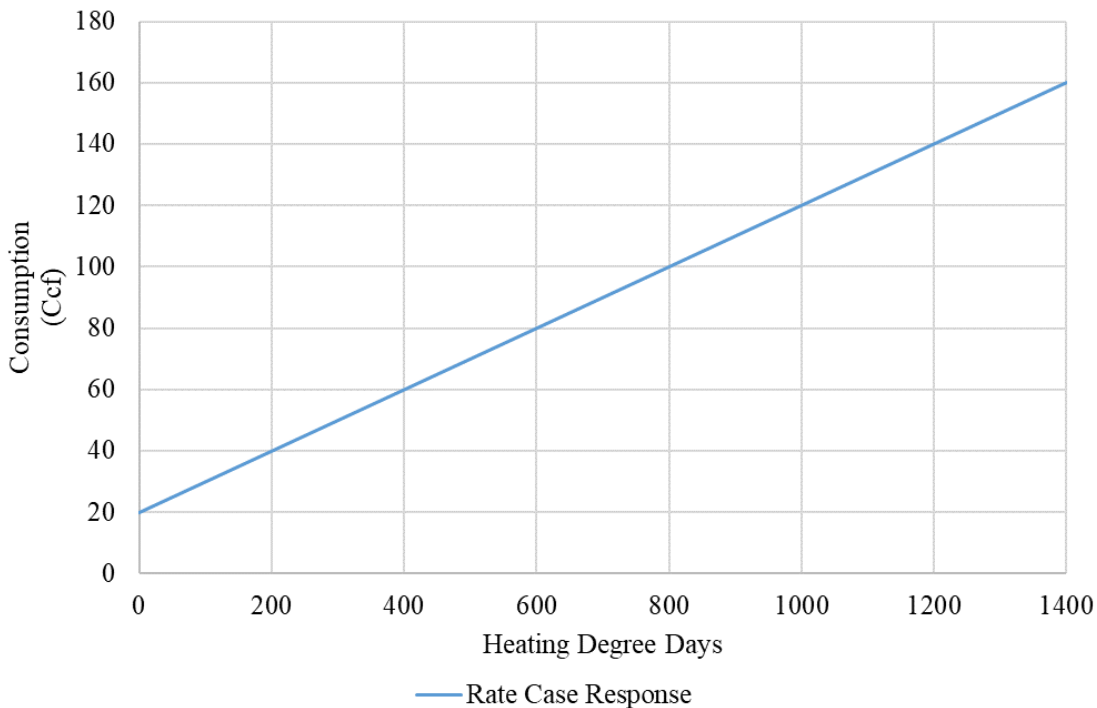
23 A. The current WNAR is an excellent interim rate mechanism to capture fluctuations
24 due to weather and conservation. Therefore, I recommend the Commission approve
25 the WNAR with the updates and modifications identified in this testimony, which
26 includes changing the interest rate to be consistent with § 386.266.

1 **Q. Before getting to your suggested changes, would you explain how this**
2 **mechanism accounts for weather and conservation?**

3 A. I will start with how the mechanism accounts for weather. In a rate case, the
4 relationship between weather and usage is measured to determine what the usage,
5 and subsequently revenues, would have been given normal weather. For gas usage,
6 weather is measured in heating degree days (“HDD”) with HDD being the
7 difference between 65 degrees Fahrenheit (“° F”) and the actual mean daily
8 temperature.³ The colder it is, the greater the HDD.

9 The Figure 1 below shows a hypothetical relationship between usage and
10 HDD.

11 Figure 1



12 This graph shows that, for this customer class, as measured in the rate case, an
13 increase of 200 HDD results in consumption increasing by 20 Ccf or for a change
14

³ Mean daily temperature is the sum of the daily high and the daily low temperatures divided by two.

1 of one (1) HDD, usage changes by 0.10 Ccf. Using this line, the usage for any
2 HDD point can be estimated.

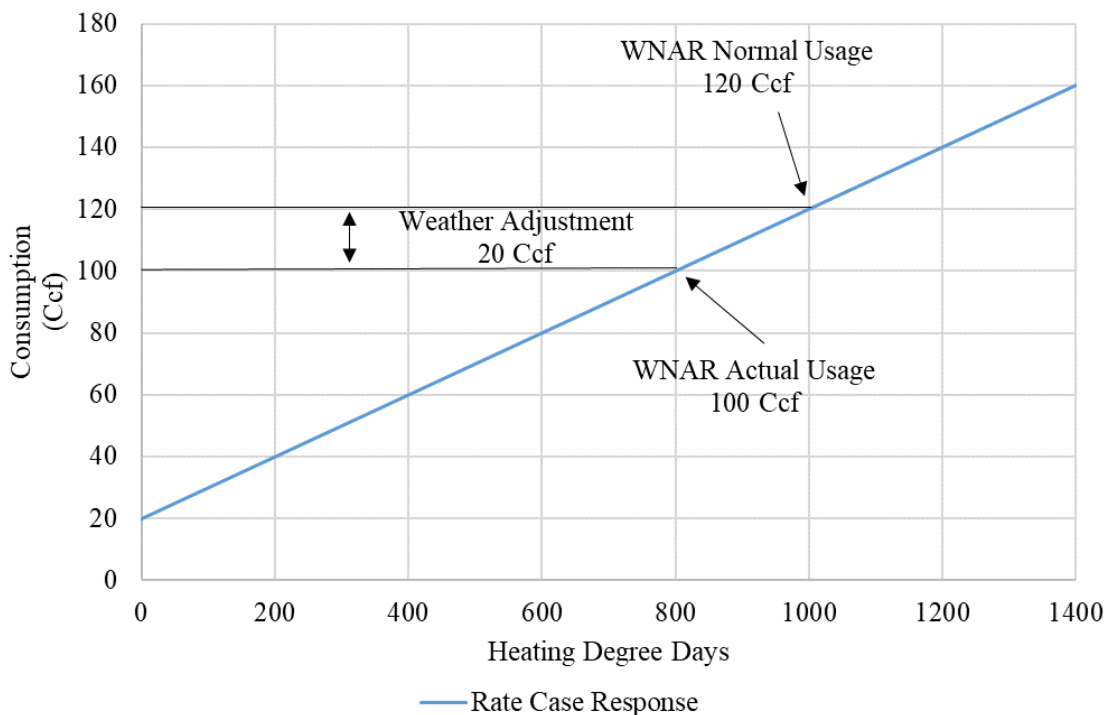
3 **Q. How is the relationship of usage to weather estimated?**

4 A. While the relationship in Figure 1 was created for simplicity, for a utility the
5 relationship is estimated by developing a regression model using the most recent
6 usage data for a customer class and the actual HDD associated with each usage data
7 point.

8 **Q. How is the relationship between HDD and usage used to calculate a weather
9 normalization adjustment?**

10 A. Let's go back to our hypothetical relationship. Assume normal weather was 1,000
11 HDD and the actual weather was warmer than normal with HDD of 800. Figure 2
12 shows the usage at 800 HDD is 100 Ccf and at 1,000 HDD is 120 Ccf.

13 Figure 2



14

1 The weather adjustment is the normal Ccf minus the actual Ccf as predicted by the
2 line. Therefore, the weather adjustment to usage in this example is 20 Ccf (120 Ccf
3 minus 100 Ccf).

4 **Q. What if it was colder than normal?**

5 A. If normal HDD was 800 and the actual was 1,000 HDD, the weather adjustment
6 would be -20 Ccf (100 Ccf minus 120 Ccf).

7 **Q. How is this related to the WNAR?**

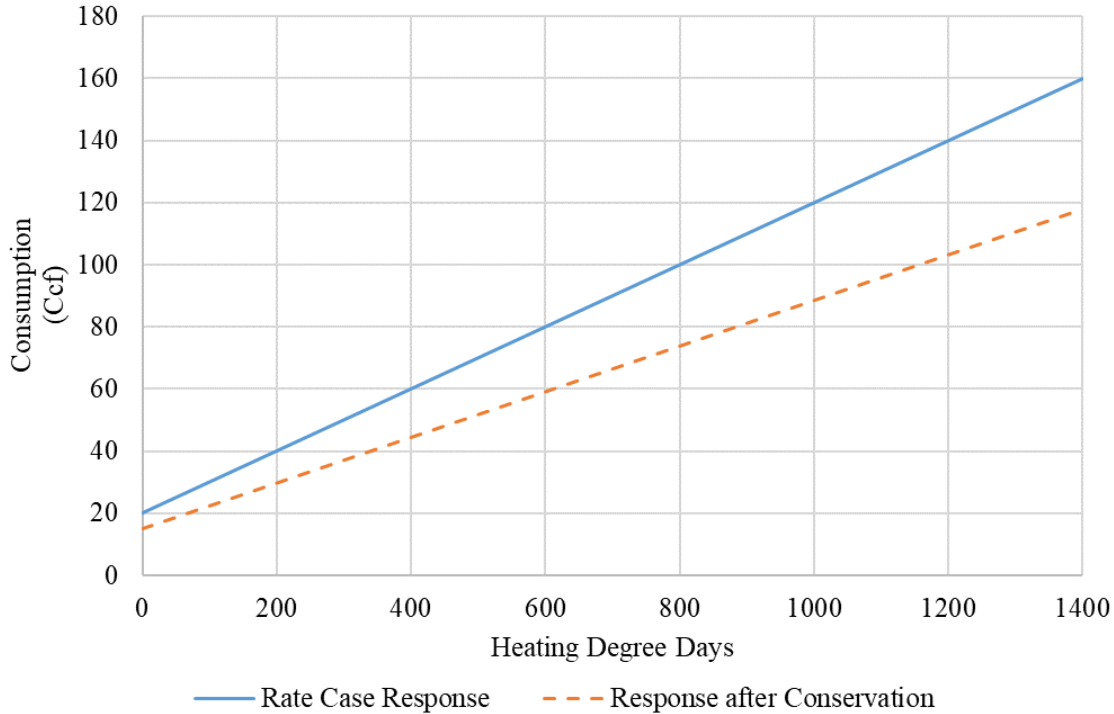
8 A. The WNAR includes a coefficient (β) that is the measurement of the usage response
9 of the customers to weather as defined in the rate case. Weather normalization
10 adjustments in Ccfs are calculated for each billing cycle and each month based on
11 this coefficient and the actual and normal weather measured for each billing cycle.
12 The adjustments are then multiplied by a rate to calculate how much revenue was
13 not collected or was over-collected. The adjustments are summed across billing
14 months and then divided by the billing determinants in the last rate case resulting
15 in a WNAR rate that is applied for the next 12 months.

16 **Q. How does the WNAR account for conservation?**

17 A. To help explain how the WNAR accounts for conservation I have created additional
18 graphs. In Figure 3 below, the solid line represents the customer class' response to
19 weather at the time of the rate case. The dashed line shows the response to weather
20 of the same customer class after time passes and customers have taken steps to
21 reduce their usage (conservation).

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Figure 3



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The response to weather as set in the rate case is the solid line showing an increase of 200 HDD results in consumption increasing by 20 Ccf.

After time passes and conservation occurs, the response to weather of this same class as shown by the dashed line in this graph is 15 Ccf for a change in HDD of 200.

8

Q. What happens when the actual weather is warmer than normal?

9

A. To get an understanding of what would occur I have taken the example one-step further as shown in Figure 4 below. Warmer than normal means that the actual HDD is lower than the normal HDD. In this example, normal HDD is 1,000 and actual is 800. Then the WNAR calculated normal usage would be 120 Ccf while the WNAR actual usage would be calculated at 100 Ccf resulting in a weather adjustment of 20 Ccf. This 20 Ccf would be used to calculate the WNAR rate.

10

11

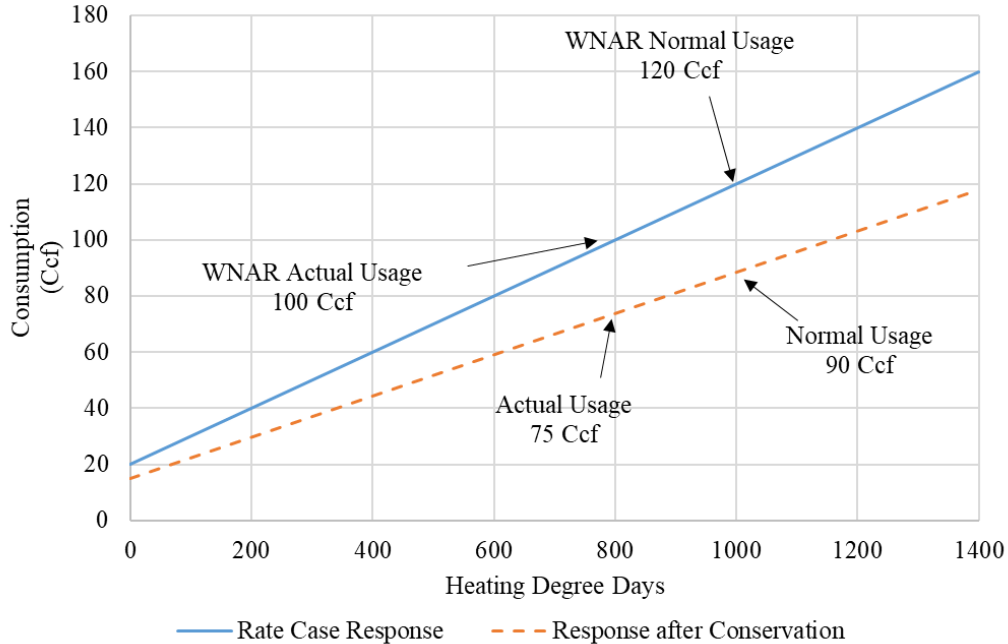
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Figure 4



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However, according to the dashed line that represents the new relationship between usage and weather after conservation, the weather adjustment for normal weather, would be 15 Ccf, the difference between 90 Ccf and 75 Ccf.

12

13

14

Q. Does this difference account for the all the change in usage due to conservation effects?

A. No, it does not.

1 **Q. Are you proposing a modification to the mechanism to capture more**
2 **conservation effects?**

3 A. No. To do so would require re-estimating the class response to weather on an
4 annual basis. This would significantly increase the complexity of the mechanism.
5 As described later in this testimony, Spire has issues with the complexity of the
6 current mechanism so I am reluctant to increase the complexity of the mechanism
7 any further.

8 In addition, by not recovering all of the effects of conservation, the
9 mechanism, while moving much of the risk to the customers, leaves some risk
10 regarding conservation on Spire.

11 **Q. You made a recommendation to the Commission that the interest rate**
12 **included in the WNAR should be changed. What is the current interest rate**
13 **required by the WNAR?**

14 A. The current WNAR tariff sheets provide that each month, carrying costs, at a simple
15 rate of interest equal to the prime bank lending rate (as published in The Wall Street
16 Journal on the first business day of such month), minus two percentage points, be
17 applied to Spire’s average beginning and ending monthly WNAR balances.

18 **Q. What interest rate should be charged in the WNAR?**

19 A. Statute states that for the mechanisms enacted as a result of § 386.266, interest at
20 the utility’s short-term borrow rate is to be included in the true-up of the difference
21 between what was ordered to be collected and what was actually collected. For
22 consistency, the short-term borrowing rate is also applied to Spire’s average
23 beginning and ending monthly WNAR balances.

24 **Q. What in the current WNAR needs to be updated?**

25 A. There are two components of the current WNAR that should be updated: (1) the
26 coefficient β ; and (2) the Weighted Residential Volumetric Rate (“WRVR”).

1 **Q. What is the β coefficient and why does it need to be updated?**

2 A. The β coefficient is the measurement of the relationship between usage and
3 weather. The β that is in the current tariff sheets reflects the relationship between
4 weather and usage as measured in the last rate case. The current β for Spire East is
5 0.1493772 and for Spire West is 0.1291586. This means for every one (1) heating
6 degree day increment, the average residential customer of Spire East uses
7 0.1493772 therm. The average residential customer of Spire West uses 0.1291586
8 Ccf.

9 Not only is this coefficient different between Spire East and Spire West, it
10 changes between rate cases. How customers use natural gas in the test year in this
11 case is different than it was in the test year of the last rate case for a variety of
12 reasons including increases and decreases in customers and conservation efforts of
13 the customers. That is why usage is normalized for a variety of factors in each rate
14 case. As a part of this normalization of usage used to calculate normal revenue, the
15 relationship between weather and usage is measured. The β coefficient is a result
16 of that process.

17 **Q. Can you recommend to the Commission the correct β s to use in WNAR rates?**

18 A. Not at this time. These should be determined through Staff's weather normalization
19 process in this case.

20 **Q. The other change to the current WNAR that is necessary is an update to the
21 weighted residential volumetric rate ("WRVR"). What is the WRVR and why
22 does it need to be updated?**

23 A. The WRVR is the rate used to calculate the weather normalization adjustment
24 amount in dollars for each billing month. This rate (\$/Ccf) multiplied by the
25 weather normalization adjustment in usage (Ccf) determines the weather
26 normalization amount in dollars (\$) that is to be collected from customers.

1 Currently for the billing months of November through April, the residential
2 gas service rate (RS) non-gas volumetric rate is the same for all Ccfs or therms
3 used. Therefore, for the billing months of November through April, the WRVR is
4 the same as the non-gas volumetric rate. For the billing months of May through
5 October, the non-gas volumetric rate is a two-block rate with the second block rate
6 being higher than the first. The WRVR for these billing months is an average of
7 the rates of these two blocks weighted by the number of customers whose usage
8 ended in each block as determined in the most recent rate case.

9 In this case, the rates and billing determinants will change from the current
10 rates. Therefore, the WRVR will need to be updated with the new rates and billing
11 determinants from this rate case.

12 **Q. Do you have any recommendations to simplify the WNAR?**

13 **A.** Yes. Spire witness Selinger, in his direct testimony told the Commission that there
14 were “issues” with the WNAR but did not provide what those issues were. To gain
15 an understanding of these “issues,” I requested a listing and detailed description of
16 Spire’s issue with the WNAR in data request 8000.⁴ In response to this data
17 request, Mr. Selinger gave the following as “issues” with the WNAR mechanism:

- 18 1. Requirement of semi-annual updates;
- 19 2. Four (4) separate rate components;
- 20 3. Billing cycle calculations;
- 21 4. Use of ranked degree days;
- 22 5. Requirement of an unbilled calculation; and
- 23 6. Greater than anticipated correlation to volumetric variances.

24 In my rebuttal testimony, I will address why Spire’s issues 3 through 6 are not really
25 issues with the WNAR. While I do not agree that the first two are issues either, the
26 WNAR can be modified to address the first two and simplify the WNAR.

⁴ Spire’s response to OPC DR 8000 is attached to this testimony as Schedule LMM-D-1.

1 **Q. What changes are you recommending?**

2 A. I recommend that the WNAR be changed to require an annual filing instead of
3 semi-annual filings. The differences between the actual and normal usage would
4 still be calculated on a billing month basis but a filing would only be required once
5 a year ending with the May billing month. The weather normalization amount
6 would be calculated using the sum of the 12 monthly adjustments with interest.

7 At the end of the May billing month, a true-up would be done determining
8 the difference between the WNAR amount calculated in the last WNAR rate change
9 case and what was actually billed.

10 To determine the rate to be charged the customers, the true-up amount
11 would be added to the weather adjustment amount. The sum of these two would
12 then be divided by the volumetric billing determinants from this case resulting in a
13 single rate to be charge over 12 months.

14 Spire would file to change the WNAR rate with the Commission annually
15 on July 1 with an effective date of the first October billing read cycle end date.
16 Staff would file its recommendation to the Commission by September 1.

17 **Q. How would this take care of the second issue Spire has with the WNAR?**

18 A. There would only be one rate component.

19 **Q. Are there other changes you would like to propose?**

20 A. Not at this time. However, as I review the current WNAR tariff sheets for the class
21 cost-of-service and rate design filing the need for more changes may become
22 apparent.

23 **Q. Would you summarize your testimony?**

24 A. Yes. A mechanism that allows for interim rates that account for changes in weather
25 and conservation is a privilege and not a right for investor-owned gas utilities in
26 Missouri. Such a mechanism shifts risk in revenue recovery away from Spire to

1 the customer thus increasing the volatility of bills for customers while decreasing
2 revenue recovery risk for Spire. For this privilege, Spire should justify its request
3 for a mechanism in each case. It has not done so in this case. The Commission has
4 been authorized to grant, modify, or reject requests for such mechanisms. Since
5 Spire has not provided a rationale for why the Commission should grant it such a
6 mechanism, the Commission should not authorize an interim rate mechanism to
7 account for weather and conservation for Spire.

8 If Spire provides justification and the Commission agrees the authorization
9 of a mechanism is reasonable, then the Commission should continue Spire's
10 weather normalization adjustment rider with modifications as set out in this
11 testimony. The interest rate charged should be consistent with statute. The β and
12 weighted residential volumetric rates should be updated for the weather
13 normalization and used in this case to determine normalized revenues and the rate
14 design approved by the Commission.

15 In addition, the accumulation periods should be changed to simplify the
16 WNAR.

17 **Q. Have you discussed Spire's WNAR with Staff?**

18 A. Yes. I will respond to their proposed changes in my rebuttal testimony.

19 **Q. Finally, what is your experience with weather normalization?**

20 A. I was a part of the team on the Commission Staff that developed a cutting edge
21 weather normalization process for electric utilities in the late 1980's and 1990s.
22 This methodology is still the basis for the weather normalization methodologies
23 used today by utilities across the nation. As shown in Schedule LMM-D-2, I was
24 the Staff weather normalization expert witness in many cases while at the
25 Commission. While much of my work was weather normalizing electric usage, the
26 same principles apply to weather normalization of gas usage.

1 | **Q. Does this conclude your direct testimony?**

2 | A. Yes, it does.

**Spire Missouri
GR-2021-0108**

Response to Office of Public Counsel (OPC) Data Request 8000

On page 28 of his direct testimony, Selinger states that the WNAR has had issues.

Please provide 1) a detailed description of each issues including, but not limited to, why it was an issue for the WNAR; and 2) how Spire's proposed RNA will eliminate each issue.

Requested by John Clizer and Lena Mantle (john.clizer@opc.mo.gov and lena.mantle@opc.mo.gov).

Response: The Company believes that the WNAR mechanism is more complicated than it needs to be. The mechanism is updated semi-annually and requires four (4) separate rate components be always in place (i.e. 2 CWNA and 2 SRR rates). The mechanism is calculated by billing cycle, uses ranked degree days, and requires an unbilled calculation. The mechanism has also not provided as close a correlation to volumetric variances as the Company anticipated. Please also see the Company's response to OPC Data Request 8001 for further explanation of this testimony.

The Company's proposed RNA will be tied to billing determinants set in this rate case. In addition, the RNA rates will be calculated on an annual basis and will not require heating degree day information.

Signed by: Wesley Selinger

Education and Work Experience Background of

Lena M. Mantle, P.E.

In my position as Senior Analyst for the Office of the Public Counsel (“OPC”) I provide analytic and engineering support for the OPC in electric, gas, and water cases before the Commission. I have worked for the OPC since August, 2014.

I retired on December 31, 2012 from the Public Service Commission Staff as the Manager of the Energy Unit. As the Manager of the Energy Unit, I oversaw and coordinated the activities of five sections: Engineering Analysis, Electric and Gas Tariffs, Natural Gas Safety, Economic Analysis, and Energy Analysis sections. These sections were responsible for providing Staff positions before the Commission on all of the electric and gas cases filed at the Commission. This included reviews of fuel adjustment clause filings, resource planning compliance, gas safety reports, customer complaint reviews, territorial agreement reviews, electric safety incidents and the class cost-of-service and rate design for natural gas and electric utilities.

Prior to being the Manager of the Energy Unit, I was the Supervisor of the Engineering Analysis Section of the Energy Department from August, 2001 through June, 2005. In this position, I supervised engineers in a wide variety of engineering analysis including electric utility fuel and purchased power expense estimation for rate cases, generation plant construction audits, review of territorial agreements, and resolution of customer complaints all the while remaining the lead Staff conducting weather normalization in electric cases.

From the beginning of my employment with the Commission in the Research and Planning Department in August, 1983 through August, 2001, I worked in many areas of electric utility regulation. Initially I worked on electric utility class cost-of-service analysis, fuel modeling and what has since become known as demand-side management. As a member of the Research and Planning Department under the direct supervision of Dr. Michael Proctor, I participated in the development of a leading-edge methodology for weather normalizing hourly class energy for rate design cases. I took the lead in developing personal computer programming of this methodology and applying this methodology to weather-normalize electric usage in numerous electric rate cases. I was also a member of the team that assisted in the development of the Missouri Public Service Commission electronic filing and information system (“EFIS”).

I received a Bachelor of Science Degree in Industrial Engineering from the University of Missouri, at Columbia, in May, 1983. I am a registered Professional Engineer in the State of Missouri.

Lists of the cases I have filed testimony as an OPC, the Missouri Public Service Commission rules in which I participated in the development of or revision to, and the cases that I provided testimony in follow.

Office of Public Counsel Case Listing

Case	Filing Type	Issue
WR-2020-0240	Direct, Rebuttal, Surrebuttal	Normalized customer usage, revenue stabilization mechanism
EO-2020-0262	Direct	FAC Imprudence
ER-2020-0311	Rebuttal	FAC rate change
ER-2019-0374	Direct, Rebuttal, Surrebuttal	Weather Norm Rider, Fuel Adjustment Clause
ER-2019-0355	Direct, Rebuttal	Fuel Adjustment Clause, Unregulated Competition tariff sheet
EO-2019-0067 & EO-2019-0068	Rebuttal	Prudence of GMO steam auxiliary costs and GMO and KCPL's wind PPAs
EA-2019-0010	Rebuttal, Surrebuttal	Energy Market Prices, Customer Protections
GO-2019-0058 & GO-2019-0059	Direct, Rebuttal	Weather
ER-2018-0145 & ER-2018-0146	Direct, Rebuttal, Surrebuttal	Purchased Power, Customer Bills, Crossroads, Resource Planning
EO-2018-0092	Rebuttal, Surrebuttal	OPC Opposition of Request for Approval of Changes to Resource Plan
WR-2017-0285	Direct, Rebuttal, Surrebuttal	Normalized base usage
GR-2017-0215 & GR-2017-0216	Direct, Rebuttal, Surrebuttal	Energy Efficiency and Low-Income Programs
EO-2017-0065	Direct, Rebuttal, Surrebuttal	Fuel Adjustment Clause Prudence Review
ER-2016-0285	Direct, Rebuttal, Surrebuttal	Fuel Adjustment Clause
ER-2016-0179	Direct, Rebuttal, Surrebuttal	Fuel Adjustment Clause,
ER-2016-0156	Direct, Rebuttal, Surrebuttal	Fuel Adjustment Clause, Resource Planning
ER-2016-0023	Direct, Rebuttal, Surrebuttal	Fuel Adjustment Clause
WR-2015-0301	Direct, Rebuttal, Surrebuttal	Revenues, Environmental Cost Recovery Mechanism
ER-2014-0370	Direct, Rebuttal, Surrebuttal	Fuel Adjustment Clause
ER-2014-0351	Direct, Rebuttal, Surrebuttal	Fuel Adjustment Clause
ER-2014-0258	Direct, Rebuttal, Surrebuttal	Fuel Adjustment Clause
EC-2014-0224	Surrebuttal	Policy, Rate Design

Missouri Public Service Commission Rules

- 20 CSR 4240-3 Filing Requirements for Electric Utilities (various rules)
- 20 CSR 4240-14 Utility Promotional Practices
- 20 CSR 4240-18 Safety Standards
- 20 CSR 4240-20.015 Electric Utility Affiliate Transactions
- 20 CSR 4240-20.017 HVAC Services Affiliate Transactions
- 20 CSR 4240-20.090 Electric Utility Fuel and Purchased Power Cost Recovery Mechanisms
- 20 CSR 4240-20.091 Electric Utility Environmental Cost Recovery Mechanisms
- 20 CSR 4240-22 Electric Utility Resource Planning
- 20 CSR 4240-80.015 Steam Heating Utility Affiliate Transactions
- 20 CSR 4240-80.017 HVAC Services Affiliate Transactions

Missouri Public Service Commission Staff Testimony

Case No.	Filing Type	Issue
ER-2012-0175	Rebuttal, Surrebuttal	Resource Planning Capacity Allocation
ER-2012-0166	Rebuttal, Surrebuttal	Fuel Adjustment Clause
EO-2012-0074	Direct/Rebuttal	Fuel Adjustment Clause Prudence
EO-2011-0390	Rebuttal	Resource Planning Fuel Adjustment Clause
ER-2011-0028	Rebuttal, Surrebuttal	Fuel Adjustment Clause
EU-2012-0027	Rebuttal, Surrebuttal	Fuel Adjustment Clause
ER-2010-0356	Rebuttal, Surrebuttal	Resource Planning Allocation of Iatan 2
EO-2010-0255	Direct/Rebuttal	
ER-2010-0036	Supplemental Direct, Surrebuttal	Fuel Adjustment Clause
ER-2009-0090	Surrebuttal	Capacity Requirements
ER-2008-0318	Surrebuttal	Fuel Adjustment Clause
ER-2008-0093	Rebuttal, Surrebuttal	Fuel Adjustment Clause Low-Income Program
ER-2007-0004	Direct, Surrebuttal	Resource Planning
GR-2007-0003	Direct	Energy Efficiency Program Cost Recovery
ER-2007-0002	Direct	Demand-Side Program Cost Recovery
ER-2006-0315	Supplemental Direct, Rebuttal	Energy Forecast, Demand-Side Programs Low-Income Programs
ER-2006-0314	Rebuttal	Jurisdictional Allocation Factor
EA-2006-0309	Rebuttal, Surrebuttal	Resource Planning
ER-2005-0436	Direct, Rebuttal, Surrebuttal	Low-Income Programs, Energy Efficiency Programs, Resource Planning
EO-2005-0329	Spontaneous	Demand-Side Programs, Resource Planning
EO-2005-0293	Spontaneous	Demand-Side Programs, Resource Planning
ER-2004-0570	Direct, Rebuttal, Surrebuttal	Reliability Indices, Energy Efficiency Programs Wind Research Program
EF-2003-0465	Rebuttal	Resource Planning
ER-2002-424	Direct	Derivation of Normal Weather
EC-2002-1	Direct, Rebuttal	Weather Normalization of Class Sales Weather Normalization of Net System
ER-2001-672	Direct, Rebuttal	Weather Normalization of Class Sales Weather Normalization of Net System
ER-2001-299	Direct	Weather Normalization of Class Sales Weather Normalization of Net System
EM-2000-369	Direct	Load Research
EM-2000-292	Direct	Load Research
EM-97-515	Direct	Normalization of Net System

Case No.	Filing Type	Issue
ER-97-394, et. al.	Direct, Rebuttal, Surrebuttal	Weather Normalization of Class Sales Weather Normalization of Net System Energy Audit Tariff
EO-94-174	Direct	Weather Normalization of Class Sales Weather Normalization of Net System
ER-97-81	Direct	Weather Normalization of Class Sales Weather Normalization of Net System TES Tariff
ER-95-279	Direct	Normalization of Net System
ET-95-209	Rebuttal, Surrebuttal	New Construction Pilot Program
EO-94-199	Direct	Normalization of Net System
ER-94-163	Direct	Normalization of Net System
ER-93-37	Direct	Weather Normalization of Class Sales Weather Normalization of Net System
EO-91-74, et. al.	Direct	Weather Normalization of Class Sales Weather Normalization of Net System
EO-90-251	Rebuttal	Promotional Practices Variance
ER-90-138	Direct	Weather Normalization of Net System
ER-90-101	Direct, Rebuttal, Surrebuttal	Weather Normalization of Class Sales Weather Normalization of Net System
ER-85-128, et. al.	Direct	Demand-Side Update
ER-84-105	Direct	Demand-Side Update

Exhibit No.:
Issue(s)
Witness/Type of Exhibit:
Sponsoring Party:
Case No.:

WNAR/Tariff Sheet
Mantle/Direct
Public Counsel
GR-2021-0108

**CLASS COST OF SERVICE
DIRECT TESTIMONY**

OF

LENA M. MANTLE

Submitted on Behalf of the Office of the Public Counsel

SPIRE MISSOURI, INC.

CASE NO. GR-2021-0108

May 26, 2021

**CLASS COST OF SERVICE
DIRECT TESTIMONY**

OF

LENA M. MANTLE

SPIRE MISSOURI, INC.

d/b/a SPIRE MISSOURI EAST & SPIRE MISSOURI WEST

CASE NO. GR-2021-0108

1 **Q. Would you state your name and business address?**

2 A. My name is Lena M. Mantle and my business address is P.O. Box 2230, Jefferson
3 City, Missouri 65102. I am a Senior Analyst for the Office of the Public Counsel
4 (“OPC”).

5 **Q. Are you the same Lena M. Mantle that filed revenue requirement direct
6 testimony in this case?**

7 A. Yes.

8 **Q. What is the purpose of your class cost of service direct testimony?**

9 A. In my revenue requirement direct testimony, I recommended that if Spire provided
10 information that the Commission believes justifies the imposition of an interim rate
11 mechanism on its smallest customers, certain modifications should be made to its
12 current weather normalization adjustment rider (“WNAR”). In this class cost-of-
13 service direct testimony, I provide tariff language, as provided in the attached
14 schedule LMM-D-3, for the modified WNAR that I recommended in my revenue
15 requirement direct testimony.

1 **Q. How is this tariff language different from the tariff sheets that describe the**
2 **current WNAR?**

3 A. One of Spire’s “issues” with the current WNAR was that it was more complicated
4 than it needed to be.¹ When I reviewed the current WNAR tariff sheets, I found
5 them to be more complicated than they needed to be, so I determined to simplify the
6 tariff language describing the WNAR. A redline/strikeout comparison of my
7 proposed tariff language and the current tariff language is attached to this testimony
8 as Schedule LMM-D-4. The current tariff sheets are attached to this testimony as
9 Schedule LMM-D-5.

10 **Q. There is a lot of redline/strikeout on Schedule LMM-D-4. Would you**
11 **summarize the changes you made to make the WNAR tariff sheets less**
12 **complicated?**

13 A. The first thing I did to make the tariff language more understandable was to make
14 the font consistent throughout the WNAR tariff sheets. I moved some of the
15 components of the current tariff language to make it clearer. For example, I moved
16 the timing of the filing of new WNAR rates near the beginning. Some of the
17 language was not necessary such as the phrase “until such time as it may
18 discontinued or modified by order of the Commission in a general rate case.” This
19 is statutory and therefore not needed in the tariff sheet. Where the tariff language
20 states a component is set in the general rate case, *i.e.* would not change until the
21 next rate case, I propose that the value set in the rate case be on the tariff sheet.
22 Additional explanations for why certain changes were made are included as
23 comments on Schedule LMM-D-4.

24 Finally, I completely replaced the rate computation with a table that is
25 limited to:

¹ Spire response to OPC data request 8000.

- 1 1. The sum of the monthly weather normalization revenue adjustments
- 2 ("ARA");
- 3 2. The interest on the monthly weather normalization adjustments;
- 4 3. The true-up amount ("TA");
- 5 4. The interest on the true-up amount;
- 6 5. The annual volumetric billing determinants; and
- 7 6. The WNAR rate.

8 This table is a simple, concise description of the WNAR described in words and
9 equations in the previous language. The table also clearly states the accumulation
10 period (Sum of Weather Revenue Adjustments for June 20XX through May 20XX
11 (ARA)). The title above the table also clearly states the billing months that the
12 WNAR will be charged to customers (Applicable for the billing months of
13 September 20XX through August 20XX).

14 **Q. Would this tariff language be the same for both Spire East and Spire West?**

15 A. The verbiage should be the same for both. However, the weather response is
16 different for Spire East and Spire West meaning the beta coefficient (β) is different
17 for Spire East and Spire West. In the current tariffs, the β coefficient for Spire East
18 is 0.1493772 meaning that for every 100 heating degree days of adjustment, the
19 difference in usage was 14.9 therms. Using the common conversion of therms to
20 Ccf, this would be 15.5 Ccf for 100 heating degree days. For Spire West, the β
21 coefficient is 0.1291586 signifying that 100 heating degree day adjustment would
22 change usage by 12.9 Ccf, approximately 17% less than Spire East.

23 In addition, the weather is different for Spire East than it is for Spire West.
24 This means the weather adjustment is also different.

25 Finally, it is OPC's position that Spire East and Spire West rates be specific
26 to each district and the number of customers with usage in the last block would be
27 different between the two districts. This means the weighted residential variable
28 rate (WRVR) would be different for Spire East and Spire West.

1 Therefore, while the majority of the tariff language would be the same, there
2 should be different values in the WNAR tariff language for Spire East and Spire
3 West. There could be one set of tariff sheets but the sheets would have to specify
4 different values for these variables. In addition, there would need to be different
5 tables showing the calculation of the WNAR rate for Spire East and Spire West.

6 **Q. Does this conclude your direct testimony?**

7 **A. Yes, it does.**

WEATHER NORMALIZATION ADJUSTMENT RIDER WNAR

APPLICABILITY

The Weather Normalization Adjustment Rider (“WNAR”) is applicable to each therm of gas delivered under the terms of the residential rate schedule throughout the entire service area of Spire East. The Rider will be applied as a separate line item on a customer’s bill.

The Company will make an annual rate filing with by July 1 to adjust the WNA Rider with an effect date that coincides with the read date of the first September billing cycle. Staff will file its recommendation to the Commission regarding the filing by August 1.

The WNAR rate will remain in effect for the twelve (12) billing months beginning with the September billing month.

CALCULATION OF ADJUSTMENT

The Weather Adjustment to Usage (“WAU”) will be calculated for each billing cycle and billing month as follows:

$$WAU_i = \sum_{j=1}^{18} ((NDD_{ij} - ADD_{ij}) * C_{ij}) * \beta$$

Where:

- i = the applicable billing month
- WAU_i = Weather Adjustment to usage for the billing month in therms
- j = the billing cycle
- NDD_{ij} = the total normal heating degree days for billing cycle j in billing month i based upon Staff’s daily normal weather as determined in the most recent rate case
- ADD_{ij} = the total actual heating degree days, base 65° at St. Louis Lambert International Airport Weather Station for billing cycle j in billing month i
- C_{ij} = the total number of customer charges charged in billing cycle j and billing month i
- β = the coefficient of 0.BBBBB for Spire East

The revenue adjustment (“RA”) for each billing month shall be calculated as follows

$$RA_i = WAU_i \times WRVR_i$$

Where

WRVR = the Weighted Residential Variable Rate applicable to the billing month. For the winter billing months (November through April), the WRVR shall be equal to the Residential Winter Charge for Gas Used of \$0.XXXXX. The WRVR for each of the summer billing months (May through October) is the average of the volumetric rates weighted by the number of customers whose usage ends in that block as normalized in the last general rate case. The WRVR for each billing month is reflected in the table below:

May	June	July	August	September	October
\$0.XXXXX	\$0.XXXXX	\$0.XXXXX	\$0.XXXXX	\$0.XXXXX	\$0.XXXXX

CALCULATION OF WNAR RATE

The WNAR rate is the Total Recovery Amount (“TRA”) divided by ZZZZZZ which is the annual volumetric billing determinants set for the residential rate class in the most recent general rate case.

The Total Recovery Amount (“TRA”) is the sum of the Annual Revenue Adjustment (“ARA”) and the True-up Amount (“TA”).

The Annual Revenue Adjustment (“ARA”) is the sum of the billing month revenue adjustment (“RA”) for each of 12 billing months ending with the May billing month.

The True-up Amount (“TA”) will be the difference between the revenue billed through the WNAR and the ordered TRA for the recovery period. The revenue billed shall be the actual WNAR revenue billed for the billing months of September through May. The WNAR revenue billed for the billing months of June, July, and August shall be estimated using the volumetric billing determinates for those months as set in the last general rate case. These billing determinants are reflected in the table below:

June	July	August
DDDDDD	DDDDD	DDDDD

OTHER TERMS

There shall be a limit of \$0.05 per therm on upward adjustments for the WNAR rate and no limit on downward adjustment. Any TRA not recovered due to this cap of \$0.05 per therm will be deferred for recovery from customers in the next recovery period.

Each month, interest at Spire’s short-term borrowing rate shall be applied to the Company’s average beginning and ending monthly TRA balances. Corresponding interest income and expense amounts shall be recorded on a net cumulative basis for the WNA deferral period.

WEATHER NORMALIZATION ADJUSTMENT RIDER
Currently Effective WNAR

Applicable for the billing months of September 20XX through August 20XX

Sum of Weather Revenue Adjustments for June 20XX through May 20XX (ARA)	\$ XXX,XXX.xx
Interest on Weather Revenue Adjustments (I_{RA})	\$ X,XXX.xx
True-Up Amount for September 20XX through August 20XX (TA)	\$ X,XXX.xx
Interest on True-Up Amount (I_{TA})	\$ XX.xx
Total Recovery Amount ($TRA = ARA + I_{RA} + TA + I_{TA}$)	\$ XXX,XXX.xx
Annual Volumetric Billing Determinants	ZZ,ZZZ,ZZZ
Weather Normalization Adjustment Rider Rate (WNAR Rate)	\$0.00000/Ccf
($TRA \div$ Annual Volumetric Billing Determinants)	

**WEATHER NORMALIZATION ADJUSTMENT RIDER
WNAR**

APPLICABILITY

The Weather Normalization Adjustment (~~WNA~~) Rider (~~WNA~~) is applicable to each term of gas delivered under the terms of the residential rate schedule throughout the entire service area of Spire East ~~until such time as it may be discontinued or modified by order of the Commission in a general rate case.~~ The Rider will be applied as a separate line item on a customer's bill.

Commented [ML1]: Not needed. When it is discontinued, there will no longer be a tariff sheet. If it is modified, the tariff sheet will be changed.

~~The Company will make an semiannual rate filing with the Commission 30 days prior to the first effective day referenced in the CSWNA table by July 1 to adjust the WNA Rider with an effect date that coincides with the read date of the first September billing cycle. Staff will file its recommendation to the Commission regarding the filing by August 1.~~

~~The WNAR rate Each CSWNA and SRR will remain in effect for the twelve (12) billing months beginning with the September billing month. The total WNA Rider rate shall be the sum of all effective CSWNAs and SRRs.~~

CALCULATION OF ADJUSTMENT

The ~~WNA Factor~~ **Weather Adjustment to Usage ("WAU")** will be calculated for each billing cycle and billing month as follows:

Commented [ML2]: This isn't a factor. It is usage in therms. Came up with another abbreviation to lessen confusion.

$$WAU_i = \sum_{j=1}^{18} ((NDD_{ij} - ADD_{ij}) * C_{ij}) * \beta$$

Where:

- i = the applicable billing cycle month
- $WNAU_i$ = ~~Weather Normalization Adjustment to usage for the billing month in therms~~
- j = the billing cycle
- NDD_{ij} = the total normal heating degree days ~~for billing cycle j in billing month i~~ based upon Staff's daily normal weather as determined in the most recent rate case.
- ADD_{ij} = the total actual heating degree days, base 65° at St. Louis Lambert International Airport ~~Weather Station for billing cycle j in billing month i~~
- C_{ij} = the total number of customer charges charged in billing cycle j and billing month i
- β = the coefficient of 0. ~~BBBBB1493772~~ for Spire East

Commented [ML3]: There is no such thing as a "billing cycle month." Referred to as billing month in the rest of the tariff sheets.

The revenue adjustment ("RA") for each billing month shall be calculated as follows

1. ~~Monthly WNARA_i = WNAU_i × Weighted Residential Volumetric Rate ("WRVR")~~

Commented [ML4]: Consistent with weather normalization in rate case. Does not change between rate cases. 5 decimal places to be consistent with rates.

Commented [ML5]: While the language will be the same for Spire West, the numbers will be different.

Where

2. ~~The WRVR = the Weighted Residential Variable Ratea applicable to the billing each month, shall be derived using the billing determinants and residential volumetric rates from the Company's then most recent rate case.~~ For the winter

billing months (November through April), the WRVR shall be equal to the Residential Winter Charge for Gas Used ~~established at the conclusion of each general rate case. For Case No. GR 2017-0215 the amount is of \$0.23330XXXXX.~~ The WRVR for each of the summer billing months (May through October) ~~shall be determined at the conclusion of each general rate case as is the percentage of total residential customers whose usage ends in the first rate block multiplied by the volumetric rate of that block plus the percentage of total residential customers whose usage ends in the second rate block multiplied by the volumetric rate of that block. Currently effective summer average of the~~

Commented [ML6]: Not necessary

Commented [ML7]: Not needed

Commented [ML8]: Can be simplified

volumetric rates weighted by the number of customers whose usage ends in that block as normalized in the last general rate case. The WRVR's for each billing month is are reflected in the table below:

May	June	July	August	September	October
\$0.XXXXX2 1368	\$0.XXXXX0- 21406	\$0.XXXXX0- 21044	\$0.XXXXX0- 21029	\$0.XXXXX0- 21054	\$0.XXXXX0-210 96

Commented [ML9]: Does not change between rate cases. Will need to be calculated after billing determinants and rates have been set.

CALCULATION OF WNAR RATE

The WNAR rate is the Total Recovery Amount ("TRA") divided by ZZZZZZ which is the annual volumetric billing determinants set for the residential rate class in the most recent general rate case.

Commented [ML10]: Does not change between rate cases

The Total Recovery Amount ("TRA") is the sum of the Annual Revenue Adjustment ("ARA") and the True-up Amount ("TA").

3. The Annual Revenue Adjustment ("ARA") Current Semiannual-WNA ("CSWNA") shall be the sum of the billing cycle-WNA month revenue adjustment ("RA") for each of 12 billing months ending with the May billing month, the six Monthly-WNA for the billing months in the applicable six month period divided by the annual volumetric billing determinants set for the residential rate class in the most recent rate case.

Commented [ML11]: The font should be consistent across the tariff language

The 4. Semiannual Reconciliation True-up Rate Amount ("SRTAR")—Two (2) months prior to the end of the twelve (12) months of billing of each CSWNA, the over- or under-billing of the numerator of the CSWNA shall be calculated based on ten (10) months actual sales and two (2) months projected sales. The amount of over- or under-billing shall be adjusted as ordered by the Commission, if applicable. The resulting amount shall be divided by the annual volumetric billing determinants set for the residential rate class in the most recent rate case. Two (2) months prior to the end of the twelve (12) months of billing of each SRR, the over- or under-billing of the SRR shall be calculated based on ten (10) months actual sales and two (2) months projected sales. Any remaining over- or under-billing from the SRR shall be applied to the next SRR. The two (2) months projected sales associated with each CSWNA and SSR shall be true-up with actuals upon calculation of the next applicable SSR. will be the difference between the revenue billed through the WNAR and the ordered TRA for the recovery period. The revenue billed shall be the actual WNAR revenue billed for the billing months of September through May. The WNAR revenue billed for the billing months of June, July, and August shall be estimated using the volumetric billing determinants for those months as set in the last general rate case. These billing determinants are reflected in the table below:

Commented [ML12]: Consistent with statutory language

June	July	August
DDDDDD	DDDDDD	DDDDDD

5. The Company will make a semiannual rate filing with the Commission 30 days prior to the first effective day referenced in the CSWNA table to adjust the WNA Rider. Each CSWNA and SRR will remain in effect for twelve (12) months. The total WNA Rider rate shall be the sum of all effective CSWNAe and SRRs.

OTHER TERMS

6. There shall be a limit of \$0.05 per therm on upward adjustments for the WNAR rate and no limit on downward adjustment. Any WNA adjustments amounts TRA not recovered, in excess due to this cap of \$0.05 per therm will be deferred for recovery from customers in the next WNA adjustment recovery period, and applicable to part a. below.

Each month, carrying costs, at a simple rate of interest equal to the prime bank lending rate (as published in The Wall Street Journal on the first business day of such month); interest at Spire's short-term

~~borrowing rate minus two percentage points~~, shall be applied to the Company's average beginning and ending monthly WNA-TRA balances. ~~In no event shall the carrying cost rate be less than 0%.~~ Corresponding interest income and expense amounts shall be recorded on a net cumulative basis for the WNA deferral period.

Commented [ML13]: Consistent with statute

RATE:

CSWNA Table:

Period	Rate-First Effective	Months	Rate-Ending-Effective	CSWNA (Semiannual)
2021-S1	4/1/2021	12	3/31/2022	\$0.00654
2020-S2	10/1/2020	12	9/30/2021	\$0.00325

SRR Table:

Period	Rate-First Effective	Months	Rate-Ending-Effective	CSWNA (Semiannual)
2021-S1	4/1/2021	12	3/31/2022	\$0.00009
2020-S2	10/1/2020	12	9/30/2021	\$0.00018

WNA Rider Rate:

Period	Rate-First Effective	Months	Rate-Ending-Effective	CSWNA (Semiannual)
2021-S1	4/1/2021	6	9/30/2022	\$0.01006

Commented [ML13]: Consistent with statute

**WEATHER NORMALIZATION ADJUSTMENT RIDER
Currently Effective WNAR**

Applicable for the billing months of September 20XX through August 20XX

Sum of Weather Revenue Adjustments for June 20XX through May 20XX (ARA)	\$ XXX,XXX.xx
Interest on Weather Revenue Adjustments (I _{RA})	\$ X,XXX.xx
True-Up Amount for September 20XX through August 20XX (TA)	\$ X,XXX.xx
Interest on True-Up Amount (I _{TA})	\$ XX.xx
Total Recovery Amount (TRA = ARA + I _{RA} + TA + I _{TA})	\$ XXX,XXX.xx
Annual Volumetric Billing Determinants	ZZ,ZZZ,ZZZ
Weather Normalization Adjustment Rider Rate (WNAR Rate) (TRA ÷ Annual Volumetric Billing Determinants)	\$0.00000 /Ccf

Commented [ML14]: This and the inputs change each year.

Commented [ML15]: Constant until next rate case

Commented [ML16]: Changes every year. Limit to 5 decimal places

Commented [ML14]: This and the inputs change each year.

Commented [ML15]: Constant until next rate case

Commented [ML16]: Changes every year. Limit to 5 decimal places

Spire Missouri Inc. d/b/a/ Spire

For: Spire Missouri East

WEATHER NORMALIZATION ADJUSTMENT RIDER
WNAR

APPLICABILITY

The Weather Normalization Adjustment (“WNA”) Rider is applicable to each therm of gas delivered under the terms of the residential rate schedule throughout the entire service area of Spire East until such time as it may be discontinued or modified by order of the Commission in a general rate case. The Rider will be applied as a separate line item on a customer’s bill.

CALCULATION OF ADJUSTMENT

The WNA Factor will be calculated for each billing cycle and billing month as follows:

$$WNA_i = \sum_{j=1}^{18} ((NDD_{ij} - ADD_{ij}) \cdot C_{ij}) \cdot \beta$$

Where:

- i = the applicable billing cycle month
- WNA_i = Weather Normalization Adjustment
- j = the billing cycle
- NDD_{ij} = the total normal heating degree days based upon Staff’s daily normal weather as determined in the most recent rate case.
- ADD_{ij} = the total actual heating degree days, base 65° at St. Louis Lambert International Airport Weather Station
- C_{ij} = the total number of customer charges charged in billing cycle j and billing month i
- β = the coefficient of 0.1493772 for Spire East

1. Monthly WNA_i = WNA_i × Weighted Residential Volumetric Rate (“WRVR”)_i
2. The WRVR applicable to each month shall be derived using the billing determinants and residential volumetric rates from the Company’s then most-recent rate case. For the winter billing months (November through April) the WRVR shall be equal to the Residential Winter Charge for Gas Used established at the conclusion of each general rate case. For Case No. GR-2017-0215 the amount is \$0.23330. The WRVR for each of the summer billing months (May through October) shall be determined at the conclusion of each general rate case as the percentage of total residential customers whose usage ends in the first rate block multiplied by the volumetric rate of that block plus the percentage of total residential customers whose usage ends in the second rate block multiplied by the volumetric rate of that block. Currently effective summer WRVR’s are reflected in the table below:

May	June	July	August	September	October
\$0.21368	\$0.21106	\$0.21044	\$0.21029	\$0.21054	\$0.21096

DATE OF ISSUE: March 20, 2018

DATE EFFECTIVE: April 19, 2018

ISSUED BY: C. Eric Lobser, VP, Regulatory & Governmental Affairs
Spire Missouri Inc., St. Louis, MO. 63101

FILED
Missouri Public
Service Commission
GR-2017-0215; YG-2018-0117

LMM-D-5

Spire Missouri Inc. d/b/a/ Spire

For: Spire Missouri East

WEATHER NORMALIZATION ADJUSTMENT RIDER
WNAR

3. The Current Semiannual WNA ("CSWNA") shall be the sum of the billing cycle WNA for each of the six Monthly WNA_i for the billing months in the applicable six month period divided by the annual volumetric billing determinants set for the residential rate class in the most recent rate case.

4. Semiannual Reconciliation Rate ("SRR"): Two (2) months prior to the end of the twelve (12) months of billing of each CSWNA, the over- or under-billing of the numerator of the CSWNA shall be calculated based on ten (10) months actual sales and two (2) months projected sales. The amount of over- or under-billing shall be adjusted as ordered by the Commission, if applicable. The resulting amount shall be divided by the annual volumetric billing determinates set for the residential rate class in the most recent rate case. Two (2) months prior to the end of the twelve (12) months of billing of each SRR, the over- or under-billing of the SRR shall be calculated based on ten (10) months actual sales and two (2) months projected sales. Any remaining over- or under-billing from the SRR shall be applied to the next SRR. The two (2) months projected sales associated with each CSWNA and SSR shall be trued-up with actuals upon calculation of the next applicable SSR.

5. The Company will make a semiannual rate filing with the Commission 30 days prior to the first effective day referenced in the CSWNA table to adjust the WNA Rider. Each CSWNA and SRR will remain in effect for twelve (12) months. The total WNA Rider rate shall be the sum of all effective CSWNAs and SRRs.

6. There shall be a limit of \$0.05 per therm on upward adjustments for the WNA and no limit on downward adjustment. Any WNA adjustments amounts in excess of \$0.05 per therm will be deferred for recovery from customers in the next WNA adjustment and applicable to part a. below.

a. Each month, carrying costs, at a simple rate of interest equal to the prime bank lending rate (as published in The Wall Street Journal on the first business day of such month), minus two percentage points, shall be applied to the Company's average beginning and ending monthly WNA balances. In no event shall the carrying cost rate be less than 0%. Corresponding interest income and expense amounts shall be recorded on a net cumulative basis for the WNA deferral period.

DATE OF ISSUE: March 20, 2018

DATE EFFECTIVE: April 19, 2018

ISSUED BY: C. Eric Lobser, VP, Regulatory & Governmental Affairs
Spire Missouri Inc., St. Louis, MO. 63101

FILED
Missouri Public
Service Commission
GR-2017-0215; YG-2018-0117

LMM-D-5

Spire Missouri Inc. d/b/a/ Spire

For: Spire Missouri East

WEATHER NORMALIZATION ADJUSTMENT RIDER
WNAR

RATE:

CSWNA Table:

<u>Period</u>	<u>Rate First Effective</u>	<u>Months</u>	<u>Rate Ending Effective</u>	<u>CSWNA (Semiannual)</u>
2021 S1	4/1/2021	12	3/31/2022	\$0.00654
2020 S2	10/1/2020	12	9/30/2021	\$0.00325

SRR Table:

<u>Period</u>	<u>Rate First Effective</u>	<u>Months</u>	<u>Rate Ending Effective</u>	<u>SRR (Semiannual)</u>
2021 S1	4/1/2021	12	3/31/2022	\$0.00009
2020 S2	10/1/2020	12	9/30/2021	\$0.00018

WNA Rider Rate:

<u>Period</u>	<u>Rate First Effective</u>	<u>Months</u>	<u>Rate Ending Effective</u>	<u>Monthly WNA Rider Rate</u>
2021 S1	4/1/2021	6	9/30/2021	\$0.01006

DATE OF ISSUE: March 2, 2021

DATE EFFECTIVE: April 1, 2021

ISSUED BY: Scott A. Weitzel, Managing Director, Regulatory & Legislative Affairs
Spire Missouri Inc., St. Louis, MO. 63101