Exhibit No.: _____
Issue(s): Normalized Customer Usage
Witness/Type of Exhibit: Mantle/Direct
Sponsoring Party: Public Counsel
Case No.: WR-2020-0344

DIRECT TESTIMONY

OF

LENA M. MANTLE

Submitted on Behalf of the Office of the Public Counsel

MISSOURI-AMERICAN WATER COMPANY

CASE NO. WR-2020-0344

November 24, 2020

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Missouri-American Water Company's Request for Authority to Implement General Rate Increase for Water and Sewer Service Provided in Missouri Service Areas	)))))	Case No. WR-2020-0344

VERIFICATION OF LENA M. MANTLE

Lena M. Mantle, under penalty of perjury, states:

1. Attached hereto and made a part hereof for all purposes is my direct testimony in the above-captioned case.

2. My answer to each question in the attached direct testimony is true and correct to the best of my knowledge, information, and belief.

Lena M. Mantle
Senior Analyst
Office of the Public Counsel

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DIRECT TESTIMONY

OF

LENA M. MANTLE, P.E.

MISSOURI AMERICAN WATER COMPANY

CASE NO. WR-2020-0344

Introduction

Q. What is your name and business address?

A. My name is Lena M. Mantle and my business address is P.O. Box 2230, Jefferson City, Missouri 65102.

Q. By whom are you employed and in what capacity?

A. I am employed by the Missouri Office of the Public Counsel ("OPC") as a Senior Analyst.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of the OPC.

Q. What are your experience, education and other qualifications?

A. I began my employment with the OPC as Senior Analyst in August 2014. In this position, I have provided expert testimony in electric, gas, and water cases before the Commission on behalf of the OPC. I am a Registered Professional Engineer in the State of Missouri.

Prior to my employment by the OPC, I worked for the Staff of the Missouri Public Service Commission ("Staff") from August 1983 until I retired as Manager of the Energy Unit in December 2012. During my employment at the Missouri Public Service Commission ("Commission"), I worked as an Economist, Engineer, Engineering Supervisor, and Manager of the Energy Unit.

Attached as Schedule LMM-D-1 is a brief summary of my experience with OPC and Staff and a list of the Commission cases in which I testified, Commission rulemakings in which I participated, and Commission reports in rate cases to which I contributed as Staff.

Q. What is the purpose of your direct testimony?

A. The purpose of this direct testimony is to provide the correct normalized usage for Missouri American Water Company ("MAWC") residential and commercial classes and to explain why these normalized usages are the appropriate measures to use to determine normalized revenues. Attached to this testimony as Schedule LMM-D-2 is a whitepaper that I wrote detailing the importance of normalizing usage in a rate case.

Q. Would you summarize your whitepaper?

A. Normalization is an important step in determining the expected customer usage upon which to calculate a company's revenue requirement because it helps provide a reasonable estimate of anticipated usage. Using a usage estimate that is too high or too low has consequences. Customers' bills would be higher if low usage is used to determine revenue and it would be much easier for the utility to earn an unreasonably higher return. Using high usage to determine revenue results in rates that, while resulting in lower customer bills, make it more difficult for the utility to earn the return on equity included in its cost-of-service.

Q. Would you summarize the recommendations in this direct testimony?

A. I recommend the Commission order the following annual gallons of usage per customer for the following classes.

	Residential	Commercial
St. Louis County	6,596	42,151
All Other Customers[1]	4,727	25,356

Q. Do you have recommendations for the normalized usage for MAWC's other rate classes?

A. Not at this time, but I may respond to other testimony on this topic in rebuttal.

Normalized Residential Usage

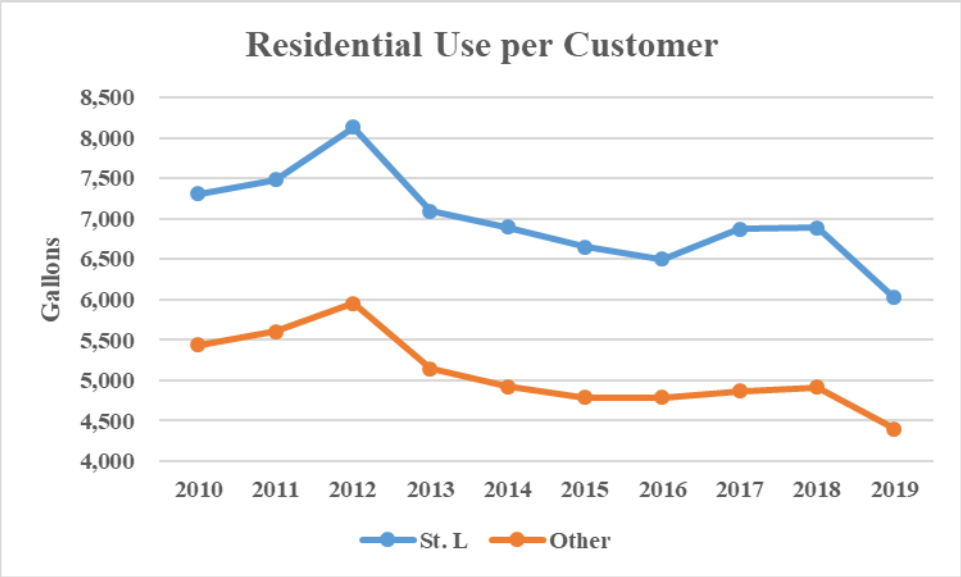
Q. How did you determine that 6,596 and 4,727 gallons per customer were the appropriate normalized usages for MAWC's residential St. Louis County and Other customer classes?

A. As should be the first step in any analysis, I spent considerable time reviewing historical usage data.

Q. What usage data did you review?

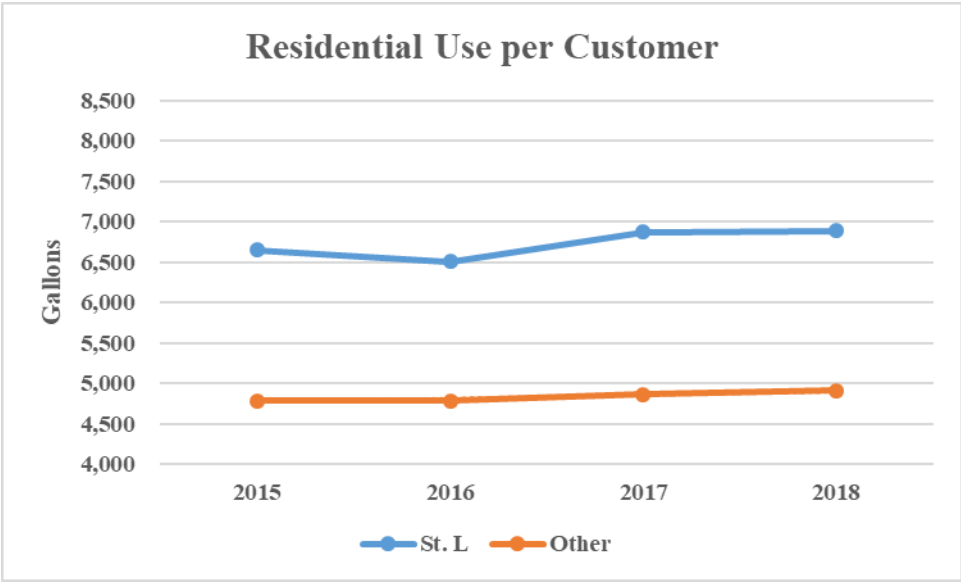
A. I started with a review of the annual residential usage per customer from 2010 through 2019 shown in the graph below.

[1] Through the rest of this testimony, this group of customers are called the "Other" class.



Q. What did you learn from this graph?

A. This graph shows declining usage over the ten years. However, a closer look at the years of 2015 through 2018 show that, over this recent time period, usage per customer has not been declining. In fact, the data showed that usage per customer was actually increasing as shown in the graph below.



From 2015 through 2018 the usage per residential customer for the St. Louis County and Other classes increased by 3.58% and 2.63% respectively.

Q. Is this increase in customer usage due to the systems that MAWC purchased during this time?

A. No. This analysis is on usage per customer data meaning that the number of customers is not driving the increase in usage.

Q. What did you conclude from your review of the data?

A. While usage per customer has dropped since 2010, it seems that, prior to 2019, the decline stopped in 2015. Since the customer usage relied upon to determine revenue and design rates is supposed to be a representation of future usage, using data prior to 2015 is inappropriate.

Q. Given this information, how did you calculate the normalized usage values?

A. This information provides only five data points to determine normalized usage, which is not enough data to do a regression analysis that takes into account weather variables.[2] Therefore, I averaged the last three years of annual data from 2017, 2018, and 2019 to determine a normalized usage.

Q. Why is using an average of the annual usage for 2017 through 2019 appropriate?

A. Using a three-year average allows the possibility that whatever caused the drop in usage in 2019, could occur again while placing more likelihood on the probability that usage will increase back to what it was in 2017 and 2018. In fact, by

[2] If time, temperature, and precipitation are included in a regression analysis with just five independent data points, the degrees of freedom would be just one meaning. Degrees of freedom is the number of independent pieces of information on which the estimate is based. One piece of information is insufficient to measure a relationship.

including it in the calculation, we are assuming that there is a one in three chance that low usage such as what happened in 2019 will happen again.

Q. Why are you placing more probability on the usage increasing back to what it was in 2017 and 2018?

A. I received usage data from MAWC through September 2020 in response to OPC data request 8002.1. This data shows that the usage per customer for 2020 is higher than the usage in 2019 through September. Therefore, I believe that future usage is more likely to return to the pre-2019 level.

Q. Why are you using an average of three years instead of five?

A. MAWC uses a three-year average to determine its usage levels for commercial customers outside of St. Louis County and its Industrial, Other Public Authority and Sale for Resale customers. For consistency, I also chose to use three-year averages for the residential classes.

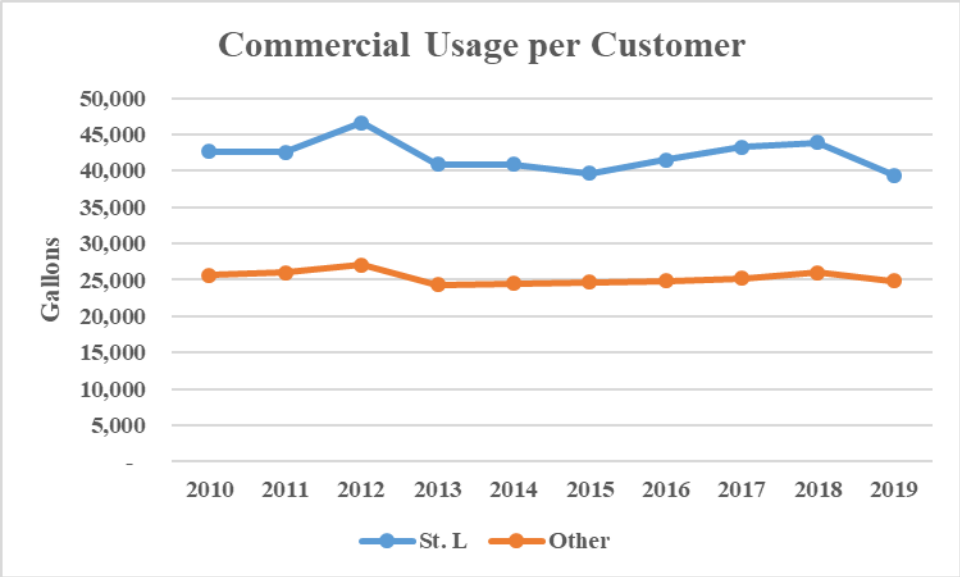
Q. What is your recommendation to the Commission regarding normalized usage for MAWC's residential classes?

A. I recommend the Commission find the average per customer residential usage is 6,596 gallons per customer for St. Louis County and 4,727 gallons per customer for its other residential customers. These are normalized values calculated as the average of the annual usages for 2017, 2018, and 2019 based on the Company's own data.

Normalized Commercial Usage per Customer

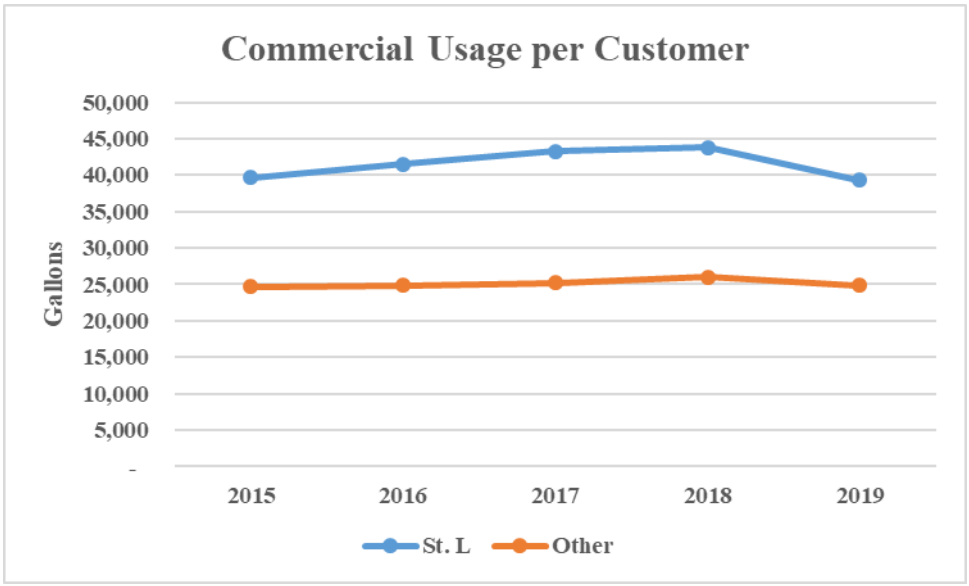
Q. Did you review the usage per customer data for the Commercial classes?

A. Yes. The graph below shows the annual average usage for MAWC's St. Louis County and Other commercial classes for 2010 through 2019.



Q. What do you conclude from this graph?

A. Like with the residential data, I notice that beginning in 2015, usage per St. Louis County commercial customers increased until 2019 when it dropped. While this can be seen in the graph above, it is more obvious when just graphing 2015 through 2019 as shown below.



This graph also shows that the usage per commercial customer in MAWC's non-St. Louis County class has remained constant over the last five years with just a small decline in 2019. In fact, the usage per customer for MAWC's St. Louis County commercial customers from 2015 through 2018 actually increased 10.63% and its Other commercial class increased by 5.4%.

Q. What do you recommend to the Commission after your review of the MAWC's commercial class usage?

A. I recommend the Commission find the normalized annual usage per customer of MAWC's St. Louis commercial class to be the average of the actual annualized usage from 2017 through 2019 at 42,151 gallons per customer.

For MAWC's Other commercial class, my analysis shows that MAWC's normalized usage of 25,356 gallons per customer calculated as the average of the actual usage over the three years of 2017, 2018, and 2019 is a reasonable estimate. Therefore, I recommend the Commission use 25,356 gallons per commercial customer to calculate revenues for this class.

Q. Does this conclude your direct testimony?

A. Yes, it does.

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
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
ER-97-394, et. al.	Direct, Rebuttal, Surrebuttal	Weather Normalization of Class Sales Weather Normalization of Net System Energy Audit Tariff

Case No.	Filing Type	Issue
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

Importance of Normalizing Usage in a Rate Case

A Whitepaper

Lena M. Mantle, PE

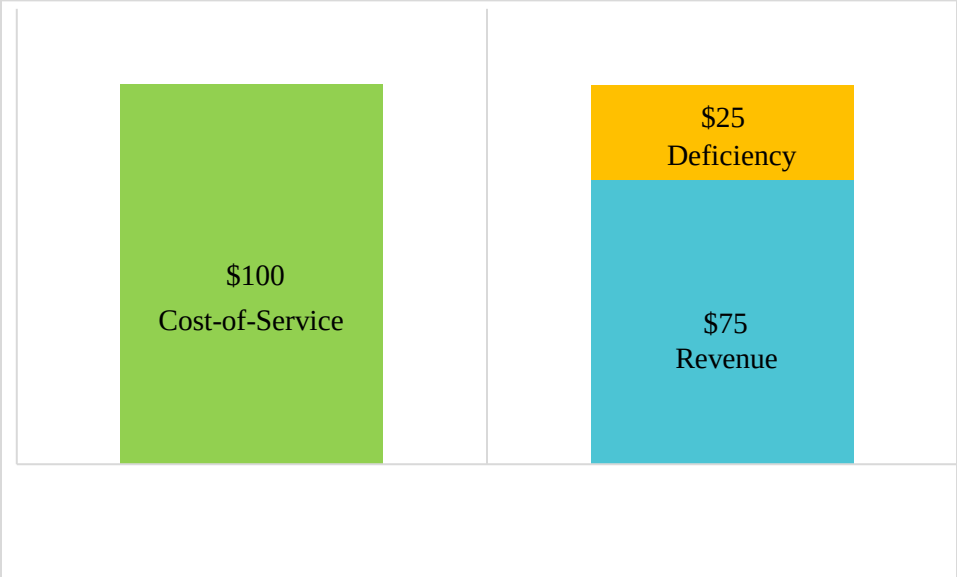
Senior Analyst

Office of the Public Counsel

November 23, 2020

Introduction

A comparison of revenues with the utility's cost-of-service - current, requested, and ordered - is fundamentally a test of the adequacy of the rates. If revenues are less than the cost-of-service, comparison of the current revenues to the requested cost-of-service gives the amount of increase the utility is requesting. A comparison of the ordered cost-of-service will give a measure of how much the revenues need to be changed to achieve the revenue requirement ordered by the Commission. This relationship is shown in the chart below.



In this chart, the cost-of-service is $100. The revenue is $75 signifying a deficiency of $25. In this situation, the rate increase to recover the cost-of-service would be the $25. If current rates were $0.10 per thousand gallons, the new rates to cover the deficiency would be $0.125 per thousand gallons increasing rates by 25%.

There are two main drivers in revenues 1) the number of customers, and 2) the usage of the customers. This whitepaper describes the importance of using a normalized usage to determine revenue deficiency and rate design once a revenue requirement is determined.

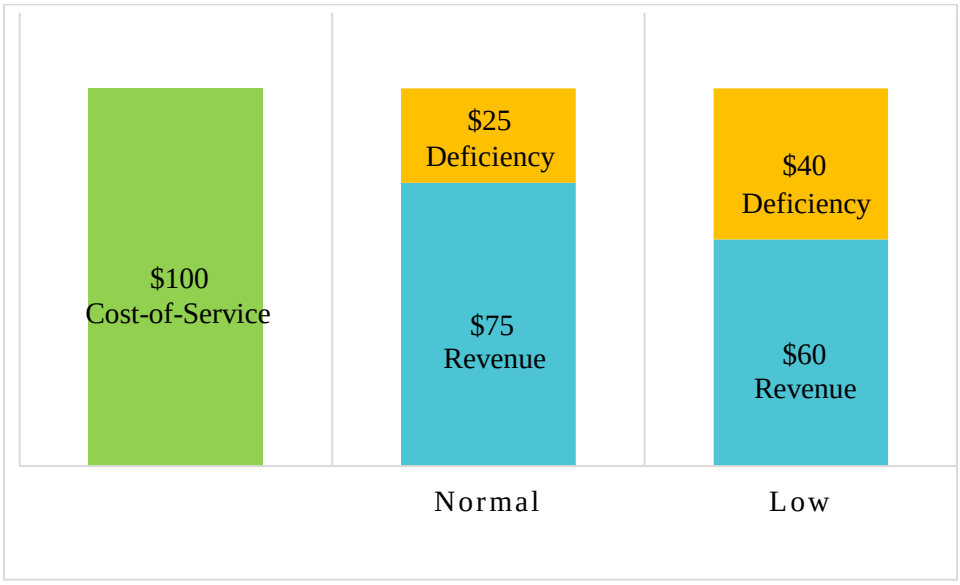
In a rate case, costs are annualized[1] and normalized[2] to give an appropriate estimate of the ongoing expenses of the utility. Some of these costs are driven by the commodity delivered and some are fixed costs. Just as the costs are normalized and annualized so should the revenues.

[1] Annualization adjustments are required when changes have occurred during the test year that are not reflective of a full year in the unadjusted test year results. .
[2] Normalization adjustments are required when the test year reflects the impact of an abnormal event.

Revenues that are set too high will result in the utility not having the opportunity to cover its costs and earn the return set by the Commission. Revenues that are set too low will result in higher bills for the customers and the utility earning more than the return set by the Commission.

Impact of Using Lower than Normal Usage

If usage during the test year was lower than normal resulting in low revenues, the deficiency between the revenues and the cost-of-service is greater than the deficiency given normal usage as shown in the chart below.

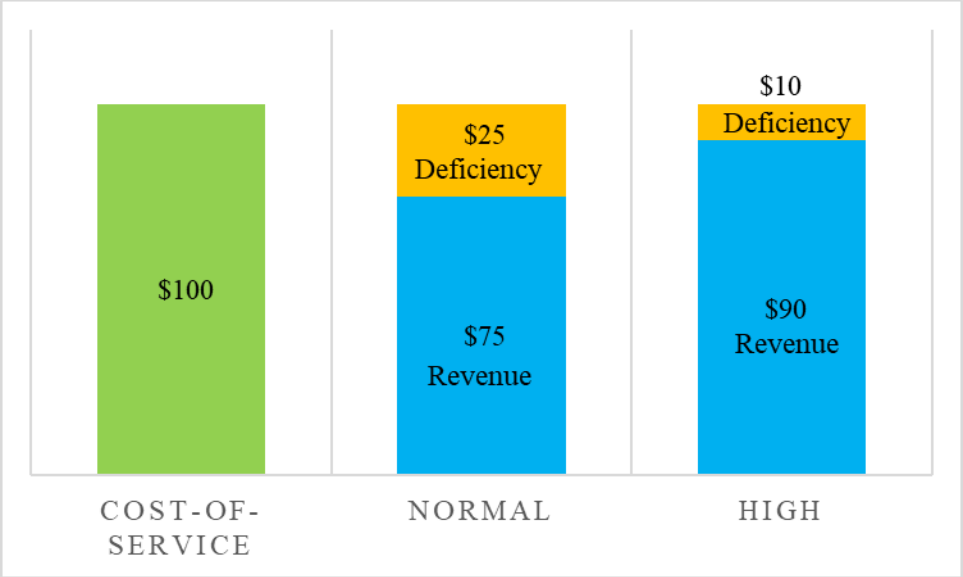


In this example, the cost-of-service is still $100. Under normal usage, revenue would be $75, and the deficiency in revenues to recover that cost-of-service is $25. If the actual test year revenues are used and this actual is less than normal due to lower than normal usage, when compared to the cost-of-service, the deficiency of revenues is higher at $40. Assuming current rates are $0.10 per thousand gallons, if the lower revenues, based on below normal usage, were used to determine revenue deficiency, the rates would be raised to $0.140 per thousand gallons – 15% higher than if normalized usage was used.

Customers' bills would be higher if the lower usage was used to set revenue and it should be much easier for the utility to earn a return higher than what was used in its cost-of service.

Impact of Using Higher than Normal Usage

Using higher than normal usage to determine revenue results in rates that make it difficult for the utility to earn the return on equity included in its cost-of-service. The relationship is shown in the next chart.



In this example, the actual test year usage was higher than the normalized usage resulting in $90 of revenue. When comparing this revenue to the cost-of-service of $100, the deficiency is measured at $10. If rates were set based on this $10 deficiency, a $0.10 per thousand gallon rate would only change to $0.110 which is less than the $0.125 that the rates would have been had normal usage been used to determine the deficiency. If the rate of $0.125 was necessary on a normalized basis to recover its cost-of-service, the utility would either need to find ways to cut its costs or ask for another increase in its rates.

Importance of Normalized Usage in Rate Design

A general rate case results in the Commission ordering a revenue requirement that allows cost recovery of normalized and annualized costs. Rate design, at its simplest is the revenue requirement divided by billing determinants. Usage is a billing determinant. Given a set revenue requirement, the higher the usage, the lower the rate. The lower the usage, the higher the rate. This relationship is shown in the table below.

Revenue Requirement = $100

	Low	Normal	High
Usage	780	880	980
Rate	$0.13	$0.11	$0.10
Revenue Recovered	$113	$100	$90

In this example, the ordered revenue requirement is $100. The rates calculated using low, normal, and high usage vary from $0.13 calculated using the low usage to $0.10 when the high usage is used. Given normal usage, the "low" rate would provide 13% more revenue than the revenue requirement set by the Commission resulting in high bills for customers and overearnings by the utilities. If the "high" rate is used, the customers' bills would be low and the utility would earn only 90% of its revenue requirement.

Conclusion

Determining normalized usage is important to both the utility and their customers in a rate case in calculating both the revenue deficiency and the rates that will be charged. Usage that is abnormally low results in higher rates for the customers. Usage that is abnormally high takes away some of the opportunity of the utility to earn a fair return. The Commission should attempt to use a normalized usage that balances the interests of both the customers and the utility.