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REBUTTAL TESTIMONY

OF

GEOFF MARKE

Submitted on Behalf of
The Office of the Public Counsel

MISSOURI-AMERICAN WATER COMPANY

CASE NO. WR-2017-0285

**

**

Denotes Confidential Information
that has been redacted

January 17, 2018

CPC Exhibit No. 204
Date 3-06-18 Reporter KF
File No. WR-2017-0285

PUBLIC VERSION

**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.) File No. WR-2017-0285

AFFIDAVIT OF GEOFF MARKE

STATE OF MISSOURI)
) ss
COUNTY OF COLE)

Geoff Marke, of lawful age and being first duly sworn, deposes and states:

1. My name is Geoff Marke. I am a Regulatory Economist for the Office of the Public Counsel.
2. Attached hereto and made a part hereof for all purposes is my rebuttal testimony.
3. I hereby swear and affirm that my statements contained in the attached testimony are true and correct to the best of my knowledge and belief.




Geoff Marke
Chief Economist

Subscribed and sworn to me this 17th day of January 2018.



JERENE A. BUCKMAN
My Commission Expires
August 23, 2021
Cole County
Commission #13764037



Jerene A. Buckman
Notary Public

My commission expires August 23, 2021.

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REBUTTAL TESTIMONY

OF

GEOFF MARKE

MISSOURI-AMERICAN WATER COMPANY

CASE NO. WR-2017-0285

I. INTRODUCTION

Q. Please state your name, title and business address.

A. Geoff Marke, PhD, Chief Economist, Office of the Public Counsel (OPC or Public Counsel),
P.O. Box 2230, Jefferson City, Missouri 65102.

Q. Are you the same Dr. Marke that filed direct testimony in WR-2017-0285?

A. I am.

Q. What is the purpose of your testimony?

A. The purpose of my rebuttal testimony is to respond to the revenue requirement direct
testimony regarding:

- Lead Line Replacement Complaint
- Future Test Year
 - Missouri American Water Company (“MAWC” or “Company”) witness
James M. Jenkins
- Decoupling (“Revenue Stabilization Mechanism” or “RSM”)
 - Company witness James M. Jenkins and John M. Watkins
- Residential Usage
 - Company witness Gregory P. Roach
- Public-Private Coordination
 - City of Jefferson City, Missouri witness Britt E. Smith, PE

1 **II. LEAD LINE REPLACEMENT**

2 **Q. Please remind the Commission on OPC's position from direct testimony.**

3 A. OPC filed placeholder testimony signaling parties that we were reserving our right to file
4 comments based on the Commission's Report and Order in WU-2017-0296 which was
5 issued the evening direct revenue requirement testimony was due this rate case. All three
6 rounds of my testimony from WU-2017-0296 were included as attachments in my direct
7 testimony.

8 **Q. Has OPC argued that the Company's lead line replacement is unlawful?**

9 A. Yes, OPC has argued that the Company's lead line replacement program is unlawful.
10 MAWC's tariff violation was put forward by Public Counsel during the WU-2017-0296
11 hearing and again in OPC's post-hearing brief which stated:

12 Since January 2017 MAWC has been violating its Commission-approved tariff. As
13 the Commission is aware, a tariff has the same force and effect as a statute and that it
14 becomes state law when approved by the Commission (*See State ex rel. Union Elec.*
15 *Co. v. Pub. Serv. Comm'n*, 399.SW.3d 467, 477 (W.D. Ct. App. 2013). The
16 Company has not asked for any relief that would resolve the current violations as
17 required by Section 386.270 RSMo and has, instead, focused only on recovering the
18 money associated with the project.¹

19 Please refer to attachment GM-1 which contains a copy of OPC's post-hearing brief from
20 WU-2017-0296. Pages 5-12 articulate the Company's tariff violations in full detail.

21 **Q. Did the Commission make a determination about the lawfulness of the Company's lead
22 line replacement program or the treatment of costs in WU-2017-0296?**

23 A. No. The Commission deferred such a determination in WU-2017-0296. Consistent with the
24 Commission's Order, OPC is raising these issues to be "addressed in MAWC's pending rate

¹ WU-2017-0296: Office of the Public Counsel's Post-Hearing Brief. p. 12.

1 case.” For the same reasons identified in OPC’s Post-Hearing Brief, OPC continues to argue
2 that MAWC’s program is unlawful.

3 **Q. How did the Commission’s Order in WU-2017-0296 advise parties to address concerns**
4 **with the lawfulness of the lead line replacement program and the treatment of costs?**

5 A. The Commission granted the AAO and stated:

6 The other issues some parties have raised, such as regulatory asset treatment of the
7 costs, alleged tariff violations, and the necessity of the LSLR itself, can be addressed
8 in MAWC’s pending rate case. Indeed, an AAO is simply approval to defer costs, the
9 ultimate recovery of which may be considered in a future rate case. The recovery of
10 those costs is in no way guaranteed by the Commission granting an AAO.²

11 **Q. What is OPC’s position?**

12 A. MAWC should not be permitted rate recovery of imprudent costs. OPC has argued that costs
13 incurred associated from this program are services not authorized by the Company’s tariff,
14 and are therefore imprudently incurred.

15 **Q. Do you have any additional comments to make?**

16 A. This is a multi-layered, complicated problem, now made more so by the Company’s failure
17 to provide supplemental direct testimony regarding how they plan to move forward with lead
18 line replacement in the context of its proposed future test year. The issue of lead line
19 replacement cuts across public health, scientific, technical, and legal arenas and should not be
20 viewed as a linear engineering exercise alone. OPC believes the potential health, economic
21 and regulatory implications are far-reaching, unprecedented, and ultimately beyond the scope
22 of the Commission’s appropriate purview. Necessary stakeholders are absent and an open,
23 honest dialogue is required, which to date has been stunted. Given the depth of potential
24 outcomes and risks, OPC firmly believes this is an issue for the Missouri legislature.

² WU-2017-0296, Report and Order, p. 10

1 **III. FUTURE TEST YEAR**

2 **Q. Please provide a general summary of the Company's request.**

3 A. According to Company witness Mr. Jenkins, MAWC is seeking approval of a future test year
4 based on the following projections:

5 Missouri-American's future test year in this case is a product of a careful projection
6 of measurable data from:

- 7 • A normalized and fully historical base year (12 months ended December 31,
8 2016);
9 • Through a verifiable link period (January 1, 2017 to May 31, 2018); and then,
10 • Across a period covering the first year that new rates are expected to be in place
11 (12 months ending May 31, 2019).³

12 **Q. Does Mr. Jenkins offer any ratepayer benefits that would result from a departure from
13 a historical test to a future test year?**

14 A. It's difficult to identify any in his testimony. The best example I could find articulating why a
15 future test year is in the public interest is as follows:

16 Over the longer term, depending on the overall rate case outcomes, it's possible this
17 can lead to fewer rate cases and to overall better, more reliable, more affordable
18 service.⁴ (emphasis added)

19 **Q. Is it "possible" that a future test year could lead to fewer rate cases, overall better, more
20 reliable, and more affordable service?**

21 A. I do not know if it's possible. I do not believe it is probable, nor do I think it will best serve
22 the public interest.

³ Direct Testimony of James M. Jenkins, p. 10, 18-23 & p. 11, 1.

⁴ Ibid. p. 13, 9-11.

1 **Q. What do you believe is probable if a future test year is approved?**

2 A. The rate cases will most assuredly become more costly and more complex as intervener's
3 would bear the burden of validating predictions and estimates. Whether a future test year
4 would enable water service to be better overall, more reliable, and more affordable would
5 appear to be a difficult proposition to guarantee (hence, the conditional "it's possible"); thus,
6 it appears equally (or arguably more) "probable" a future test year will result in an overall net
7 detriment to the public and socially undesirable rates. I believe this is primarily due to the
8 pronounced asymmetric information advantage the Company has.

9 **Q. What do you mean by asymmetric information?**

10 A. In markets plagued by information asymmetry, the market player holding an information
11 advantage will likely dominate the outcome at the expense of others. This is also known as an
12 example of market failure.⁵ Utilities have a clear advantage over other parties in
13 understanding their operations and what constitutes efficient management. In the free market,
14 consumers can exercise their power of choice by taking their power elsewhere or by
15 becoming a more informed shopper.⁶ Captive ratepayers are afforded no such luxury and
16 must depend on credible regulatory oversight and consumer protections to provide just and
17 reasonable rates.

18 Although there already are information asymmetries giving utilities advantages with a
19 historical test year, a future test year risks compounding the problem even further. For
20 example, and to help illustrate this point, the Company can make post-rate case management
21 decisions that allow them to shed costs (e.g., firing employees to decrease payroll expense)
22 while reaping the benefits of inflated projections of payroll expense. In fact, in this case, the
23 Company projects filling vacant payroll positions, but elsewhere in testimony, the veracity of

⁵ In Nobel Prize winning economists George Akerlof's seminal work, "The Market for Lemons': Quality Uncertainty and the Market Mechanism," Akerlof described the market failure of asymmetric information (or adverse selection) inherent in the used car market. Many of the principles formulated in Akerlof's work are also applicable to regulation as well as the risk to ratepayers in adopting a future test year.

⁶ In fact, a preponderance of economic theory clearly suggests that competition and competitive risk should lead not to higher but to lower prices and profit margins.

1 their projections become questionable because the Company is also claiming that jobs will be
2 cut as advanced metering is installed.

3 **Q. Does Mr. Jenkins offer any shareholder benefits that would result from departure from**
4 **a historical test to a future test year?**

5 A. Yes. He believes it will provide the Company “a realistic opportunity to earn its authorized
6 rate of return in the year they are implemented.”⁷

7 **Q. What is preventing the Company from earnings its authorized rate of return in the**
8 **future?**

9 A. I do not believe there is anything. Mr. Jenkins cites the lack of foreseeable customer growth
10 and declining household water usage in the face of rising capital investments.

11 **Q. Please respond.**

12 A. A prudent utility should have a fair chance of earning its authorized rate of return. However,
13 there is no guarantee that a prudent utility will earn close to or at its authorized rate of return.
14 To be clear, MAWC has always had positive net income; therefore, it has always recovered
15 its costs and had a positive return on investment. The authorized return sets a goal for the
16 utility—one that often is not reached (acting more as a ceiling than a threshold). Arguably,
17 achieving returns should be viewed as an ongoing challenge, not an entitlement, just as in a
18 competitive environment.

19 On a practical level, the Company’s ISRS substantially mitigates any possibility of future
20 potential earnings erosions. As was evident when the Company waited its three-year ISRS
21 term before filing its 2015 case.

22 As to the assertion that MAWC is not posed for considerable customer growth in the
23 foreseeable future, it would appear to be at odds with the public narrative put forward by
24 MAWC’s parent Company, American Water, who has identified acquisition growth as one of
25 its five areas of focus over the next five years, targeting:

⁷ Ibid. p. 12, 11-12.

1 Growth from acquisitions in our Regulated Businesses segment of \$600 million to
2 \$1.2 billion to expand our water and wastewater customer base with \$120 million to
3 240 million expected in 2017⁸

4 I will address Mr. Jenkins views on trends in residential household water usage later in this
5 testimony as he was not the primary witness on that topic.

6 **Q. Is there anything else you would like to comment on this topic?**

7 **A.** I think it is inappropriate that the Company failed to file direct testimony on the Commission
8 ordered Mueller Meter Investigation as Staff requested. As the Commission is well aware,
9 Staff made three recommendations:

10 As explained more fully throughout this report, Staff is of the opinion that MAWC:
11 (1) should have provided the Commission notice of the ongoing problem during its
12 previous rate case, and (2) **should address this matter in direct testimony in the**
13 **next rate case**; and, Staff (3) will propose ratemaking adjustments as necessary in the
14 next rate case to address any concerns related to the metering issues experienced by
15 MAWC and its customers.⁹

16 Mr. Jenkins is also well aware of the events that transpired in MAWC's last rate case. He was
17 there. Many of the Company's witnesses in WR-2015-0301 who filed direct testimony were
18 no longer employed by the time the case went to hearing. Not one, but two separate sets of
19 residential usage data were given to parties to work from and make sense of. The
20 aforementioned Mueller Meter issue came to light only days before surrebuttal testimony was
21 due and questions abounded regarding "acquisition terms" of small systems. In short,
22 MAWC's last rate case was *complicated* with past utility management at least partially to
23 blame. OPC finds it disconcerting to imagine the risk exposure ratepayers would have been

⁸ American Water (2016) Annual Report: The Cycle of Success p. 51.

<http://ir.amwater.com/Cache/1500097756.PDF?O=PDF&T=&Y=&D=&FID=1500097756&iid=4004387>

⁹ Wo-2017-0012 Staff Report Regarding the Investigation of Missouri-American Water Company ("MAWC") with Respect to MAWC's Faulty Water Meter and Negative Reserve Balance Issues as Disclosed during Rate Case No. WR-2015-0301. P.2

1 subject to if a future test year was endorsed in that case. We are also not entirely convinced
2 the issues have been adequately resolved in this rate case.

3 To be clear, OPC does not endorse a future test year for reasons articulated here and in direct
4 testimony. But even if OPC did, MAWC's recent managerial inefficiencies suggest that the
5 Company would not likely be the utility of first choice to serve as a test run case.

6 **IV. DECOUPLING**

7 **Q. Please provide a general summary of the Company's request.**

8 A. MAWC is seeking approval of a decoupling mechanism (aka "revenue stabilization
9 mechanism" or "RSM"). The Company argues this mechanism will allow them to earn their
10 authorized return, mitigate risks from fluctuations in weather and enable them to freely
11 promote demand-side energy efficiency and conservation programs.

12 **Q. What is OPC's position?**

13 A. The Commission should reject this request.

14 I have been advised by legal counsel that decoupling is not legally permissible in the State of
15 Missouri for a water utility. Only gas companies have a statutorily-enabled "opportunity" to
16 make an application to the Commission to approve a decoupling mechanism to reflect
17 variation in revenue increases/decreases due to weather, conservation/energy efficiency or
18 both. 386.266 contains three sections that expressly provide for interim energy charges or
19 periodic rate adjustments for certain types of utility service. They are listed in Table 1 as
20 follows:

1 Table 1: Summary of Statutorily Authorized Interim Rate Adjustments & Applicable Utility Service

Statute Section	Periodic Rate Adjustment Activity	Applicable Utility Service
382.266.1 RSMo	Fuel Adjustment Clause	Any electrical corporation
382.266.2 RSMo	Environmental Compliance Recovery	Any electrical, gas or water corporation
381.266.3 RSMo	Nongas revenue effects due to variation in weather, conservation or both	Any gas corporation

2 As can be seen by the summary, water corporations were not singled out for the opportunity
3 to seek single-issue ratemaking by the Commission under 381.266.3 RSMo. That opportunity
4 applies solely to a gas corporation. The Commission should also note that 382.266.7 RSMo
5 also explicitly recognizes that approval of single-issue ratemaking whether via revenue
6 assurance or accelerated cost recovery will impact the utility's risk profile and the
7 Commission is allowed to take that into account in setting appropriate allowed return. Section
8 382.266.7 RSMo states:

9 The commission may take into account any change in business risk to the corporation
10 resulting from implementation of the adjustment mechanism in setting the
11 corporation's allowed return in any rate proceeding, in addition to any other changes
12 in business risk experienced by the corporation.¹⁰

13 **Q. What is decoupling?**

14 **A.** The term "decoupling" is a blanket phrase that refers to a mechanism or rate design that
15 separates utilities' sales from its profits. A decoupling mechanism is a policy/accounting
16 tool that can be effective in removing the disincentive for utilities to promote energy
17 efficiency in certain situations or could merely transfer weather and economic risk to
18 ratepayers in other situations. Context and details matter otherwise this tool will not work
19 as intended. When "decoupling" is implemented as a mechanism, the "true-up" occurs

¹⁰ State of Missouri, Revisor of Statutes.
<http://revisor.mo.gov/main/OneSection.aspx?section=386.255&bid=21715&hl=>

1 outside of a rate case and adjusts in isolation of all relevant factors. This is also known as
2 “single-issue ratemaking” and is largely prohibited in the context of traditional rate of
3 return regulatory settings.

4 The Company’s preferred nomenclature, “revenue stabilization mechanism” or “RSM,” is
5 merely a rebranded term for decoupling. Revenues are “stabilized” or “guaranteed” while
6 ratepayer’s bills are “destabilized” through periodic true-ups outside the context of a rate
7 case and outside the context of all relevant factors.

8 **Q. From OPC’s perspective, what is the general argument and context for a decoupling
9 mechanism?**

10 A. A decoupling mechanism can be a regulatory tool to complement policy support for energy
11 efficiency programs, most appropriately with electric utilities in states where utilities are
12 statutorily required to meet resource standards. A decoupling mechanism could also be an
13 appropriate regulatory tool to be utilized during extreme, extended periods of conservation
14 rationing (e.g., the Southern California drought (2012-2017)).

15 **Q. From OPC’s perspective, what is the general argument and context against a
16 decoupling mechanism?**

17 A. It further distorts the free market proxy that regulation is supposed to substitute for by
18 shifting risk to captive ratepayers away from shareholders by ensuring recovery of the
19 Company’s profits irrespective of market conditions or inefficient utility behavior. For a
20 water company, the risk exposure to shareholders profits are, in part, present due to weather
21 volatility, fluctuations in the economy during periods of contraction (recessions) or the loss
22 of customers. A decoupling mechanism effectively eliminates all of these risks. If it is
23 ordered, it should be married to a large, explicit reduction in reward (i.e., a lower return on
24 equity).

1 **Q. Is the promotion of water efficiency programs an appropriate trade-off for a**
2 **Commission-approved decoupling mechanism?**

3 A. Categorically no. Imagine a spectrum of utilities where at one-end, ratepayer-funded
4 efficiency programs should be aggressively promoted and at the other end, ratepayer-funded
5 efficiency programs should be avoided in their entirety. MAWC would be one degree
6 removed from the Commission's regulated small water and sewer utility companies on the
7 avoided in their entirety side of the ratepayer-funded efficiency spectrum.

8 **Q. Please explain.**

9 A. First, it is important to note, that no one in this case is proposing to aggressively promote
10 ratepayer subsidized water efficiency measures. Nor is anyone proposing to increase the
11 \$150,000 pilot project budget from the last rate case. The Company merely states that a
12 decoupling mechanism "removes the disincentive to promote end use efficiency."¹¹ Perhaps
13 most importantly, no one *should* be aggressively promoting ratepayer subsidized water
14 efficiency measures. To date, we have not even been able to spend down the \$150,000
15 budget that was allocated almost two-years ago. Without going into great detail, as a member
16 of the committee assigned to providing guidance on the pilot, I can affirmatively state that it
17 has been a singularly unique challenge to try to spend down these funds.¹²

18 **Q. Putting aside the challenges of giving away or greatly reducing the price of efficient**
19 **water end-use measures, why does it not make practical sense to direct more ratepayer**
20 **dollars to this activity?**

21 A. On the whole, water is not a scarce resource in Missouri. Compared to water-strained states
22 out West, MAWC and its ratepayers benefit from being at the confluence of two of the

¹¹ See Direct Testimony of James M. Jenkins, p. 17, 17-18.

¹² To provide just one anecdotal example, I personally reached out to several homeless shelters in the hopes of "giving away" low-flow toilets in exchange for one-year worth of pre- and post-usage data to inform the feasibility of future efforts. I was ultimately unsuccessful in each of my attempts. In one case, I was told they did not want to receive the no-cost, "low-flow toilets" because they don't work well (i.e., they don't flush everything away).

1 largest rivers in the United States.^{13,14} This is not to suggest that OPC does not value the
2 efficient use of water; rather OPC offers that there is no cost justification that a ratepayer-
3 funded efficiency program is the most efficient policy option in which to maximize the
4 conservation of water and the embedded energy used in servicing that water. As it stands,
5 OPC cannot state with any confidence that saving a gallon of water is comparable to saving
6 an equivalent amount of kWh (electricity) or therm (natural gas). Additionally, the value of
7 that saved gallon of water will vary between class (source, conveyance, and treatment) and
8 district due to a variety of factors, including the size of the water system, pumping
9 requirements between geographic locations, and raw water characteristics.

10 For illustrative purposes, consider for a moment that there are over 300 miles separating the
11 districts of St. Louis Metro and St. Joseph. Hypothetically, if MAWC were to retrofit every
12 toilet, showerhead and faucet for every St. Joseph ratepayer, those actions would still have no
13 effect on deferring future capital investment in St. Louis. Again, this is because the water
14 systems (stations, treatment, and distribution) are uniquely local. The water source, its
15 abundance and its quality are all parochial. In the example above, even the electric provider to
16 the water system, the cost of the energy from that provider, and its impact on the environment
17 will differ considerably. Moreover, there may be situations where water usage should be
18 promoted based on underutilized infrastructure in specific water systems to spur economic
19 growth for local communities.^{15,16}

20 **Q. Are ratepayer-funded water efficiency programs common in the United States?**

21 **A.** No. Unlike electric or gas efficiency programs, ratepayer-funded water efficiency programs
22 are extraordinarily rare and largely confined to local municipal systems that are experiencing

¹³Missouri Department of Natural Resources (2015) Frequently Asked Missouri Water Resource Questions.
<http://dnr.mo.gov/pubs/pub1350.htm>

¹⁴Kammerer, J.C. (1990) Largest Rivers in the United States. USGS. <http://pubs.usgs.gov/of/1987/ofr87-242/>

¹⁵Downs, P (2014) St. Louis recruiters see water as a selling opportunity. St. Louis Post-Dispatch.
http://www.stltoday.com/business/local/st-louis-recruiters-see-water-as-a-selling-opportunity/article_62200991-18d5-543b-8920-af49714907ef.html

¹⁶Lueck, J. (2015) Drinking water-making a splash in economic development?
<http://mobizmagazine.com/2015/08/17/drinking-water-making-a-splash-in-economic-development/>

1 or are susceptible to water shortage risks or are otherwise mandated by the local, county, or
2 state governments.

3 **Q. Please summarize OPC's position on this topic.**

4 A. OPC does not believe a decoupling mechanism would be in the public interest. The
5 regulatory conditions necessary to utilize such a tool are not present. Approval of such a
6 mechanism would merely shift risk to captive ratepayers. To restate an earlier assertion:
7 MAWC has always had positive net income; therefore, it has always recovered its costs and
8 had a positive return on investment. The authorized return sets a goal for the utility—one that
9 often is not reached (acting more as a ceiling than a threshold). Arguably, achieving returns
10 should be viewed as an ongoing challenge, not an entitlement, just as in a competitive
11 environment.

12 The secondary argument for decoupling to enable water efficiency measures is without merit,
13 is not support by empirical evidence, and will only serve to needlessly raise rates.

14 **V. RESIDENTIAL USAGE**

15 **Q. Please explain the Company's position.**

16 A. Company witness Mr. Roach argues that there is a continuing decline of water use across all
17 MAWC zones, at various ranges, based on select months over a ten year period. Mr. Roach's
18 testimony then expounds on the reasons behind this:

19 This decline can be attributed to several key factors, including but not limited to:
20 increasing prevalence of low flow (water efficient) plumbing fixtures and appliances
21 in residential households, customers' conservation efforts, conservation programs
22 implemented by the federal government, state government, MAWC and other
23 entities, and price elasticity.¹⁷

¹⁷ Direct Testimony of Gregory P. Roach, p. 5, 19-23.

1 **Q. Is this the same testimony Mr. Roach's filed in the last rate case?**

2 A. In part. The data points are different but the theoretical argument is the same as it was in the
3 2015 case and, to my understanding, is the same narrative (joined with a requested
4 decoupling mechanism) American Water has maintained with each of its affiliates.

5 OPC witness Mrs. Mantle will be filing rebuttal testimony in response to Mr. Roach's
6 methodology and I will be commenting on the soundness with his theoretical argument. Like
7 Mr. Roach, much of my testimony echoes arguments made in the last MAWC rate case. The
8 issue was ultimately withdrawn by the Company before it went to hearing.

9 **Q. According to Mr. Roach, how long will his alleged trend take place?**

10 A. It's not entirely clear. At different points in his testimony Mr. Roach states:

- 11 • "May continue for up to the next 30 years."¹⁸
- 12 • Citing a 2012 American Water Works Association ("AWWA") article: "the
13 trend in declining usage will likely continue to occur for at least the next
14 fifteen years."^{19, 20}
- 15 • "Given that the implied theoretical term of the trend is 40 years, all factors
16 staying the same, the trend could continue for an additional 23 years."²¹

17 Previously, in WR-2015-0301, he stated:

- 18 • "Given the implied theoretical term of the trend at 45 years, all factors staying
19 the same, the trend could continue for an additional 30 years."²²

¹⁸ Ibid, p. 5, 8.

¹⁹ Ibid. 31, 10-11.

²⁰ It should also be inferred that based on the recommendations of the 2012 article, the declining trend usage will now only be for another nine years.

²¹ Ibid. p. 34, 14-15.

²² WR-2015-0301 Direct Testimony of Gregory P. Roach. p. 16, 1-2

1 **Q. Has billing and usage data analysis posed a challenge for the water industry?**

2 A. Yes. There a number of articles and reports that speak to this problem. For example, according
3 to the AWWA:

4 Historically, the lack of consistent definition of terms and practices has
5 complicated the water industry's ability to measure, standardize, and compare
6 the utility performance. Even when precise definitions exist (e.g., population
7 served), many utilities are challenged when asked to provide accurate numbers
8 and rely instead on best available estimates.²³

9 This sentiment is also echoed in the Water Research Foundation / US EPA paper that
10 Mr. Roach cited²⁴ in his testimony which states:

11 *Misclassification of residential customers within utility database* - The water
12 industry does not have a standardized methodology for customer billing
13 classification. Academic research and industry officials acknowledge that most
14 water companies group customers according to similar "use characteristics"—
15 such as amount of water consumed, topographic constraints, and service type—
16 rather than actual property use. This approach poses a problem when water
17 consumption patterns are analyzed based on economic and demographic models.²⁵

18 The Commissions own Standards of Quality rule, 4 CSR 240-10-030 (37), explicitly
19 acknowledged and allow for error in the measurement of up to "five percent (5%) when
20 registering water at stream flow equivalent approximately one-tenth (1/10) and full normal
21 rating under the average service pressure."

²³Dziegielewski, B. & J.C. Kiefer (2010) *American Water Works Association Journal*,
http://www.hazenandsawyer.com/uploads/files/Journal_Article_Water_Use_and_Conservation_Metrics_and_Bench_marks.pdf

²⁴ Direct Testimony of Gregory R. Roach. P. 16, 1-2.

²⁵ Coomes P. et al. (2009) North America residential water usage trends since 1992. Water Research Foundation & US EPA <http://usi.louisville.edu/wp-content/uploads/2014/12/AwwARF-edits-92809.pdf>

1 **Q. Can you provide some examples of billing inconsistencies that could distort water usage?**

2 A. Yes. For example, MAWC's largest district, St. Louis Metro,²⁶ bills a large percentage of its
3 customers on a quarterly basis while other districts receive a monthly bill. Work in
4 behavioral economics suggests that the timing of payment will influence consumption
5 patterns. In short, if you pay as you consume you will tend to purchase less of a product.²⁷
6 This, also, runs into contrast to another example in trying to properly account for billing and
7 usage data of multifamily dwellings who are not metered and billed at a flat rate.

8 Finally, it is important to remind the Commission of the 23,833 Mueller meters that were
9 removed from operation and prompted a Commission ordered Staff investigation at the end
10 of MAWC's last rate case. Some of the highlights of that Staff investigation include the
11 following comments:

12 In instances where MAWC had customers with no recorded usage, it billed the
13 customers based upon a prior year's measurement of same period usage. **Based on**
14 **Staff's review, MAWC did not attempt to adjust customer bills for meter**
15 **readings that produced lower than actual usages.** At the February 2016
16 meeting, MAWC explained that an estimated level of 22,000 meters were replaced
17 during the period covering August 2015 through January 2016, with the most
18 significant number of replacements occurring during October 2015.(emphasis
19 added)²⁸ . . .

20 The period between meter reads, according to MAWC, is one (1) month for
21 districts other than St. Louis and three (3) months for the majority of the St. Louis

²⁶ This designation contributes to the confusion regarding usage and customer numbers. This district may show up as St. Louis County or St. Louis Quarterly. Sometimes it includes St. Charles County and sometimes St. Charles County data is analyzed separately. A consistent definition of MAWC's St. Louis area customers would alleviate this problem.

²⁷See Ariely, D. (2010) Predictably irrational, revised and expanded edition: The hidden forces that shape our decisions. & Dan Ariely's TED talk: Are we in control of our own decisions?

https://www.ted.com/talks/dan_ariely_asks_are_we_in_control_of_our_own_decisions?language=en

²⁸ WO-2017-0012 Staff Report Regarding the Investigation of Missouri-American Water Company ("MAWC") with Respect to MAWCs Faulty Water Meter and Negative Reserve Balance Issues as Disclosed during Rate Case No. WR-2015-0301. P. 3.

1 customers. Given the time period between reads, MAWC asserts that it is not
2 possible to determine the exact date that a meter began to fail. **The assumption is**
3 **that the meters were registering correctly before the meter died or started**
4 **reading slowly, but there is no way to definitively prove the exact time period**
5 **of the default.** (emphasis added)²⁹ . . .

6 **Finally this issue has impacted customer usages by some undeterminable**
7 **amount.** Staff points out that during the time frame of the defective metering issue
8 meter problems have reduced actual customer usage amounts by some unknown
9 degree. (emphasis added)³⁰

10 **Q. Moving on from the faulty meter issue for a moment, Mr. Roach only looked at three**
11 **months of consumption to determine base usage for MAWC's East District. Is it standard**
12 **practice to look at only three months of consumption a year to determine base usage?**

13 **A.** No. It appears as though American Water is the only utility that deploys this method. Even
14 then, which months and how many constitutes "base usage" is different across MAWC districts
15 and its affiliates in other states.³¹

16 **Q. What three months are used for MAWC's East District?**

17 **A.** In his analysis, Mr. Roach used the billing months of February, March, and April. These billing
18 months include usage in January, February, and March.

19 **Q. What months are used for MAWC's other districts?**

20 **A.** Mr. Roach used the billing months of January, February, March and April for the Southwest
21 District and Northwest District. These billing months include usage in December, January,
22 February, and March.

²⁹ Ibid. p. 6-7.

³⁰ Ibid. P. 17.

³¹ See the 2014 Indiana American Water rate case 44450

1 **Q. Do you have any concerns with the months selected?**

2 A. Although I understand the argument for a base usage. I do not agree that Mr. Roach's
3 methodology is appropriate. First, the months by themselves do not appear to be "winter
4 months." While most people naturally select December or January as winter months, both
5 months include periods where holiday breaks from work and especially school mean that
6 residents would generally be home more often than usual. Academic research on water demand
7 suggests that households with more occupants and children consume considerably more water
8 on average than those that do not.^{32,33} Reasonable minds can differ on the appropriateness of
9 failing to take this into account.

10 The real issue that should give the Commission pause is the variation in the selection of months
11 between districts. These deviations undermine the credibility of his results.

12 Far from being conclusive, further scrutiny of MAWC's analysis suggests that there is nearly
13 unlimited room to manipulate data, especially if one is predisposed to a specific outcome.

14 **Q. Mr. Roach asserts that water usage is declining because of efficiency, conservation and**
15 **price elasticity. Did the Company collect any data to substantiate these assertions?**

16 A. No. OPC issued the following data requests and received the following responses (listed
17 below) from the Company:

18 **OPC DR-2053**

19 Please disclose whether MAWC has conducted a price elasticity analysis on its
20 historical and/or proposed rate increase in relation to customer usage. If yes, please
21 provide said analysis.

22 In building its customer usage models, MAWC witness Roach has explored
23 how a number of variables, including price, affected base and non-base usage.
24 Generally, Mr. Roach has rejected the use of a price variable because he

³² Chen, X. et al. (2015) A benchmarking model for household water consumption based on adaptive logic networks. *Computing and control for the water industry*. <http://www.sciencedirect.com/science/article/pii/S1877705815026685>

³³ Klein B. et al. (2006) Factors influencing residential water demand: A review of the literature. http://sciencepolicy.colorado.edu/admin/publication_files/2006.28.pdf

1 found the price term to be highly autocorrelated with the time variable over
2 the historic period. . . . In other words, price is not a predictive variable for
3 non-base modeling. . . .³⁴

4 **OPC DR-2055**

5 Please provide a copy of any and all documents pertaining to any MAWC specific
6 residential end-use saturation studies performed in its service territory in the last ten
7 years.

8 MAWC does not have documentation pertaining to any specific residential
9 end-use saturation studies performed in its service territory in the last ten
10 years.³⁵

11 **OPC DR-2056**

12 Please provide a copy of any and all documents pertaining to any MAWC specific
13 customer water conservation studies performed in its service territory in the last ten
14 years.

15 There have been no MAWC specific customer water conservation studies
16 performed in the last ten years.³⁶

17 **OPC DR-2057**

18 Please provide a copy of any and all documents pertaining to any local government
19 conservation policies that have been in effect in MAWC's service territory from the
20 date current rates went into effect to present.

21 A search of local policies for some communities we serve was conducted.
22 Please see OPC 2057_Attachment 1 for a summary of local conservation
23 policies and where applicable, a web link to the policy.³⁷

³⁴ See GM-2

³⁵ See GM-3

³⁶ See GM-4

³⁷ See GM-5

1 **OPC DR-2058**

2 Please provide a copy of any and all documents pertaining to any state government
3 conservation policies that have been in effect in MAWC's service territory from the
4 date current rates went into effect to present.

5 We are not aware of any State of Missouri water usage conservation policies
6 that have been in effect in MAWC's service territory from the dates current
7 rates went into effect to present.³⁸

8 **OPC DR-2059**

9 Please provide a copy of any and all documents pertaining to any federal government
10 conservation policies that have been in effect in MAWC's service territory from the
11 date current rates went into effect to present.

12 To our knowledge there are no federal conservation policies that are in effect
13 for Missouri for water.³⁹

14 To summarize, there is no price elasticity study, no end-use saturation study, no customer
15 water conservation study, no federal conservation laws enacted, no state conservation laws
16 enacted, and only a handful of local municipalities who have some degree of water
17 conservation ordinances in place. Mr. Roach's entire argument of water efficient appliances
18 centers on the knowledge of federal appliance standards, time and the isolation of three or
19 more select months of metered residential data (of which approximately 24,000 were
20 removed due to inaccurate readings). He provided no analytical support of the impact of
21 efficiency, conservation and price elasticity on the usage of MAWC's customer usage.

22 **Q. Please comment on the federal efficiency standards.**

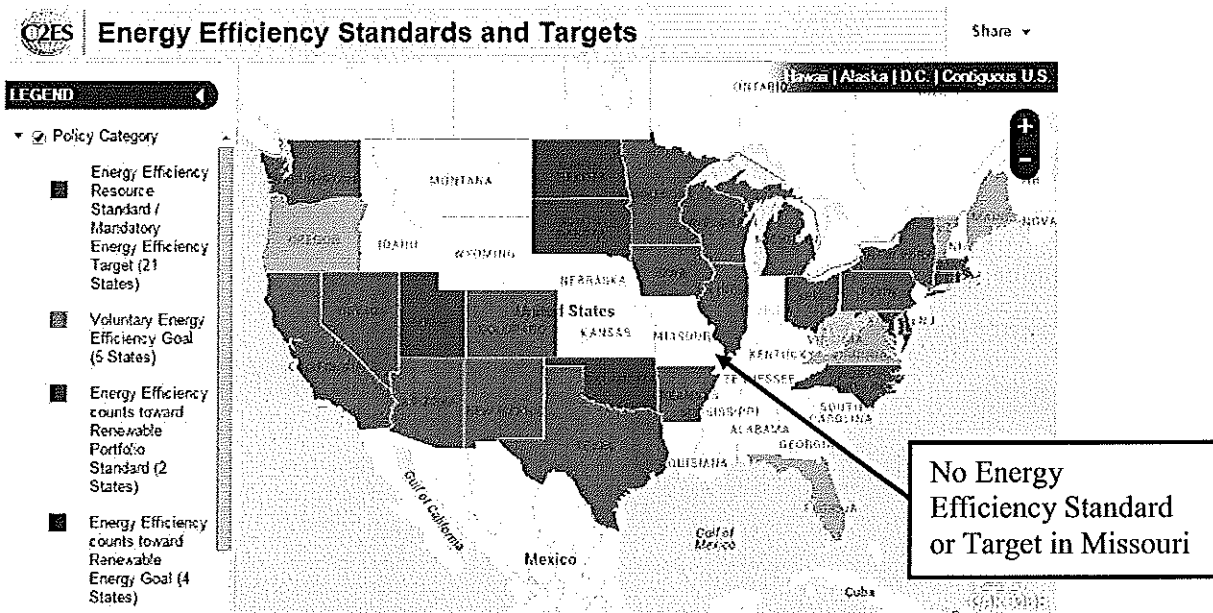
23 **A.** Federal appliance efficiency standards set minimum energy efficiency levels. They remove
24 the most inefficient products from the market while retaining consumer choice. Moreover, the

³⁸ See GM-6

³⁹ See GM-7

1 enactment⁴⁰ and enforcement⁴¹ of those standards has been inconsistent and has played out
2 unevenly over multiple years. Even then, the adoption of energy efficient end-use measures
3 varies widely across states largely based on state-mandated building codes, appliance standards
4 or energy efficiency standards. A look at U.S. energy policy on a state-by-state basis in Figure
5 1 through 4 from the Center for Climate and Energy Solutions shows the wide variation of
6 enacted policy across the nation.

7 Figure 1: Energy Efficiency Standards and Targets.⁴²

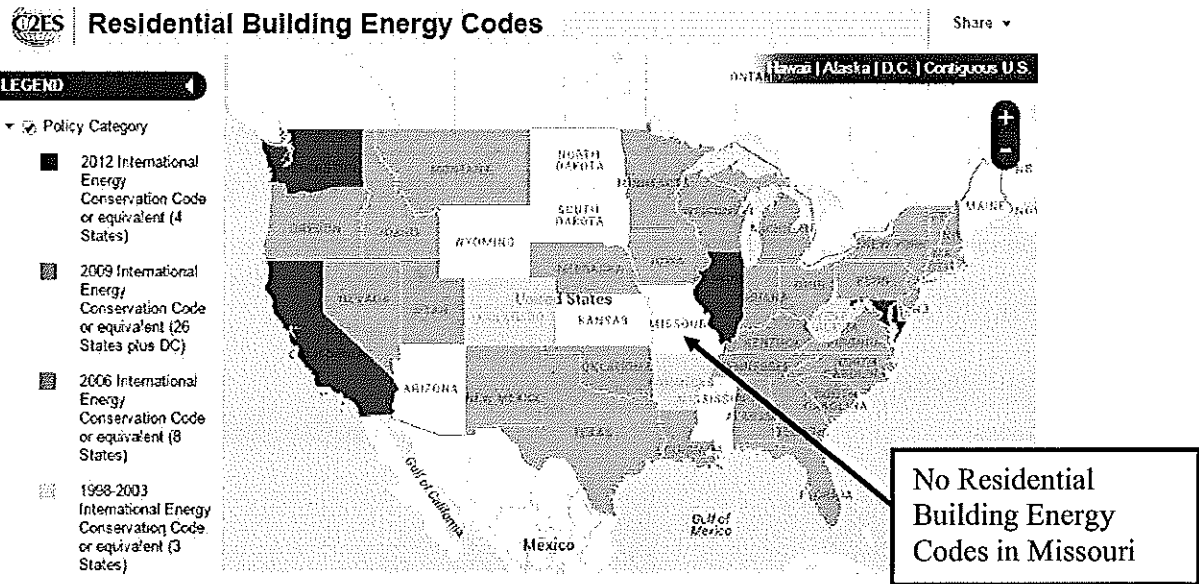


⁴⁰ Tomich, J. (2013) Feds withdraw new furnace efficiency standards. St. Louis Post Dispatch. http://www.stltoday.com/business/local/feds-withdraw-new-furnace-efficiency-standards/article_7ccf47e4-2e7b-55a4-a1fc-6c301b7eec7f.html

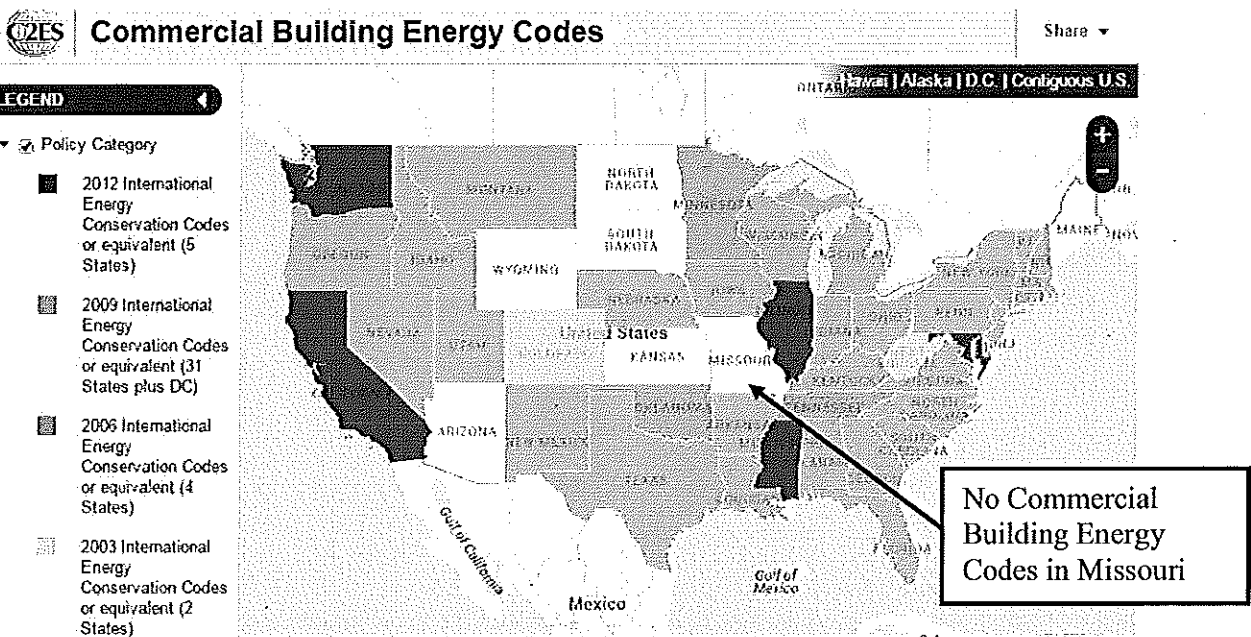
⁴¹ Dawson, K. (2013) US House blocks enforcement standards again. <http://thehill.com/blogs/floor-action/house/310167-house-again-blocks-enforcement-of-light-bulb-standards>

⁴² Center for Climate and Energy Solutions: Energy efficiency standards and targets (2015) <http://www.c2es.org/us-states-regions/policy-maps/energy-efficiency-standards>

1 **Figure 2: Residential Building Energy Codes:**⁴³



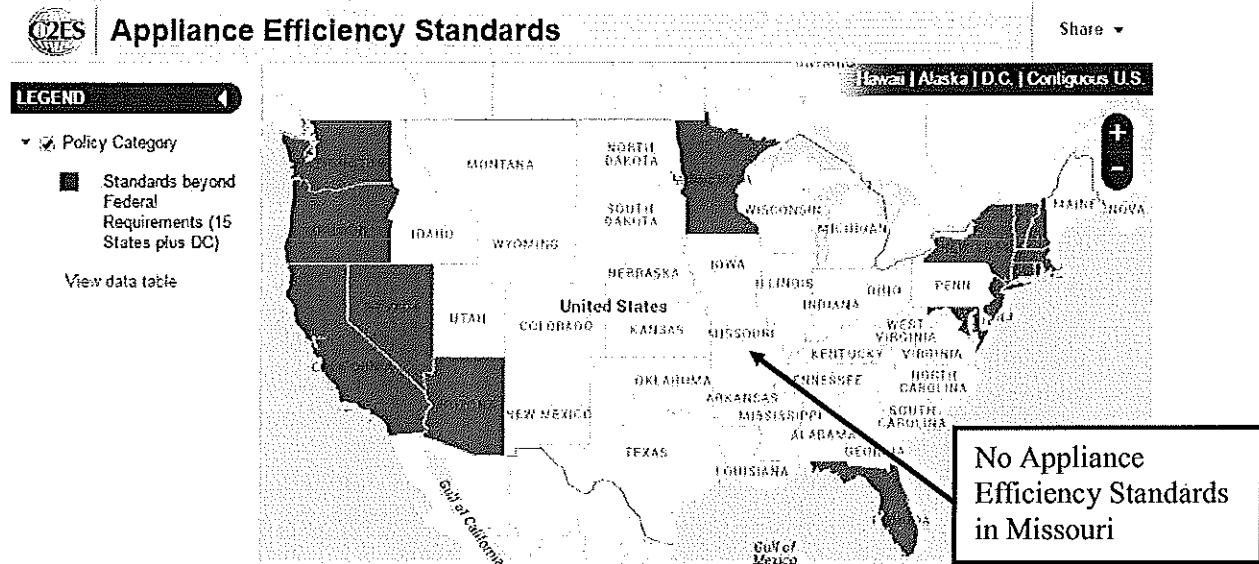
2
3 **Figure 3: Commercial Building Energy Codes:**⁴⁴



4
⁴³ Center for Climate and Energy Solutions: Residential building energy codes (2015) <http://www.c2es.org/us-states-regions/policy-maps/residential-building-energy-codes>

⁴⁴ Center for Climate and Energy Solutions: Commercial building energy codes(2015) <http://www.c2es.org/us-states-regions/policy-maps/commercial-building-energy-codes>

1 Figure 4: Appliance Efficiency Standards:⁴⁵



3 Figures 1 through 4 reveals that Missouri has no:

- 4 • Mandated Energy Efficiency Standards and Targets
- 5 • Residential Building Energy Codes
- 6 • Commercial Building Energy Codes
- 7 • Appliance Efficiency Standards

8 Only two other states—Kansas and Wyoming—share these characteristics. The fact that there
9 are no state-specific building codes or appliance standards in place in Missouri should temper
10 Mr. Roach’s hypothesis that water efficient appliances are meaningfully influencing water
11 usage.

12 In fact, according to the Alliance for Water Efficiency’s 2012 state scorecard (a report that
13 examined state laws and policies related to water efficiency and conservation), Missouri tied
14 for last in the nation with Alabama, Louisiana, Mississippi, North Dakota, and Wyoming. The

⁴⁵ Center for Climate and Energy Solutions: Appliance efficiency standards (2015) <http://www.c2es.org/us-states-regions/policy-maps/appliance-energy-efficiency>

1 results of each state are reprinted from the report and shown in Table 2. Missouri's individual
 2 scoring results are also reprinted from the report and shown in Table 3.

3 Table 2: AWE's water efficiency and conservation state scorecard results summary:

STATE	POINTS	GRADE
Alabama	2	D
Alaska	3	D
Arizona	23	B+
Arkansas	7	C-
California	29	A-
Colorado	16.5	B-
Connecticut	14	C+
Delaware	7	C-
Florida	11	C
Georgia	18.5	B
Hawaii	4	D
Idaho	3	D
Illinois	5	C-
Indiana	6	C-
Iowa	10.5	C
Kansas	10	C
Kentucky	13	C+
Louisiana	2	D
Maine	3	D
Maryland	7.5	C
Massachusetts	13	C+
Michigan	3	D
Minnesota	14.5	C+
Mississippi	2	D
Missouri	2	D

STATE	POINTS	GRADE
Montana	3	D
Nebraska	3	D
Nevada	17.5	B-
New Hampshire	17	B-
New Jersey	16.5	B-
New Mexico	14	C+
New York	11	C
North Carolina	11	C
North Dakota	2	D
Ohio	3.5	D
Oklahoma	3	D
Oregon	15.5	B-
Pennsylvania	3	D
Rhode Island	20	B
South Carolina	6.5	C-
South Dakota	4	D
Tennessee	4	D
Texas	29	A-
Utah	14	C+
Vermont	6	C-
Virginia	16.5	B-
Washington	21.5	B
West Virginia	4	D
Wisconsin	15.5	B-
Wyoming	2	D

4



1 Table 3: AWE's water efficiency and conservation state scorecard results for Missouri:

Missouri		Water Efficiency Scorecard		Grade: D
QUESTION	ANSWER	NOTABLE DETAILS	POINTS	
1. State agency in charge of drinking water conservation?	Department of Natural Resources		1	←
2. Water consumption regulation for toilets?	No		0	
3. Water consumption regulation for showerheads?	No		0	
4. Water consumption regulation for urinals?	No		0	
5. Water consumption regulation for clothes washers?	No		0	
6. Water consumption regulation for pre-rinse spray valves?	No		0	
7. Mandatory building or plumbing codes?	No		0	
8. Water loss regulation or policy?	No		0	
9. Conservation activities as part of water permitting process?	No		0	
10. Drought emergency plans required?	No		0	
11. Conservation planning required separate from drought plans?	No		0	
12. Authority to approve or reject conservation plans?	N/A		0	
13. How often are plans required?	N/A		0	
14. Planning framework or methodology?	N/A		0	
15. Implementation of conservation measures required?	N/A		0	
16. State funding for urban water conservation programs?	Yes		1	←
17. Technical assistance for urban water conservation programs?	No		0	
18. Does the state require volumetric billing?	No		0	
19. Percent of publicly supplied connections that are metered?	N/A		0	
20. ET microclimate information for urban landscapes?	No		0	
EXTRA CREDIT			0	
	TOTAL		2	

2

3 **Q. Does Missouri provide state funding for urban water conservation programs?**

4 **A.** Missouri does provide state funding for water conservation programs, but not specifically
 5 urban programs and not in a context that is relevant to this discussion. The Missouri
 6 Department of Natural Resources administers a grant program funded through the Parks, Soils
 7 and Water sales tax to help Missouri farmers with soil erosion by improving the state's water
 8 supply.⁴⁶ This state funded conservation program would have no impact on the residential

⁴⁶ Missouri Department of Natural Resources (2015) The Parks, Soils and Water Sales Tax. Conserving Soil and Water for Future Generations <http://dnr.mo.gov/pubs/pub2166.pdf>

1 water usage of MAWC customers. There have been no other state-funded water conservation
2 programs of which OPC is aware.

3 **Q. Does Mr. Roach provide any secondary sources to substantiate his claim that declining**
4 **residential water usage is pervasive across the nation because of efficient appliances?**

5 A. He cites to a handful of studies throughout his testimony,⁴⁷ but only two studies attempt to
6 empirically verify the water savings induced from efficient appliances. The first is a 2010
7 Water Research Foundation Report (previously cited in this testimony) in which Mr. Roach
8 states:

9 According to the 2010 Water Research Foundation (“WRF”) report, “many
10 water utilities across the United States and elsewhere are experiencing
11 declining water sales among households.” (WRF Report, p.1) The report
12 further states: “A pervasive decline in household consumption has been
13 determined at the national and regional levels.” (WRF Report, p. xxviii).⁴⁸

14 And the second, an article from the AWWA in which Mr. Roach states:

15 An article in the June 2012 issue of the AWWA Journal entitled “Insights Into
16 Declining Single-family Residential Water Demand” states: “Reduced
17 residential demand is a cornerstone of future urban water resource
18 management. Great progress has been made in the last 15 years and the
19 industry appears poised to realize further demand reductions in the future”⁴⁹

20 **Q. Have you reviewed these articles?**

21 A. Yes, and they are not as favorable as Mr. Roach would have the Commission believe. First, it
22 is telling that there have not been any more recent publications on this seemingly relevant topic.
23 In fact, these are the exact same studies quoted in his 2015 testimony. Even the scorecard
24 report that I reference above is now six-years old and has not been updated. Second, it is

⁴⁷ For example, a 2010 American Council of Energy-Efficient Economy (“ACEEE”) press release.

⁴⁸ WR-2015-0301 Direct Testimony of Gregory P. Roach p. 10, 3-7.

⁴⁹ Ibid. p. 11, 16-18 & p. 12, 1-2.

1 exceedingly difficult to make generalizations about the impact of water efficient appliances on
2 water usage because of the lack of a standardized methodology for billing and usage as well as
3 the localized and government-centric characteristics inherent in the water industry. For
4 example, speaking to the problems of standardized classification and data management
5 practices, the authors of the Water Research Foundation report, that Mr. Roach relies on, state:

6 Researchers faced difficulties in obtaining accurate data for measuring usage
7 and identifying patterns. **Water-usage data obtained from utilities reflect**
8 **information captured for billing and metering reason, not for analysis.** It
9 is challenging to assemble consistent household water-usage data over time
10 across utilities because of the lack of universal metering practices, a
11 standardized method for classifying customers and maintaining databases. . .

12 Though the water usage model developed for this study provides valuable
13 insight into the detailed structure of residential water usage, **these models are**
14 **still weak in explaining the huge variations in residential water usage**
15 **among the participating utilities. For a utility to adequately understand**
16 **the local factors influencing residential usage, it needs to conduct an in-**
17 **depth demographic study of existing customers** (emphasis added).⁵⁰

18 As an aside, it should be noted that the primary data utilized for this study was confined to only
19 one water utility in Louisville, Kentucky.

20 Mr. Roach's second referenced study is a literature review of water efficient end-use studies
21 from 2010 by authors William Deoreo and Peter Mayer of Aquacraft Inc. (a water engineering
22 and management consulting firm that specializes in end-use analyses and evaluations of water
23 conservation programs). I have reprinted the bibliography of that paper in Figure 5 to give a
24 sense of the scope of empirical work that exists on this nation-wide trend.

⁵⁰ Coomes et al. (2009) North American residential water usage trends since 1992. Water Research Foundation.
<http://usi.louisville.edu/wp-content/uploads/2014/12/AwwARF-edits-92809.pdf>

1 Figure 5: DeOreo and Mayer bibliography screenshot

DeOreo, W.B. & Mayer, P. <http://dx.doi.org/10.5842/jawwa.2012.104.C030>
Journal - American Water Works Association
Peer-Reviewed

Consortium for Energy Efficiency, 2011. Clothes Washer Standards. www.cce1.org/resid/seh/rwsh/reswash_specs.pdf (accessed Apr. 18, 2012).

DeOreo, W.B., 2011a. Analysis of Water Use in New Single Family Homes. Aquacraft Inc., Boulder, Colo. www.aquacraft.com/sites/default/files/pub/DeOreo-%202011-%20Analysis-of-Water-Use-in-New-Single-Family-Homes.pdf (accessed Apr. 18, 2012).

DeOreo, W.B., 2011b. Report On In-Home Water Use Patterns in Single Family Homes From Jordan, Project Number 278-06-06-00329 Aquacraft Inc., Boulder, Colo. www.aquacraft.com/sites/default/files/pub/DeOreo-%202011-%20Report-on-in-Home-Water-Use-Patterns-in-Single-Family-Homes-from-Jordan.pdf (accessed Apr. 25, 2012).

DeOreo, W.B.; Mayer, P.W.; Marten, L.; Hayden, M.; Funk, A.; Kramer-Duffield, M. & Davis, R., 2011. California Single-family Water Use Efficiency Study. Aquacraft Inc., Boulder, Colo. www.aquacraft.com/sites/default/files/pub/DeOreo-%202011-%20California-Single-Family-Water-Use-Efficiency-Study.pdf (accessed Apr. 18, 2012).

DeOreo, W.B.; Dietsmann, A.; Skeel, T.; Mayer, P.W.; Lewis, D.M.; & Smith, J., 2001. Retrofit Realities. *Jour AWWA*, 93:3:58.

DeOreo, W.B.; Heaney, J.P.; & Mayer, P.W., 1996a. Flow Trace Analysis to Assess Water Use. *Jour AWWA*, 88:1:79.

DeOreo, W.B.; Lander, P.; & Mayer, P.W., 1996b. New Approaches in Assessing Water Conservation Effectiveness. *Proc. Conserv96*, Orlando, Fla.

Heinrich, M., 2007. Water End-use and Efficiency Project (WEEP)—A Case Study. SB07 NZ Conference Transforming our Build Environment, Auckland, New Zealand. www.kranz.co.nz/cms_show_download.php?id=1007e933aa7e3b02ab5d072ca78d3c411421098b (accessed Apr. 18, 2012).

Lewis, D.M.; DeOreo, W.; & Dinatale, K., 1993. Flow Trace Analysis to Determine Irrigation Efficiency in a Large Municipal Water User. *Proc. AWWA 1993 Annual Conference and Exhibits*, Dallas.

Loh, M. & Coghlan, P., 2003. Domestic Water Use Study in Perth, Western Australia, 1993-2001. Water Corporation, Perth, Australia. www.watercorporation.com.au/_files/PublicationsRegistered/12/Domestic_water_use_study.pdf (accessed Apr. 18, 2012).

Mayer, P.W.; DeOreo, W.B.; Gpitz, E.M.; Kiefer, J.C.; Davis, W.Y.; Dziugalewski, B.; Nelson, J.D., 1993. Residential End Uses of Water. Water Research Foundation, Denver. www.waterrf.org/ProjectsReports/PublicReportLibrary/RR93721_1993_241A.pdf (accessed Apr. 19, 2012).

Roberts, P., 2005. Yarra Valley Water. 2004 Residential End Use Measurement Study. Melbourne, Australia. www.yvw.com.au/yvw/groups/public/documents/document/yvw1001680.pdf (accessed Apr. 18, 2012).

USD OE (US Department of Energy), 1992. Alternative Fuels & Advanced Vehicles Data Center. Federal & State Incentives & Laws. www.afdc.energy.gov/afdc/laws/key_legislation (accessed April 19, 2012).

Willis, R.; Steward, R.A.; Panuwatwanich, K.; Capati, B.; & Guirco, D., 2009. Gold Coast Domestic Water End Use Study. Water, September 2009. Brisbane, Australia. www.maruaelectronics.com.au/pdfs/willisetal2009goldcoastwater.pdf (accessed April 19, 2012).

2
3 There are fifteen citations referenced in the article.⁵¹ Of those fifteen citations:

- 4
- 5 • None were published after 2011;
 - 6 • Two are citing federal appliance standards, and thus, not studies;
 - 7 • Four are from studies conducted in either Australia or New Zealand; and
 - 8 • The remaining nine sources are self-citations by the authors.

9 Q. What is a self-citation?

10 A. It is when a research author cites themselves. This is generally frowned upon, as it might
11 convey an attempt at self-advertising. In this case, William DeOreo, the author of Mr.
Roach's cited article, is also the author of nine of the thirteen studies self-cited and is also the

⁵¹ There is one source on the previous page that references a 2005 Aquacraft study.

1 founder of Aquacraft (see also <http://www.aquacraft.com/about/>) which is also cited as an
2 empirical secondary source.

3 **Q. Please summarize your observations on the empirical literature cited on this topic.**

4 A. As it stands, it appears research into this field is either still very much in its infancy, is populated
5 by only a couple of researchers/consultants, or has largely been abandoned. Neither I, nor Mr.
6 Roach, have provided citations to any more recent quantitative studies since the last rate case
7 in which the most recent research is now already seven-years-old. As it stands, it appears to be
8 premature to definitively state that water efficient appliances are altering the water usage
9 landscape in the United States.

10 **Q. Mr. Roach references price elasticity as the third component contributing to the decline**
11 **in usage. What is price elasticity?**

12 A. Price elasticity measures the responsiveness of customer usage to price changes. More
13 precisely, price elasticity of water demand measures the sensitivity of water use relative to
14 changes in the price of water, after controlling for the influence of other factors that can also
15 alter water demand, such as income, weather, age of occupants, the economy, structure of
16 house, number of occupants within a house, density of the development, etc.

17 The demand for a good is said to be elastic (or relatively elastic) when it is greater than
18 one (in absolute value): that is, changes in price have a relatively large effect on the
19 quantity of a good demanded. In contrast, a good is said to be inelastic when it is less than
20 one: that is, less than the percentage change in price.⁵²

21 In general, water is considered to be an inelastic good and not that responsive (at least in
22 the short-term) to changes in price. However, there is a critical distinction between
23 “inelastic demand” and demand which is “unresponsive to price.” If demand is truly
24 unresponsive to price, price elasticity is equal to zero, and the demand curve would be a

⁵² Gallo, A. (2015) A refresher on price elasticity. Harvard Business Review. <https://hbr.org/2015/08/a-refresher-on-price-elasticity>

1 vertical line – the same quantity of water will be demanded at any price. This may be true
2 in theory, but it has not been observed for water demand more broadly in fifty years of
3 empirical economic analysis.⁵³

4 The price elasticity for water (or any good) will also vary across socio-demographic
5 considerations. High-income households will generally be less sensitive to water price
6 increases than low-income households.

7 **Q. Was a price elasticity analysis performed?**

8 A. No, as stated above in the referenced OPC data requests, no price elasticity analysis for MAWC
9 has been performed.

10 **Q. Do you believe past increases in MAWC's rates would have negatively impacted water
11 usage?**

12 A. I believe it is plausible, but the degree and extent of the impact is highly debatable and would
13 be difficult to identify with this historical data. We know that consumers generally behave as
14 if they are aware of water prices. Price elasticity estimates measure the reduction in demand
15 to be expected from a one percent increase in the marginal price of water, all else constant.
16 Confounding variables such as population growth, changes in weather or climate, increases
17 in average household income, or other factors can and will also influence the outcome.
18 Taking that into account, a price increase can reduce the rate of growth in water demand to
19 a level below what would have been observed if prices had remained constant. Of course
20 the same reduction may instead be due to the installation of faulty meters. In theory, if water
21 demand was truly unresponsive to price, the same quantity of water will be demanded at any
22 price.

⁵³ Olmstead, S. (2006) Managing water demand: price vs. non-price programs. Pioneer Institute for Public Policy Research. <http://s3.amazonaws.com/ebcne-web-content/fileadmin/misc/WaterPrice.pdf>

1 **Q. What is OPC recommendation regarding this issue?**

2 A. The Commission should adhere to the five-year average usage advocated by Staff and OPC
3 and dismiss both the requested decoupling mechanism and future test year as both requests
4 are premised on Mr. Roach's flawed assertions.

5 **VI. PUBLIC-PRIVATE COORDINATION**

6 **Q. Please summarize Jefferson City's concern and request.**

7 A. Jefferson City witness Mr. Britt Smith states that the lack of coordination between Jefferson
8 City's Public Works Department and MAWC has resulted and will continue to result in
9 wasteful ratepayer and taxpayer expenses. Namely, through the continued construction and
10 repair of public roads and company water lines that is exacerbated because of MAWC's
11 unwillingness to exchange information or engage in meaningful coordination with the city.

12 Mr. Smith provides a summary of the long term advantages of a transparent exchange of
13 information and coordination and requests that the Commission order the Company to
14 provide:

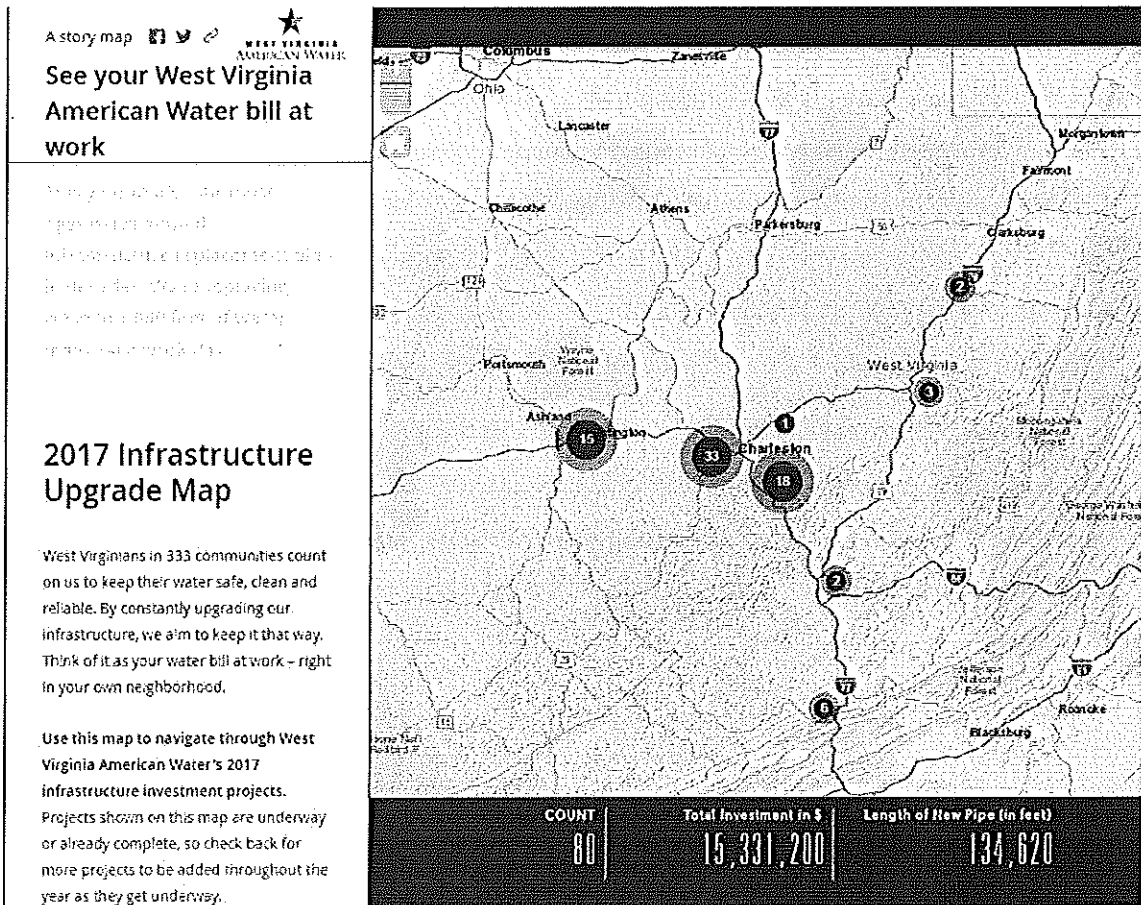
- 15 1.) Annual or multi-year capital expenditure plan;
- 16 2.) Leak studies of the Jefferson City service area system;
- 17 3.) Current pressure and volume model (with an understanding it be shared with the
18 fire department);
- 19 4.) The age of the water system infrastructure; and
- 20 5.) Current and subsequent versions of MAWC's Resource Supervised Plan as
21 outlined in 10 CSR 60-10.010(2)C.2.⁵⁴

⁵⁴ Direct Testimony of Britt E. Smith, p. 6 and 7.

1 **Q. What is OPC’s position regarding MAWC’s coordination with entities such as**
2 **Jefferson City?**

3 A. OPC supports Mr. Smith’s reasonable requests and applauds Jefferson City for engaging
4 stakeholders and bringing this topic before the Commission. OPC strongly supports greater
5 coordination, transparency and minimization of taxpayer and ratepayer dollars. The
6 Commission should order the Company to not only meet Mr. Smith’s practical requests, but
7 to extend the same information to each of municipal public works departments throughout its
8 service territory. Furthermore, the Commission should consider opening a working docket to
9 explore this issue in greater detail with explicit feedback from Missouri’s various public
10 works departments, the Missouri Municipal League and other utilities. If Jefferson City
11 proves not to be an anomaly, the Commission is an excellent position to help facilitate a
12 dialogue and promote positive public policy that defines the extent of “the problem,” and
13 constructively work on potential solutions moving forward. At a minimum, MAWC should be
14 adopting best practices its affiliates are already utilizing such as West Virginia American
15 Water’s (“WVAM”)’s online Infrastructure Upgrade Project Map as seen in Figure 6.

1. **Figure 6: West Virginia American Water Infrastructure Upgrade Project Map⁵⁵**



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3 The WVAW infrastructure upgrade map provides at least some cursory level of transparency

4 to customers, regulators and other relevant actors (e.g., local public works departments) to

5 review and confirm it's in the best interest of ratepayers (and taxpayers). No doubt, more

6 detail could and should be provided.

⁵⁵ West Virginia American Water 2017 Infrastructure Upgrade Map.
<https://wvaw.maps.arcgis.com/apps/MapJournal/index.html?appid=3ed2afbba7c346d4a8731633c8ca02c5>

1 **Q. Does OPC have any concerns due to the testimony of Mr. Smith?**

2 A. Yes. OPC was under the impression (perhaps naively) that regulated utilities—particularly
3 MAWC⁵⁶—were routinely coordinating with local municipalities and other utilities in a
4 transparent manner in the hopes of producing cost-effective outcomes when applicable. That
5 does not appear to be the case, at least insofar as it pertains to the insufficient coordination of
6 MAWC with Jefferson City. Mr. Smith’s examples raise prudence questions and provide a
7 concrete example that underscores the information asymmetry concerns echoed earlier in my
8 testimony regarding the inappropriateness of a future test year.

9 Of particular concern is Mr. Smith’s cited example of the major street improvement project
10 for East Capitol Avenue between Adams Street and Lafayette Street. Apparently, Jefferson
11 City contacted MAWC in late 2015 or early 2016 about the scope of the project and
12 anticipated commencement in the hopes that MAWC would replace its water main before the
13 City would begin. **

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⁵⁶ Anecdotally, this was the message conveyed publically by American Water CEO Susan Story at the 2017 annual meeting of National Association of State Utility Advocates in Baltimore.

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Further discovery is warranted on this subject before recommendations can be offered up by
OPC.

Q. Does this conclude your testimony?

A. Yes

⁵⁷ WU-2017-0296 Surrebuttal Testimony of Geoff Marke p.21, 3-10 & p. 22, 1-5.

⁵⁸ See also GM-8 which contains a copy of the OPC ** ** in WU-2017-0296

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**

In the Matter of the Application of)
Missouri-American Water Company for an) File No. WU-2017-0296
Accounting Order Concerning MAWC's)
Lead Service Line Replacement Program.)

OFFICE OF THE PUBLIC COUNSEL'S POST-HEARING BRIEF

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THE OFFICE OF THE PUBLIC COUNSEL'S POST-HEARING BRIEF

COMES NOW the Office of the Public Counsel ("Public Counsel" or "OPC") and presents its post-hearing brief to the Missouri Public Service Commission ("Commission") as follows:

I. Introduction

1. Missouri-American Water Company's ("MAWC" or "company") plan to replace customer-owned lead service lines may be a waste of \$180,000,000. The company failed to prove that full lead service line replacement results in lower water lead levels. The company failed to prove that full lead service line replacement results in lower blood lead levels. The evidence in the record demonstrates full lead service line replacement is no better at achieving either lower water lead levels or lower blood lead levels than the partial service line replacement the company has been doing for decades.

2. Despite the company's failure to prove that its plan to spend \$180,000,000 replacing lead service lines is better than the partial replacement is has done for decades, Public Counsel has worked to develop an outline for a pilot program as a legal way for the company to continue replacing customer-owned lead service lines while stakeholders (including those state agencies tasked with addressing water quality and monitoring blood lead levels, the Department of Natural Resources and Department of Health and Senior Services respectively) address the issues -- including the necessity and efficacy of full lead service line replacement.

3. The company's claims that this case is only about deferral authority are disingenuous. MAWC can defer costs into NARUC USOA Account 186, Miscellaneous Deferred Debits without the Commission issuing an Accounting Authority Order ("AAO").¹ Every witness testifying on the accounting treatment agreed.

4. OPC's Chief Accountant Mr. Charles Hyneman, a Certified Public Accountant in the State of Missouri, testified that a utility is never required to get permission from the Commission to book or to defer a cost to Account 186 (Tr. Vol. 2, p. 310). This testimony was corroborated by the testimony of both the Commission's Staff ("Staff") and company. The Staff's witness Ms. McMellen testified that neither the Uniform System of Accounts nor generally accepted accounting principles ("GAAP") require a company to obtain an order from the Commission prior to booking costs to Account 186 (Tr. Vol. 2, p. 257). Similarly, though less decisively, MAWC witness Mr. LaGrand testified that he was unaware of anything in GAAP that requires a finding of extraordinary before a company can book costs to Account 186 (Tr. Vol. 2, p. 179). Mr. Lagrand further testified he did not believe anything in GAAP requires the company to seek approval to defer costs into Account 186 (Tr. Vol. 2, p. 179). Yet, despite the foregoing consensus, MAWC still seeks an order permitting it to defer costs into Account 186 (Tr. Vol 2, p. 158). The company's request begs the question: what is the company really seeking the Commission to order?

5. First, MAWC seeks implicit permission from the Commission to continue violating its approved tariff sheets and implicit forgiveness from the Commission for having violated its tariff

¹ Since the Commission cannot make a ratemaking decision in this case, Public Counsel does not comment on whether including all or a portion of any costs deferred by the company in future rates would be prohibited retro-active or single-issue ratemaking. *See generally State ex rel. Util. Consumers' Council of Mo., Inc. v. Pub. Serv. Comm'n*, 585 S.W.2d 41 (Mo. 1979).

since January 2017. It does so by presenting a petition focused solely on the company's ability to pass these costs onto all customers through higher rates to be determined in a later rate case. Rather than offering any citation to authority permitting its on-going pipe replacement actions, the company incorrectly contends its tariff neither requires nor prohibits the company's actions (MAWC Statement of Positions, Doc. No. 36, p. 3). Then, attempting to support its flawed premise, MAWC compares replacing customer-owned service lines to "restoration costs" incurred repairing sidewalks and lawns it has disturbed performing work on utility pipes (*Id*). The comparison is inapt. Importantly, the company likely has a legal obligation to repair customer-owned property it damages; no legal obligation requires (or authorizes) the company to replace customer-owned lead service lines. In fact, the company's tariff is unequivocal in stating those pipes are the responsibility of the customer. Whether it is installation, construction, maintenance or replacement, if the work is performed on a customer-owned pipe the customer owner is responsible.

6. Second, MAWC seeks an order from the commission giving the company permission to re-classify the status of money spent replacing customer-owed property (in violation of its tariff) by placing certain costs into an intermediary account (Account 186). As explained above, the company does not need an order from the Commission to do so. However, MAWC seeks this order to probe the mindset of the Commission as to how its members view the actions the company has taken. The company's intention to recover these deferred costs in rates is undisputed. MAWC witness Mr. Lagrand explained that the company is asking to re-classify any costs deferred into Account 186 and ultimately move them to Account 345 in its pending rate case (Tr. Vol. 2, p. 159). Notably the company's proposal re-classifies the money spent replacing customer-owned service

lines into one account (in this case) and then re-classifies that account into another different account (in the rate case). Each step obscures the undisputed fact that the company does not own and is not required to replace customer-owned service lines.

7. During the evidentiary hearing, the company's own witnesses admitted the company does not have an ownership interest in the property at issue. In the following exchange between Commissioner Kenney and MAWC witness Mr. Aiton discusses ownership of the service lines:

Q (by Commissioner Kenney): So who owns that pipe now?

A (by Mr. Aiton): As far as we're concerned, they still own that pipe.

Q: So then it's not plant and service, right?

A: Not currently. Again, that -- that would be the determination in the rate case.

Q: But, I mean, if it's not -- if you don't own it, how can you claim it as plant in service?

A: That's one of the reasons we're here to discuss that and get some indication from the Commission.

(Tr. Vol. 2, p. 208). Another MAWC witness, Mr. Naumick, agreed that premise plumbing owned by the customer is the responsibility of that homeowner (Tr. Vol. 2, p. 138). However, when it comes to customer-owned service lines, Mr. Naumick does not recognize that those pipes, too, are the responsibility of the homeowner. Instead, MAWC chose to begin replacing these pipes without resolving outstanding issues regarding the legality, necessity, and efficacy of its actions.

8. Insofar as the company wants an indication about the future classification of these costs, OPC witness Mr. Hyneman testified it would be totally inappropriate to book costs incurred replacing customer-owned service lines into Account 345 because doing so would violate numerous accounting principles (Tr. Vol. 2, p. 312). Staff witness Ms. McMellen agreed it would be inappropriate to record costs spent on customer-owned service lines in account 345 because it is not the responsibility of the company (Tr. Vol. 2, pp. 258-59).

9. Having decided to spend money it knew it could not recover from ratepayers – a choice made by company management alone – and having failed to achieve statutory authorization for its actions from the legislature, MAWC seeks to establish public policy under the guise of an accounting case. No action from the Commission is necessary for MAWC to defer costs to Account 186 and so the Commission should reject the company's petition for an AAO. Furthermore, the Commission *should not* use accounting authority orders as a means to endorse public policy positions and *cannot* inoculate the company from tariff violations by issuing an AAO. Importantly, should the company management decide to defer these costs into Account 186 the rate treatment, if any, will be determined in the company's pending rate case.

10. Since the company has undertaken its program to replace customer-owned lead service lines, Public Counsel has worked to examine the legal, policy, and accounting aspects of the program. To aid the Commission in its decision, Public Counsel has presented a list of issues for the Commission to consider when making its determination in this case as detailed below.

II. **Does MAWC's tariff permit the company to replace customer-owned service lines?**

11. No. MAWC's current and proposed practice violates a number of the company's commission-approved tariff provisions. The company began replacing customer-owned service lines in January of 2017 without making any demonstration whether the program was legal, without demonstrating whether the program was necessary, and without providing any cost/benefit analysis.

12. As an initial matter, it is well established that "[a] tariff is a document which lists a public utility services and the rates for those services." *State ex rel. Mo. Gas Energy v. Pub. Serv. Comm'n*, 210 S.W.3d 330, 337 (Mo. App. W.D. 2006)(quoting *Bauer v. Sw. Bell Tel. Co.*, 958

S.W.2d 568, 570 (Mo. App. E.D. 1997)). In other words, the tariff contains parameters delineating the obligations between, and among, the utility, the commission, and the customers. Importantly, any validly adopted tariff "has the same force and effect as a statute, and it becomes state law." *PSC v. Mo. Gas Energy*, 388 S.W.3d 221, 227 (Mo. App. W.D 2012)(quoting *State ex rel. Mo. Gas Energy*, 210 S.W.3d at 337 (Mo. App. W.D. 2006)). Section 386.270 RSMo, states that tariffs approved by the Commission "shall be in force and shall be prima facie lawful and reasonable until found otherwise in a suit brought for that purpose pursuant to the provisions of this chapter."

13. MAWC's Commission-approved tariff contains a number of provision's contrary to the company's ongoing program replacing certain customer-owned water service lines with the stated intent to socialize the cost to all other customers and permit MAWC shareholders to earn a return in the process. Troublingly, even though the company's own petition references certain tariff provisions, no request for relief from those tariff provisions is sought. Instead, the company incorrectly contends its tariff neither requires nor prohibits the company's actions (MAWC Statement of Positions, Doc. No. 36, p. 3). Then, as noted above, MAWC attempts to support its flawed premise, by comparing replacing customer-owned service lines to "restoration costs" incurred repairing sidewalks and lawns it has disturbed performing work on utility pipes. The Commission must reject the company's invitation to disregard the plain language of the Commission-approved tariff provisions as it relates to the customer's service lines.

14. As it relates to this case, MAWC's tariff at PSC MO No. 13 Sheet No. R 6-R7 defines "Service Line" and the scope of "Customer's Service Line". When examining a tariff, the Commission should bear in mind Missouri courts will analyze a tariff as they do a statute; "if a tariff is clear and unambiguous, [the Court] cannot give it another meaning." (*State ex rel.*

Associated Natural Gas Co. v. Public Service Commission, 37 S.W.3d 287, 293 (Mo. App. W.D. 2000). "In determining whether the language of a tariff is clear and unambiguous, the standard is whether the tariff's terms are plain and clear to one of ordinary intelligence." (*Id.*)(quoting *Allstates Transworld Vanlines, Inc. v. Southwestern Bell Telephone Co.*, 937 S.W.2d 314, 317 (Mo. App. E.D. 1996)).

15. MAWC's filed tariffs plainly explain its customer's responsibilities relating to the service lines the company began replacing in January 2017. As PSC MO No. 13 Original Sheet No. R. 12, Rule 4.C makes clear "Any change in location and/or size of an existing service connection and/of service line requested by the customer shall be made at the Customer's expense." Tariff sheet PSC MO No. 13 Original Sheet No. R 12, Rule 4.I requires that "[f]or service at a new location, a replacement service, or additional service at an existing location, applicant shall pay, in advance, a service connection charge in accordance with approved tariff charges or as provided in these rules" (emphasis added). PSC MO No. 13 Original Sheet No. R. 12, Rule 4.J states, in part, "[t]he Customer's Water Service Line shall be installed by the Customer at that Customer's expense." When a service connection or service line is installed by the company "[t]he company will hold title to all such service connections, Service Lines and meter box installations installed by the company." (See PSC MO No. 13, 1st Revised Sheet No. R. 14, Rule 4.N). MAWC tariff sheet PSC MO No. 13 1st Revised Sheet No. R 16, Rule 6.B specifically addresses "all new or replacement Water Service Lines". At B.2 of the same tariff sheet, the law requires for all service areas (delineated separately in the tariff section based on customer ownership) that "the Customer shall be responsible for construction and maintenance of the Customer's water service line...". Tariff sheet PSC MO No. 13 1st Revised Sheet No. R 17.F demands "[c]ustomers at their own expense

shall make all changes in their Customer Water Service Line required by changes of grade relocation of mains, or other causes.” On the same sheet paragraph H requires that “[r]epairs or maintenance necessary on the Customer Water Service Line or on any pipe or fixture in or upon the Customer’s premise ... shall be the responsibility of the Customer.” (Emphasis added). Because the foregoing tariff provisions are clear and unambiguous in describing both the company’s and customers’ rights and responsibilities, the Commission must reject the company’s position that it may voluntarily replace customer-owned service lines and pass those costs onto other customers.

Each of the foregoing tariff provisions and the company’s actions are summarized in the table below:

	Tariff provision	Company’s actions
1.	PSC MO No. 13 Original Sheet No. R. 12, Rule 4.C makes clear “Any change in location and/or size of an existing service connection and/of service line requested by the customer shall be made at the Customer’s expense.”	Company is assuming the cost of replacing customer-owned service lines.
2.	Tariff sheet PSC MO No. 13 Original Sheet No. R 12, Rule 4.I requires that “[f]or service at a new location, a replacement service, or additional service at an existing location, applicant shall pay, in advance, a service connection charge in accordance with approved tariff charges or as provided in these rules” (emphasis added)	Company is assuming the cost of replacing customer-owned service lines without requiring advance payment.
3.	PSC MO No. 13 Original Sheet No. R. 12, Rule 4.J states, in part, “[t]he Customer’s Water Service Line shall be installed by the Customer at that Customer’s expense.”	Company is assuming the cost of replacing customer-owned service lines.

4.	PSC MO No. 13, 1 st Revised Sheet No. R. 14, Rule 4.N states: When a service connection or service line is installed by the company “[t]he company will hold title to all such service connections, Service Lines and meter box installations installed by the company.”	Schedule BA-SR3 purports to be an agreement between MAWC and the company wherein MAWC “will install a Customer connecting line from the Installation to Customer’s residence.” Adding the caveat “[t]he Customer connecting line is currently and will continue to be owned and maintained by Customer.”
5.	MAWC tariff sheet PSC MO No. 13 1 st Revised Sheet No. R 16, Rule 6.B specifically addresses “all new or replacement Water Service Lines”. At B.2 of the same tariff sheet, the law requires for all service areas (delineated separately in the tariff section based on customer ownership) that “the Customer shall be responsible for construction and maintenance of the Customer’s water service line...”.	Company is assuming the cost of replacing customer-owned service lines.
6.	Tariff sheet PSC MO No. 13 1 st Revised Sheet No. R 17.F demands “[c]ustomers at their own expense shall make all changes in their Customer Water Service Line required by changes of grade relocation of mains, or other causes.”	Company is assuming the cost of replacing customer-owned service lines in connection with main replacement projects.
7.	Tariff sheet PSC MO No. 13 1 st Revised Sheet No. R 17.H requires that “[r]epairs or maintenance necessary on the Customer Water Service Line or on any pipe or fixture in or upon the Customer’s premise ... shall be the responsibility of the Customer.” (Emphasis added).	Company is assuming the cost of replacing customer-owned service lines.

8.	PSC MO No. 13 1st Revised Sheet No. R 9, Rule 2.D requires that all “written agreements shall conform to these Rules and Regulations in accordance with the statutes of the State of Missouri and rules of the Commission.”	Company asks its customers to sign forms containing provisions contrary to the approved tariff (those forms can be found attached to MAWC witness Aiton’s pre-filed surrebuttal as Schedule BA-SR3, pp. 3-8).
9.	PSC MO No. 13 Original Sheet No. R 10, Rule 2.K provides that “[n]o employee or agent of the Company shall have the right or authority to bind it by any promise, agreement or representation contrary to the letter or intent of these Rules and Regulations of law.”	Company asks its customers to sign forms containing provisions contrary to the approved tariff (those forms can be found attached to MAWC witness Aiton’s pre-filed surrebuttal as Schedule BA-SR3, pp. 3-8).
10.	PSC MO No. 13 Original Sheet No. R 11, Rule 3 defines the parameters surrounding MAWC’s liability.	Schedule BA-SR3, p. 7 <i>extends</i> MAWC’s (and its customers) liability with an additional putative agreement wherein MAWC “warrants the workmanship of its installation of its installation of the Customer service line for a period of 12 months ... [.]”
11.	PSC MO No. 13 Original Sheet No. R 11, Rule 3.F prohibits the company from entering agreements that assume or assign liability contrary to the parameters in the tariff.	Form agreements include language attempting to limit liability to the company when, in fact, the agreements expose the company to <i>greater</i> liability.

16. As stated above, the company does not request reprieve from these obligations or otherwise request any modification. Based on the documents attached to MAWC witnesses' testimony, Public Counsel infers the company's putative solution is to ask that customers sign a contract affecting payment obligations to replace their service lines (at least a few customers have declined) as well as having the company assume liability for replacing the customer-owned service line (Ex. 9, Schedule BA-SR3, pp. 3-8). Schedule BA-SR3 is a contract that purports to reflect an agreement wherein MAWC "warrants the workmanship of its restoration [for determining whether lead service lines are at a location] ... for a period of two months ... with the Company's liability limited to the cost of repairing ... [.]" Schedule BA-SR3 purports to be an agreement between MAWC and the company wherein MAWC "will install a Customer connecting line from the Installation to Customer's residence." Adding the caveat "[t]he Customer connecting line is currently and will continue to be owned and maintained by Customer." (*Id.*). However, the same document *extends* MAWC's (and its customers) liability with an additional putative agreement wherein MAWC "warrants the workmanship of its installation of its installation of the Customer service line for a period of 12 months ... [.]" (*See* Ex. 9, Schedule BA-SR3, p. 7). These contracts do not resolve MAWC's tariff violations. In fact, the company's decision asking its customers to sign these documents violates its tariff in two additional ways.

17. First, MAWC's tariff unambiguously requires that all "written agreements shall conform to these Rules and Regulations in accordance with the statutes of the State of Missouri and rules of the Commission." (PSC MO No. 13 1st Revised Sheet No. R 9, Rule 2.D). Furthermore, the general provisions of the company's tariff provide that "[n]o employee or agent of the Company shall have the right or authority to bind it by any promise, agreement or representation contrary to

the letter or intent of these Rules and Regulations of law.” (PSC MO No. 13 Original Sheet No. R 10, Rule 2.K). The agreements utilized by MAWC in furtherance of its program are contrary to the current tariff.

18. Second, the form agreements include language attempting to limit liability to the company when, in fact, the agreements expose the company to *greater* liability. MAWC tariff sheet PSC MO No. 13 Original Sheet No. R 11, Rule 3 defines the parameters surrounding MAWC’s liability. Rule 3.F prohibits the company from entering agreements that assume or assign liability contrary to the parameters in the tariff (*See* PSC MO No. 13 Original Sheet No. R 11). When MAWC increases its liability it places a greater burden and risk on its customers from whom MAWC would seek to recover any payments made under the liability terms.

19. Since January 2017 MAWC has been violating its Commission-approved tariff. As the Commission is aware, a tariff has the same force and effect as a statute and that it becomes state law when approved by the Commission (*See State ex rel. Union Elec. Co. v. Pub. Serv. Comm’n*, 399 S.W.3d 467, 477 (W.D. Ct. App. 2013)). The Company has not asked for any relief that would resolve the current violations as required by Section 386.270 RSMo and has, instead, focused only on recovering the money associated with the project.

III. Has MAWC demonstrated the necessity of replacing customer-owned lead service lines?

20. No. As an initial matter, MAWC, as the applicant bears the burden of proof. Here, the company has not offered testimony demonstrating the necessity of replacing customer-owned lead service lines. In fact, the overwhelming and uncontroverted evidence presented during the hearing

casts doubt on the necessity of replacing customer-owned lead service lines in MAWC's service territory.²

21. The company's witnesses testified there is no legal or regulatory requirement to replace the customer-owned lead service lines (*See* Tr. Vol. 2, p. 166, Mr. LaGrand stating "[b]ut to my knowledge, there's not a regulatory requirement"; Ex. 25). Mr. Aiton testified the lead and copper rule does not require replacement of the customer-owned lead service lines (Tr. Vol. 2, p. 199). Certainly, the lead and copper rule requires the company to meet standards regarding lead content in water. However, MAWC's Mr. Aiton and Mr. Naumick both testified the company is in compliance with the lead and copper rule requirements (Tr. Vol. 2, pp. 147, 200). This testimony confirmed the Commission Staff's recent report the "Overview of lead in Missouri's drinking water", stating that all of the water utilities regulated by the Public Service Commission, including MAWC, are presently in compliance with the Lead and Copper Rule (*See* Ex. 14, p. 11). Importantly, the company does not plan to go back and replace all prior partial replacements because they are in a stable condition (Tr. Vol. 2, p. 128). Simply put, the evidence shows there is no inherent risk to water quality from the existence and continued use of lead service lines.³

22. Rather than asserting that lead line replacement is necessary, the company offers merely that the project may reduce "potential exposure to lead in drinking water" that may increase as a result of disturbances caused by the company's main replacement program (*See* Naumick Direct,

² OPC's proposed outline for a pilot program would provide the company an opportunity to continue replacing customer-owned lead service lines while it explores whether the company's project is necessary.

³ The Staff Counsel's irresponsible farce during opening statements suggesting the contrary is not supported by evidence in the record and risks creating a public panic with wide-reaching consequences. Public Counsel witness Dr. Marke offered testimony describing how property values were impacted after the Flint water crisis (Ex. 16, p. 44).

Ex. 1, pp. 11-12). However, the Commission can infer that the risk is not significant because although the company has stated it would avoid partial service line replacements if possible, Mr. Naumick testified the company would, in some circumstances, resume partial lead line replacements (Tr. Vol. 2, p. 127). Furthermore, it is not clear that “full”⁴ replacement is superior to partial replacement. Importantly, the evidence shows the potential increase exists whether it is a partial replacement or a “full” replacement (*See* Ex. 16, p. 34 stating “[w]hether you remove the lead line partially or fully it is still being “broken” and thus subject to the potential for elevated levels of lead exposure”). Documents provided by the company confirm the foregoing conclusion of OPC witness Dr. Marke (*See* Ex. 21C, Attachment p. 2). Importantly, the evidence in this case shows the potential for temporarily elevated lead levels will subside relatively quickly. MAWC’s Mr. Naumick testified that the predominating research is that partial replacements will return to a stable condition in hours or days (Tr. Vol 2, p. 129). The only different timeframe offered in this case was by Staff’s witness who, upon cross-examination, admitted his estimate was “a wild guess” (Tr. Vol. 2, p. 249).

23. The evidence in this case shows no recognizable difference in lead levels between conducting a partial lead service line replacement compared to a “full” lead service line replacement. The Staff’s witness offers an alternative reason it supports “full” lead service line replacement because “the existence of LSLs are considered a major risk of possible leaching of lead into the drinking water” (Ex. 13, p. 2). Staff’s putative concern⁵ about leaching caused by unbalanced water chemistry, as it

⁴ MAWC witness Mr. Naumick testified there may be circumstances when the full line is not replaced (Tr. Vol. 2, p. 123).

⁵ Staff’s testimony recognizes the company is not proposing to replace all lead service lines and is, apparently, unconcerned about the potential for leaching in existing partial replacement (*See generally* Ex. 13, p. 6).

relates to MAWC’s system, is unfounded. MAWC will continue to treat its water appropriately. Mr. Naumick testified the company does not intend to stop treating its water (Tr. Vol. 2, p. 126). Mr. Aiton testified he was involved in the decision making on treating water at Missouri-American and could not envision a scenario where the company would go for months without treating its water (Tr. Vol. 2, pp. 201-02). Spending hundreds of millions of dollars to address the potential for a temporary increase in lead levels that the company’s own witness testified lasted for “a matter of hours or days” should not be undertaken without careful consideration of the costs and benefits – especially when the result is the same under partial or full replacement.

24. Consider the worst-case scenario. In the Flint, Michigan water crisis the water system was subjected to prolonged exposure to untreated water (Ex. 16, p. 40). Based on media coverage, one might have expected a spike in blood lead levels to all-time highs. However, as shown in the table below, the percentage of children with elevated blood lead levels in the City of Flint was less than the State of Michigan as a whole during the water crisis.

Table 4: Reprint of incidence of elevated blood levels ($\geq 5 \mu\text{g/dL}$) among children less than 6 years of age in Michigan, Genesee County and the city of Flint⁸²

		Michigan	Genesee County	Flint
10/1/2015 to 01/20/2017	Total tested for lead*	186,112	13,333	7,482
	Number of test results $\geq 5 \text{ mcg/dL}$	5,647	239	191
	Percent of test results $\geq 5 \text{ mcg/dL}$	3.6%	1.8%	2.6%
4/1/2014 to 01/20/2017	Total tested for lead*	332,797	18,783	9,288
	Number of test results $\geq 5 \text{ mcg/dL}$	12,331	411	294
	Percent of test results $\geq 5 \text{ mcg/dL}$	3.7%	2.2%	3.2%
1/1/2016 to 01/20/2017	Total tested for lead*	157,175	11,708	6,637
	Number of test results $\geq 5 \text{ mcg/dL}$	5,722	212	172
	Percent of test results $\geq 5 \text{ mcg/dL}$	3.6%	1.8%	2.6%

(Ex. 16, p. 41). The impact of prolonged exposure to untreated corrosive water on water lead levels in homes with lead service lines in Flint is not certain. Dr. Marke testified that “the concentration of elevated water lead levels in Flint, Michigan followed a power law distribution where a small number

of locations accounted for a disproportionate amount of the elevated lead levels” and continued “[i]mportantly, the cause of that increased lead exposure in water samples, in some cases, may be attributable to lead-based premised plumbing and/or fixtures not necessarily (or just) lead service lines.” (Ex. 16, pp. 31-32). The inconclusive impact on water and blood lead levels stemming from the worst –case scenario in terms of water treatment should give the Commission pause before it grants a blank-check to MAWC for its program.

25. In the testimony of Dr. Marke, Public Counsel has raised a number of concerns regarding the company’s approach to lead service line replacement. As explained in the testimony of OPC witness Marke, the issue of lead line replacements cuts across public health, scientific, technical, and legal arenas and should not be viewed as an engineering exercise alone. Where MAWC has failed to establish a corollary between their proposal and a reduction in blood and water lead levels, offices tasked to address blood lead levels (such as the Missouri Childhood Lead Poisoning Prevention Program) have identified contamination sources other than service lines where remediation projects can actually improve health conditions. For example, OPC witness Dr. Marke testified “[a]ccording to the Missouri Department of Health and Senior Services (“MO DHSS”), the primary lead hazard to children in Missouri is deteriorated lead-based paint (Ex. 15, p. 6 citing to the Missouri Department of Health and Senior Services (2016) Missouri Childhood Lead Poisoning prevention program Annual Report for Fiscal Year 2015). Spending \$180,000,000 to replace lead water service lines is an opportunity cost that could be better spent elsewhere. The Company’s proposal falls short in addressing the multitude of issues presented by a plan to remove customer-owned lead service lines.

26. OPC's proposed pilot program presents a path forward to address the issues – including the necessity and efficacy of full lead service line replacement – while permitting the Company to continue replacing lead service lines as the pilot is conducted. OPC's proposed pilot study from its direct testimony provides the framework to facilitate the substantive research, planning and communication to mitigate known risks and to anticipate and plan for the otherwise unintended consequences that are undoubtedly linked to this complex, decade(s)-long policy reform.

IV. **What is the cost of MAWC's proposed program to replace customer-owned lead service lines?**

27. Public Counsel does not know the cost of the program. More importantly, MAWC does not know either. Instead, the company asks for a “blank check” without demonstrating the necessity of the project or developing any kind of cost-benefit study. In testimony, Public Counsel has challenged the company's estimates of both the number of lead service lines and the cost to replace each line. In their surrebuttal testimonies, MAWC witnesses Naumick and Aiton admit the company's estimate of lead service lines is not perfect (Ex. 3; Ex. 9) when the company's estimated the average per customer cost jumped from \$3,000 per customer to \$6,000 per customer (*See* Ex. 9, p. 4). Based on the company's initial and renounced cost estimate (30,000 lines at \$3,000), MAWC's initial proposed program would cost ratepayers \$90,000,000. Now, with the Company's new estimate of \$6,000 average replacement cost, assuming the service line estimate is accurate, the cost *explodes* to \$180,000,000.⁶ Even the new per household cost estimates have failed to accurately represent the actual replacement costs to homes in St. Louis County, which regularly exceed the revised estimate by thousands of dollars (*See* Ex. 13, p. 7; Ex. 13, Schedule JAM-R6).

⁶ 30,000 x \$6,000 = \$180,000,000.

This is not a trivial amount of money for customers to bear, especially considering that MAWC is currently seeking to increase the rates of its customers in the St. Louis area by 45%. OPC's estimates presented by Dr. Marke, based on the information provided by MAWC, say replacing lead service lines in Missouri approaches two billion dollars as shown in the table below:

Table 1: Projected Lead Service Line Replacement Costs in Company Application.

Source	# of Service Lines	MAWC low/high Estimated Cost	Total Cost
MAWC territory estimate	30,000	\$3,000 per unit	\$90,000,000
MAWC territory estimate	30,000	\$5,500 per unit	\$165,000,000
AWWA territory estimate	330,000	\$3,000 per unit	\$990,000,000
AWWA territory estimate	330,000	\$5,500 per unit	\$1,815,000,000

(Ex. 16, p. 14). This truth that the company seeks a blank check is self-evident when considering, after OPC and other parties raised substantive cost concerns, the company never sought cost caps on per customer basis or on total project costs.

28. These costs, when combined with the fact that MAWC has not demonstrated a need to replace these service lines, underscore the importance of performing a cost-benefit study to explore all available options. Public Counsel's proposed pilot program offers an opportunity to do so while continuing to replace the lead service lines while the study is conducted. For example, considering that both partial and full lead line replacement potentially elevates lead exposure in the short-term would, a "point of use" lead-free water filter represent a reasonable alternative? Lead-free water filters have also been historically utilized by the EPA at federally designated Superfund sites found in Missouri's old lead belt (*See* Ex. 16, p. 15; Ex. 16, Schedule GM-2). Today, lead-free water filters cost approximately \$50 (Ex. 16, p. 14). If water filters are appropriate in federally designated superfund sites, certainly it should be an option considered to address the mere potential for

temporarily increased water lead levels. Through OPC's proposed pilot program and collaborative study, the company would have an opportunity to identify alternative solutions that could produce *superior* public benefits at a fraction of the price.

29. Public Counsel's pilot program proposes an annual cost-cap *double* what the company projects to spend in 2017 to accommodate the company's stated intent to replace more lines in the future⁷(Tr. Vol 2, p. 28). The reasonable budget parameters proposed by OPC will permit the company to continue replacing customer-owned lead service lines for the duration of the study and ensure that customers are protected from unnecessary rate increases.

V. **Should the Commission grant MAWC the Accounting Authority Order it has requested in this case?**

30. No. First, as explained above, the company's proposal does not address the fundamental question of its legal ability to replace customer-owned service lines. Second, as a matter of policy, the company's proposed plan focuses only on the engineering aspect of replacing customer lines without demonstrating any cost-benefit analysis or addressing any of the feasibility and policy considerations raised in the testimony of OPC witness Dr. Marke. Third, to the extent MAWC is seeking an order determining the "probability of rate recovery" the Commission can only make rate determinations in a rate case and so cannot grant the AAO requested by MAWC.

31. As explained during the hearing, and in the pre-filed testimony of OPC witness Hyneman no action from the Commission is necessary for MAWC to defer costs to Account 186. The

⁷ To the extent MAWC can demonstrate it requires more money than double what it has spent so far annually in order to fund lead line replacement during the pilot, OPC would consider a counter-proposal. The company's assumption of 3,000 replacements annually to support its projected costs based only on dividing the estimated total number of lines by the company's desired 10 year completion date is insufficient to justify any increase (*See Ex. 4, p. 5*).

Commission *should not* use accounting authority orders as a means to endorse public policy positions when the company has not demonstrated the necessity or provided a cost/benefit analysis. Furthermore, the Commission *cannot* inoculate the company from tariff violations by issuing an AAO because the company's existing Commission-approved tariff has the same force and effect as a statute and the company has not asked for any relief that would resolve the current violations as required by Section 386.270 RSMo (*See State ex rel. Union Elec. Co. v. Pub. Serv. Comm'n*, 399 S.W.3d 467, 477 (W.D. Ct. App. 2013); Section 386.270 RSMo). Importantly, should the company management decide to defer these costs into Account 186 the rate treatment, if any, will be determined in the company's pending rate case. The Commission should reject the company's petition for an AAO.

VI. **If the Commission grants an AAO, what carrying costs should be utilized in regard to the balance of the costs deferred?**

32. The monthly carrying costs to be charged to Account 186 should be the American Water Works Company's ("AWWC") current short term debt rate (Ex. 18, p. 15). OPC witness Mr. Hyneman testified that it is common for the Commission to require short-term debt costs to be applied to utility projects. He noted two prominent examples: (1) the Commission ordered Kansas City Power & Light Company to include its short-term debt rate as the financing cost of its off-system sales tracker during the period of its experimental regulatory plan and (2) the Commission requires that any under- or over-collection of fuel and purchased power costs included in the fuel adjustment clause ("FAC") tracker be accrued with a short-term debt interest rate (Ex. 18, pp. 12-13).

33. Furthermore, the Commission should order the short-term debt interest rate because it is the first cost applied to utility construction projects (Ex. 18, p. 13). This is a practice required by

the Commission, as well as FERC, in the allowance for funds used during construction formula (*Id.*). On this point, Public Counsel agrees with the Staff's recommendation (Ex. 12, p.3). The AWWC short term debt rate should be used because MAWC does not issue its own debt, and so, the parent company's rate should be used (Ex. 12, p. 4).

VII. If the Commission grants an AAO, what is the starting date of the amortization of the deferred account?

34. The amortization of the deferred amounts should begin immediately in order to match the incurrence of the costs to the benefit received from the incurrence of the costs (Ex. 18, p. 11). The proper treatment for deferred costs is for the amortization expense to begin immediately or very soon after the project starts (Ex. 18, p. 12). Delaying the amortization to a date significantly later than the date the benefit occurs (as the company proposes) is the true distortion of the matching principle and should be rejected (Ex. 18, p. 12).

VIII. If the Commission grants an AAO, does the Commission classify any deferred cost related to this application as a "deferred debit" per NARUC USOA Account 186, or does the Commission make a determination that the deferred costs are a "regulatory asset", as defined by generally accepted accounting principles?

35. Based on the comments of MAWC Counsel during its opening statement, Public Counsel understands the company is no longer asking the Commission to issue an order with language authorizing a "regulatory asset" and does not ask the Commission to make a GAAP regulatory asset determination in this case (Tr. Vol 2, p. 19). The company's position statement also included the position that "[t]he identified costs should be recorded in NARUC account 186 Miscellaneous Deferred Debits. The Commission need not make a regulatory asset determination." (MAWC Statement of Positions, Doc. No. 36, p. 3).

36. Public Counsel opposes the company's requested AAO. However, if the Commission grants an AAO it should permit the company to classify the deferred cost as "deferred debit" to be recorded in NARUC USOA Account 186. Under GAAP, in order for MAWC to record the deferred costs as a "regulatory asset" company management must determine the deferred costs are probable of rate recovery (Ex. 18, pp. 1-3). The Commission cannot make rate determinations outside of a rate case and so it should not grant an AAO classifying the deferred amounts as a "regulatory asset".

IX. Conclusion

37. MAWC can already defer costs into Account 186 without a Commission order. No witness testified otherwise. However, if the company wants to continue replacing customer-owned lead service lines, it must seek a legal basis to do so and provide the Commission with the policy and evidentiary support for such a program. MAWC has failed to do either. Instead the company has focused only on cost-recovery for expenses it incurred violating its tariff.

38. If the Commission wants to enable MAWC to continue replacing customer-owned lead service lines, only Public Counsel provides legal basis to do so (See Ex. 14, Ex. 15, and Ex. 16). Only Public Counsel provides the Commission with relevant facts and an evidentiary basis for a decision (*Id*). Only Public Counsel has attempted to examine carefully the multiple policy issues presented by the company's plans. Importantly, OPC's proposed pilot program presents a path forward to address the issues – including the necessity and efficacy of full lead service line replacement – while permitting the Company to continue replacing lead service lines as the pilot is conducted (Ex. 17, Ex. 18).

WHEREFORE Public Counsel submits its Post-hearing Brief and asks the Commission to deny the company's AAO petition.

Respectfully,

OFFICE OF THE PUBLIC COUNSEL

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Certificate of Service

I hereby certify that copies of the foregoing have been mailed, emailed or hand-delivered to all counsel of record this 19th day of October 2017:

/s/ Tim Opitz

DATA INFORMATION REQUEST
Missouri-American Water Company
WR-2017-0285

Requested From: Tim Luft
Date Requested: 8/15/17

Information Requested:

Please disclose whether MWAC has conducted a price elasticity analysis on its historical and/or proposed rate increase in relation to customer usage. If yes, please provide said analysis.

Requested By: Geoff Marke - Office of Public Counsel – geoff.marke@ded.mo.gov

Information Provided:

In building its customer usage models, MAWC witness Roach has explored how a number of variables, including price, affected base and non-base usage. Generally, Mr. Roach has rejected the use of a price variable because he found the price term to be highly autocorrelated with the time variable over the historic period. This is illustrated by the additional data and modeling provided in OPC_2053_Attachment which takes the base and non-base modeling worksheet and adds a base price term (Feb-April) used in the base modeling and an annual average price used in non-base modeling.

For purposes of base usage modeling, the use of a price term in place of time as a variable produces general diagnostic statistics that are similar to those produced by the time variable but with a greater probability of the influence of autocorrelation. This renders time to be a superior value over price. Further, if the price variable is also used with a time variable, general diagnostic statistics result that are similar to those utilizing the time variable alone but with the probability of greater autocorrelation when both time and price are used as variables. Generally, the consequence of autocorrelation in any model is an increase of the t-statistics resulting in the estimator appearing more accurate than it actually is.

For purposes of non-base modeling, the inclusion of a price term results in general diagnostic statistics that are similar to those utilizing the two climatic variables and the t-statistic for average price illustrates that the explanatory properties of the price term are not statistically significant. In other words, price is not a predictive variable for non-base modeling.

In short, Mr. Roach has elected to use models based on time because they avoid the effects of autocorrelation on the modeling and estimation of the regression coefficients. Mr. Roach's models use time, which is a fixed known and measurable term for purposes of estimating future reductions in residential usage per customer.

As a real world check on the value of time as a variable over price as a variable, consider the effect of the tornado in Joplin. There was no change in price after the tornado struck and a significant share of housing was rebuilt. Nevertheless, there was a much larger decline in usage. Essentially, the tornado simply accelerated the conservation effect when homes were rebuilt, resulting in a compression of the time effect on conservation. This shows anecdotally what the models show, i.e., that time is the more influential on conservation of water use than is price.

Submitted by: Greg Roach

GM-2

DATA INFORMATION REQUEST
Missouri-American Water Company
WR-2017-0285

Requested From: Tim Luft
Date Requested: 8/15/17

Information Requested:

Please provide a copy of any and all documents pertaining to any MAWC-specific residential end-use saturation studies performed in its service territory performed in the last ten years.

Requested By: Geoff Marke - Office of Public Counsel – geoff.marke@ded.mo.gov

Information Provided:

MAWC does not have documentation pertaining to any specific residential end-use saturation studies performed in its service territory in the last ten years.

Submitted by: Andrew Clarkson

**DATA INFORMATION REQUEST
Missouri-American Water Company
WR-2017-0285**

Requested From: Tim Luft
Date Requested: 8/15/17

Information Requested:

Please provide a copy of any and all documents pertaining to any MAWC specific customer water conservation studies performed in its service territory in the last ten years.

Requested By: Geoff Marke - Office of Public Counsel – geoff.marke@ded.mo.gov

Information Provided:

There have been no MAWC specific customer water conservation studies performed in the last ten years.

Submitted by: Andrew Clarkson

DATA INFORMATION REQUEST
Missouri-American Water Company
WR-2017-0285

Requested From: Tim Luft
Date Requested: 8/15/17

Information Requested:

Please provide a copy of any and all documents pertaining to any local government conservation policies that have been in effect in MAWC's service territory from the date current rates went into effect to present.

Requested By: Geoff Marke - Office of Public Counsel – geoff.marke@ded.mo.gov

Information Provided:

A search of local policies for some communities we serve was conducted. Please see OPC 2057_Attachment 1 for a summary of local conservation policies and where applicable, a web link to the policy.

Submitted by: Andrew Clarkson

DATA INFORMATION REQUEST
Missouri-American Water Company
WR-2017-0285

Requested From: Tim Luft
Date Requested: 8/15/17

Information Requested:

Please provide a copy of any and all documents pertaining to any state government conservation policies that have been in effect in MAWC's service territory from the date current rates went into effect to present.

Requested By: Geoff Marke - Office of Public Counsel – geoff.marke@ded.mo.gov

Information Provided:

We are not aware of any State of Missouri water usage conservation policies that have been in effect in MAWC's service territory from the date current rates went into effect to present.

Submitted by: Andrew Clarkson

DATA INFORMATION REQUEST
Missouri-American Water Company
WR-2017-0285

Requested From: Tim Luft
Date Requested: 8/15/17

Information Requested:

Please provide a copy of any and all documents pertaining to any federal government conservation policies that have been in effect in MAWC's service territory from the date current rates went into effect to present.

Requested By: Geoff Marke - Office of Public Counsel – geoff.marke@ded.mo.gov

Information Provided:

To our knowledge, there are no federal conservation policies that are in effect for Missouri for water.

Submitted by: Andrew Clarkson

WR-2017-0285
Marke Rebuttal

Schedule
GM-8

has been deemed

“Confidential”

in its entirety