

Exhibit No.:
Issues: Overview of Operations and Facilities,
Operating and Maintenance Expense,
Commitment to Water Quality and
Safety, Improving Water Efficiency and
Employee Levels and Compensation.
Witness: William Andrew Clarkson
Exhibit Type: Direct
Sponsoring Party: Missouri-American Water Company
Case No.: WR-2017-0285
SR-2017-0285
Date: June 30, 2017

MISSOURI PUBLIC SERVICE COMMISSION

**CASE NO. WR-2017-0285
CASE NO. SR-2017-0285**

DIRECT TESTIMONY

OF

WILLIAM ANDREW CLARKSON

ON BEHALF OF

MISSOURI-AMERICAN WATER COMPANY

Exhibit No. 11
Date 3/8/18
File No. WR-2017-0285

Exhibit 11
WR-2017-0285
Direct Testimony of William Andrew
Clarkson

**DIRECT TESTIMONY WILLIAM ANDREW CLARKSON
MISSOURI-AMERICAN WATER COMPANY
CASE NO. WR-2017-0285
CASE NO. SR-2017-0285**

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BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

IN THE MATTER OF MISSOURI-AMERICAN)	
WATER COMPANY FOR AUTHORITY TO)	
FILE TARIFFS REFLECTING INCREASED)	CASE NO. WR-2017-0285
RATES FOR WATER AND SEWER)	CASE NO. SR-2017-0286
SERVICE)	

AFFIDAVIT OF W. ANDREW CLARKSON

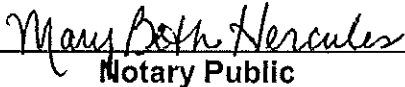
W. Andrew Clarkson, being first duly sworn, deposes and says that he is the witness who sponsors the accompanying testimony entitled "Direct Testimony of W. Andrew Clarkson"; that said testimony and schedules were prepared by him and/or under his direction and supervision; that if inquiries were made as to the facts in said testimony and schedules, he would respond as therein set forth; and that the aforesaid testimony and schedules are true and correct to the best of his knowledge.



W. Andrew Clarkson

State of New Jersey
County of Camden

SUBSCRIBED and sworn to
Before me this 6th day of June 2017.


Notary Public

My commission expires:



DIRECT TESTIMONY

WILLIAM ANDREW CLARKSON

I. INTRODUCTION

1
2
3 **Q. Please state your name and business address.**

4 A. My name is William Andrew Clarkson, and my business address is 727 Craig Road,
5 St. Louis, MO, 63141.

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

7 A. I am employed by Missouri-American Water Company (“MAWC”, “Missouri-
8 American” or “Company”) as Vice President of Operations.

9 **Q. Please describe your educational background and work experience.**

10 A. I received a Bachelor of Science degree in Geology in 1985 from Principia College,
11 and an Associate’s degree in Applied Science (Water/Wastewater Technology) from
12 Crowder College in 1987. I received a Master’s of Business Administration from
13 Virginia Commonwealth University in 1997.

14 I began my career with American Water Works Company (“American Water”) as a
15 Supervisor at Maryland-American Water Company in 1987. In 1991, I was promoted
16 to Operations Manager for Virginia-American Water Company . In 1997, I accepted
17 the position as Project Manager to operate the water system in Buffalo, New York.
18 Subsequently, I accepted a position in St. Louis as a Regional Manager for American
19 Water’s market based business. In 2000, I moved to New Jersey-American Water
20 Company as the Manager of the Northern Division before transferring into the role of

1 Business Development Director for the Northeast Region of American Water in 2003.
2 I was promoted to Director of Network Operations in 2003 for New Jersey American
3 Water. In March 2006, I became the statewide Director of Customer Field Service for
4 New Jersey's operations, and then became the Senior Director for the southern area of
5 New Jersey-American's Field Operations in 2007. In 2008, I was promoted to Director,
6 Customer and Operational Support for American Water's Eastern Division. In 2009, I
7 became American Water Business Transformation program ("BT") lead for customer
8 and field service processes, and later became the BT Business Intelligence Lead
9 responsible for reporting, data conversion and data governance. In 2014, I became the
10 Corporate Director of Asset Performance, and in 2016, I was promoted to my current
11 position.

12 **Q. What are your current employment responsibilities?**

13 A. I am responsible for all of the Company's water and sewer operations across the State
14 of Missouri, including field services, production, maintenance, water quality,
15 environmental compliance and safety. My oversight includes ensuring that our
16 operations team continues to provide high quality water and sewer service and meets
17 MAWC's operational targets.

18 **Q. What is the purpose of your testimony in this proceeding?**

19 A. The purpose of my direct testimony is five-fold. First, I describe the Company's water
20 and sewer operations and facilities throughout Missouri. Next, I will discuss the
21 Company's commitment to water quality and safety that benefit MAWC's customers.
22 Third, I discuss MAWC's level of operating and maintenance ("O&M") expense in this

1 case and how it supports the Company's efforts to continue providing high quality
2 water and sewer service in the most cost-effective way to our customers in the long-
3 term. Fourth, I discuss MAWC's programs and commitment to improving water
4 efficiency. Finally, I will support the Company's employee levels and explain
5 MAWC's employee compensation philosophy.

6 **II. OVERVIEW OF OPERATIONS AND FACILITIES**

7 **Q. Please describe Missouri American's operations.**

8 A. As of December 31, 2016, MAWC provided water and/or sewer utility service to over
9 476,000 customers throughout the State of Missouri. The Company's operations are
10 widely dispersed throughout the state. We provide water service to districts ranging in
11 size from St. Louis Metro (largest) to Lakewood Manor (26 customers). We also
12 provide sewer utility service in our Platte County, Warren County, Cedar Hill, Arnold,
13 Stonebridge and Saddlebrooke, Meramec, and Emerald Pointe districts, and more
14 recently the Hickory Hills, Jaxson Estates and Wardsville systems.

15 **Q. Please describe the facilities and property MAWC uses to provide water and
16 sewer service to customers.**

17 A. MAWC's utility plant accounts include land and land rights, structures and
18 improvements, wells, pumping equipment and associated facilities, purification plant
19 and equipment, sludge disposal facilities, transmission and distribution mains,
20 collection pipes, distribution storage facilities, service lines, meters, hydrants and other
21 facilities, including materials and supplies. All of this plant and property is being used
22 for and is useful for providing safe, adequate, efficient, and reliable water and sewer

1 services to MAWC's customers.

2 **Q. Please describe MAWC's sources of water supply, treatment facilities, pumping**
3 **equipment and distribution system property.**

4 A. MAWC draws water for our water districts from surface supplies, wells and/or
5 infiltration galleries. About 85% of the total source of supply comes from surface
6 supply and 14% comes from wells and infiltration galleries. The remaining 1% is
7 purchased water. The Company operates 31 distinct public water systems and from the
8 Company's 11 water treatment plants and 66 wells, producing approximately 73 billion
9 gallons from January 1, 2016 through December 31, 2016. The treatment processes
10 include sedimentation and filtration, clarification, disinfection, taste and odor removal,
11 organic chemical absorption, iron and manganese removal or sequestering, pH
12 adjustment, corrosion control, and fluoridation for dental prophylaxis, all in order to
13 meet or exceed the standards of the drinking water regulations of the Drinking Water
14 Branch of the Missouri Department of Natural Resources, the United States
15 Environmental Protection Agency ("EPA"), municipal and county fluoridation
16 ordinances, and a municipal water softening franchise requirement. The Company has
17 in excess of 6,700 miles of transmission and distribution mains ranging in size from 1-
18 inch to 42-inch diameter, 119 water storage tanks, 100 pump stations, and over 43,500
19 fire hydrants available for public fire service. The total capacity of water storage is
20 approximately 143 million gallons which is strategically located in the service areas for
21 drawdown during peak demand periods and for fire protection services.

22

1 **Q. Please describe MAWC's sewer operations.**

2 A. MAWC operates 65 sewer systems in the Platte County, Warren County, Cedar Hill,
3 Arnold, Stonebridge and Saddlebrooke, Meramec, Cole County, Hickory Hills, Jaxson
4 Estates, Wardsville, and Emerald Pointe districts. The sewer system facilities consist
5 of approximately 200 miles of collection mains ranging in size from 2-inch to 10-inch
6 diameter, over 5,000 manholes, and 50 lift stations. There are 47 mechanical
7 wastewater treatment plants with capacity to treat over 300,000 gallons of wastewater
8 daily and 13 lagoons that serve our sewer customers.

9 **III. OPERATING AND MAINTENANCE EXPENSE**

10 **Q. Please discuss some of Missouri-American's efforts to control O&M costs over the**
11 **past several years.**

12 A. Missouri-American has successfully controlled costs over the past several years. The
13 Company's 2016 operating expenses were only one percent (1%) higher than 2010
14 operating expenses (exclusive of the additional O&M expense related to new
15 acquisitions), and we are continuing our cost mitigation efforts. At the same time, there
16 are other cost areas that are increasing - inflation marches on despite our best efforts.
17 Particularly, fuel, power and employee costs, such as wages and group insurance, have
18 increased since the end of the 2016. These increases have somewhat outstripped the
19 continued savings we have achieved in other areas, and they too are included in our
20 rate filing.

21 **Q. What level of O&M expense is the Company seeking in this case?**

22 A. MAWC is seeking recovery of \$133 million in O&M expense for the future test period

1 ending May 31, 2019, which represents about a 2% percent annual increase from 2016
2 levels. The requested increases in O&M expense over these periods support the
3 Company's efforts to continue providing high quality water and sewer service in the
4 most cost-effective way to our customers in the long-term. The direct testimonies of
5 MAWC witnesses Brian LaGrand and Nikole Bowen discuss MAWC's specific O&M
6 pro forma adjustments in this case.

7 **Q. Why is the Company seeking an increase in O&M expense in this case?**

8 A. As part of the requested revenue requirement in this case, the Company is seeking to
9 enhance its maintenance activities. The Company plans to increase its level of plant
10 maintenance, valve operation, hydrant maintenance and flushing from current levels
11 through the future test year in this case in an effort to establish and sustain a more cost
12 effective level of service for our customers over the long term.

13 **IV. COMMITMENT TO WATER QUALITY AND SAFETY**

14 **A. Water Quality**

15 **Q. Please discuss Missouri-American's commitment to water quality.**

16 A. MAWC has provided water service to customers for over 130 years. We are acutely
17 aware that water is the only utility product intended for customers to ingest, and that
18 our customers rely on MAWC to provide them with safe and reliable water services.
19 Water quality is of paramount importance to the health and well-being of our
20 customers. Beyond health and safety, we know that MAWC's customers are also
21 interested in the aesthetic qualities of the water we treat and deliver to them. We
22 proactively look for ways to optimize treatment capabilities to continue to improve the

1 overall quality of drinking water delivered to our customers, and do so in a way that
2 strives to create operational efficiencies that also benefit our customers.

3 **Q. Please discuss MAWC's efforts with respect to water quality.**

4 A. The Company's participation in The Partnership for Safe Water (the "Partnership")
5 program is one demonstration of MAWC's commitment to the health and safety of our
6 customers through the delivery of clean, safe, aesthetically pleasing drinking water.
7 The Partnership is an alliance of six drinking water organizations¹ with a mission to
8 improve the quality of water delivered to customers by optimizing water system
9 operations. Each year, the Partnership recognizes water treatment plants for their
10 optimization and water quality.

11 MAWC has also partnered with University of Missouri – Rolla and The Water
12 Research Foundation to evaluate the watershed for possible causes of taste and odor
13 issues and to determine best possible treatment methods.

14 **Q. Has MAWC been recognized for its optimization and water quality achievements?**

15 A. Yes. Missouri-American is a participant in the Partnership's water treatment plant
16 optimization program and has repeatedly been recognized for its optimization and
17 water quality achievements. MAWC's six water treatment plants have received Phase
18 III Directors Awards and this year, five² of them have been recognized for maintaining

¹ Partnership organizations include EPA, the American Water Works Association ("AWWA"), Association of State Drinking Water Administrators ("ASDWA"), Association of Metropolitan Water Agencies ("AMWA"), National Association of Water Companies ("NAWC") and the Water Research Foundation ("WRF").

² The five plants include the Central Plant, North Plant, South Plant, Meramec Plant and Joplin Plant.

1 the Phase III Directors Award status for fifteen years.

2 **Q. Please describe other ways the Company is demonstrating its commitment to**
3 **water quality.**

4 A. The Company has enhanced its source water protection program by taking an integrated
5 approach to monitoring its source water quality and evaluating risks to that source using
6 innovative technologies, which support the Company's ability to make more informed
7 decisions regarding treatment and when responding to potential source water
8 contamination events. The integrated approach includes source water quality
9 monitoring panels and a map-based information gathering tool called WaterSuite.

10 **Q. Please describe MAWC's source water quality monitoring panels.**

11 A. The Company installed an online, multi-panel source water quality monitoring device
12 at each of its surface water treatment plants as an effective tool for optimizing treatment
13 decisions and aiding in the detection of potential source water contamination. The
14 sensors in each panel monitor parameters in the source water that include turbidity, pH,
15 oxygen reduction potential, temperature, conductivity and dissolved oxygen,. This
16 equipment will establish baseline water quality data for each parameter and alert water
17 plant operators to certain changes in water characteristics. The Company can use this
18 information to better understand the characteristics of its source water. In addition, a
19 change in the baseline characteristics may indicate an issue that warrants additional
20 investigation.

21 **Q. Please describe WaterSuite.**

22 A. WaterSuite is a map-based tool that collects information about potential sources of

1 contamination from various sources³ and pulls it into a database for a defined area of
2 concern. The database is updated on a regular basis to include the latest available
3 information and has search and reporting capabilities, which provides a significant
4 advantage over standard static contaminant assessments. This gives the Company a
5 dynamic tool it can continue to use over time rather than a paper based equivalent that
6 captures only the circumstances present at a point in time. The database provides a
7 larger set of data that is automatically updated on a periodic basis without requiring
8 manual work by MAWC. As a result, MAWC can access more information more
9 efficiently than in the past. The Company can use the monitoring panels and
10 WaterSuite together to better inform its response to a potential contamination event.

11 **B. Safety**

12 **Q. Please describe MAWC's overall commitment to safety.**

13 A. Ensuring the health and safety of our employees and protecting our product is a high
14 priority for our Company and is critical to our success. Our colleagues' and customers'
15 safety is the most important thing we focus on every day, and my commitment is to
16 ensure that every MAWC employee chooses safety in every job, every day. Employee
17 health and safety is the responsibility of every MAWC employee, and to that end, every
18 employee strives for safety. A safe workplace increases employee morale, increases
19 our commitment to one another, and in the long-run, makes for a more engaged and
20 productive workforce.

³ Data sources may include publically available regulatory databases, aerial imagery analyses, and local knowledge.

1 **Q. Is safety an important part of MAWC's operational performance?**

2 A. Yes. Safety is both a Value and a Strategy for MAWC. We ask our employees to place
3 safety first in everything they do. We have a strong commitment to our employees
4 (and their families) to keep them safe.

5 **Q. How do you measure safety performance?**

6 A. The Occupational Recordable Incident Rate ("ORIR") is a key metric we can use to
7 gauge the effectiveness of our safety program. It considers the number of recordable
8 injuries occurring during a specified time frame (e.g., month, quarter, year) and the
9 total number of hours worked by all employees during that same period. American
10 Water establishes a safety target annually to drive continuous improvement (i.e.,
11 reduced injury rates). The target is based on a variety of factors, including historical
12 performance and rate of improvement and safety performance data for both utility and
13 non-utility industries. The Company is placing a greater emphasis on employee
14 engagement and providing training as well as better tools and personal protective
15 equipment ("PPE") to employees to improve our safety performance.

16 **Q. What safety initiatives has MAWC implemented to improve its safety
17 performance?**

18 A. In 2015, the Company launched a Near Miss Reporting Program. Near Miss Reporting
19 involves employees reporting a situation that almost resulted in an injury or accident.
20 For example, if a piece of equipment becomes worn outside of a regular maintenance
21 cycle, an employee reports this as a near miss so MAWC can replace the worn part and
22 avoid a potential injury from an equipment malfunction.

1 In early 2017, we initiated a “Peer to Peer” worksite inspection program where hourly
2 union employees in St. Louis conduct worksite inspections of their peers. Generally,
3 twice a week, groups of two people go to work areas and evaluate the worksite using a
4 checklist of safety items. The team is also provided with a vehicle equipped with
5 personal protective equipment (“PPE”) and other equipment to provide employees if
6 they find a deficiency. These worksite inspections are conducted in addition to the
7 safety inspections performed by supervisors and health and safety managers.

8 MAWC also has active safety committees at all levels, including safety committees at
9 each work location and a statewide Safety Culture Council. The Safety Culture Council
10 includes representatives from all operating areas, including union and management,
11 and meets to discuss statewide topics regarding safety practices and culture. In
12 addition, MAWC also has union and management representatives on a National Safety
13 Council made up of representatives from American Water’s utility subsidiaries, which
14 investigates and shares information about good practices and helps to prioritize safety
15 initiatives for the future.

16 MAWC also continues to evaluate contractors who must submit safety performance
17 information to demonstrate their commitment to a safe work environment. Contractors
18 with poor safety performance or that don’t have a safe work program are disqualified
19 from doing business with MAWC.

20 **Q. How did MAWC perform in the Near Miss Reporting?**

21 A. MAWC has seen good progress since the program’s inception in 2015 with more
22 employees becoming engaged in the process. The majority of Near Miss Reports are

1 now corrected by the individual identifying the issue in the first place by resolving the
2 issue when observed or working with the appropriate people to obtain resources where
3 necessary. In total, approximately 90% of all issues are corrected within 30 days of the
4 report.

5 **Q. Please describe how communication fits within MAWC's safety program.**

6 A. Regularly talking about safety keeps safety top of mind and shows our commitment to
7 safety being a part of everything we do every day. We have implemented several types
8 of communication opportunities in addition to fostering discussions within safety
9 committees and councils discussed above.

- 10 • Weekly tailgate talks have been and will continue to be a standard part of our
11 safety program.
- 12 • A "Show Me Safety" program was launched in 2017 where employees are
13 acknowledged for demonstrating safe work. Part of the program is to make
14 personalized posters of employees with their families that show a personalized
15 safety message to emphasize that going home with no injuries every day is our
16 vision and to share these messages across the Company.
- 17 • Near Miss videos that feature examples of safety awareness as told by the
18 employees that recognized it were also added in 2017. It's a great way to share
19 good practices and experiences within MAWC as well as from around
20 American Water's operations.

21 **Q. How does MAWC plan to continue to improve its safety performance?**

22 A. Delivering comprehensive safety training is at the core of MAWC's plan to improve

1 safety performance. We are implementing a variety of safety initiatives to enhance
2 employee engagement, improve how we communicate with employees about safety
3 and address particular safety concerns, including:

- 4 • training that focuses on preventing our most common injuries. For example, we
5 have already delivered five 10-hour long OSHA training classes to approximately
6 125 employees at our St. Louis service center in 2017, to which we added training
7 on slips, trips and falls, and strains and sprains, which are by far the two injury
8 categories experienced most by our workers.
- 9 • a “Certified Safe Worker” program where employees certify they have completed
10 or demonstrated 6 safety actions in areas such as health screenings, CPR/First Aid
11 training, other safety training, pre-job stretching, stopping an unsafe job, submitting
12 safety improvement suggestions and/or practicing safety at home. To assist
13 workers in achieving some of the criteria, MAWC has committed to train all
14 employees on CPR/First Aid by the end of 2017. To date, approximately 155
15 employees have completed the criteria to become a Certified Safe Worker,
16 exceeding our goal to have twenty percent (20%) of our workforce achieve this
17 status by the end of 2017.

18 To further develop and support a robust safety training program, we plan to add a safety
19 training coordinator to our team in 2018 to oversee our training program.

20 **Q. Have the recent attacks on utility workers in the St. Louis area changed your**
21 **approach to worker security?**

22 **A.** Yes. Recent attacks on utility worker have prompted us to improve our training for
23 worker security. We have scheduled Active Shooter, Verbal Defense and Influence,

1 and Gang Awareness training for all of our workers, starting with the St. Louis County
2 field personnel. This training will take place on multiple dates throughout the year.
3 The Company’s Enterprise Security team is also a charter member of a “Utility Worker
4 Task Force” being formed by St. Louis area utility companies. The Task Force is
5 comprised of the security leads from Missouri American, Spire, Ameren, Charter,
6 AT&T, and MSD. The purpose is to develop strategies and action plans to solve some
7 of our common safety and security problems, including information sharing and
8 notifications regarding incidents that occur in the field. The Company is also
9 developing a “Safe Streets Training” program, which is an initiative to capture the
10 institutional knowledge of some of our more senior field workers and document it in
11 training modules to share with new hires. We are in the process of identifying union
12 personnel, managers, and supervisors to participate in the information sharing sessions.

- 13 **Q. How has MAWC’s commitment to safety benefited MAWC’s customers?**
14 **A.** A strong safety culture is a cornerstone for any high performing organization. A strong
15 safety culture also improves employee morale, as our employees know that we care for
16 them and their families. In turn, MAWC’s safety culture illustrates that our employees
17 are thoughtful in their work, which directly benefits our customers, as safety is one part
18 of our high performing culture. Lastly, strong safety performance reduces safety-
19 related incidents and the attendant costs, which also benefits customers.

20 **V. IMPROVING WATER EFFICIENCY**

- 21 **Q. What is water efficiency?**
22 **A.** In simple terms, water efficiency means using improved practices and technologies to

1 deliver water service more efficiently. MAWC's efforts to improve water efficiency
2 cover a wide range, and include supply-side practices, such as water loss reduction
3 efforts and improved meter reading, as well as demand-side strategies, such as
4 customer efficiency and public education programs that provides incentives to improve
5 water and energy efficiency. From an operations perspective, improving water
6 efficiency requires achieving a cost-effective mix of prudent investments and improved
7 operations and maintenance management capabilities targeting safety, customer
8 satisfaction, sustainability, and system efficiency.

9 **Q. Please describe some of MAWC's efforts to improve operating efficiency.**

10 A. The Company continually strives to find more efficient and cost effective ways to
11 operate and maintain its business. As part of that effort, we strive to manage our cost
12 structure as efficiently as possible. We use various operational and efficiency reviews
13 to further focus on improving customer service and efficiency of production and field
14 operations. We also leverage the size and scale of American Water to improve
15 transactional efficiencies through increased automation, the adoption of more effective
16 business processes, and a continuous improvement mindset.

17 **A. Reducing Water Loss**

18 **Q. Please describe the Company's program to reduce water loss.**

19 A. Reducing water loss is a very complex issue with many contributing factors. To reduce
20 water loss as effectively as possible, we need to address both apparent and real losses
21 to mitigate unaccounted for water ("UFW"). UFW can be defined in a variety of ways

1 across the water industry.⁴ Non-revenue water (“NRW”), however, is consistently
2 calculated by subtracting the number of gallons of water sold from the number of
3 gallons of water treated. To avoid any ambiguity, American Water, based in part on
4 guidance from AWWA, measures its reduction in water loss in terms of NRW rather
5 than UFW.

6 As of May 2017, MAWC’s 12-month rolling average for NRW was 22.7%, which is
7 down slightly from 23.8% at December 31, 2016. While this demonstrates some
8 improvement, it still reflects a loss of approximately 16 billion gallons of water
9 annually. The Company’s plan is to take a more proactive approach to reduce apparent
10 and real losses in order to achieve its long-term NRW goal of 15%. The Company’s
11 first step toward achieving that long-term goal is to work on improving its NRW by
12 approximately 4% over the next three years. We added one statewide NRW
13 coordinator in 2017 to better focus our efforts on managing apparent and real losses.

14 **Q. Please describe the difference between apparent and real losses.**

15 **A.** Apparent and real losses make up the two sides of the NRW equation. Apparent losses
16 represent the difference between the gallons of water delivered and the gallons of water
17 billed to customers. This difference can result from a variety of issues, ranging from
18 estimated bills to theft of service. In any event, the water loss is not caused by a leak in
19 the system. Leaks in the system are captured in real losses. Real losses reflect water

⁴ The AWWA had begun to discourage the use of the term Unaccounted for Water (UFW) since 2012 because its definition is inconsistent from organization to organization. There are several opportunities for inconsistency. For example, some organizations may deduct the number of gallons lost during a known main break while other exclude gallons lost as a result of main breaks all together.

1 treated and sent into the distribution system that is not delivered to customers.

2 **Q. What is MAWC doing to improve apparent losses?**

3 A. Apparent losses can be addressed by improving our implementation and execution of
4 billing processes. One fundamental approach to mitigate apparent losses is to reduce
5 estimated reads. An estimated read by definition is a calculated bill based on previous
6 usage for that customer, which is adjusted once an actual read is obtained. Estimates
7 add more steps in an already long meter-to-cash billing process and can often lead to
8 customer inquiries. Even though our statewide actual read rate was relatively high at
9 over 97% in April this year, it still resulted in over 6,700 estimated reads on a monthly
10 basis. Our goal is to achieve 99% or more actual reads, which our conversion to AMI
11 in St. Louis will help us achieve.

12 We also plan on reviewing and improving our processes related to fire services.
13 MAWC has approximately 9,000 fire services, over 5,900 of which are unmetered (i.e.
14 there is no meter to detect usage on the fire line). If a customer intentionally or
15 inadvertently tapped into a fire service and used that connection for some other use,
16 there would be no record of the water used through that fire service. Consequently, the
17 Company is unable to bill for that usage. We plan to start field investigations of all
18 unmetered fire services to determine if there is any such unauthorized use but we began
19 by focusing on a billing review of all fire services. In 2017, we initiated fire service
20 review activities and started by analyzing all inactive fire service accounts to confirm
21 the service was truly off and then flagged approximately 300 accounts for further
22 investigation. We then initiated onsite inspections of these sites to confirm whether the

1 fire services are truly active. To date we have completed field inspections of over one-
2 third of the 300 accounts identified.

3 **Q. What is the Company's main break experience and related expense?**

4 A. MAWC had over 2,800 water main breaks across the state during 2016. The volume
5 of breaks alone is not a good indicator of the distribution system's condition so breaks
6 per 100 miles of pipe is the generally accepted metric used in the industry to gauge
7 distribution system performance. On a statewide basis, MAWC experienced an annual
8 average of 43 breaks per 100 miles of pipe in 2016. MAWC's systems experiences
9 roughly two to three times more main breaks per year than the national average, as
10 reported by a 2012 study published by Utah State University.

11 Oftentimes, however, main breaks are repaired rather than replacing a property unit of
12 main. In that case, the Company incurs an O&M expense for repairing that main. The
13 number of main breaks repaired in any given year can fluctuate depending on a variety
14 of factors, including weather. For example, in 2014 the Company experienced about
15 1,000 more main breaks and 14 or more breaks per 100 miles than in 2015 or 2016 due
16 to the polar vortex. In order to appropriately capture the level of expense necessary to
17 repair main breaks during any given year, the Company must account for these
18 potential fluctuations. It is doing so in this case by smoothing out variations in expense
19 that may be related to weather and averaging its main break expense over the past three
20 years. Company Witness Nikole Bowen provides additional detail regarding how main
21 break expense is calculated in this case.

22

1 **Q. What is MAWC doing to improve on real losses?**

2 A. In addition to using ISRS to support the continued accelerated replacement of aging
3 infrastructure in St. Louis County, MAWC is also addressing real losses by enhancing
4 its leak detection efforts throughout the state. We are using acoustic listening devices
5 to conduct surveys of our systems to assist in determining the condition of our buried
6 infrastructure. Last year, three of the districts completed system acoustic leak detection
7 surveys, each of which identified multiple leaks in each system. Most were small leaks
8 on mains and hydrants that had not surfaced and, therefore, would likely have gone
9 undetected and resulted in a failure that impacted service to customers. The Company's
10 ability to proactively address these leaks saves the customers from potential disruptions
11 in service, the Company from losing millions of gallons of treated and pumped water,
12 and both from bearing the increased costs associated with that water loss. In St. Louis
13 County, we have using in-house acoustic leak detection equipment, including leak
14 detection loggers to listen for leaks in the system at night when customer usage is
15 generally at its lowest. This allows us to better identify noise in the system related to
16 leaks as opposed to other usage.

17 We are also piloting a new technology that uses satellite imaging to identify areas
18 showing high leakage. The technology uses aerial imaging taken from satellite
19 mounted sensors to spot leakage in underground distribution pipes over a large area.
20 The raw imagery is then overlaid on a geographic information system and is processed
21 by unique algorithms. The algorithm detects treated water, by looking for a particular
22 spectral "signature" typical to drinking water. We will then be presented with a leakage
23 graphic report overlaid on a map showing streets and potential problem areas. Other

1 utilities have had some success using this technology to locate leaks in very large
2 distribution systems. Over 4,000 miles of pipe in the St. Louis district will be surveyed
3 later in 2017 at a fraction of the cost it would take to do the whole system solely with
4 acoustic devices.

5 **Q. Has MAWC implemented any other programs to help reduce water loss?**

6 A. Yes. MAWC uses its integrated geographic information system (“GIS”) mapping
7 information as part of its comprehensive review of water main breaks to identify and
8 better prioritize areas with an abnormally high main break frequency over a defined
9 period. Main breaks are not only costly to repair, but could also interrupt service to
10 customers or result in damage to MAWC property, customer property, and city streets.
11 Being able to identify potential problem areas before main breaks occur could avoid
12 catastrophic failures, reducing the cost of repairs, restoration, and damage to other
13 facilities or property.

14 In addition to proactively identifying and repairing leaks, a key strategy to reduce leaks
15 is to reduce the number of main breaks in the system. Therefore, we are also taking a
16 closer look at how we operate the system through our pressure management program
17 to help us further reduce main break frequency. This entails distributing pressure
18 sensors in the system sensitive enough to detect pressure surges lasting less than a
19 second. The Company integrates that data into the SCADA database to correlate
20 pressure surges caused by pump and valve operation at the plants or at booster stations.
21 This will lead to better, more targeted investment like variable frequency drive
22 (“VFD”) equipment or elevated tanks resulting in fewer main breaks.

1 More proactive leak detection to identify problem areas before main breaks occur,
2 accelerated pipeline replacement program, and controlling pressure surges are all
3 important ways the Company is working to reduce water loss as well as the cost of
4 repairs, restoration, and damage to property. .

5 **B. Advanced Metering Infrastructure**

6 **Q. Please describe the Company’s advanced metering infrastructure (“AMI”)**
7 **program?**

8 A. Missouri American is currently installing an Aclara AMI system with primarily Badger
9 meters in its St. Louis County system. As of June 13, 2017, the Company has 46,000
10 meters equipped with the new AMI technology. AMI radio units have been installed
11 on meters currently in service as well as on new meters replacing those that are due for
12 replacement due to their length of service (“LOS”). The AMI program allows remote
13 reading of our meters at customers’ homes and businesses. In his direct testimony,
14 Bruce Aiton describes the level of AMI investment planned through May 31, 2019.

15 **Q. Why is MAWC installing AMI technology?**

16 A. The primary drivers for deploying AMI in St. Louis County are to increase meter
17 reading efficiencies and effectiveness and to transition our customers from quarterly to
18 monthly billing. Monthly billing makes it easier for customers to manage household
19 budgets and detect leaks sooner (potentially reducing high bills and costly damage to
20 customers’ homes) . Implementation of AMI will allow MAWC to realign its business
21 processes and redeploy personnel previously focused on meter reading to other work.
22 AMI also enhances customer service, improves employee and public safety, and

1 reduces costs.

2 **Q. How will AMI improve customer service?**

3 A. The implementation of AMI will increase billing accuracy and reduce the likelihood
4 of estimated bills (e.g., due to weather events or other obstacles to accessing customer
5 meters) by automatically providing timely, accurate reads through the network. In
6 addition, re-reads will be reduced due to the human factor being removed from
7 obtaining the actual read. AMI also has the potential to provide customers with a view
8 to their personal consumption more frequently than monthly, allowing them to monitor
9 their usage – be it for conservation purposes or to identify and address unusually high
10 usage. The transition of customers from quarterly to monthly billing not only will make
11 it easier for customers to manage household budgets, it also will allow Missouri-
12 American’s St. Louis County residential customers the option of paying bills under the
13 Company’s budget billing plan as they transition to monthly billing.⁵

14 **Q. How does AMI improve employee and public safety?**

15 A. Some MAWC employees are still walking meter routes. Having employees in the field
16 reading meters in potentially unsafe environments, inconvenient locations, inclement
17 weather, and exposed to vehicular traffic, animals, and the like, creates an exposure to
18 potential injuries and accidents. Being able to read meters remotely reduces this
19 potential risk, both for injuries to our employees and injuries and damage to third

⁵ Missouri-American’s residential customers who are on monthly billing have the option of paying bills under the Company’s budget billing plan, whereby the total service for the succeeding twelve (12)-month period is estimated in advance, and bills are rendered monthly on the basis of one-twelfth (1/12) of the twelve (12)-month estimate.

1 parties.

2 **Q. How will AMI affect operating costs?**

3 A. The deployment of AMI will virtually eliminate the need for manual meter reading in
4 St. Louis County – work currently performed by 18 full time MAWC employees. Over
5 the next several years, MAWC will be able to redeploy most of the 18 full time
6 equivalent positions to improve other areas of operations, including leak detection,
7 valve operation, hydrant maintenance and flushing programs, as well as an enhanced
8 training and safety program.

9 **Q. Are there other benefits of the Company's AMI program?**

10 A. Yes. With the implementation of a meter data management system, the Company will
11 be able to more efficiently collect, organize and analyze large quantities of meter data
12 to support its water loss reduction efforts and improved customer billing. AMI data can
13 be used to uncover irregularities that may signal a leak, meter tampering or water theft.
14 AMI is an example of how prudent investment in technology can produce a wide range
15 of operational benefits. AMI will improve safety, meter reading accuracy, and
16 employee efficiency, and it will enable more proactive and progressive customer
17 service. It will enable us to work smarter and improve water efficiency.

18 **Q. How does MAWC protect the data transmitted across the AMI network?**

19 A. All of the meter reads are encrypted before they are transmitted from the meter across
20 the Company owned network of over 400 collectors and ultimately to the Company's
21 meter read collection database.

1 **C. Enhancing Maintenance Activities**

2 **Q. Please explain MAWC’s planned valve operation program.**

3 A. MAWC has approximately 125,000 production and distribution valves throughout its
4 system and has developed a plan to inspect and operate these valves on a routine basis.
5 MAWC also considers the criticality of its valves in prioritizing their inspection and
6 operation. Accordingly, over the next several years, the Company plans to implement
7 the following inspection and operation schedule for its valves, which will ultimately
8 result in the inspection and operation of approximately 34,000 valves each year.

Valve Size	Inspection/Operation Schedule
≥ 16”	Annual
10” to 14”	Once Every 2 Years
< 8”	Once Every 5 Years

9 To sustain the proposed program, we anticipate that we will need 13 full-time
10 equivalent (“FTE”) positions, seven (7) of which are included in this case. Five (5)
11 positions are now supporting the program and two additional positions will be available
12 through the redeployment of employees as a result of AMI implementation (discussed
13 in greater detail below).

14 **Q. Why is it important to inspect valves regularly?**

15 A. Routine valve inspection and operation minimizes the potential duration and scope of
16 service disruptions when a main break occurs. When the Company repairs a main
17 break, it first has to isolate the area by closing off certain valves. If the nearest valve
18 to the main break does not work, workers will need to continue searching for operable
19 valves in order to stop the flow of water, isolate the main break, and begin making
20 repairs. Every time a valve is found to be inoperable, crews have to expand the

1 shutdown area and operate another three or more valves to isolate the break. This not
2 only increases the time it takes to repair the main break, but also increases the length
3 of time service to customers may be impacted as well as the potential number of
4 customers whose service is affected because a larger area had to be isolated in order to
5 make the repairs. Through a valve operation program, MAWC will proactively
6 exercise valves to ensure that they are operational if and when they need to be opened
7 or closed and schedule them for repair if they are not working. As explained above,
8 this proactive approach will help to reduce the time it takes to repair a main break as
9 well as to limit the number of customers whose service is affected by the main break.

10 **Q. Please describe MAWC's planned hydrant maintenance and flushing program.**

11 A. MAWC has over 43,000 hydrants throughout its distribution systems. The primary
12 purpose of hydrants is for public safety to suppress fires. It is critical that hydrants be
13 inspected and operated regularly to ensure they will perform as expected in an
14 emergency. Accordingly, MAWC, is planning to implement an annual, instead of bi-
15 annual, inspection program. To do so, it will need approximately 4 additional FTE's,
16 one (1) of which is included in this case through the redeployment of employees as a
17 result of AMI implementation (discussed in greater detail below).

18 In addition to annual inspections, the Company also plans routine system flushing.
19 Flushing scours pipes to remove sediment, scale, and biofilm and moves high-velocity
20 water through pipes in a single direction to improve hydraulic and water quality
21 conditions. While MAWC performs flushing when needed to resolve a water quality
22 issue, we have not maintained routine flushing program. Consequently, the Company

1 plans to flush its system annually by flushing every other hydrant in the system each
2 year (rotating the hydrants flushed each year), which is nearly 22,000 hydrants. We
3 estimate that up to 7 additional people are needed to conduct a thorough flushing
4 program in future years, two (2) of which are included in this case through the
5 redeployment of employees as a result of AMI implementation (discussed in greater
6 detail below).

7 Finally, our hydrant maintenance program also includes routine hydrant painting.
8 Hydrants are one of the few above-ground facilities that we operate throughout our
9 distribution system and therefore, are visible to our customers. If painting is not done
10 consistently, hydrants can develop surface corrosion that not only looks bad but can
11 lead to performance problems in the long term if not addressed. MAWC's plan is to
12 paint each hydrant every 20 years or approximately 2,000 hydrants each year. Some
13 hydrants still contain lead based paint that must be removed and disposed of in
14 compliance with regulatory requirements. Rather than purchase all the necessary
15 equipment to perform this work, the Company plans to engage a third party contractor
16 with hydrant painting experience to perform hydrant painting for MAWC. Company
17 witness Nikole Bowen explains how hydrant painting expense was calculated for the
18 current test year ending May 31, 2018, and the future test year ending May 31, 2019.

19 **Q. How is MAWC using technology to further enhance its preventative maintenance**
20 **programs?**

21 **A.** The Company has a geographic information system that integrates hardware, software,
22 and data for capturing, managing, analyzing and displaying all forms of geographically

1 referenced information. GIS is our primary platform to view various geospatial
2 datasets (hydrants, pipes, valves, pressure gradients, etc.) and is used by employees
3 across the business. Our GIS team has begun to map our valve exercising routes in
4 each district, allowing our employees to exercise valves in a more efficient manner.
5 Distribution crews can use GIS in the field to identify the network of valves needed to
6 isolate water mains for repair or replacement. GIS also allows our employees to update
7 simple inspection fields to initiate a work order and track progress in the Company's
8 Computerized Maintenance Management System ("CMMS") for valves that have been
9 operated during an inspection and need follow up maintenance or replacement.

10 **Q. Is the Company incurring increased operating expense associated with particular**
11 **plant maintenance?**

12 A. Yes. In 2016, our production staff in St. Louis County notified us that two critical
13 water treatment pipelines had become restricted over the years with lime scale. We
14 estimate that the cleaning program will last seven years and that the Company will
15 incur \$572,338 and \$577,108 in expense during the current test year and future test
16 year, respectively, with a similar level of annual expense for the remainder of the
17 cleaning program.

18 **Q. Does the Company also anticipate increased operating expenses for its tank-**
19 **painting program?**

20 A. Yes. The Company has 119 above ground water storage tanks it must maintain. These
21 tanks are critical to the Company's operations for the safe delivery of water and for fire
22 protection. The Company is committed to maintaining these tanks by prioritizing tank

1 painting through Company and third party inspections. MAWC inspects each tank the
2 third year after painting, the fifth year after painting, and then every 5 years after that.
3 We expect a tank paint coating to last 12 to 15 years and prioritize which tanks to paint
4 based on inspection reports. Based on current tank inspection reports, seven tanks need
5 their interior surface painted and ten need their exterior surface painted from 2017
6 through the end of the future test year, May 31, 2019.⁶ Company witness Nikole
7 Bowen describes how the tank painting expense was calculated in this case.

8 **VI. EMPLOYEE LEVELS AND COMPENSATION**

9 **Q. Please discuss how MAWC staffs its business operations.**

10 A. The Company continually strives to find more efficient and cost effective ways to
11 operate and maintain its business. As part of that effort, we strive to manage our cost
12 structure as efficiently as possible, including employee costs. We recognize our duty
13 to staff our business in a manner consistent with the provision of safe, reliable and
14 affordable service. This requires a constant evaluation of the right mix of internal and
15 contract labor, straight time versus overtime, training programs, and replacing labor
16 with technology. We continue to evaluate costs and expenses going forward, always
17 looking for the best solution for the unique and changing challenges we face. A large
18 portion of our cost structure is for labor, and as a position becomes vacant in our
19 organization, we look to the value of that position. We review the overall need for that
20 position and consider, among other things, whether it should be transferred to another

⁶ The Company is in the process of or scheduled to paint both the interior and exterior of two tanks in 2017, Tesson Ferry#1 and Kehr's Mill. The Company anticipates painting both the interior and exterior of two additional tanks in 2018, Agency Tank, and Stratmann #2, as well as the exterior only of the Clayton and King Hill #2 tanks in 2018. Finally, in 2019 the Company plans to paint the interior and exterior of three additional tanks, Rockwood, Hazelwood #1, and CP WW #1, as well as the exterior only of the Stonebridge Ground tank.

1 area, modified, or even eliminated. Cost control and improved business performance
 2 are the goals of these efforts. We continue to evaluate the new roles that will be created
 3 as new regulatory requirements are promulgated, and the appropriate positions that
 4 MAWC will need to optimize new technology and most effectively serve our
 5 customers.

6 **Q. Is the Company proposing to redeploy any positions in this case?**

7 A. Yes. The Company will implement AMI over the next several years and expects to
 8 complete its implementation in St. Louis County by the end of 2021 or early 2022.
 9 Over the next several years, the Company plans to redeploy up to 15 meter readers and
 10 up to 6 field service representative (“FSR”) positions as it implements AMI in St. Louis
 11 County to address important operational needs. By May 31, 2018, the Company will
 12 redeploy one (1) meter reader and one (1) FSR position to positions that will enhance
 13 the Company’s safety training and valve operation programs. By May 31, 2019, the
 14 Company will redeploy an additional three (3) meter readers and one (1) FSR position
 15 to its valve operation and flushing programs.

	Redeployed Positions as of May 31, 2018	Redeployed Positions as of May 31, 2019
Valve Operations	1	1
Flushing	0	2
Hydrant Maintenance	0	1
Training Coordinator -- Safety & Skills	1	0
	2	4

16

17 **Q. What is MAWC’s forecasted staffing level in this case?**

18 A. We have identified 696 full time equivalent (“FTE”) employees and twelve (12)

1 temporary summer employees as the appropriate staffing level for the Company's water
2 and sewer operations. The number of employees is based upon each department's and
3 functional area's plans to continue providing safe, adequate, reliable and affordable
4 service to our customers. Service needs and related resource requirements are
5 consistent with meeting regulatory requirements, tariff requirements, industry
6 standards, service requests, customer needs, and providing support to the business
7 operations in the most cost-effective way to best serve the long-term interests of our
8 customers. The direct testimony of Nikole Bowen explains how the Company's labor
9 and labor-related costs were determined.

10 **Q. Please explain why it is necessary to increase MAWC's authorized staffing level.**

11 A. Following the loss of ISRS early in 2016, the Company decided that it would keep the
12 employee complement existing at that time but not fill open positions arising
13 throughout the year as a result of attrition. Consequently, MAWC's employee level
14 reduced from 659 to 641 FTEs through the course of the year. MAWC currently
15 employs 645 FTEs (excluding the 12 temporary summer employees noted above) and
16 expects to reach the requested employee complement of 696 by the end of 2017. These
17 employees will support the Company's enhanced maintenance activities and increased
18 capital investment. A list of positions the Company intends to fill by the end of this
19 year is attached hereto as Schedule WAC-1.

20 While the Company has been able to provide safe and adequate service to its customers,
21 the Company's requested employee complement balances near term cost control with
22 service levels that, over time, provides more cost-effective water and sewer service to

1 our customers.⁷ This means rather than simply doing what needs to be done to keep
2 the water flowing and to collect and treat sewage, the Company strives to provide safe,
3 reliable and affordable service in the most cost-effective way to best serve the long-
4 term interests of our customers.

5 **Q. Please describe MAWC’s approach to employee compensation.**

6 A. Missouri American aims to offer compensation that is on par with that offered by the
7 companies that MAWC competes with for employees so we can attract and maintain
8 committed, dedicated and highly qualified employees. Therefore, MAWC targets its
9 total direct compensation (base and variable compensation) for each role at the
10 Company near the market median (50th percentile) for that role.

11 **Q. Please identify the various employee classifications at MAWC and briefly describe**
12 **how each group is compensated.**

13 A. There are three classifications of employees at MAWC: union hourly employees, non-
14 union hourly employees, and exempt employees. Union hourly employees receive base
15 pay, overtime pay and possibly shift pay. Non-union hourly employees receive base
16 pay, overtime pay, and are eligible for performance pay. Exempt employees receive
17 base pay but are not compensated for overtime. They, too, are eligible for performance
18 pay. Each classification of employees’ total compensation, therefore, includes fixed
19 pay (base pay) and some form(s) of variable pay (e.g., overtime, shift pay, or
20 performance pay).

⁷ The Company requested recovery for 693 FTEs in its last rate case.

1 **Q. How is variable compensation provided to exempt and non-union hourly**
2 **employees?**

3 A. Variable compensation is provided to exempt employees through the Company's
4 Annual Performance Plan ("APP") and Long-Term Performance Plan ("LTPP"). In
5 2016, the APP was expanded to include non-union hourly employees as well. The
6 direct testimony of MAWC witness Robert Mustich discusses the reasonableness of
7 MAWC's performance pay program.

8 **Q. Please generally describe the purpose of the APP and the LTPP.**

9 A. The plans are designed to provide compensation for operational and financial
10 performance, and to focus plan participants on delivering safe, reliable and affordable
11 water and sewer services.

12 **Q. Does the Company's compensation plan benefit customers?**

13 A. Yes. As I mentioned, the plan is designed to provide compensation for performance
14 and to focus plan participants on delivering safe, reliable and affordable water and
15 sewer service. The compensation plan includes components of financial, operational,
16 and individual measures. The operational components measure performance that can
17 most directly influence customer satisfaction, health and safety, environmental
18 performance, and operational efficiency. Customers derive a direct benefit from our
19 focus on these key measures in the plan. Further, well-grounded financial measures
20 keep the organization focused on improved performance at all levels of the
21 organization, particularly in increasing efficiency, decreasing waste, and boosting
22 overall productivity.

1 All of these aspects of overall performance benefit customers by rewarding superior
2 performance in every function. This superior performance supporting our improved
3 O&M efficiency is the result of having a workforce that is incented to find smarter,
4 more efficient ways to deliver water and sewer services.

5 Finally, a financially healthy utility focused on efficiency and customer satisfaction is
6 able to attract the capital investments necessary to provide safe and reliable service and
7 to maintain the technological expertise necessary to operate the company and comply
8 with increasing water quality standards. A financially healthy utility is very much in
9 the interest of MAWC's customers, as it helps ensure MAWC the ability to provide
10 safe and reliable service at the lowest reasonable cost.

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

12 **A. Yes.**

Open Positions

Position	FTE	Location	Cost Center	U/NU
GIS Tech	1.0	St Louis	170114	Non Union
Sr Project Eng	1.0	St Louis	170114	Non Union
Sr Project Eng	1.0	St Louis	170114	Non Union
Sr Project Eng	1.0	St Louis	170114	Non Union
Sr Project Eng	1.0	St Louis	170114	Non Union
Engineer	1.0	St Louis	170114	Non Union
Project Mgr Eng	1.0	St Louis	170114	Non Union
Project Engineer	1.0	Parkville	170114	Non Union
Sr Eng Tech	1.0	St Louis	170114	Non Union
Sr ORM Spec	1.0	St Louis	170120	Non Union
Supv Ops II	1.0	St Louis	170106	Non Union
Spec Service Delivery	1.0	St Louis	170106	Non Union
Supervisor Ops I	1.0	St Louis - Prod	170253	Non Union
Supervisor Ops I	1.0	St Louis - Prod	170201	Non Union
Supervisor Ops II	1.0	St Louis - Prod	170201	Non Union
Specialist Ops	1.0	St Louis - Prod	170253	Non Union
Assistant Operator	1.0	St Louis - North Plant	170251	Union
Sub Station Operator Helper	1.0	St Louis-- - North Plant	170251	Union
Sub Station Operator Helper	1.0	St Louis - Central Plant	170253	Union
Sr Operator	1.0	St Louis - Central Plant	170253	Union
Operator Helper	1.0	St Louis - North Plant	170251	Union
Utility Worker	1.0	St Louis - Central Plant	170253	Union
Mgr Ops	1.0	St Louis	170206	Non Union
Garage Mechanic Lead	1.0	St Louis	170223	Union
Service Building Janitor	1.0	St Louis	170223	Union
Ops Tech	1.0	St Louis	170206	Non Union
Dist Field Worker	1.0	St Louis	170206	Union
Dist Field Worker	1.0	St Louis	170206	Union
Dist Field Worker	1.0	St Louis	170206	Union
Dist Field Worker	1.0	St Louis	170206	Union
Dist Field Worker	1.0	St Louis	170206	Union
Dist Field Worker	1.0	St Louis	170206	Union
Dist Field Worker	1.0	St Louis	170206	Union
Dist Field Worker	1.0	St Louis	170206	Union
Dist Field Worker	1.0	St Louis	170206	Union
Dist Field Worker	1.0	St Louis	170206	Union
Dist Field Worker	1.0	St Louis	170223	Union
Dist Field Worker	1.0	St Louis	170233	Union
Dist Field Worker	1.0	St Louis	170223	Union
Dist Field Worker - Equipment Operator	1.0	St Louis	170206	Union
Specialist Ops	1.0	Jefferson City	171205	Non Union
Plant Operator	1.0	Jefferson City	171201	Non Union
Utility Worker	1.0	Jefferson City	172706	Non Union

Missouri-American Water Company
Schedule WAC-1

Position	FTE	Location	Cost Center	U/NU
Utility Worker	1.0	Jefferson City	172706	Non Union
Utility Worker	1.0	Jefferson City	172706	Non Union
Utility Worker	1.0	Jefferson City	172706	Non Union
Utility Worker	1.0	Mexico	171006	Union
Service Worker	1.0	Joplin	171121	Union
Plant Operator	1.0	Joplin	171101	Union
Utility Worker	1.0	Tri-County	172806	Non Union
Process Tech	1.0	St Joseph	170301	Union
Utility Person	1.0	St Joseph	170306	Union
	51.0			