

Exhibit No.:	
Issues:	Cash Working Capital
Witness:	Harold Walker, III
Exhibit Type:	Direct
Sponsoring Party:	Missouri-American Water Company
Case No.:	WR-2024-0320 SR-2024-0321
Date:	July 1, 2024

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. WR-2024-0320

CASE NO. SR-2024-0321

DIRECT TESTIMONY

OF

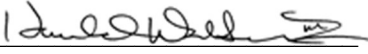
HAROLD WALKER, III

ON BEHALF OF

MISSOURI-AMERICAN WATER COMPANY

AFFIDAVIT

I, Harold Walker, III, under penalty of perjury, and pursuant to Section 509.030, RSMo, state that I am Manager, Financial Studies for Gannett Fleming Valuation and Rate Consultants, LLC, that the accompanying testimony has been prepared by me or under my direction and supervision; that if inquiries were made as to the facts in said testimony, I would respond as therein set forth; and that the aforesaid testimony is true and correct to the best of my knowledge and belief.


Harold Walker, III

July 1, 2024
Dated

**DIRECT TESTIMONY
HAROLD WALKER, III
MISSOURI AMERICAN WATER COMPANY
CASE NO.: WR-2024-0320
CASE NO.: SR-2024-0321**

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DIRECT TESTIMONY

HAROLD WALKER, III

I. INTRODUCTION

1

2 **Q. Please state your name and address.**

3 A. My name is Harold Walker, III. My business address is 1010 Adams Avenue,
4 Audubon, Pennsylvania, 19403.

5 **Q. By whom are you employed?**

6 A. I am employed by Gannett Fleming Valuation and Rate Consultants, LLC as Manager,
7 Financial Studies.

8 **Q. What is your educational background and employment experience?**

9 A. My educational background, business experience and qualifications are provided in the
10 Appendix attached to this testimony.

11

II. SCOPE OF TESTIMONY

12 **Q. What is the purpose of your Direct Testimony?**

13 A. The purpose of my Direct Testimony is to recommend appropriate working capital
14 allowances for inclusion in Missouri-American Water Company's (MAWC or the
15 Company) rate base. My recommendations are based upon the results of four lead-lag
16 studies that were performed under my direct supervision. The four studies are for St.
17 Louis County, Other Missouri Water, Other Missouri Sewer, and Arnold Sewer tariff

1 groups.

2 **Q. Have you prepared Schedules presenting the results of your studies?**

3 A. Yes. I have prepared 33 Schedules identified as Schedule HW-1 through Schedule HW-
4 33 summarizing the Company's working capital claim in this proceeding.

5 **III. PRINCIPLES OF CASH WORKING CAPITAL**

6 **Q. What is cash working capital?**

7 A. Cash working capital is the amount of funds necessary to finance the day-to-day
8 operations of the Company.

9 **Q. How is cash working capital treated for ratemaking purposes?**

10 A. It is included in the determination of a utility's rate base.

11 **Q. Why is cash working capital included as an element of rate base?**

12 A. Cash working capital bridges the gap between the time when funds are provided to the
13 Company by investors to allow the Company to provide service to customers, and the
14 time revenues are received from customers as reimbursement for these services.
15 Working capital is included in rate base to compensate investors for the use of their
16 funds over and above their investment in plant, and to provide investors with a return
17 on the funds required by the Company for daily operations.

18 **Q. How was the cash working capital requirement determined?**

19 A. I conducted four lead-lag studies to determine the timing of MAWC's cash inflows and
20 outflows and analyze the level of funding required to operate on a day-to-day basis. In
21 Missouri, a utility's cash working capital is measured by calculating: (1) the amount of

1 time elapsed between when the Company provides a service to its customers and when
2 the Company receives payments from its customers; and (2) the amount of time elapsed
3 between when the Company receives goods and services and when the Company pays
4 its suppliers for those goods and services. The difference between these two elapsed
5 periods of time is known as the “net lag.”

6 The net lag is multiplied by the average daily cost of service (or revenue requirement)
7 to determine the cash working capital requirement.

8 **Q. Please describe the components of a cash working capital analysis.**

9 A. The two primary components of a cash working capital analysis are revenue lags and
10 expense leads. The revenue lag is the elapsed time between the delivery of a company’s
11 product to its customers and when a company receives payment for the delivery of the
12 product. Investor-provided funds are required to keep a company running during the
13 revenue lag time period, when the revenue stream is temporarily insufficient to finance
14 daily operational needs.

15 The expense lead is the elapsed time between when a good or service is provided to a
16 company and when a company pays its supplier for the good or service. During the
17 expense lead time period, cash received from customers may temporarily exceed a
18 company’s payments to its suppliers for goods or services, and the excess may be used
19 to repay investor-provided funds.

20 The net difference between the revenue lag and expense lead determines a company’s

1 cash working capital requirement.

2 **Q. Generally speaking, how did you calculate the revenue lag?**

3 A. The revenue lag is the sum of three distinct components: the service period lag, the
4 billing lag, and the collection lag.

5 **Q. What is the service period lag?**

6 A. The service period lag is the average time between meter readings. The average, or
7 mid-point, between meter readings, based on monthly meter readings, is roughly 14
8 days. The mid-point service period lag is produced by dividing the service period of
9 roughly 28 days by two.

10 **Q. What is the billing lag?**

11 A. The billing lag is the time from the meter reading date to the date the customer is billed.
12 On the customer billing date, the bill is mailed to the customer, and the total billing
13 amount for the cycle is recorded to MAWC's accounts receivable. The bills are
14 prepared and mailed roughly 5 days after meters are read.

15 **Q. What is the collection lag?**

16 A. The collection lag is the average number of days from the date the bills are mailed to
17 customers to the date payments are received by MAWC. This was determined by
18 summing the daily accounts receivable balance during the 12 months ended December
19 31, 2023 (recent period available at the time of filing) and dividing by the sum of the

1 daily receipts for the same period.

2 **Q. Generally speaking, how did you calculate the expense lead?**

3 A. The expense lead is the sum of two distinct components: the service lead and the
4 payment lead. The service lead is the average time that a service or good was provided
5 to the Company. If a service or good was provided for 20 days, the 20-day service
6 period is divided by two to produce a midpoint of 10 days for the service period lead.
7 The payment lead is the number of days from the end of the service period to the
8 payment date for the service or good. If payment for the service or good was provided
9 on the 30th day and the end of the service period was the 20th day, the payment lead is
10 10 days (30 days – 20 days). MAWC's expenses can be separated into four major sub-
11 accounts: operating expenses, taxes other than income taxes, income taxes, and interest
12 expenses. In each of these sub-accounts, the lead days were calculated for each invoice
13 or account by adding the midpoints of the service periods (the service lead) to the date
14 the Company paid the invoices or accounts (the payment lead).

15 **Q. Why are midpoints used in cash working capital analysis?**

16 A. Midpoints are used to determine the average period during which a service or good is
17 rendered or provided, prior to, or subsequent to, payment for the service. The midpoint
18 assumes that service is provided evenly over the service and payment period. For
19 example, if a service is provided over a 30-day period prior to the payment for service,

1 then on average, service was provided for 15 days (30÷2) before payment.

2 **Q. Did you consider only a part of MAWC's overall cost of service in your lead-lag**
3 **studies?**

4 A. Yes, I considered only a portion of MAWC's cost of service items in my lead-lag
5 studies to be consistent with the "Partial Revenues" lag used in past Company filings.
6 In Missouri, "Partial Revenues" do not include the return on equity.

7 A lead-lag study based on "Partial Revenues" likely understates the full cash working
8 capital requirement and affords the minimum cash working capital requirement. A
9 lead-lag study based on the entire revenue requirement and cost of service provides a
10 more accurate measure of the cash working capital requirement.

11 **Q. Were the four lead-lag studies that you conducted for the Company prepared**
12 **using similar methods and techniques?**

13 A. Yes. The lead-lag studies were prepared using the same methods and techniques. Since
14 the methods are identical, I will discuss the lead-lag study prepared for St. Louis
15 County in detail as a means of explaining the methodology used for Other Missouri
16 Water, Other Missouri Sewer, and Arnold Sewer.

17 **Q. Why did you conduct four lead-lag studies in four MAWC rate zones?**

18 A. MAWC required four lead-lag studies for the four rate zones because each rate zone
19 has a different composition of "Partial Revenues" associated with it and have different
20 cash working capital needs. The lag days for revenues in each rate zone are the same
21 because service, billings and receivables were measured on a total Company basis.

1 Similarly, the lead days for expenses and taxes in each rate zone are the same because
2 payables are generated from a central system and were also analyzed collectively.

3 **Q. What data set did you utilize in your lead-lag studies?**

4 A. The data sets were selected after developing an understanding of the Company's
5 collections, payment policies, and procedures. I requested representative data sets from
6 the Company. Once the requested raw data had been provided, data validation was
7 performed by comparing an actual invoice or a bill with data from the utility's systems
8 to ensure accuracy.

9 The revenue lag data set for the Company was based on an accounts receivable analysis
10 of the beginning balance, the daily charges to this balance as bills were processed and
11 mailed, and the daily receipts for all the days of the year during the 12 months ended
12 December 31, 2023. The revenue lag data set for the Company also included an analysis
13 of the cycle billing, the beginning and ending service dates (meter read dates), the total
14 amount of billings (revenues), and the date bills were mailed (or posted).

15 The expense lead data set was based on information generated from the Company's
16 central accounts payable system. The expense lead data sets for the 12 months ended
17 December 31, 2023 were analyzed to develop the service beginning and ending dates,
18 the amount purchased, and the date of payment. Generally speaking, sampling was
19 randomly done for the invoices within each expense and tax category. In instances
20 where there were large differences in the dollar amount of the invoices in a single
21 expense category, sampling was focused on the largest invoices within the expense
22 category. For example, the larger electric accounts were sampled instead of the smaller

1 electric accounts. The samples analyzed averaged 73% of the Company's total expense
2 and tax dollars.¹

3 **Q. What time period does your lead-lag study encompass?**

4 A. The lead-lag studies in this case analyzed the net revenues and the associated net cost
5 of service during the 12 months ended December 31, 2023, to derive the lag (lead)
6 days. The lag (lead) days were then used to develop the pro forma weighted net revenue
7 requirement for the 12-months ended May 31, 2026, and the associated weighted net
8 cost of service to calculate the Company's working capital requirement.

9 **IV. RESULTS OF THE LEAD-LAG STUDY**

10 **Q. What are the results of the lead-lag studies?**

11 A. Schedule HW-1 summarizes MAWC's cash working capital requirements. The cash
12 working capital requirement for St. Louis County is -\$4,917,918 (negative). The cash
13 working capital requirement for the Other Missouri Water rate zone is -\$777,260
14 (negative); the cash working capital requirement for the Other Missouri Sewer rate
15 zone is -\$504,079 (negative); and the cash working capital requirement for the Arnold
16 Sewer rate zone is -\$198,776 (negative). The cash working capital requirement for
17 Total Water, which includes St. Louis County and the Other Missouri Water rate zone,
18 is -\$5,695,179 (negative). The cash working capital requirement for Total Sewer, which
19 includes Arnold Sewer and the Other Missouri Sewer rate zone, is -\$702,854

¹ Sampling for the total expense and tax dollars paid totaled 73% and reflected a range of sampling from 11% to over 100% of the total line-item dollars (or expenses). Sampling of total line-item dollars greater than 100% of the expense occurred for those line items which included the capital portion, employee contributions, or deferred amounts.

1 (negative). When the results for Total Water and Total Sewer are combined, they show
2 a Total Company cash working capital requirement of -\$6,398,033 (negative).

3 **Q. Please describe Schedule HW-1.**

4 A. Schedule HW-1 calculates the working capital requirements based on the “Partial
5 Revenues” lag used in past Company filings. Schedule HW-1 is the source of
6 information for the lead days and lag days data that is also shown on the Company’s
7 filing Schedule CAS-7, Working Capital.

8 As shown on Schedule HW-1, the cash working capital requirement is based on the net
9 lag days required to finance each expense line item. The net lag day calculations use
10 revenue lag days and subtract their respective expense lead days to determine the
11 appropriate net lag day which was multiplied by the average daily expense (expenses /
12 365 days) line item. The lag days for the receipt of the revenue requirement is
13 developed on Schedule HW-2. The lead days for the payments of the partial cost of
14 service is developed on Schedules HW-4 through HW-33 and the schedule references
15 for the lead days for the partial cost of service is shown on page 1 of Schedule HW-3.

16 **Q. Please explain the procedures used to determine the revenue lag.**

17 A. Schedule HW-2 summarizes the development of the 48.7-day revenue lag for the
18 Company. The Company’s 48.7-day revenue lag was used for each rate zone. The

1 revenue lags reflect the Company's service, billings, and collections frequencies.

2 **Q. Please explain the procedures used to determine the service period and the billing**
3 **lag days for customer revenues.**

4 A. The lag days for the service period and the billing lag are developed on page 2 of
5 Schedule HW-2. As mentioned previously, the service period lag was measured from
6 the midpoint of the service period to the meter reading date, and the billing lag was
7 measured from the meter reading date to the billing date.

8 A weighted average service period lag of 14.1 days is shown on page 2 of Schedule
9 HW-2. MAWC's bills are prepared, mailed, and recorded to accounts receivable 5.5
10 days after meters are read. Adding the service period lag to the billing lag produces a
11 combined 19.6-day service period and billing lag (14.1 days + 5.5 days = 19.6 days) as
12 shown on page 2 of Schedule HW-2.

13 **Q. Please describe the procedure used to calculate the collection lag.**

14 A. As mentioned previously, the collection lag is the average number of days from the
15 date the bills were mailed to the date payments are received and was determined by
16 summing the daily accounts receivable balance during the test year and dividing by the
17 sum of the daily test year receipts. This results in an average collection lag of 29.1 days
18 as shown on page 3 of Schedule HW-2.

19 **Q. Please summarize the total revenue lag.**

20 A. The total revenue lag of 48.7 lag days is the result of adding the 19.6-day service period
21 and billing lag and an average collection lag of 29.1 days as shown on page 1 of

1 Schedule HW-2.

2 **Q. Please explain the calculation of lead days for the cost of service expenses shown**
3 **on Schedule HW-1.**

4 A. For each cost of service expense item that is shown, the lead days were calculated for
5 each invoice or account based on the midpoints of the service periods to the dates the
6 Company paid the invoices or accounts. Schedule HW-3 shows the schedule references
7 for the partial cost of service lead days for the Company.

8 **Q. How were the lead days determined for the operating expenses sub-account line**
9 **items shown on Schedule HW-1?**

10 A. For the operating expense sub-accounts line items shown, the lead days were
11 determined for each invoice or account sampled based on the midpoints of the service
12 periods to the dates the Company paid the invoices or accounts. As explained
13 previously, sampling was randomly done for the invoices within each expense and tax
14 category.

15 For example, the weighted average lead days for fuel and power equal 21.1 days (see
16 Schedule HW-6). The lead days for fuel and power expense were calculated for each
17 invoice examined based on the midpoints of the service periods to the dates the
18 Company paid the invoices. In total, 78% of the fuel and power expenses were sampled.
19 Similar analyses were conducted for chemicals expense (see Schedule HW-4),
20 customer accounting expense (see Schedule HW-5), insurance other than group
21 expense (see Schedule HW-7), salaries and wages expense (see Schedule HW-8),
22 purchased water expense (see Schedule HW-9), support services expense (see Schedule

1 HW-10), waste disposal expense (see Schedule HW-11), group insurance expense (see
2 Schedule HW-12), pensions expense (see Schedule HW-13), other benefits expense
3 (see Schedule HW-14), rents expense (see Schedule HW-15), contracted services
4 expense (see Schedule HW-16), building maintenance and services expense (see
5 Schedule HW-17), telecommunications expense (see Schedule HW-18), postage,
6 printing, and stationary expense (see Schedule HW-19), office supplies and services
7 expense (see Schedule HW-20), employee related expenses (see Schedule HW-21),
8 transportation expense (see Schedule HW-22), miscellaneous expenses (see Schedule
9 HW-23), and maintenance supplies expense (see Schedule HW-24).

10 **Q. How were the lead days determined for the taxes other than income taxes sub-**
11 **account line items shown on Schedule HW-1?**

12 A. For most of the taxes other than income taxes sub-account line items shown, the lead
13 days were calculated based on the midpoint of the tax liability period to the payment
14 date, weighted by the actual amount paid. The exception to this was payroll taxes,
15 where the lead days were calculated based on the midpoint of the tax liability period to
16 the payment date. These tax sub-accounts are shown on Schedules HW-25 through
17 HW-28. These taxes include payroll taxes (see Schedule HW-25), property taxes (see
18 Schedule HW-26), PSC fees (see Schedule HW-27), and environmental tax (see
19 Schedule HW-28).

20 **Q. How were the lead days determined for the income taxes sub-account line items**
21 **shown on Schedule HW-1?**

22 For the federal taxes (current) and state taxes (current) sub-account line items shown,

1 the lead days were calculated based on the midpoint of the tax period to the payment
2 date, weighted by the percent of the payment required. The derivation of the federal
3 taxes (current) 35.5 lead days is shown on Schedule HW-29 and the derivation of the
4 state taxes (current) 43.3 lead days is shown on Schedule HW-30.

5 **Q. How were the lead days determined for interest expense sub-account line items**
6 **shown on Schedule HW-1?**

7 A. For the interest expense sub-account line items, the lead days were calculated based on
8 the midpoint of the interest period to the payment date. The derivation of the interest
9 expense lead days is shown on Schedules HW-31 through HW-33.

10 **Q. Please summarize your determination of the working capital requirement shown**
11 **on Schedule HW-1.**

12 A. The cash working capital requirement for St. Louis County -\$4,917,918 (negative) is
13 shown on page 4 of Schedule HW-1. The cash working capital requirement for the
14 Other Missouri Water rate zone is -\$777,260 (negative) (page 5 of Schedule HW-1);
15 the cash working capital requirement for the Other Missouri Sewer rate zone is -
16 \$504,079 (negative) (page 7 of Schedule HW-1); and the cash working capital
17 requirement for the Arnold Sewer rate zone is -\$198,776 (negative) (page 6 of Schedule
18 HW-1). The cash working capital requirement for Total Water, which includes St.
19 Louis County and the Other Missouri Water rate zone, is -\$5,695,179 (negative) (page
20 2 of Schedule HW-1). The cash working capital requirement for Total Sewer, which
21 includes Arnold Sewer and the Other Missouri Sewer rate zone, is -\$702,854 (negative)
22 (page 3 of Schedule HW-1). When the results for Total Water and Total Sewer are

1 combined, they show a Total Company cash working capital requirement of -
2 \$6,398,033 (negative) (page 1 of Schedule HW-1).

3 **Q. Does this conclude your Direct Testimony?**

4 A. Yes, it does.

Professional Qualifications
of
Harold Walker, III
Manager, Financial Studies
Gannett Fleming Valuation and Rate Consultants, LLC.

EDUCATION

Mr. Walker graduated from Pennsylvania State University in 1984 with a Bachelor of Science Degree in Finance. His studies concentrated on securities analysis and portfolio management with an emphasis on economics and quantitative business analysis. He has also completed the regulation and the rate-making process courses presented by the College of Business Administration and Economics Center for Public Utilities at New Mexico State University. Additionally, he has attended programs presented by The Institute of Chartered Financial Analysts (CFA).

Mr. Walker was awarded the professional designation "Certified Rate of Return Analyst" (CRRRA) by the Society of Utility and Regulatory Financial Analysts. This designation is based upon education, experience, and the successful completion of a comprehensive examination. He is also a member of the Society of Utility and Regulatory Financial Analysts (SURFA) and has attended numerous financial forums sponsored by the Society. The SURFA forums are recognized by the Association for Investment Management and Research (AIMR) and the National Association of State Boards of Accountancy for continuing education credits.

Mr. Walker obtained a license as a Municipal Advisor Representative (Series 50) by Municipal Securities Rulemaking Board (MSRB) and Financial Industry Regulatory Authority (FINRA).

BUSINESS EXPERIENCE

Prior to joining Gannett Fleming Valuation and Rate Consultants, LLC., Mr. Walker was employed by AUS Consultants - Utility Services. He held various positions during his eleven years with AUS, concluding his employment there as a Vice President. His duties included providing and supervising financial and economic studies on behalf of investor owned and municipally owned water, wastewater, electric, natural gas distribution and transmission, oil pipeline and telephone utilities as well as resource recovery companies.

In 1996, Mr. Walker joined Gannett Fleming Valuation and Rate Consultants, LLC. In his capacity as Manager, Financial Studies and for the past twenty years, he has continuously studied rates of return requirements for regulated firms. In this regard, he supervised the preparation of rate of return studies in connection with his testimony and in the past, for other individuals. He also

assisted and/or developed dividend policy studies, nuclear prudence studies, calculated fixed charge rates for avoided costs involving cogeneration projects, financial decision studies for capital budgeting purposes and developed financial models for determining future capital requirements and the effect of those requirements on investors and ratepayers, valued utility property and common stock for acquisition and divestiture, and assisted in the private placement of fixed capital securities for public utilities.

Head, Gannett Fleming GASB 34 Task Force responsible for developing Governmental Accounting Standards Board (GASB) 34 services and educating Gannett Fleming personnel and Gannett Fleming clients on GASB 34 and how it may affect them. The GASB 34 related services include inventory of assets, valuation of assets, salvage estimation, annual depreciation rate determination, estimation of depreciation reserve, asset service life determination, asset condition assessment, condition assessment documentation, maintenance estimate for asset preservation, establishment of condition level index, geographic information system (GIS) and data management services, management discussion and analysis (MD&A) reporting, required supplemental information (RSI) reporting, auditor interface, and GASB 34 compliance review.

In 2004, Mr. Walker was elected to serve on the Board of Directors of SURFA. Previously, he served as an ex officio directors as an advisor to SURFA's existing President. In 2000, Mr. Walker was elected President of SURFA for the 2001-2002 term. Prior to that, he was elected to serve on the Board of Directors of SURFA during the period 1997-1998 and 1999-2000. He also previously served on the Pennsylvania Municipal Authorities Association, Electric Deregulation Committee.

EXPERT TESTIMONY

Mr. Walker has submitted testimony or been deposed on various topics before regulatory commissions and courts in 27 states including: Alaska, Arizona, California, Colorado, Connecticut, Delaware, Hawaii, Idaho, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Michigan, Missouri, New Hampshire, Nevada, New Jersey, New York, North Carolina, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, and West Virginia. His testimonies covered various subjects including lead-lag studies, fair rate of return, fair market value, the taking of natural resources, benchmarking, appropriate capital structure and fixed capital cost rates, depreciation, purchased water adjustments, synchronization of interest charges for income tax purposes, valuation, cash working capital, financial analyses of investment alternatives, and fair value. The following tabulation provides a listing of the electric power, natural gas distribution, telephone, wastewater, and water service utility cases in which he has been involved as a witness.

<u>Client</u>	<u>Docket No.</u>
Alpena Power Company	U-10020
Armstrong Telephone Company - Northern Division	92-0884-T-42T
Armstrong Telephone Company - Northern Division	95-0571-T-42T
Artesian Water Company, Inc.	90 10
Artesian Water Company, Inc.	06 158
Aqua Illinois Consolidated Water Divisions and Consolidated Sewer Divisions	11-0436
Aqua Illinois Hawthorn Woods Wastewater Division	07 0620/07 0621/08 0067
Aqua Illinois Hawthorn Woods Water Division	07 0620/07 0621/08 0067
Aqua Illinois Kankakee Water Division	10-0194
Aqua Illinois Kankakee Water Division	14-0419
Aqua Illinois Vermilion Division	07 0620/07 0621/08 0067
Aqua Illinois Willowbrook Wastewater Division	07 0620/07 0621/08 0067
Aqua Illinois Willowbrook Water Division	07 0620/07 0621/08 0067
Aqua Pennsylvania, Inc	A-2022-3034143
Aqua Pennsylvania Wastewater Inc	A-2016-2580061
Aqua Pennsylvania Wastewater Inc	A-2017-2605434
Aqua Pennsylvania Wastewater Inc	A-2018-3001582
Aqua Pennsylvania Wastewater Inc	A-2019-3008491
Aqua Pennsylvania Wastewater Inc	A-2019-3009052
Aqua Pennsylvania Wastewater Inc	A-2019-3015173
Aqua Pennsylvania Wastewater Inc	A-2021-3024267
Aqua Pennsylvania Wastewater Inc	A-2021-3026132
Aqua Pennsylvania Wastewater Inc	A-2021-3027268
Aqua Pennsylvania Wastewater Inc	A-2023-3041695
Aqua Virginia - Alpha Water Corporation	Pue-2009-00059
Aqua Virginia - Blue Ridge Utility Company, Inc.	Pue-2009-00059
Aqua Virginia - Caroline Utilities, Inc. (Wastewater)	Pue-2009-00059
Aqua Virginia - Caroline Utilities, Inc. (Water)	Pue-2009-00059

Aqua Virginia - Earlysville Forest Water Company	Pue-2009-00059
Aqua Virginia - Heritage Homes of Virginia	Pue-2009-00059
Aqua Virginia - Indian River Water Company	Pue-2009-00059
Aqua Virginia - James River Service Corp.	Pue-2009-00059
Aqua Virginia - Lake Holiday Utilities, Inc. (Wastewater)	Pue-2009-00059
Aqua Virginia - Lake Holiday Utilities, Inc. (Water)	Pue-2009-00059
Aqua Virginia - Lake Monticello Services Co. (Wastewater)	Pue-2009-00059
Aqua Virginia - Lake Monticello Services Co. (Water)	Pue-2009-00059
Aqua Virginia - Lake Shawnee	Pue-2009-00059
Aqua Virginia - Land'or Utility Company (Wastewater)	Pue-2009-00059
Aqua Virginia - Land'or Utility Company (Water)	Pue-2009-00059
Aqua Virginia - Mountainview Water Company, Inc.	Pue-2009-00059
Aqua Virginia - Powhatan Water Works, Inc.	Pue-2009-00059
Aqua Virginia - Rainbow Forest Water Corporation	Pue-2009-00059
Aqua Virginia - Shawnee Land	Pue-2009-00059
Aqua Virginia - Sydnor Water Corporation	Pue-2009-00059
Aqua Virginia - Water Distributors, Inc.	Pue-2009-00059
Atlantic City Sewerage Company	WR21071006
Berkshire Gas Company	18-40
Berkshire Gas Company	22-20
Bermuda Water Company, Inc	W-01812A-22-0256
Borough of Brentwood	A-2021-3024058
Borough of Hanover	R-2009-2106908
Borough of Hanover	R-2012-2311725
Borough of Hanover	R-2014-242830
Borough of Hanover	R-2021-3026116
Borough of Hanover	P-2021-3026854
Borough of Royersford	A-2020-3019634
Butler Area Sewer Authority	A-2020-3019634
Chaparral City Water Company	W 02113a 04 0616
California-American Water Company	CIVCV156413
Connecticut-American Water Company	99-08-32
Connecticut Water Company	06 07 08
Citizens Utilities Company	

Colorado Gas Division	-
Citizens Utilities Company	
Vermont Electric Division	5426
Citizens Utilities Home Water Company	R 901664
Citizens Utilities Water Company	
of Pennsylvania	R 901663
City of Beaver Falls	A-2022-3033138
City of Bethlehem - Bureau of Water	R-00984375
City of Bethlehem - Bureau of Water	R 00072492
City of Bethlehem - Bureau of Water	R-2013-2390244
City of Bethlehem - Bureau of Water	R-2020-3020256
City of Dubois – Bureau of Water	R-2013-2350509
City of Dubois – Bureau of Water	R-2016-2554150
City of Lancaster Sewer Fund	R-00005109
City of Lancaster Sewer Fund	R-00049862
City of Lancaster Sewer Fund	R-2012-2310366
City of Lancaster Sewer Fund	R-2019-3010955
City of Lancaster Sewer Fund	R-2019-3010955
City of Lancaster Water Fund	R-00984567
City of Lancaster Water Fund	R-00016114
City of Lancaster Water Fund	R 00051167
City of Lancaster Water Fund	R-2010-2179103
City of Lancaster Water Fund	R-2014-2418872
City of Lancaster Water Fund	R-2021-3026682
City of Lancaster Water Fund	P-2022-3035591
Coastland Corporation	15-cvs-216
Commonwealth Edison Company	23-0728
Community Utilities of Pennsylvania-Water	R-2023-3042804
Community Utilities of Pennsylvania-Wastewater	R-2023-3042805
Consumers Pennsylvania Water Company	
Roaring Creek Division	R-00973869
Consumers Pennsylvania Water Company	
Shenango Valley Division	R-00973972
Country Knolls Water Works, Inc.	90 W 0458
East Resources, Inc. - West Virginia Utility	06 0445 G 42T
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Schedules

**BEFORE THE
MISSOURI PUBLIC SERVICE COMMISSION**

**CASE NO. WR-2024-0320
CASE NO. SR-2024-0321**

MISSOURI-AMERICAN WATER COMPANY

Lead-Lag Schedules

Schedule HW-1 Through Schedule HW-33

To Accompany the

Direct Testimony of Harold Walker, III

On Lead-Lag Study - Working Capital

MISSOURI-AMERICAN WATER COMPANYCALCULATION OF CASH WORKING CAPITAL REQUIREMENTS
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

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TOTAL COMPANY

SUMMARY CALCULATION OF CASH WORKING CAPITAL REQUIREMENTS
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Line Number	Expense Category	Present Rates			Expense (Lead)/Lag	Net (Lead)/Lag	Cash Requirement
		Pro Forma For the 12 Months Ended 5/31/26	Average Daily Expense	Revenue Lag			
1							
2	Purchased Water	\$1,871,660	\$5,128	48.70	42.40	6.30	\$32,305
3	Fuel and Power	15,271,659	41,840	48.70	21.10	27.60	1,154,788
4	Chemicals	20,282,165	55,568	48.70	37.60	11.10	616,800
5	Waste Disposal	6,262,428	17,157	48.70	70.30	(21.60)	(370,598)
6	Labor	42,260,825	115,783	48.70	10.50	38.20	4,422,914
7	Pensions	1,218,944	3,340	48.70	(1.20)	49.90	166,645
8	OPEB	(4,420,974)	(12,112)	48.70	48.70	0.00	0
9	Group Insurance	9,099,708	24,931	48.70	10.50	38.20	952,353
10	Other Benefits	3,567,469	9,774	48.70	33.40	15.30	149,540
11	Support Services	43,850,619	120,139	48.70	(5.60)	54.30	6,523,530
12	Contracted services	7,292,251	19,979	48.70	34.20	14.50	289,692
13	Building Maintenance and Services	2,246,996	6,156	48.70	37.20	11.50	70,796
14	Telecommunication expenses	1,818,295	4,982	48.70	26.30	22.40	111,589
15	Postage, printing and stationary	43,692	120	48.70	20.60	28.10	3,364
16	Office supplies and services	929,806	2,547	48.70	50.20	(1.50)	(3,821)
17	Employee related expense travel & entertainment	680,644	1,865	48.70	55.80	(7.10)	(13,240)
18	Rents	382,612	1,048	48.70	25.50	23.20	24,319
19	Transportation	3,968,437	10,872	48.70	32.30	16.40	178,308
20	Miscellaneous	3,300,129	9,041	48.70	41.00	7.70	69,619
21	Uncollectible accounts expense	5,076,750	13,909	48.70	48.70	0.00	0
22	Customer Accounting	1,881,316	5,154	48.70	59.20	(10.50)	(54,120)
23	Regulatory Expense	631,928	1,731	48.70	48.70	0.00	0
24	Insurance Other than Group	9,047,745	24,788	48.70	(74.60)	123.30	3,056,402
25	Maintenance supplies and services	11,947,373	32,733	48.70	49.30	(0.60)	(19,640)
26							
27	Total Operations and Maintenance	<u>188,512,476</u>					<u>17,361,546</u>
28							
29	Depreciation	90,865,638	248,947	48.70	48.70	0.00	0
30	Amortization	11,163,488	30,585	48.70	48.70	0.00	0
31	Property Taxes	49,487,693	135,583	48.70	169.60	(120.90)	(16,391,951)
32	Payroll Taxes	3,226,078	8,839	48.70	10.50	38.20	337,633
33	PSC Fees	2,567,448	7,034	48.70	(62.50)	111.20	782,193
34	Other General Taxes	(246,484)	(675)	48.70	48.70	0.00	0
35	Current Federal Income Tax	(32,744,710)	(89,712)	48.70	35.50	13.20	(1,184,192)
36	Current State Income Tax	(5,836,648)	(15,991)	48.70	43.30	5.40	(86,350)
37	Deferred Income Taxes	35,647,384	97,664	48.70	48.70	0.00	0
38	Amortization of Investment Tax Credit	(101,928)	(279)	48.70	48.70	0.00	0
39	Interest Expense Deduction	79,823,410	218,694	48.70	81.70	(33.00)	(7,216,911)
40	Preferred Stock	0	0	48.70	0.00	48.70	0
41	Total Working Capital Requirement	<u>\$422,363,845</u>					<u>(\$6,398,033)</u>
42							
43	Total Cash and Working Capital Requirement Used						(\$6,398,033)
44							
45							

TOTAL WATER

SUMMARY CALCULATION OF CASH WORKING CAPITAL REQUIREMENTS
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Line Number	Expense Category	Present Rates Pro Forma For the 12 Months Ended 5/31/26	Average Daily Expense	Revenue Lag	Expense (Lead)/Lag	Net (Lead)/Lag	Cash Requirement
1							
2	Purchased Water	\$1,871,660	\$5,128	48.70	42.40	6.30	\$32,305
3	Fuel and Power	14,607,060	40,019	48.70	21.10	27.60	1,104,534
4	Chemicals	20,154,577	55,218	48.70	37.60	11.10	612,920
5	Waste Disposal	2,255,017	6,178	48.70	70.30	(21.60)	(133,448)
6	Labor	40,886,185	112,017	48.70	10.50	38.20	4,279,047
7	Pensions	1,213,824	3,326	48.70	(1.20)	49.90	165,945
8	OPEB	(4,404,617)	(12,067)	48.70	48.70	0.00	0
9	Group Insurance	8,835,349	24,206	48.70	10.50	38.20	924,686
10	Other Benefits	3,484,473	9,547	48.70	33.40	15.30	146,061
11	Support Services	43,688,371	119,694	48.70	(5.60)	54.30	6,499,393
12	Contracted services	7,083,345	19,406	48.70	34.20	14.50	281,393
13	Building Maintenance and Services	1,776,436	4,867	48.70	37.20	11.50	55,970
14	Telecommunication expenses	1,811,567	4,963	48.70	26.30	22.40	111,176
15	Postage, printing and stationary	43,530	119	48.70	20.60	28.10	3,351
16	Office supplies and services	876,962	2,403	48.70	50.20	(1.50)	(3,604)
17	Employee related expense travel & entertainment	678,126	1,858	48.70	55.80	(7.10)	(13,191)
18	Rents	312,199	855	48.70	25.50	23.20	19,844
19	Transportation	3,791,790	10,388	48.70	32.30	16.40	170,371
20	Miscellaneous	3,186,969	8,731	48.70	41.00	7.70	67,232
21	Uncollectible accounts expense	4,869,827	13,342	48.70	48.70	0.00	0
22	Customer Accounting	1,874,375	5,135	48.70	59.20	(10.50)	(53,920)
23	Regulatory Expense	629,590	1,725	48.70	48.70	0.00	0
24	Insurance Other than Group	8,994,973	24,644	48.70	(74.60)	123.30	3,038,576
25	Maintenance supplies and services	11,331,535	31,045	48.70	49.30	(0.60)	(18,627)
26							
27	Total Operations and Maintenance	<u>179,853,124</u>					<u>17,290,014</u>
28							
29	Depreciation	86,752,330	237,678	48.70	48.70	0.00	0
30	Amortization	9,876,453	27,059	48.70	48.70	0.00	0
31	Property Taxes	47,915,924	131,277	48.70	169.60	(120.90)	(15,871,329)
32	Payroll Taxes	3,139,266	8,601	48.70	10.50	38.20	328,548
33	PSC Fees	2,556,665	7,005	48.70	(62.50)	111.20	778,907
34	Other General Taxes	(245,234)	(672)	48.70	48.70	0.00	0
35	Current Federal Income Tax	(32,217,065)	(88,266)	48.70	35.50	13.20	(1,165,110)
36	Current State Income Tax	(5,742,949)	(15,734)	48.70	43.30	5.40	(84,964)
37	Deferred Income Taxes	34,587,264	94,760	48.70	48.70	0.00	0
38	Amortization of Investment Tax Credit	(101,551)	(278)	48.70	48.70	0.00	0
39	Interest Expense Deduction	77,106,183	211,250	48.70	81.70	(33.00)	(6,971,244)
40	Preferred Stock	0	0	48.70	0.00	48.70	0
41	Total Working Capital Requirement	<u>\$403,480,411</u>					<u>(\$5,695,179)</u>
42							
43	Total Cash and Working Capital Requirement Used						(\$5,695,179)
44							
45							

TOTAL SEWER

SUMMARY CALCULATION OF CASH WORKING CAPITAL REQUIREMENTS
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Line Number	Expense Category	Present Rates Pro Forma For the 12 Months Ended 5/31/26	Average Daily Expense	Revenue Lag	Expense (Lead)/Lag	Net (Lead)/Lag	Cash Requirement
1							
2	Purchased Water	\$0	\$0	48.70	42.40	6.30	\$0
3	Fuel and Power	664,599	1,821	48.70	21.10	27.60	50,255
4	Chemicals	127,588	350	48.70	37.60	11.10	3,880
5	Waste Disposal	4,007,410	10,979	48.70	70.30	(21.60)	(237,151)
6	Labor	1,374,640	3,766	48.70	10.50	38.20	143,866
7	Pensions	5,120	14	48.70	(1.20)	49.90	700
8	OPEB	(16,358)	(45)	48.70	48.70	0.00	0
9	Group Insurance	264,359	724	48.70	10.50	38.20	27,667
10	Other Benefits	82,996	227	48.70	33.40	15.30	3,479
11	Support Services	162,247	445	48.70	(5.60)	54.30	24,137
12	Contracted services	208,906	572	48.70	34.20	14.50	8,299
13	Building Maintenance and Services	470,561	1,289	48.70	37.20	11.50	14,826
14	Telecommunication expenses	6,728	18	48.70	26.30	22.40	413
15	Postage, printing and stationary	162	0	48.70	20.60	28.10	12
16	Office supplies and services	52,844	145	48.70	50.20	(1.50)	(217)
17	Employee related expense travel & entertainment	2,518	7	48.70	55.80	(7.10)	(49)
18	Rents	70,413	193	48.70	25.50	23.20	4,476
19	Transportation	176,647	484	48.70	32.30	16.40	7,937
20	Miscellaneous	113,160	310	48.70	41.00	7.70	2,387
21	Uncollectible accounts expense	206,923	567	48.70	48.70	0.00	0
22	Customer Accounting	6,941	19	48.70	59.20	(10.50)	(200)
23	Regulatory Expense	2,338	6	48.70	48.70	0.00	0
24	Insurance Other than Group	52,771	145	48.70	(74.60)	123.30	17,827
25	Maintenance supplies and services	615,838	1,687	48.70	49.30	(0.60)	(1,012)
26							
27	Total Operations and Maintenance	<u>8,659,351</u>					<u>71,532</u>
28							
29	Depreciation	4,113,308	11,269	48.70	48.70	0.00	0
30	Amortization	1,287,035	3,526	48.70	48.70	0.00	0
31	Property Taxes	1,571,769	4,306	48.70	169.60	(120.90)	(520,621)
32	Payroll Taxes	86,812	238	48.70	10.50	38.20	9,086
33	PSC Fees	10,783	30	48.70	(62.50)	111.20	3,285
34	Other General Taxes	(1,250)	(3)	48.70	48.70	0.00	0
35	Current Federal Income Tax	(527,645)	(1,446)	48.70	35.50	13.20	(19,082)
36	Current State Income Tax	(93,699)	(257)	48.70	43.30	5.40	(1,386)
37	Deferred Income Taxes	1,060,120	2,904	48.70	48.70	0.00	0
38	Amortization of Investment Tax Credit	(377)	(1)	48.70	48.70	0.00	0
39	Interest Expense Deduction	2,717,227	7,444	48.70	81.70	(33.00)	(245,667)
40	Preferred Stock	0	0	48.70	0.00	48.70	0
41	Total Working Capital Requirement	<u>\$18,883,434</u>					<u>(\$702,854)</u>
42							
43	Total Cash and Working Capital Requirement Used						<u>(\$702,854)</u>
44							
45							

ST. LOUIS COUNTY

SUMMARY CALCULATION OF CASH WORKING CAPITAL REQUIREMENTS
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Line Number	Expense Category	Present Rates Pro Forma For the 12 Months Ended 5/31/26	Average Daily Expense	Revenue Lag	Expense (Lead)/Lag	Net (Lead)/Lag	Cash Requirement
1							
2	Purchased Water	\$449,333	\$1,231	48.70	42.40	6.30	\$7,756
3	Fuel and Power	9,444,860	25,876	48.70	21.10	27.60	714,187
4	Chemicals	16,120,089	44,165	48.70	37.60	11.10	490,227
5	Waste Disposal	456,115	1,250	48.70	70.30	(21.60)	(26,992)
6	Labor	30,338,984	83,121	48.70	10.50	38.20	3,175,203
7	Pensions	820,227	2,247	48.70	(1.20)	49.90	112,135
8	OPEB	(3,092,029)	(8,471)	48.70	48.70	0.00	0
9	Group Insurance	6,147,077	16,841	48.70	10.50	38.20	643,338
10	Other Benefits	2,518,284	6,899	48.70	33.40	15.30	105,561
11	Support Services	30,669,123	84,025	48.70	(5.60)	54.30	4,562,557
12	Contracted services	5,723,367	15,680	48.70	34.20	14.50	227,367
13	Building Maintenance and Services	836,858	2,293	48.70	37.20	11.50	26,367
14	Telecommunication expenses	1,271,715	3,484	48.70	26.30	22.40	78,045
15	Postage, printing and stationary	30,558	84	48.70	20.60	28.10	2,353
16	Office supplies and services	546,739	1,498	48.70	50.20	(1.50)	(2,247)
17	Employee related expense travel & entertainment	476,043	1,304	48.70	55.80	(7.10)	(9,260)
18	Rents	239,657	657	48.70	25.50	23.20	15,233
19	Transportation	2,958,000	8,104	48.70	32.30	16.40	132,907
20	Miscellaneous	2,142,050	5,869	48.70	41.00	7.70	45,188
21	Uncollectible accounts expense	3,505,183	9,603	48.70	48.70	0.00	0
22	Customer Accounting	1,311,999	3,595	48.70	59.20	(10.50)	(37,742)
23	Regulatory Expense	441,971	1,211	48.70	48.70	0.00	0
24	Insurance Other than Group	6,298,945	17,257	48.70	(74.60)	123.30	2,127,835
25	Maintenance supplies and services	7,795,588	21,358	48.70	49.30	(0.60)	(12,815)
26							
27	Total Operations and Maintenance	<u>127,450,734</u>					<u>12,377,203</u>
28							
29	Depreciation	61,269,102	167,861	48.70	48.70	0.00	0
30	Amortization	7,290,335	19,974	48.70	48.70	0.00	0
31	Property Taxes	36,744,136	100,669	48.70	169.60	(120.90)	(12,170,866)
32	Payroll Taxes	2,321,901	6,361	48.70	10.50	38.20	243,004
33	PSC Fees	1,727,636	4,733	48.70	(62.50)	111.20	526,337
34	Other General Taxes	(190,174)	(521)	48.70	48.70	0.00	0
35	Current Federal Income Tax	(21,636,622)	(59,278)	48.70	35.50	13.20	(782,475)
36	Current State Income Tax	(3,863,687)	(10,585)	48.70	43.30	5.40	(57,161)
37	Deferred Income Taxes	23,389,634	64,081	48.70	48.70	0.00	0
38	Amortization of Investment Tax Credit	(71,288)	(195)	48.70	48.70	0.00	0
39	Interest Expense Deduction	55,899,870	153,150	48.70	81.70	(33.00)	(5,053,961)
40	Preferred Stock	0	0	48.70	0.00	48.70	0
41	Total Working Capital Requirement	<u>\$290,331,577</u>					<u>(\$4,917,918)</u>
42							
43	Total Cash and Working Capital Requirement Used						<u>(\$4,917,918)</u>
44							
45							

ALL OTHER WATER

SUMMARY CALCULATION OF CASH WORKING CAPITAL REQUIREMENTS
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Line Number	Expense Category	Present Rates Pro Forma For the 12 Months Ended 5/31/26	Average Daily Expense	Revenue Lag	Expense (Lead)/Lag	Net (Lead)/Lag	Cash Requirement
1							
2	Purchased Water	\$1,422,327	\$3,897	48.70	42.40	6.30	\$24,550
3	Fuel and Power	5,162,199	14,143	48.70	21.10	27.60	390,347
4	Chemicals	4,034,489	11,053	48.70	37.60	11.10	122,693
5	Waste Disposal	1,798,903	4,929	48.70	70.30	(21.60)	(106,456)
6	Labor	10,547,201	28,896	48.70	10.50	38.20	1,103,844
7	Pensions	393,597	1,078	48.70	(1.20)	49.90	53,810
8	OPEB	(1,312,587)	(3,596)	48.70	48.70	0.00	0
9	Group Insurance	2,688,272	7,365	48.70	10.50	38.20	281,348
10	Other Benefits	966,190	2,647	48.70	33.40	15.30	40,501
11	Support Services	13,019,249	35,669	48.70	(5.60)	54.30	1,936,836
12	Contracted services	1,359,978	3,726	48.70	34.20	14.50	54,027
13	Building Maintenance and Services	939,578	2,574	48.70	37.20	11.50	29,603
14	Telecommunication expenses	539,852	1,479	48.70	26.30	22.40	33,131
15	Postage, printing and stationary	12,972	36	48.70	20.60	28.10	999
16	Office supplies and services	330,223	905	48.70	50.20	(1.50)	(1,357)
17	Employee related expense travel & entertainment	202,083	554	48.70	55.80	(7.10)	(3,931)
18	Rents	72,542	199	48.70	25.50	23.20	4,611
19	Transportation	833,790	2,284	48.70	32.30	16.40	37,463
20	Miscellaneous	1,044,919	2,863	48.70	41.00	7.70	22,044
21	Uncollectible accounts expense	1,364,644	3,739	48.70	48.70	0.00	0
22	Customer Accounting	562,376	1,541	48.70	59.20	(10.50)	(16,178)
23	Regulatory Expense	187,619	514	48.70	48.70	0.00	0
24	Insurance Other than Group	2,696,028	7,386	48.70	(74.60)	123.30	910,740
25	Maintenance supplies and services	3,535,947	9,688	48.70	49.30	(0.60)	(5,813)
26							
27	Total Operations and Maintenance	<u>52,402,391</u>					<u>4,912,811</u>
28							
29	Depreciation	25,483,228	69,817	48.70	48.70	0.00	0
30	Amortization	2,586,118	7,085	48.70	48.70	0.00	0
31	Property Taxes	11,171,788	30,608	48.70	169.60	(120.90)	(3,700,464)
32	Payroll Taxes	817,364	2,239	48.70	10.50	38.20	85,543
33	PSC Fees	829,029	2,271	48.70	(62.50)	111.20	252,570
34	Other General Taxes	(55,061)	(151)	48.70	48.70	0.00	0
35	Current Federal Income Tax	(10,580,443)	(28,988)	48.70	35.50	13.20	(382,635)
36	Current State Income Tax	(1,879,263)	(5,149)	48.70	43.30	5.40	(27,803)
37	Deferred Income Taxes	11,197,630	30,678	48.70	48.70	0.00	0
38	Amortization of Investment Tax Credit	(30,262)	(83)	48.70	48.70	0.00	0
39	Interest Expense Deduction	21,206,312	58,099	48.70	81.70	(33.00)	(1,917,283)
40	Preferred Stock	0	0	48.70	0.00	48.70	0
41	Total Working Capital Requirement	<u>\$113,148,833</u>					<u>(\$777,260)</u>
42							
43	Total Cash and Working Capital Requirement Used						(\$777,260)
44							
45							

ARNOLD

SUMMARY CALCULATION OF CASH WORKING CAPITAL REQUIREMENTS
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Line Number	Expense Category	Present Rates Pro Forma For the 12 Months Ended 5/31/26	Average Daily Expense	Revenue Lag	Expense (Lead)/Lag	Net (Lead)/Lag	Cash Requirement
1							
2	Purchased Water	\$0	\$0	48.70	42.40	6.30	\$0
3	Fuel and Power	7,401	20	48.70	21.10	27.60	560
4	Chemicals	0	0	48.70	37.60	11.10	0
5	Waste Disposal	1,977,544	5,418	48.70	70.30	(21.60)	(117,027)
6	Labor	419,694	1,150	48.70	10.50	38.20	43,924
7	Pensions	488	1	48.70	(1.20)	49.90	67
8	OPEB	(3,095)	(8)	48.70	48.70	0.00	0
9	Group Insurance	77,660	213	48.70	10.50	38.20	8,128
10	Other Benefits	25,979	71	48.70	33.40	15.30	1,089
11	Support Services	30,695	84	48.70	(5.60)	54.30	4,566
12	Contracted services	20,009	55	48.70	34.20	14.50	795
13	Building Maintenance and Services	18,539	51	48.70	37.20	11.50	584
14	Telecommunication expenses	1,273	3	48.70	26.30	22.40	78
15	Postage, printing and stationary	31	0	48.70	20.60	28.10	2
16	Office supplies and services	30,434	83	48.70	50.20	(1.50)	(125)
17	Employee related expense travel & entertainment	476	1	48.70	55.80	(7.10)	(9)
18	Rents	49,877	137	48.70	25.50	23.20	3,170
19	Transportation	53,810	147	48.70	32.30	16.40	2,418
20	Miscellaneous	11,043	30	48.70	41.00	7.70	233
21	Uncollectible accounts expense	51,398	141	48.70	48.70	0.00	0
22	Customer Accounting	1,313	4	48.70	59.20	(10.50)	(38)
23	Regulatory Expense	442	1	48.70	48.70	0.00	0
24	Insurance Other than Group	6,304	17	48.70	(74.60)	123.30	2,130
25	Maintenance supplies and services	36,726	101	48.70	49.30	(0.60)	(60)
26							
27	Total Operations and Maintenance	<u>2,818,042</u>					<u>(49,516)</u>
28							
29	Depreciation	510,328	1,398	48.70	48.70	0.00	0
30	Amortization	1,034,075	2,833	48.70	48.70	0.00	0
31	Property Taxes	347,240	951	48.70	169.60	(120.90)	(115,017)
32	Payroll Taxes	25,537	70	48.70	10.50	38.20	2,673
33	PSC Fees	1,027	3	48.70	(62.50)	111.20	313
34	Other General Taxes	(328)	(1)	48.70	48.70	0.00	0
35	Current Federal Income Tax	148,058	406	48.70	35.50	13.20	5,354
36	Current State Income Tax	26,292	72	48.70	43.30	5.40	389
37	Deferred Income Taxes	97,110	266	48.70	48.70	0.00	0
38	Amortization of Investment Tax Credit	(71)	(0)	48.70	48.70	0.00	0
39	Interest Expense Deduction	475,288	1,302	48.70	81.70	(33.00)	(42,971)
40	Preferred Stock	0	0	48.70	0.00	48.70	0
41	Total Working Capital Requirement	<u>\$5,482,597</u>					<u>(\$198,776)</u>
42							
43	Total Cash and Working Capital Requirement Used						<u>(\$198,776)</u>
44							
45							

ALL OTHER WW

SUMMARY CALCULATION OF CASH WORKING CAPITAL REQUIREMENTS
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Line Number	Expense Category	Present Rates Pro Forma For the 12 Months Ended 5/31/26	Average Daily Expense	Revenue Lag	Expense (Lead)/Lag	Net (Lead)/Lag	Cash Requirement
1							
2	Purchased Water	\$0	\$0	48.70	42.40	6.30	\$0
3	Fuel and Power	657,199	1,801	48.70	21.10	27.60	49,695
4	Chemicals	127,588	350	48.70	37.60	11.10	3,880
5	Waste Disposal	2,029,866	5,561	48.70	70.30	(21.60)	(120,124)
6	Labor	954,946	2,616	48.70	10.50	38.20	99,942
7	Pensions	4,632	13	48.70	(1.20)	49.90	633
8	OPEB	(13,263)	(36)	48.70	48.70	0.00	0
9	Group Insurance	186,699	512	48.70	10.50	38.20	19,539
10	Other Benefits	57,016	156	48.70	33.40	15.30	2,390
11	Support Services	131,552	360	48.70	(5.60)	54.30	19,571
12	Contracted services	188,897	518	48.70	34.20	14.50	7,504
13	Building Maintenance and Services	452,021	1,238	48.70	37.20	11.50	14,242
14	Telecommunication expenses	5,455	15	48.70	26.30	22.40	335
15	Postage, printing and stationary	131	0	48.70	20.60	28.10	10
16	Office supplies and services	22,410	61	48.70	50.20	(1.50)	(92)
17	Employee related expense travel & entertainment	2,042	6	48.70	55.80	(7.10)	(40)
18	Rents	20,536	56	48.70	25.50	23.20	1,305
19	Transportation	122,837	337	48.70	32.30	16.40	5,519
20	Miscellaneous	102,117	280	48.70	41.00	7.70	2,154
21	Uncollectible accounts expense	155,525	426	48.70	48.70	0.00	0
22	Customer Accounting	5,628	15	48.70	59.20	(10.50)	(162)
23	Regulatory Expense	1,896	5	48.70	48.70	0.00	0
24	Insurance Other than Group	46,467	127	48.70	(74.60)	123.30	15,697
25	Maintenance supplies and services	579,112	1,587	48.70	49.30	(0.60)	(952)
26							
27	Total Operations and Maintenance	<u>5,841,309</u>					<u>121,048</u>
28							
29	Depreciation	3,602,980	9,871	48.70	48.70	0.00	0
30	Amortization	252,960	693	48.70	48.70	0.00	0
31	Property Taxes	1,224,529	3,355	48.70	169.60	(120.90)	(405,604)
32	Payroll Taxes	61,275	168	48.70	10.50	38.20	6,413
33	PSC Fees	9,756	27	48.70	(62.50)	111.20	2,972
34	Other General Taxes	(922)	(3)	48.70	48.70	0.00	0
35	Current Federal Income Tax	(675,704)	(1,851)	48.70	35.50	13.20	(24,436)
36	Current State Income Tax	(119,991)	(329)	48.70	43.30	5.40	(1,775)
37	Deferred Income Taxes	963,010	2,638	48.70	48.70	0.00	0
38	Amortization of Investment Tax Credit	(306)	(1)	48.70	48.70	0.00	0
39	Interest Expense Deduction	2,241,939	6,142	48.70	81.70	(33.00)	(202,696)
40	Preferred Stock	0	0	48.70	0.00	48.70	0
41	Total Working Capital Requirement	<u>\$13,400,837</u>					<u>(\$504,079)</u>
42							
43	Total Cash and Working Capital Requirement Used						<u>(\$504,079)</u>
44							
45							

MISSOURI-AMERICAN WATER COMPANY
CALCULATION OF TOTAL REVENUE LAG DAYS
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

<u>Description</u>	<u>Total Company</u>	<u>Water</u>	<u>Sewer</u>	<u>St. Louis County</u>	<u>Other Missouri Water</u>	<u>Arnold Sewer</u>	<u>Other Missouri Sewer</u>
<u>Operating Revenues - Water, Sewer, & Other:</u>							
Service Period & Billing Lag Days(1)	19.6	19.6	19.6	19.6	19.6	19.6	19.6
Collection Lag(2)	29.1	29.1	29.1	29.1	29.1	29.1	29.1
Total Revenue Lag Days	48.7	48.7	48.7	48.7	48.7	48.7	48.7

Notes: (1) From mid-point of service period to the A/R Posting Date. See page 2 of this Schedule.

(2) Sum of daily accounts receivable balance divided by the sum of daily receipts. See page 3 of this Schedule.

MISSOURI-AMERICAN WATER COMPANY

CALCULATION OF SERVICE PERIOD AND BILLING LAG DAYS

<u>Description</u>	<u>Total Company</u>	<u>Water</u>	<u>Sewer</u>	<u>St. Louis County</u>	<u>Other Missouri Water</u>	<u>Arnold Sewer</u>	<u>Other Missouri Sewer</u>
Weighted Service Lag *	\$612,662,583						
Billing Total *	43,508,146						
Service Lag Days	14.1	14.1	14.1	14.1	14.1	14.1	14.1
Weighted Billing Lag *	239,649,448						
Billing Total *	43,508,146						
Billing Lag Days	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Billing Lag Days for Monthly Billing	19.6	19.6	19.6	19.6	19.6	19.6	19.6

* - October 2023

MISSOURI-AMERICAN WATER COMPANY

CALCULATION OF COLLECTION LAG DAYS

<u>Description</u>	<u>Total Company</u>
Sum of Net Daily Accounts Receivable Balance in a Year	\$ 13,042,087,980
Plus:	
Uncollectible Deducted From A/R Balance	<u>(2,758,564)</u>
Subtotal	\$ 13,039,329,417
Divided By The Sum of Daily Receipts in a Year	<u>447,530,450</u>
Total Service Period Collection Lag Days	<u><u>29.1</u></u>

MISSOURI-AMERICAN WATER COMPANY
SUMMARY OF OPERATING EXPENSES AND TAXES LAG DAYS
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Description (1)	Schedule Reference (2)	Amount (3)	Weighted Amount (4)	(Lead)/ Lag Days (5)=(4)/(3)
<u>Partial Expenses & Taxes</u>				
Chemicals Expense	Schedule HW-4	7,565,907	284,343,336	37.6
Customer Accounting Expense	Schedule HW-5	1,806,041	106,860,174	59.2
Fuel and Power Expense	Schedule HW-6	11,531,709	243,533,026	21.1
Insurance Other Than Group Expense	Schedule HW-7	8,079,350	(603,094,980)	(74.6)
Salaries and Wages Expense	Schedule HW-8	872,196	9,158,058	10.5
Purchased Water Expense	Schedule HW-9	1,306,553	55,407,992	42.4
Support Services Expense	Schedule HW-10	69,197,357	(386,251,889)	(5.6)
Waste Disposal Expense	Schedule HW-11	2,197,540	154,449,203	70.3
Group Insurance Expense	Schedule HW-12	16,222,264	170,333,770	10.5
Pensions Expense	Schedule HW-13	6,240,575	(7,295,613)	(1.2)
Other Benefits Expense	Schedule HW-14	3,191,072	106,506,290	33.4
Rents Expense	Schedule HW-15	97,287	2,483,082	25.5
Contracted Services Expense	Schedule HW-16	2,707,565	92,635,160	34.2
Building Maintenance and Services Expense	Schedule HW-17	1,182,000	43,948,302	37.2
Telecommunications Expense	Schedule HW-18	1,316,091	34,620,060	26.3
Postage, Printing, and Stationary Expense	Schedule HW-19	10,365	213,060	20.6
Office Supplies and Services Expense	Schedule HW-20	155,939	7,835,164	50.2
Employee Related Expenses	Schedule HW-21	228,018	12,731,535	55.8
Transportation Expense	Schedule HW-22	1,332,539	42,977,016	32.3
Miscellaneous Expenses	Schedule HW-23	2,294,460	93,964,250	41.0
Maintenance Supplies Expense	Schedule HW-24	1,147,518	56,550,305	49.3
Payroll Taxes	Schedule HW-25	5,126,603	53,829,337	10.5
Property Taxes	Schedule HW-26	8,726,216	1,479,607,463	169.6
PSC Fees	Schedule HW-27	2,687,091	(167,906,386)	(62.5)
Environmental Tax	Schedule HW-28	5,140	1,223,370	238.0
Current Federal Income Taxes	Schedule HW-29			35.5
Current State Income Taxes	Schedule HW-30			43.3
Total Interest Expenses	Schedule HW-31	56,618,649	4,625,985,063	81.7
Interest On Long-Term Debt	Schedule HW-32	47,480,517	4,330,234,106	91.2
Interest On Short-Term Debt	Schedule HW-33	4,280,148	62,944,915	14.7

MISSOURI-AMERICAN WATER COMPANY
OPERATING EXPENSES & TAXES SAMPLE SIZES USED IN THE
LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Description (1)	Per Books (2)	Sample Size (3)	Percentage Sampled (4)=(3)/(2)
<u>Expenses & Taxes</u>			
1. Chemicals Expense	\$17,512,993	\$7,565,907	43%
2. Customer Accounting Expense	2,248,817	1,806,041	80%
3. Fuel and Power Expense	14,773,817	11,531,709	78%
4. Insurance Other Than Group Expense	7,834,108	8,079,350	103% (1)
5. Salaries and Wages Expense	38,797,772	38,797,772	100%
6. Purchased Water Expense	1,603,303	1,306,553	81%
7. Support Services Expense	40,261,910	69,197,357	172% (1)
8. Waste Disposal Expense	5,703,464	2,197,540	39%
9. Group Insurance Expense	5,504,855	16,222,264	295% (1)
10. Pensions Expense	(230,598)	6,240,575	-2706% (1)
11. Other Benefits Expense	3,292,841	3,191,072	97%
12. Rents Expense	296,658	97,287	33%
13. Contracted Services Expense	6,156,778	2,707,565	44%
14. Building Maintenance and Services Expense	2,471,068	1,182,000	48%
15. Telecommunications Expense	1,587,113	1,316,091	83%
16. Postage, Printing, and Stationary Expense	37,036	10,365	28%
17. Office Supplies and Services Expense	820,936	155,939	19%
18. Employee Related Expenses	628,994	228,018	36%
19. Transportation Expense	2,317,627	1,332,539	57%
20. Miscellaneous Expenses	3,964,985	2,294,460	58%
21. Maintenance Supplies Expense	10,016,294	1,147,518	11%
22. Payroll Taxes	5,126,603	5,126,603	100%
23. Property Taxes	33,515,540	8,726,216	26%
24. PSC Fees	2,687,091	2,687,091	100%
25. Environmental Tax	(15,671)	5,140	-33%
25. Current Federal Income Taxes	(17,349,176)	(17,349,176)	100%
26. Current State Income Taxes	(3,054,948)	(3,054,948)	100%
27. Total Interest Expenses	56,618,649	51,760,666	91% (2)
28. Interest On Long-Term Debt	51,052,394	47,480,517	93%
29. Interest On Short-Term Debt	4,280,148	4,280,148	100%
	<u>\$243,128,859</u>	<u>\$178,119,432</u>	<u>73%</u>

Notes: (1) Sample amount is greater than 100% of expense because it includes the capital portion, employee contributions, or deferred amounts.

(2) Based on the sampling for line items 29-30.

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR CHEMICALS EXPENSE
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
January-23	11.2	\$63,177.90	\$705,366.33
February-23	35.1	373,053.83	13,095,277.95
March-23	33.3	635,155.72	21,155,609.33
April-23	37.7	988,047.64	37,292,999.82
May-23	38.4	848,748.75	32,559,586.37
June-23	37.1	487,990.86	18,100,924.86
July-23	39.2	826,495.74	32,438,807.94
August-23	37.5	881,382.17	33,038,500.57
September-23	36.6	602,747.51	22,076,546.28
October-23	39.3	861,538.87	33,825,763.17
November-23	39.4	445,346.00	17,532,875.14
December-23	<u>40.8</u>	<u>552,222.04</u>	<u>22,521,078.36</u>
Total Chemicals Expense	<u>37.6</u>	<u>\$7,565,907.03</u>	<u>\$284,343,336.12</u>

MISSOURI-AMERICAN WATER COMPANY
CALCULATION OF LEAD DAYS FOR CUSTOMER ACCOUNTING EXPENSE
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
January-23	61.5	\$143,634.74	\$8,837,693.41
February-23	57.8	140,131.83	8,103,583.59
March-23	58.0	136,842.80	7,942,815.86
April-23	56.6	144,248.32	8,161,349.79
May-23	57.6	152,740.19	8,792,801.62
June-23	58.6	130,311.25	7,638,361.63
July-23	58.3	147,896.09	8,616,147.66
August-23	62.1	160,017.59	9,931,820.50
September-23	65.2	147,242.11	9,594,088.41
October-23	57.2	175,540.47	10,045,749.51
November-23	59.2	157,617.43	9,332,911.13
December-23	<u>58.1</u>	<u>169,818.22</u>	<u>9,862,850.94</u>
Total Customer Accounting Expense	<u>59.2</u>	<u>\$1,806,041.04</u>	<u>\$106,860,174.03</u>

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR FUEL AND POWER EXPENSE
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
January-23	23.8	\$650,110.10	\$15,459,215.14
February-23	21.7	622,946.28	13,493,141.33
March-23	18.6	608,273.50	11,302,847.83
April-23	20.9	622,144.28	13,022,944.25
May-23	22.8	749,979.83	17,113,987.97
June-23	21.5	907,517.92	19,477,165.29
July-23	21.1	1,521,786.40	32,133,670.83
August-23	19.3	1,498,874.92	28,888,039.91
September-23	21.9	1,412,243.70	30,889,012.63
October-23	21.1	1,371,102.13	28,977,213.97
November-23	19.5	816,021.53	15,917,695.17
December-23	<u>22.5</u>	<u>750,708.11</u>	<u>16,858,091.28</u>
Total Fuel and Power Expense	<u>21.1</u>	<u>\$11,531,708.70</u>	<u>\$243,533,025.59</u>

MISSOURI-AMERICAN WATER COMPANY

CALCULATION OF LEAD DAYS FOR INSURANCE OTHER THAN GROUP EXPENSE
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
January-23	(159.8)	\$2,949,635.35	-\$471,432,083.68
February-23	(35.1)	1,284,543.48	-45,060,141.78
April-23	(24.4)	1,240,386.74	-30,251,035.30
May-23	(147.4)	122,738.71	-18,091,212.90
July-23	(15.5)	1,240,386.74	-19,225,994.47
September-23	150.5	1,272.31	191,482.66
October-23	(15.5)	1,240,386.75	-19,225,994.63
 Total Insurance Other Than Group Expense	 <u>(74.6)</u>	 <u>\$8,079,350.08</u>	 <u>-\$603,094,980.09</u>

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR SALARIES AND WAGES EXPENSE
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Facts (1)	<u>(Lead)/ Lag Days</u> (2)	Amount (3)	Weighted Amount (4)
<p>All company employees are paid for a two week period (i.e., Days 1 through 14).</p> <p>Pay date is five days following the end of the payroll period (i.e., Day 19, where $19 = 14 + 5$).</p> <p>Thrid party vendor, ADP, recives funds 1 day before paydays (i.e., Day 18, where $18 = 19 - 1$).</p> <p>Salaries and Wages lead is 10.5 days. (i.e., Calculated as: $10.5 = 18 - 7.5$; where $7.5 = [1 + 14 = 15 \div 2 = 7.5]$)</p>			
Non-Union Salaries (5 days)	10.5	\$246,189.58	\$2,584,990.61
Union Labor (5 days)	10.5	626,006.42	6,573,067.39
Total Salaries And Wages Expense	10.5	\$872,196.00	\$9,158,058.00

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR PURCHASED WATER EXPENSE
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
January-23	30.8	\$73,388.39	\$2,257,231.57
February-23	30.9	70,861.47	2,187,826.41
March-23	28.2	63,690.51	1,796,187.34
April-23	31.2	67,578.46	2,110,814.94
May-23	30.0	66,424.56	1,992,650.16
June-23	40.9	124,653.70	5,099,185.01
July-23	29.3	66,256.93	1,941,279.57
August-23	26.9	281,060.98	7,552,788.76
September-23	31.9	60,876.40	1,941,395.51
October-23	29.0	128,809.76	3,733,084.38
November-23	31.2	67,306.85	2,096,888.87
December-23	<u>96.3</u>	<u>235,644.59</u>	<u>22,698,659.12</u>
Total Purchased Water Expense	<u>42.4</u>	<u>\$1,306,552.60</u>	<u>\$55,407,991.60</u>

MISSOURI-AMERICAN WATER COMPANY
CALCULATION OF LEAD DAYS FOR SUPPORT SERVICES EXPENSE
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
January-23	(4.0)	\$4,030,631.01	-\$16,122,524.04
February-23	(5.5)	3,005,362.11	-16,529,491.61
March-23	(7.0)	2,956,467.39	-20,695,271.73
April-23	(3.5)	3,601,175.47	-12,604,114.15
May-23	(6.0)	2,941,778.82	-17,650,672.92
June-23	(6.5)	31,812,023.42	-206,778,152.23
July-23	(4.0)	3,819,725.16	-15,278,900.64
August-23	(6.0)	3,111,947.48	-18,671,684.88
September-23	(3.5)	3,225,072.16	-11,287,752.56
October-23	(4.0)	4,159,235.22	-16,636,940.88
November-23	(6.5)	3,144,250.76	-20,437,629.94
December-23	(4.0)	3,389,688.25	-13,558,753.00
Total Support Services Expense	<u>(5.6)</u>	<u>\$69,197,357.25</u>	<u>-\$386,251,888.57</u>

MISSOURI-AMERICAN WATER COMPANY
CALCULATION OF LEAD DAYS FOR WASTE DISPOSAL EXPENSE
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
January-23	69.8	\$50,797.12	\$3,547,442.70
February-23	74.2	355,075.69	26,338,267.91
March-23	49.6	37,598.94	1,866,339.04
April-23	71.5	450,973.27	32,247,216.26
May-23	47.1	64,777.78	3,053,952.60
June-23	45.1	64,942.03	2,926,526.58
July-23	66.7	407,260.65	27,146,128.15
August-23	38.3	80,049.01	3,062,075.70
September-23	30.3	33,251.50	1,008,977.12
October-23	35.3	59,312.28	2,093,194.24
November-23	93.4	518,779.66	48,462,462.75
December-23	<u>36.1</u>	<u>74,721.90</u>	<u>2,696,619.80</u>
Total Waste Disposal Expense	<u>70.3</u>	<u>\$2,197,539.83</u>	<u>\$154,449,202.81</u>

MISSOURI-AMERICAN WATER COMPANY
CALCULATION OF LEAD DAYS FOR GROUP INSURANCE EXPENSE
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment	Lead/ (Lag) Days	Amount	Weighted Amount
(1)	(2)	(3)	(4)
January-23	10.5	\$1,243,405.10	\$13,055,753.55
February-23	10.5	1,255,863.08	13,186,562.34
March-23	10.5	1,249,544.70	13,120,219.35
April-23	10.5	1,248,928.78	13,113,752.19
May-23	10.5	1,872,061.76	19,656,648.48
June-23	10.5	1,256,640.02	13,194,720.21
July-23	10.5	1,257,069.68	13,199,231.64
August-23	10.5	1,256,012.55	13,188,131.78
September-23	10.5	1,255,145.28	13,179,025.44
October-23	10.5	1,239,402.33	13,013,724.47
November-23	10.5	1,851,321.31	19,438,873.76
December-23	10.5	1,236,869.24	12,987,127.02
Total Group Insurance Expense	<u>10.5</u>	<u>\$16,222,263.83</u>	<u>\$170,333,770.22</u>

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR PENSIONS EXPENSE
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
February-23	0.5	\$1,490,775.00	\$745,387.50
May-23	(1.0)	1,458,600.00	-1,458,600.00
August-23	(1.5)	1,645,600.00	-2,468,400.00
November-23	<u>(2.5)</u>	<u>1,645,600.00</u>	<u>-4,114,000.00</u>
Total Pensions Expense	<u>(1.2)</u>	<u>\$6,240,575.00</u>	<u>-\$7,295,612.50</u>

MISSOURI-AMERICAN WATER COMPANY
CALCULATION OF LEAD DAYS FOR OTHER BENEFITS EXPENSE
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

<u>Month of Payment</u> (1)	<u>Lead/ (Lag) Days</u> (2)	<u>Amount</u> (3)	<u>Weighted Amount</u> (4)
January-23	17.2	\$9,673.61	\$166,750.99
February-23	201.1	\$285,540.57	\$57,422,996.57
March-23	38.5	52,131.64	2,008,664.93
April-23	39.4	90,316.71	3,557,293.88
May-23	24.5	217,713.71	5,328,139.60
June-23	14.5	353,987.61	5,140,013.51
July-23	13.4	338,434.90	4,524,496.07
August-23	12.5	504,070.08	6,277,466.47
September-23	10.7	321,689.80	3,457,059.44
October-23	32.2	350,830.09	11,290,575.13
November-23	12.5	351,172.09	4,383,332.47
December-23	<u>9.3</u>	<u>315,511.09</u>	<u>2,949,500.94</u>
Total Other Benefits Expense	<u>33.4</u>	<u>\$3,191,071.90</u>	<u>\$106,506,289.97</u>

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR RENTS EXPENSE
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
January-23	(2.8)	\$2,884.51	-\$8,174.34
February-23	13.9	6,002.71	83,668.65
March-23	20.0	9,620.52	192,147.03
April-23	45.7	9,482.40	432,919.04
May-23	36.9	5,701.00	210,177.67
June-23	7.2	6,629.21	47,900.36
July-23	38.0	5,275.51	200,477.13
August-23	40.5	12,614.19	511,023.19
September-23	53.7	14,593.60	784,099.26
October-23	24.5	7,908.63	193,985.47
November-23	(30.0)	1,191.09	-35,732.70
December-23	(8.4)	15,383.27	-129,408.87
Total Rents Expense	<u>25.5</u>	<u>\$97,286.64</u>	<u>\$2,483,081.87</u>

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR CONTRACTED SERVICES EXPENSE
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
January-23	(205.0)	\$6,824.00	-\$1,398,920.00
February-23	(86.9)	245,842.42	-21,375,935.82
March-23	(37.0)	253,164.92	-9,364,943.56
April-23	54.7	28,974.99	1,586,098.34
May-23	35.4	97,544.66	3,455,939.57
June-23	46.3	975,816.81	45,226,736.53
July-23	56.0	52,170.68	2,921,173.71
August-23	65.4	59,762.94	3,908,396.64
September-23	59.0	56,484.43	3,332,974.07
October-23	42.8	322,721.78	13,823,705.05
November-23	83.5	369,547.22	30,864,448.99
December-23	82.3	238,710.29	19,655,486.50
Total Contracted Services Expense	<u>34.2</u>	<u>\$2,707,565.14</u>	<u>\$92,635,160.00</u>

MISSOURI-AMERICAN WATER COMPANYCALCULATION OF LEAD DAYS FOR BUILDING MAINTENANCE AND SERVICES EXPENSE
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment	Lead/ (Lag) Days	Amount	Weighted Amount
(1)	(2)	(3)	(4)
January-23	25.3	\$36,508.51	\$924,726.69
February-23	26.9	60,391.70	1,623,166.34
March-23	27.6	66,979.97	1,849,449.25
April-23	28.9	34,164.72	988,004.17
May-23	27.0	64,624.46	1,743,375.05
June-23	30.8	90,288.61	2,776,636.03
July-23	46.8	128,745.53	6,031,541.57
August-23	44.3	106,265.90	4,710,024.04
September-23	48.5	101,548.07	4,929,411.77
October-23	48.8	138,984.68	6,780,884.66
November-23	58.7	84,597.67	4,967,888.70
December-23	24.6	268,899.70	6,623,193.45
Total Building Maintenance and Services Expense	<u>37.2</u>	<u>\$1,181,999.52</u>	<u>\$43,948,301.70</u>

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR TELECOMMUNICATIONS EXPENSE
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
January-23	26.4	\$118,344.47	\$3,128,900.21
February-23	30.7	65,853.16	2,022,698.20
March-23	36.4	196,367.80	7,148,722.12
April-23	15.7	100,783.00	1,582,421.73
May-23	16.8	47,151.84	791,127.55
June-23	29.2	98,576.76	2,880,860.42
July-23	31.2	143,919.47	4,491,916.67
August-23	12.3	92,907.96	1,143,751.01
September-23	20.9	96,923.20	2,024,661.12
October-23	39.9	121,831.40	4,858,111.68
November-23	27.0	109,704.05	2,967,422.51
December-23	<u>12.8</u>	<u>123,727.82</u>	<u>1,579,467.22</u>
 Total Telecommunicatio ns Expense	 <u>26.3</u>	 <u>\$1,316,090.93</u>	 <u>\$34,620,060.40</u>

MISSOURI-AMERICAN WATER COMPANYCALCULATION OF LEAD DAYS FOR POSTAGE, PRINTING, AND STATIONARY EXPENSE
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

<u>Month of Payment</u> (1)	<u>Lead/ (Lag) Days</u> (2)	<u>Amount</u> (3)	<u>Weighted Amount</u> (4)
March-23	14.4	533.07	7,696.19
June-23	31.0	423.50	13,128.50
July-23	40.0	230.08	9,203.20
August-23	45.0	417.42	18,783.90
September-23	29.6	861.46	25,528.42
November-23	57.7	655.50	37,797.74
December-23	13.9	7,244.20	100,921.84
Total Postage, Printing, and Stationary Expense	<u>20.6</u>	<u>\$10,365.23</u>	<u>\$213,059.79</u>

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR OFFICE SUPPLIES AND SERVICES EXPENSE
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
January-23	19.7	\$3,348.43	\$65,940.11
February-23	52.9	5,123.76	271,054.97
March-23	35.0	20,201.75	706,481.27
April-23	44.8	11,782.54	527,472.83
May-23	37.1	32,598.82	1,210,797.55
June-23	54.5	20,590.71	1,122,389.48
July-23	84.5	15,906.69	1,344,663.96
August-23	45.6	8,023.49	366,066.56
September-23	54.6	9,708.61	530,026.06
October-23	76.1	7,870.97	598,720.94
November-23	43.6	12,118.42	528,729.86
December-23	<u>65.0</u>	<u>8,664.68</u>	<u>562,820.15</u>
 Total Office Supplies and Services Expense	 <u>50.2</u>	 <u>\$155,938.87</u>	 <u>\$7,835,163.74</u>

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR EMPLOYEE RELATED EXPENSES
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
January-23	13.1	\$9,174.84	\$119,853.44
February-23	36.2	12,342.97	447,394.81
March-23	27.1	22,002.74	595,636.42
April-23	35.8	11,567.02	413,844.04
May-23	26.0	29,942.73	778,977.18
June-23	32.2	12,188.37	392,344.12
July-23	30.6	23,954.75	731,842.65
August-23	87.2	28,962.63	2,524,846.36
September-23	37.2	13,743.63	511,866.46
October-23	155.8	31,157.23	4,854,228.28
November-23	46.0	6,516.58	299,650.77
December-23	<u>40.1</u>	<u>26,464.12</u>	<u>1,061,050.28</u>
 Total Employee Related Expenses	 <u>55.8</u>	 <u>\$228,017.61</u>	 <u>\$12,731,534.81</u>

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR TRANSPORTATION EXPENSE
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
February-23	40.9	\$104,064.93	\$4,253,483.88
March-23	32.4	32,124.91	1,039,513.83
April-23	18.3	139,539.37	2,555,184.05
May-23	31.0	149,137.48	4,627,331.15
June-23	59.0	19,251.32	1,135,827.88
August-23	18.0	63,137.88	1,136,481.84
October-23	31.4	571,726.94	17,928,516.49
December-23	40.6	253,556.41	10,300,676.56
Total Transportation Expense	<u>32.3</u>	<u>\$1,332,539.24</u>	<u>\$42,977,015.67</u>

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR MISCELLANEOUS EXPENSES
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
January-23	14.3	\$43,709.76	\$625,324.48
February-23	22.7	27,837.72	631,991.00
March-23	38.0	132,652.45	5,036,257.79
April-23	25.8	87,086.27	2,249,403.50
May-23	43.1	110,886.83	4,774,897.90
June-23	32.6	123,929.34	4,040,085.28
July-23	60.7	104,857.96	6,363,062.29
August-23	53.5	362,418.53	19,407,066.46
September-23	38.8	711,005.39	27,588,732.54
October-23	(6.6)	95,777.08	-633,234.68
November-23	65.5	184,427.81	12,077,072.48
December-23	38.1	309,870.48	11,803,590.94
Total Miscellaneous Expenses	<u>41.0</u>	<u>\$2,294,459.62</u>	<u>\$93,964,249.97</u>

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR MAINTENANCE SUPPLIES EXPENSE
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
January-23	25.6	\$9,955.71	\$254,562.75
February-23	22.1	46,254.90	1,021,540.71
March-23	48.7	86,230.11	4,200,390.14
April-23	45.8	69,823.75	3,200,174.00
May-23	49.7	110,990.10	5,510,805.27
June-23	48.8	147,279.31	7,190,894.68
July-23	51.3	111,789.05	5,736,606.75
August-23	53.5	178,074.20	9,528,881.72
September-23	43.7	116,922.15	5,106,787.12
October-23	50.9	92,883.19	4,728,984.19
November-23	59.2	97,899.11	5,796,490.15
December-23	<u>53.8</u>	<u>79,416.45</u>	<u>4,274,187.58</u>
 Total Maintenance Supplies Expense	 <u>49.3</u>	 <u>\$1,147,518.03</u>	 <u>\$56,550,305.05</u>

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR PAYROLL TAXES
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Facts (1)	(Lead)/ Lag Days (2)	Amount (3)	Weighted Amount (4)
All company employees are paid for a two week period (i.e., Days 1 through 14).			
Pay date is five days following the end of the payroll period (i.e., Day 19, where $19 = 14 + 5$).			
Thrid party vendor, ADP, recives funds 1 day before paydays (i.e., Day 18, where $18 = 19 - 1$).			
Payroll Tax lead is 10.5 days. (i.e., Calculated as: $10.5 = 18 - 7.5$; where $7.5 = [1 + 14 = 15 \div 2 = 7.5]$)			
FUTA (5 days)	10.5	\$34,185.78	\$358,950.69
FICA (5 days)	10.5	5,090,263.40	53,447,765.70
STUTA (5 days)	10.5	\$2,154.31	\$22,620.26
Total Payroll Taxes	10.5	\$5,126,603.49	\$53,829,336.65

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR PROPERTY TAXES
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment	Lead/ (Lag) Days	Amount	Weighted Amount
<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>
December-23	<u>169.6</u>	<u>\$8,726,215.66</u>	<u>\$1,479,607,463.09</u>
Total Property Taxes	<u><u>169.6</u></u>	<u><u>\$8,726,215.66</u></u>	<u><u>\$1,479,607,463.09</u></u>

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR PSC FEES
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

<u>Month of Payment</u> (1)	<u>Lead/ (Lag) Days</u> (2)	<u>Amount</u> (3)	<u>Weighted Amount</u> (4)
January-23	6.0	\$488,321.70	\$2,929,930.20
April-23	95.0	488,321.68	46,390,559.60
July-23	(172.5)	855,223.92	-147,526,126.20
October-23	<u>(81.5)</u>	<u>855,223.92</u>	<u>-69,700,749.48</u>
 Total PSC Fees	 <u>(62.5)</u>	 <u>\$2,687,091.22</u>	 <u>-\$167,906,385.88</u>

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR ENVIRONMENTAL TAX
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment	Lead/ (Lag) Days	Amount	Weighted Amount
<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>
October-23	<u>238.0</u>	<u>\$5,140.21</u>	<u>\$1,223,369.98</u>
Total Environmental Tax	<u>238.0</u>	<u>\$5,140.21</u>	<u>\$1,223,369.98</u>

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LAG DAYS FOR CURRENT FEDERAL INCOME TAXES
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

<u>Service Period</u>		<u>Payment</u>	<u>(Lead)/</u>	<u>Amount</u>	<u>Weighted</u>
<u>From</u>	<u>To</u>	<u>Date</u>	<u>Lag Days</u>		<u>Amount</u>
(1)	(2)	(3)	(4)	(5)	(6)
<u>Federal Income Taxes (Current)</u>					
1/1/23	12/31/23	4/14/23 (1)	(79.0)	25%	(19.8)
1/1/23	12/31/23	6/14/23 (1)	(18.0)	25%	(4.5)
1/1/23	12/31/23	9/14/23 (1)	74.0	25%	18.5
1/1/23	12/31/23	12/14/23 (1)	<u>165.0</u>	<u>25%</u>	<u>41.3</u>
Total Current Federal Income Taxes			<u>35.5</u>	<u>100%</u>	<u>35.5</u>

Notes: (1) Payment date assumed to be 1.0 day prior to due date.

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LAG DAYS FOR CURRENT STATE INCOME TAXES
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

<u>Service Period</u>		<u>Payment</u>	<u>(Lead)/</u>	<u>Amount</u>	<u>Weighted</u>
<u>From</u>	<u>To</u>	<u>Date</u>	<u>Lag Days</u>		<u>Amount</u>
(1)	(2)	(3)	(4)	(5)	(6)
<u>State Income Taxes (Current)</u>					
1/1/22	12/31/22	1/14/23 (1)	196.0	25%	49.0
1/1/23	12/31/23	4/14/23 (1)	(79.0)	25%	(19.8)
1/1/23	12/31/23	6/14/23 (1)	(18.0)	25%	(4.5)
1/1/23	12/31/23	9/14/23 (1)	<u>74.0</u>	<u>25%</u>	<u>18.5</u>
Total Current State Income Taxes			<u>43.3</u>	<u>100%</u>	<u>43.3</u>

Notes: (1) Payment date assumed to be 1.0 day prior to due date.

MISSOURI-AMERICAN WATER COMPANY
CALCULATION OF LAG DAYS FOR TOTAL INTEREST EXPENSES
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

G/L Account	Per Books Amount	(Lead)/ Lag Days	Schedule Ref. For (Lead)/ Lag Days	Weighted Amount
(1)	(2)	(3)	(4)	(5)
Interest Long Term Debt	\$2,230,888.53	91.2	32	\$203,457,033.94
Interest Long Term Debt Intercompany	47,802,739.57	91.2	32	4,359,609,848.78
Interest expense-LTD debt discount amort inside	192,569.16	0.0		0.00
Early Debt Retirement Loss - Intercompany	826,197.12	0.0		0.00
Interest Short Term Debt Intercompany	4,280,148.32	14.7	33	62,918,180.30
Amortize Debt Disc & Exp	224,047.23	0.0		0.00
Amortize Debt Disc & Exp Intercompany	947,725.60	0.0		0.00
Amortize Debt Exp Inside-Revolving Credit Line	114,333.67	0.0		0.00
Total Interest Expenses	<u>\$56,618,649.20</u>	<u>81.7</u>		<u>\$4,625,985,063.02</u>

MISSOURI-AMERICAN WATER COMPANY
CALCULATION OF LEAD DAYS FOR INTEREST ON LONG-TERM DEBT
BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
March-23	90.5	\$4,000,287.84	\$362,026,049.52
April-23	91.0	5,934,537.50	540,042,912.50
May-23	90.5	1,897,500.00	171,723,750.00
June-23	91.0	10,699,600.00	973,663,600.00
September-23	92.0	4,000,287.84	368,026,481.28
October-23	91.0	5,934,537.50	540,042,912.50
November-23	92.0	1,897,500.00	174,570,000.00
December-23	91.5	13,116,266.67	1,200,138,400.31
Total Interest On Long-Term Debt	<u>91.2</u>	<u>\$47,480,517.35</u>	<u>\$4,330,234,106.11</u>

MISSOURI-AMERICAN WATER COMPANY
 CALCULATION OF LEAD DAYS FOR INTEREST ON SHORT-TERM DEBT
 BASED ON LEAD-LAG STUDY FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Month of Payment <u>(1)</u>	Lead/ (Lag) Days <u>(2)</u>	Amount <u>(3)</u>	Weighted Amount <u>(4)</u>
January-23	15.0	\$525,137.45	\$7,877,061.75
February-23	13.5	677,634.99	9,148,072.37
March-23	15.0	497,525.72	7,462,885.80
May-23	15.2	844,110.38	12,828,293.47
June-23	14.5	654,762.31	9,494,053.50
July-23	15.0	730,248.98	10,953,734.70
August-23	15.0	270,614.45	4,059,216.75
December-23	<u>14.0</u>	<u>80,114.04</u>	<u>1,121,596.56</u>
 Total Interest On Short-Term Debt	 <u>14.7</u>	 <u>\$4,280,148.32</u>	 <u>\$62,944,914.89</u>