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Water Usage,
Master Meter Data
Witness: Michael D. Irwin
Sponsoring Party: MoPSC Staff
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Case No.: WR-2024-0104
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MISSOURI PUBLIC SERVICE COMMISSION

INDUSTRY ANALYSIS DIVISION

WATER, SEWER, AND STEAM DEPARTMENT

REBUTTAL TESTIMONY

OF

MICHAEL D. IRWIN

LIBERTY UTILITIES (Missouri Water) LLC,

d/b/a Liberty

CASE NO. WR-2024-0104

Jefferson City, Missouri
September 2024

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MICHAEL D. IRWIN
LIBERTY UTILITIES (Missouri Water) LLC,
d/b/a Liberty
CASE NO. WR-2024-0104**

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1 **REBUTTAL TESTIMONY**

2 **OF**

3 **MICHAEL D. IRWIN**

4 **LIBERTY UTILITIES (Missouri Water) LLC,**

5 **d/b/a Liberty**

6 **CASE NO. WR-2024-0104**

7 Q. Please state your name and business address.

8 A. My name is Michael D. Irwin, and my business address is 200 Madison Street,
9 Jefferson City, Missouri 65102.

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

11 A. I am employed by the Missouri Public Service Commission (“Commission”)
12 as a Senior Research/Data Analyst in the Water, Sewer, and Steam Department; Industry
13 Analysis Division.

14 Q. Please describe your educational background and work experience.

15 A. I received a Master of Science and a Bachelor of Science in Biology from
16 Western Illinois University in 1998 and 1994, respectively. Prior to my position at the
17 Commission, I was employed by the Missouri Department of Natural Resources from 2000 to
18 2024. My credentials are attached to this direct testimony as Schedule MDI-r1.

19 Q. Have you previously filed testimony before this Commission?

20 A. No. This will be my first testimony before the Commission.

21 **EXECUTIVE SUMMARY**

22 Q. What is the purpose of your rebuttal testimony?

1 A. The purpose of my rebuttal testimony is to provide a thorough review of
2 customer count, water usage, and master meter data provided by Liberty Utilities (Missouri
3 Water), LLC d/b/a Liberty (“Liberty Water”) as the basis for its Class Cost of Service (“CCOS”)
4 and resulting rate design. Sources reviewed for this analysis include Liberty Water’s witness
5 Thomas O’Neill’s direct testimony and associated schedules, Mr. O’Neill’s workpapers used
6 in support of his direct testimony, an update to Mr. O’Neill’s workpapers, data provided by
7 Liberty Water to fulfill Staff Data Requests (“DRs”), updates to those DR responses, and
8 Liberty Water’s Annual Reports submitted via the Commission’s Electronic Filing and
9 Information System (“EFIS”).

10 All reviewed data sources provided by Mr. O’Neill are limited to the 2022 test year;
11 however, reviewed data provided by Liberty Water’s Annual Reports and responses to Staff
12 DRs span January 2019 to April 2024.

13 Staff’s analyses show data utilized as the basis for Liberty Water’s CCOS and resulting
14 rate design were inconsistent with data provided as the result of responses to Staff DRs and
15 Annual Reports provided by Liberty Water. Liberty Water presents errors, unexplained
16 inconsistencies in customer numbers, and physically improbable amounts of customer water
17 usage. In addition to Liberty Water’s rate design and CCOS being inaccurate, Liberty Water’s
18 DR responses continue to exhibit unexplained errors.

19 Accurate billing determinants are critical for determining the necessary increase in
20 revenue requirement, designing and calculating rates, and ensuring a company is appropriately
21 allocating resources. The very poor quality of Liberty Water’s data creates significant
22 challenges for Staff in reviewing Liberty Water’s application. Liberty Water’s inability to

1 determine how many customers they have, and how much water they sold during the test year,
2 calls into question the basis for Liberty Water's request for an additional \$8,065,267 in revenue.

3 As shown in Staff witness Angela Niemeier's direct testimony, Staff did what it could,
4 after meetings and rounds of revisions by Liberty Water, to provide as accurate a set of billing
5 determinants as possible.

6 **CUSTOMER COUNTS**

7 Q. Can you provide an example of customer count data inconsistencies provided in
8 Liberty Water's testimony?

9 A. Yes, the total for Bolivar residential water customer months, a measure
10 multiplying customer count by 12, found in Mr. O'Neill's Figure 3 and Schedule TO-6.9 in his
11 direct testimony is 48,282, but the value for Bolivar residential water customer months found
12 Mr. O'Neill's MO Water Billing Determinants workpaper is 47,796, a value consistent with
13 Mr. O'Neill's Schedule TO-8.9 for residential sewer, not water, customer months. This
14 inconsistency was carried over to Mr. O'Neill's Figure 4 for Bolivar residential water customer
15 months in February, March, and April. In response to Staff DR No. 0120 regarding these
16 inconsistencies, Liberty Water stated there is an error in Mr. O'Neill's direct testimony, and a
17 correction was provided for Mr. O'Neill's direct Figure 4. The error, however, persisted in an
18 updated direct Figure 3 provided in the Liberty Water's response to Staff DR No. 0122.
19 A correction to Mr. O'Neill's Figure 3 is provided below:

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Service Area Rate							
Group	Service Type	Description	Units	Total	Resi	Comm	Indu
Missouri Water	Water	Total Customer Months	<i>Cust. Mo.</i>	91,995	83,269	8,319	407
		% of Total	%	100%	91%	9%	0%
		Total Consumption	<i>Gal (000s)</i>	582,584	350,190	125,637	106,757
		% of Total	%	100%	60%	22%	18%
		Consumption / Cust. Mo.	<i>Gal (000s)</i>	6.33	4.21	15.10	262.30
Missouri Water Bolivar	Water	Total Customer Months	<i>Cust. Mo.</i>	55,285	47,796	7,489	-
		% of Total	%	100%	87%	13%	0%
		<i>Tier 1 Consumption</i>	<i>Gal (000s)</i>	97,252	87,646	9,606	-
		<i>Tier 2 Consumption</i>	<i>Gal (000s)</i>	182,703	94,855	87,848	-
		Total Consumption	<i>Gal (000s)</i>	279,955	182,501	97,454	-
		% of Total	%	100%	65%	35%	0%
		Consumption / Cust. Mo.	<i>Gal (000s)</i>	5.02	3.78	13.01	-
Missouri Water - Sewer	Sewer	Total Customer Months	<i>Cust. Mo.</i>	8,318	8,198	120	-
		% of Total	%	100%	99%	1%	0%
		Total Consumption	<i>Gal (000s)</i>	6,566	5,141	1,425	-
		% of Total	%	100%	78%	22%	0%
		Consumption / Cust. Mo.	<i>Gal (000s)</i>	0.79	0.63	11.88	-
Missouri Water Bolivar - Sewer	Sewer	Total Customer Months	<i>Cust. Mo.</i>	55,300	48,432	6,868	-
		% of Total	%	100%	87%	13%	0%
		<i>Tier 1 Consumption</i>	<i>Gal (000s)</i>	96,442	87,351	9,091	-
		<i>Tier 2 Consumption</i>	<i>Gal (000s)</i>	157,685	89,553	68,132	-
		Total Consumption	<i>Gal (000s)</i>	254,127	176,903	77,223	-
		% of Total	%	100%	70%	30%	0%
		Consumption / Cust. Mo.	<i>Gal (000s)</i>	4.65	3.70	11.24	-

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Q. Can you provide examples of customer count inconsistencies from Liberty Water's supporting documentation?

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A. Yes, customer counts were also provided in Liberty Water's response to Staff DR No. 0026. Upon reviewing these customer counts, notable inconsistencies were found between this new source of customer count data and Mr. O'Neill's schedules. For example, excluding customer counts in January 2022 prior to the purchase of the Bolivar system, differences for Bolivar residential water customers in 2022 between Mr. O'Neill's Direct Schedule TO-6.9 and Liberty Water's response to Staff DR No. 0026 range from 9 to 84 customers per month, averaging a difference of approximately 44 customers per month. Similarly, for Empire residential water customers in 2022, customer count differences between

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1 Mr. O'Neill's Direct Schedule TO-5.9 and the response to Staff DR No. 0026 range from 0
2 to 58 customers per month, averaging a difference of approximately 29 customers per month.

3 There is nothing provided in Mr. O'Neill's testimony, schedules, or workpapers or Liberty
4 Water's response to Staff DR No. 0026 that explains these differences.

5 Q. Are customer count inconsistencies limited to the Liberty Water's
6 water customers?

7 A. No, for Bolivar residential sewer customers in 2022, customer count differences
8 between Mr. O'Neill's Direct Schedule TO-8.9 and Liberty Water's response to Staff DR
9 No. 0026 average approximately 42 customers per month. For RD Sewer residential customers
10 in 2022, customer counts were not included in Mr. O'Neill's Direct Schedule TO-7.9,
11 but customer count differences between Mr. O'Neill's billing determinants workpaper and
12 Liberty Water's response to Staff DR No. 0026 average approximately 59 customers per month.

13 Q. Are these the only customer count issues?

14 A. There are more specific but minor examples, but the provided examples are
15 adequate to illustrate the challenge Staff faced when trying to determine this portion of Liberty
16 Water's billing determinants.

17 Q. Has Liberty Water provided insight regarding customer count inconsistencies?

18 A. Yes, in their response to Staff DR No. 0026.4, Liberty Water noted Mr. O'Neill's
19 workpaper was "sourced by information that is static in nature and, therefore, represents
20 customer counts at a point in time," but the customer counts provided by the Liberty Water's
21 response to Staff DR No. 0026 is "sourced by live information that changes in real time for
22 monthly reporting purposes and, therefore, would reflect a customer count that is more up to
23 date." Although corrections to more recent data, such as the first quarter of 2024,

1 are understandable, Liberty Water did not provide any information how or why customer counts
2 as far back as 2022 would need to be updated. Liberty Water noted, however, the customer
3 count data provided in the response to Staff DR No. 0026 “may be used as the definitive source
4 for customer counts.”

5 Q. Did Liberty Water file an amended version of Mr. O’Neill’s testimony to
6 account for their revision of their customer numbers?

7 A. No, although Mr. O’Neill’s submitted updated workpapers, his testimony has
8 not been amended.

9 Q. Have you found any examples showing data provided by Mr. O’Neill’s
10 testimony to be more reasonable?

11 A. Yes, Liberty Water’s response to Staff DR No. 0026 shows Savers Farm
12 customer numbers for January and February 2022 to be 266 and 268 customers, respectively;
13 however, Mr. O’Neill’s billing determinants workpaper shows Savers Farm customer numbers
14 for January and February 2022 to be 134 and 136 customers, respectively. Considering the
15 average Savers Farm customer counts for March through December 2022, according to Liberty
16 Water’s response to Staff DR No. 0025, is 144, Mr. O’Neill’s customer counts for January and
17 February are more reasonable.

18 Q. So not only are there errors in Mr. O’Neill’s testimony, there continue to be
19 errors in Liberty Water’s revised customer counts?

20 A. It appears so, yes.

21 Q. Is the manner in which Liberty Water structured and presented customer count
22 data consistent with Commission standards?

1 A. For the most part, customer counts are arranged into the following three
2 traditional customer classes: residential, commercial, and industrial. However, additional
3 customer classes, such as Interdepartmental, Company Use, Municipal Buildings, and
4 Municipal Pumping, are found in the data provided as Liberty Water's response to Staff DR
5 No. 0026. In response to Staff DR No. 0026.3 regarding these atypical classes, Liberty Water
6 states some of these classes are tied to accounts from Empire District Electric Company,
7 an acquisition approved by the Commission on April 8, 2020, in Case No. WM-2020-0156,
8 but should fall under Commercial or Industrial classifications. Although the existence of
9 atypical customer classes may account for a minor disparity in Empire customer counts, their
10 existence is more notable for Empire water usage.

11 **WATER USAGE**

12 Q. How does the addition of customer classes that are not authorized in a tariff
13 impact Empire water usage?

14 A. When comparing water usage data, also known as gallons sold, by Empire
15 commercial customers, data from Mr. O'Neill's Direct Schedule TO-5.9 does not correlate
16 directly with data received in response to Staff DR No. 0025. However, if commercial,
17 interdepartmental, municipal, and municipal pumping data from the data derived from the
18 response Staff DR No. 0025 are added together, the sum is then consistent with Mr. O'Neill's
19 Direct Schedule TO-5.9.

20 Q. Are there any notable data inconsistencies in regard to water usage found in
21 Liberty Water's testimony?

22 A. Yes, according to Mr. O'Neill's Direct Schedules TO-5.9, TO-6.9, TO-7.9, and
23 TO-8.9, the amount of January and February 2022 water and sewer usage was identical for all

1 tariff areas, with the exception of adjustments made to Noel commercial water usage (due to
2 the loss of a major commercial and industrial water customer). In addition to being incredibly
3 unlikely, it is not consistent with usage data derived from Liberty Water's response to Staff DR
4 No. 0025.

5 Q. Is that the only notable water usage inconsistency provided in Liberty
6 Water's testimony?

7 A. No, in Mr. O'Neill's Direct Schedule TO-5.9, there are three instances of
8 negative water usage. According to this data source, Noel commercial water usage in January
9 2022 was -5,873,627. Mr. O'Neill's adjustments to Noel data appears to have impacted
10 this number.

11 Q. Is that the only example of negative water usage provided by Liberty
12 Water's data?

13 A. No, Mr. O'Neill's Direct Schedule TO-5.9 also shows Taney County
14 commercial water usage in August and September 2022 to be -28,000 and -17,000, respectively.
15 In contrast, usage data derived from Liberty Water's response to Staff DR No. 0025 shows
16 Taney County commercial water usage in August and September 2022 to be 3,000 and 6,000,
17 respectively. When an explanation for the negative consumption values found in Mr. O'Neill's
18 data was requested in Staff DR No. 0123, the response noted there are "misreads or other
19 instances which can create anomalies such as random negative consumption," but continued
20 that "adjustments are made in other months to 'net' out the proper consumption levels." A more
21 detailed explanation of how the anomalies would be detected and corrected was not provided.

22 Q. Can you provide examples of water usage inconsistencies from Liberty Water's
23 supporting documentation?

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1 A. Yes, when comparing usage data for water customers as provided in
2 Mr. O'Neill's Direct Schedules TO-5.9 and TO-6.9 against data derived from Liberty Water's
3 response to Staff DR No. 0025, there are several inconsistencies. Excluding adjustments made
4 to water usage data for the Bolivar acquisition in early 2022 and for Noel's loss of a major
5 commercial and industrial water customer, as well as including municipal and interdepartmental
6 classes in the commercial class for Empire Water, usage data for these data sources were
7 consistent only 25.3% of the time in 2022.

8 Q. Were these inconsistencies limited to water customers?

9 A. No, when comparing usage data for sewer customers as provided in
10 Mr. O'Neill's Direct Schedules TO-7.9 and TO-8.9 against usage data derived from Liberty
11 Water's response to Staff DR No. 0025, usage data was consistent 47.1% of the time in 2022.

12 Q. Was this inconsistency addressed by Liberty Water in any way?

13 A. Yes, on June 27, 2024, Mr. O'Neill provided billing determinants workpapers
14 updated to align his data with the Liberty Water's response to Staff DR No. 0025. When data
15 from this updated source is compared to data derived from Liberty Water's response to Staff
16 DR No. 0025, excluding data adjusted for the Bolivar acquisition in January 2022 and the loss
17 of a major commercial and industrial customer in Noel, Mr. O'Neill's water usage data are
18 100% consistent with Liberty Water's response to Staff DR No. 0025. However, while Liberty
19 Water and their witnesses' water usage data was revised to be consistent, this revision continues
20 to include the problematic water usage data mentioned above and problematic customer count
21 data from DR No. 0026.

22 Q. Did you have any concerns with how water usage data was organized in Liberty
23 Water's response to Staff DR No. 0025?

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1 A. There were some challenges organizing and analyzing data from this source.
2 There were multiple types of meter readings, including “normal,” “regular,” “manual,” “rebill,”
3 “skipped,” and “missed” meter reads, often leading to multiple meter readings for the same
4 customers in a single month. The “skipped” and “missed” meter reads also resulted in estimated
5 and duplicate meter reads across a variety of water systems. After discussing the data structure
6 with Liberty Water during a technical conference, Staff was able to arrange the data into a
7 meaningful and workable summary using a pivot table.

8 Q. Should data derived from information provided in Liberty Water’s response to
9 Staff DR No. 0025 be considered as the definitive source for water usage?

10 A. Although most of the data from that source appears to be legitimate, it is not
11 without its faults. For example, Mr. O’Neill’s Direct Schedule TO-5.9 shows March 2022
12 usage for Valley Woods for residential and commercial to be 182,000 and 5,000 gallons,
13 respectively, whereas data derived from Liberty Water’s response to Staff DR 0025.0 show
14 March 2022 usage for Valley Woods for residential and commercial to be 2,000 and 0 gallons,
15 respectively. As mentioned, Mr. O’Neill’s updated workpapers now correlate to Liberty
16 Water’s response to Staff DR 0025.0; however, considering the averages of all other 2022
17 values in Liberty Water’s response to Staff DR No. 0025 for residential and commercial
18 customers are 228,727 and 27,364 gallons, respectively, the water usage amounts originally
19 provided in Mr. O’Neill’s Direct Schedule TO-5.9 are more reasonable.

20 Q. Would there be any other reasons not to use Liberty Water’s response to Staff
21 DR No. 0025 as the definitive source for billing determinant data?

22 A. The original response to Staff DR No. 0025 was provided on April 17, 2024,
23 but an update was provided to Staff on June 14, 2024. In this update many of the 2019 to 2021

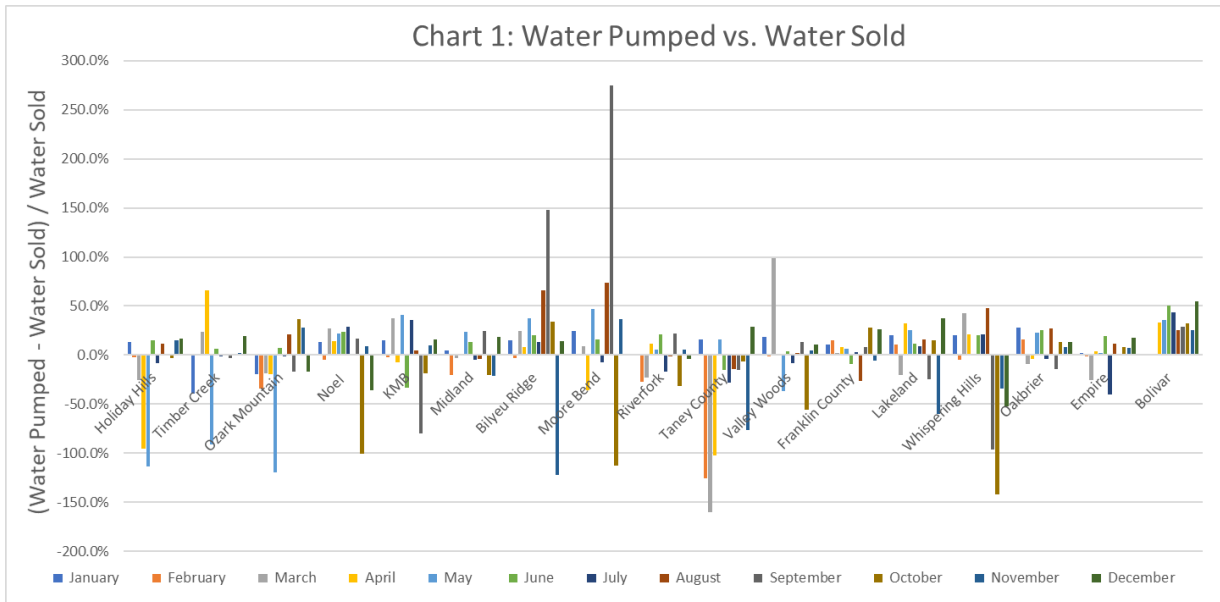
1 water usage amounts changed for residential and commercial classes in the Taney County tariff
2 area. In the Holiday Hills tariff area, water usage amounts were changed for the residential
3 usage class in October 2019 and the industrial usage class in June 2021. Reasons for changes
4 back to 2019 were not provided by Liberty Water. Although Staff could not determine the
5 reasons for all of the changes, one change in October 2019 appears to be caused by the deletion
6 of a single water bill in the dataset.

7 **MASTER METER DATA**

8 Q. Did any of the other data sources you reviewed yield data inconsistencies?

9 A. Yes, when comparing reported water usage to reported amounts pumped,
10 more inconsistencies were found. For example, when comparing 2022 water usage amounts as
11 provided in the response to Staff DR No. 0025 to the 2022 pumped amounts as provided in
12 response to Staff DR No. 0024, the Taney County tariff area reportedly sold 29.4% more water
13 than it pumped, and the River Fork tariff area reportedly sold 2.2% more than it pumped. When
14 comparing monthly water usage amounts as provided in the response to Staff DR No. 0025 to
15 the monthly pumped amounts as provided in response to Staff DR No. 0024, more water was
16 reportedly sold than pumped in 38.3% of the months across all tariff areas. This is demonstrated
17 in the chart below. Please note that values below the 0.0% line are months when more water
18 was reported to be sold than pumped:

1



2

3

Q. Do the amounts of water pumped provide any other insight into the validity of water usage?

4

5

A. Although it is difficult to determine whether discrepancies are due to errors in provided data for water usage or water pumped, this analysis, as well as the above graph, helped pinpoint a couple of specific data issues. According to Liberty Water's response to Staff DR No. 0024, the gallons of water pumped for Bilyeu Ridge and Moore Bend in September 2022 were -556,300 and -60,500, respectively. This resulted in the exceedingly high values seen for those tariff areas in the above graph.

10

11

Q. Did this analysis help you find other data inconsistencies?

12

A. Yes. According to Liberty Water's response to Staff DR No. 0024, the gallons of water pumped for Valley Woods in March 2020 was 154,700 gallons, but the corresponding amount of water usage as provided in the response to Staff DR No. 0025 was only 2,000 gallons. Considering the amount of water sold for the next-lowest month is 154,000 gallons and the average of the other eleven months is greater 225,000 gallons, this warranted additional

16

1 scrutiny. As provided in the response to Staff DR No. 0025, the number of gallons sold the
2 following month, April 2022, was 334,000, the highest of any reported monthly amounts in
3 2022 and nearly twice the amount sold for the lowest month. In short, water usage reported for
4 April 2022 might be a correction for underreported usage in March 2022.

5 Q. Were these data inconsistencies found outside of the 2022 test year?

6 A. Yes. Looking outside of the 2022 test year, there are several examples of data
7 inconsistencies in Liberty Water's response to DR No. 0024. For example, the amount of water
8 pumped for Bilyeu Ridge in June 2020 was reported to be zero. It appears December 2020
9 pumped amounts for the Midland and Riverfork tariff areas, 83,700 gallons and 111,800
10 gallons, respectively, were very low compared to the rest of the year. The value for the
11 Riverfork tariff area being approximately 10% and the Midland tariff area being approximately
12 15% of their averages for the year. Additionally, the same amount of water pumped was
13 reported for the first four months of Liberty Water service for three tariff areas, Oakbrier
14 reported as 103,000 gallons, Whispering Oaks reported as 81,000 gallons, and Lakeland
15 reported as 136,250. And in June 2021, the amount of water pumped for Oakbrier tariff area
16 was reportedly -470,086 gallons.

17 Q. Were there other data sources supplied by Liberty Water that were reviewed
18 regarding water pumped and water usage?

19 A. Annual amounts provided in Liberty Water's response to Staff DR No. 0024 for
20 water pumped and Staff DR No. 0025 for water sold were compared to Liberty Water's 2020
21 through 2023 Annual Reports. Updates to the Annual Reports for 2020 through 2022 were
22 provided by Liberty Water on March 7, 2024, just six days before Liberty Water filed the
23 current rate case. The 2023 Annual Report was submitted May 15, 2024. As shown in Table 1

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1 below, the amount of gallons pumped in the updated 2020 Annual Report was not consistent
2 with data provided in response to Staff DR No. 0024. There is a note provided in the response
3 to Staff DR No. 0024 that the amount is tied to an aggregate of the 2020 Annual Report and
4 Empire data, but additional information regarding this “aggregate” amount could not be located.
5 More noteworthy, however, is none of the amounts for gallons passed thorough customers’
6 meters provided in the Annual Reports is consistent with data provided in the response to Staff
7 DR No. 0025 for gallons sold. These differences are provided in Table 1 below.

8

Year	2020	2021	2022	2023
Gallons station pumping into distribution main from Annual Report	545,489,424	651,301,035	1,049,185,969	1,061,089,279
Gallons pumped from response to DR No. 0024	844,602,424	651,301,035	1,049,185,969	1,061,089,279
Total gallons passed through customers' meters from Annual Report	418,480,543	574,218,965	904,484,434	948,774,374
Gallons sold derived from response to DR No. 0025	573,949,781	618,382,147	916,847,235	955,435,759

9

10 Q. What is the overall quality of Liberty Water’s customer count, water usage,
11 and master meter data?

12 A. Considering the data variability and inconsistency among multiple data sources,
13 the validity of data sets provided by Liberty Water for customer counts, water usage, and master
14 meter data is highly questionable and should not be utilized for CCOS purposes. As discussed
15 in the direct testimonies of Staff witnesses Daronn A. Williams, Jarrod J. Robertson, and
16 Angela Niemeier, the data problems impact Staff’s ability to conduct reviews and develop
17 recommendations on several facets of this case.

18 Q. Does this conclude your rebuttal testimony?

19 A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the Request of Liberty Utilities)
(Missouri Water) LLC d/b/a Liberty for) Case No. WR-2024-0104
Authority to Implement a General Rate)
Increase for Water and Wastewater Service)
Provided in its Missouri Service Areas)

AFFIDAVIT OF MICHAEL D. IRWIN

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW MICHAEL D. IRWIN and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Rebuttal Testimony of Michael D. Irwin*; and that the same is true and correct according to his best knowledge and belief.

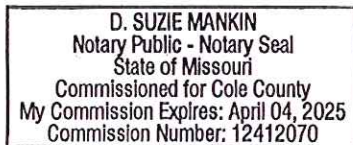
Further the Affiant sayeth not.




MICHAEL D. IRWIN

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 23rd day of September 2024.





Notary Public

Michael D. Irwin

Present Position

I have been a Senior Research/Data Analyst for the Water, Sewer, and Steam Department in the Industry Analysis Division of the Missouri Public Service Commission (Commission) since February 2024. In my current position, my duties include, but are not limited to, analyzing data and composing testimony related to utility rate cases; corresponding with Staff, utilities, and Office of the Public Counsel; and reviewing and revising utility tariffs.

Educational Background and Work Experience

I received a Master of Science and a Bachelor of Science in Biology from Western Illinois University in 1998 and 1994, respectively. Prior to my position at the Commission, I was employed by the Missouri Department of Natural Resources from 2000 to 2024 in the following positions: Water Quality Assessment Specialist, Volunteer Water Quality Monitoring Program Quality Assurance/Quality Control Specialist, Biological Assessment Specialist, Section 401 Water Quality Certification Scientist, and Environmental Program Supervisor. Through my years at the agency, my responsibilities included reviewing and analyzing Missouri surface water quality data, developing Missouri Water Quality Standards for metal pollutants, designing and implementing in-depth water quality studies, reviewing and analyzing aquatic biological survey data, authoring Water Quality Certifications to ensure federally authorized projects complied with Missouri Water Quality Standards, and supervising five wastewater and stormwater general permit writers and the agency's Water Quality Certification Coordinator.