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Witness: John J. Spanos
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Case No.:   WR-2015-0301
                  SR-2015-0302
Date: February 11, 2016

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. WR-2015-0301
CASE NO. SR-2015-0302

REBUTTAL TESTIMONY

OF

JOHN J. SPANOS

ON BEHALF OF

MISSOURI-AMERICAN WATER COMPANY

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

IN THE MATTER OF MISSOURI-AMERICAN) WATER COMPANY FOR AUTHORITY TO) FILE TARIFFS REFLECTING INCREASED) RATES FOR WATER AND SEWER) SERVICE)	CASE NO. WR-2015-0301 CASE NO. SR-2015-0302

AFFIDAVIT OF JOHN J. SPANOS

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

_____
John J. Spanos

Commonwealth of Pennsylvania
County of Cumberland
SUBSCRIBED and sworn to
Before me this _2nd_ day of _February_ 2016.

_____
Notary Public

My commission expires:

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
Cheryl Ann Rutter, Notary Public
East Pennsboro Twp., Cumberland County
My Commission Expires Feb. 20, 2019
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

REBUTTAL TESTIMONY
JOHN J. SPANOS
MISSOURI-AMERICAN WATER COMPANY
CASE NO. WR-2015-0301
CASE NO. SR-2015-0302

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I. INTRODUCTION

Q. **PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

A.   My name is John J. Spanos, and my business address is 207 Senate Avenue, Camp Hill, PA 17011.

Q. **HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY IN THIS PROCEEDING?**

A.   Yes, I have submitted direct testimony in this proceeding.

Q. **WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?**

A.   The purpose of my testimony is to rebut the portions of the Staff Report filed by the Missouri Public Service Commission Staff ("Staff") related to depreciation. Specifically, I will address Staff's positions to maintain existing rates and parameters; the life span procedure; the remaining life method; general plant amortization; negative reserve adjustments; negative rate base for sewer divisions and the recovery pattern for the Business Transformation assets.

Q. **PLEASE SUMMARIZE YOUR TESTIMONY.**

A.   I will address each subject individually, however, it should be noted that each of the individual subjects are also affected by others. Therefore, topics will overlap with discussion and explanation that may be addressed simultaneously.

The first part of my testimony presents a general discussion of the depreciation study process and why it is important to update current rates with renewed analyses periodically. I will then discuss the remaining life method and why this method is superior to the whole life method. I will then address the need for the life span technique for major facilities. The remaining life discussion will be intertwined with the negative reserve

1   adjustments and negative rate base issues presented by Staff. A few of the

2   sections will also correlate with the need for proper general plant amortization

3   practices.   Finally, I will address the proper amortization period for the

4   Business Transformation assets.

5

6   **II. DEPRECIATION PROCESS AND CONTINUED USE OF EXISTING RATES**

7

8   **Q.   WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?**

9   A.   Based on the testimony in the Staff Report, it is important to explain the

10   objective of depreciation and the process for a depreciation study.   An

11   understanding of this objective will illustrate why maintaining existing rates

12   and parameters is not appropriate, as Staff is recommending. The key point

13   to understand is that depreciation is intended to recover the costs of a

14   company's assets over the actual period of time they will be in service.

15   Because of this, the process for estimating or forecasting service lives and

16   net salvage requires an explanation.

17

18   **Q.   WHY DO YOU BELIEVE IT IS IMPORTANT TO EXPLAIN THESE**

19   **CONCEPTS?**

20   A.   There are three main reasons. First, depreciation studies are intended to

21   incorporate judgment as a basis for future expectations so continually

22   incorporating new information, both actual and expected, is critical for proper

23   depreciation rates. Second, many of the issues that have developed in Staff's

24   Report are resolved with utilization of methods and procedures in the

25   Depreciation Study. Specifically, the use of remaining life and development

26   of rates at the Company level. Finally, application of depreciation rates

1   consistent with the basis for developing the parameters eliminates the need

2   for so many adjustments to specific components.

3

4   **Q.   WHAT IS DEPRECIATION?**

5   A.   Depreciation is defined in the FERC Uniform System of Accounts as:

6   12. *Depreciation*, as applied to depreciable electric plant, means
7   the loss in service value not restored by current maintenance,
8   incurred in connection with the consumption or prospective
9   retirement of electric plant in the course of service from causes
10   which are known to be in current operation and against which the
11   utility is not protected by insurance. Among the causes to be given
12   consideration are wear and tear, decay, action of the elements,
13   inadequacy, obsolescence, changes in the art, changes in demand
14   and requirements of public authorities.

15

16   **Q.   WHAT IS THE OBJECTIVE OF DEPRECIATION?**

17   A.   The objective of depreciation is to allocate, in a systematic and rational

18   manner, the full cost of an asset (original cost less net salvage) over its

19   service life.   The Uniform System of Accounts ("USofA") requires this in

20   General Instruction 22-A:

21   *Method.* Utilities must use a method of depreciation that allocates in a
22   systematic and rational manner the service value[1] of depreciable
23   property over the service life of the property.
24

25   Thus, the USofA confirms that depreciation represents the allocation of the

26   full costs of a company's assets (original cost less any net salvage) over their

27   service lives – that is, over the period of time the assets are providing service.

28   Costs are allocated over the service lives of the assets so that customers pay

---

[1] The USofA defines service value as the original cost less net salvage

1   for the costs of the assets that provide them service. Current customers

2   should not pay for the costs of assets that have already been retired or those

3   not yet in service. Similarly future customers should not have to pay for the

4   costs of assets that are no longer in service because current customers pay

5   too little for their service.

6

7   Q.   **CAN YOU EXPLAIN THE PROCESS FOR ESTIMATING SERVICE LIVES**

8   **AND NET SALVAGE?**

9   A.   A depreciation study requires the estimation of events that will happen many

10   years in the future. The average service lives for many of the Company's

11   assets such as water mains and services are sixty years or more. Many

12   individual assets will live longer than the average. Thus, the depreciation

13   study must predict what will occur over the next sixty years or more. There

14   are tools available to aid in forecasting service lives and net salvage, such as

15   the statistical analyses of historical data. However, the Commission should

16   not lose sight of the fact that depreciation is necessarily a forward-looking

17   process in which uncertain events are being forecast many years into the

18   future.

19   Because depreciation is a process of forecasting the future, it is

20   impossible to predict what will occur with 100% precision. The statistical tools

21   available by definition consist of imperfect information, because the

22   Company's assets have only lived for a fraction of their lives. Estimation

23   therefore requires extrapolation and judgment, which must incorporate the

24   knowledge and experience of the depreciation professional performing the

1   study. For example, the curve fitting process for life analysis may result in a

2   wide range of average service life estimates that could be supported by the

3   data alone. The judgment of the depreciation professional making the

4   estimate is therefore required to differentiate between these possible

5   estimates.

6   **Q. DO ANY AUTHORITATIVE SOURCES RECOGNIZE THE NECESSITY OF**

7   **JUDGMENT IN A DEPRECIATION STUDY?**

8   A. Yes. The National Association of Regulatory Utility Commissioners

9   ("NARUC") 1996 publication *Public Utility Depreciation Practices* (referred to

10 as the "NARUC Manual") is a well-regarded, authoritative Depreciation text.

11 The NARUC Manual has an entire section dedicated to "informed judgment."

12 NARUC defines "informed judgment" as:

13 [A] term used to define the subjective portion of the depreciation study

14 process. It is based on a combination of general experience,

15 knowledge of the properties and a physical inspection, information

16 gathered throughout the industry, and other factors which assist the

17 analyst in making a knowledgeable estimate.[2]

18 NARUC also notes that "the use of informed judgment can be a major factor

19 in forecasting"[3] and explains that "[t]he analyst's judgment, comprised of a

20 combination of experience and knowledge, will determine the most

21 reasonable estimate."[4]

---

[2] NARUC Manual, p. 128
[3] Ibid.
[4] Ibid., p. 129

1 **Q.** **IN ADDITION TO THE STATISTICAL LIFE AND NET SALVAGE**

2 **ANALYSES, HAS YOUR JUDGMENT BEEN INFORMED BY ADDITIONAL**

3 **INFORMATION RELATED TO MAWC?**

4 A. Yes. As is the typical practice for depreciation studies performed by my firm, I

5 have conducted field reviews and met with operations and engineering

6 management for MAWC. These reviews and meetings provide valuable

7 insight into the operations of the Company's assets and the plans and outlook

8 for the assets as only Company management would understand. Information

9 obtained from these field reviews and meetings is invaluable.

10 Further, over the course of my career I have performed hundreds of

11 depreciation studies, and have conducted similar field reviews and

12 management meetings. These have provided a wealth of knowledge and

13 experience as it pertains to the operations and life and net salvage

14 characteristics for utility property. All of this knowledge informs my judgment

15 and contributes to reasonable estimates of service lives and net salvage.

16

17 **Q.** **DOES MAINTAINING THE EXISTING RATES BASED ON OUTDATED**

18 **LIFE AND SALVAGE PARAMETERS ALONG WITH THE WHOLE LIFE**

19 **METHOD MEET THE BEST DEPRECIATION PROCESS?**

20 A. No, it does not. The existing rates do not consider any changes in life

21 characteristics of the assets within an account that were added between 2011

22 and 2014, as well as the type of assets retired during that time period. The

23 existing life parameters do not reflect any changes in company practice, new

24 programs that may have been implemented, such as pipe integrity programs,

1	or decisions to rehabilitate major structures such as treatment plants. Also,
2	the existing rates do not consider the potential changes in cost of removal or
3	gross salvage that have or will occur into the future as a percentage of the
4	associated plant being retired. Additionally, applying existing or outdated
5	rates to assets using the whole life method will not properly address accounts
6	that have a recovery pattern that has changed or needs to change. This is
7	why negative rate base could occur.
8	
9	**Q.** **CAN YOU SUPPLY EXAMPLES AS TO WHY EXISTING RATES MAY NOT**
10	**BE APPROPRIATE?**
11	A. Yes. I will present two examples which illustrate the concerns of outdated
12	parameters. First, I will set forth Account 311.00, Electric Pumping
13	Equipment (Account 325.00 in Staff Report). The proposed parameters in the
14	Depreciation Study are the 47-R1 survivor curve and negative 10 percent net
15	salvage as compared to Staff's proposed maintaining of the existing 42-R1.5
16	survivor curve and negative 10 percent net salvage. Since the proposed net
17	salvage percentages are the same in this case, the life parameter will be the
18	focus for this account. By recommending to maintain the 42-R1.5 survivor
19	curve, Staff has ignored the recent trend that the life characteristics for
20	pumping equipment has changed. In this account, we have learned that more
21	electronic assets are added annually in order to improve operations. These
22	assets will need to be upgraded more frequently; however their existence
23	allows for the major pumping assets to stay in service longer. Therefore, the
24	dispersion pattern has changed over the last six years when the 42-R1.5 type

1   curve was established as most representative of assets in service at that

2   time. The overall average and maximum lives are now expected to be longer

3   but the mode of the retirements is dispersed at greater ages. In other words,

4   a longer average service life of 47 with a lower moded curve, R1 is more

5   representative of the assets currently in the account today and will be in the

6   account in the foreseeable future.

7   As a result, Staff's 2.62 percent rate which is derived from the 42-year

8   life and negative 10 percent net salvage will have a higher recovery rate than

9   the overall service life is anticipating. This in turn will create over recovery

10   and possible negative rate base. This unnecessary situation is what Staff has

11   attempted to manually correct in some instances of their Report. Additionally,

12   using the whole life method that Staff recommends will not identify this over

13   recovery because whole life does not self-correct like the remaining life

14   method.   The whole life method versus remaining life method will be

15   discussed later in this testimony.

16   Another example which illustrates the issues developed by using

17   existing life and salvage parameters beyond a reasonable time period is in

18   Account 331, Transmission and Distribution Mains (Account 343 in Staff

19   Report). My proposed parameters are a 90-R2 type curve and negative 30

20   percent net salvage as compared to Staff's proposed maintaining the 90-R2.5

21   survivor curve and negative 25 percent net salvage. In this account, the

22   proposed average service lives are the same at 90 years but the dispersion

23   pattern of R2 versus R2.5 type curve is slightly different. Although the

24   dispersion patterns are different and that does produce a different recovery

1   pattern, I will be focusing on the net salvage percent in this example. Since

2   the existing 25 percent negative net salvage was established through 2008,

3   there has been a considerable increase in the retirements in the account as

4   well as an increase in the associated cost of removal which is set forth

5   statistically on pages VIII-27 through VIII-29 of the Depreciation Study. The

6   overall 41-year period (1974-2014) shows an average net salvage of negative

7   32 percent and the most recent 5-years, which Staff ignores, shows an

8   average negative 49 percent net salvage. Thus, the 30 percent negative net

9   salvage reflects the trend to more negative net salvage but is still

10 conservative compared to statistics. Consequently, Staff's recommendation

11 establishes a 5% underrecovery as compared to my estimate of the existing

12 $1,173,712,222.45 plant in service for Account 331.00 as of March 31, 2015.

13 Not only will the approximately $59 million not be recovered rationally through

14 depreciation rates over the life of the assets, but it will not be recovered at all

15 if Staff's whole life method is utilized. These are just two examples that

16 illustrate why periodically updating depreciation rates is important.

17

18   III. **THE LIFE SPAN PROCEDURE**
19
20 **Q. EXPLAIN THE IMPORTANCE OF THE LIFE SPAN PROCEDURE.**

21 A. The use of the life span procedure is the most appropriate method for

22   matching recovery of plant in service to the life characteristics of assets at

23   major structures. For example, the life characteristics of assets at a treatment

24   plant will experience some interim retirements over the life of the facility and

25   then many assets will be concurrently retired at final retirement. Therefore,

1   capital recovery should reflect these life characteristics, which can only be

2   accomplished with a life span component in the depreciation parameters. In

3   many cases, the life span is an estimate far into the future until management

4   determines the facility needs to be replaced, rehabilitated or retired. If you

5   wait until management determines the actual date, then intergenerational

6   inequities will occur over the last few years when depreciation is drastically

7   increased to obtain full recovery at the time of retirement. The lack of a life

8   span and consequential depreciation recovery flaw is quite obvious if we

9   review the history of the St. Joe treatment plant, for example.

10

11   **Q.   ARE THERE ANY OTHER ISSUES RELATING TO STAFF'S PROPOSAL**

12   **RELATING TO ACCOUNTS YOU HAVE UTILIZED THE LIFE SPAN**

13   **APPROACH?**

14   A.   Yes, there are. Staff's proposal of calculating rates with the use of the

15   existing interim survivor curve without the use of the life span approach is

16   inaccurate, because Staff has ignored the many retirements associated with

17   final retirement of a facility. Therefore, if you eliminate the life span approach,

18   you must analyze life characteristics as though all plant in service is part of a

19   mass account. Consequently, the proposed life for Accounts 304.20,

20   Structures and Improvements – Power and Pumping; 304.30, Structures and

21   Improvements – Water Treatment; and 306, Lake, River and Other Intakes

22   must be shorter than what Staff has proposed in order to include all

23   retirements. Additionally, final retirements for Accounts 304.61, Structures

24   and Improvements - Office Buildings; 304.70, Structures and Improvements -

1		Shop and Garage; 304.80, Structures and Improvements - Miscellaneous;
2		and 309.0, Supply Mains, should be included in the life analyses.
3		
4	**Q.**	**PLEASE EXPLAIN THE FLAWS IN STAFF'S LIFE ESTIMATE.**
5	A.	Staff has attempted to compare my interim survivor curves with truncation to
6		their survivor curves without properly analyzing all the data. The life analyses
7		in the Depreciation Study for Accounts 304.20, 304.30 and 306, represent an
8		interim survivor curve, and therefore, only interim retirements are considered
9		when determining the survivor curve. This is an important distinction because
10		all final retirements, such as those related to the St. Joseph plant final
11		retirement, were not considered; a critical focus in the analyses for these
12		accounts which should be truncated, and thus, should have recovery with a
13		concurrent date. Consequently, if Staff is going to ignore the life span
14		approach in recovery, then their analyses must reflect the St. Joseph
15		retirements for life analyses. The retirements coded as final for Account
16		304.20, 304.30 and 306 in the service life file equals $2,067,689 as compared
17		to the regular (interim) retirement of $4,873,283. It should be noted that of
18		the $4,873,283 interim retirements for these three accounts, over half,
19		$2,886,514.53 occurred since the last study, which Staff has ignored by
20		maintaining existing rates and parameters. In addition to these three life span
21		accounts, retirements in Accounts 304.61, 304.70, 304.80 and 309.00 were
22		coded as final since these accounts are quite often life spanned in other
23		jurisdictions.

1   With this necessary correction that Staff would need to make to their

2   life analyses along with updating the statistical analyses through 2014, the

3   revised life tables and survivor curves without truncation for each of the

4   accounts discussed above are set forth to this testimony as JJS-R2. The

5   recommended survivor curves using this approach as compared to the

6   depreciation study are as follows:

Account	Depreciation Study Survivor Curve	Rebuttal Testimony Survivor Curve
304.20	75-R2.5	73-R2
304.30	80-R2.5	75-R2.5
304.61	47-S0	36-S0.5
304.70	55-R2.5	48-R1.5
304.80	55-R2	32-S0
306.00	70-S0.5	35-S0
309.00	80-R3	78-S2

7

8   Therefore, if Staff is recommending ignoring the life span procedure,

9   then all retirements must be considered in their analyses. As can be seen

10   from the attached curves and life tables, the life characteristics are quite

11   different.

12

13   **Q.   HAS THE LIFE SPAN APPROACH BEEN IN EFFECT FOR SOME OF THE**

14   **ASSETS?**

15   A.   Yes, it has. The life span approach was utilized and approved for some of the

16   facilities in the old St. Louis County Operations.

17   **Q.   HAS THE MISSOURI STAFF AGREED TO THE LIFE SPAN PROCEDURE**

18   **IN OTHER PROCEEDINGS?**

1 A. Yes. The Missouri Staff has agreed on the life span procedure in the recent

2   Kansas City Power and Light and Ameren Missouri cases.[5]

3

4 Q. **WHAT ARE YOUR CONCLUSIONS REGARDING THE USE OF THE LIFE**

5   **SPAN APPROACH?**

6 A. During the life of a water facility, interim additions, replacements, and

7   retirements occur regularly. At the time of the final retirement of a water

8   facility, all of the structures and equipment are retired, regardless of whether

9   they were part of the original installation or were added as recently as a year

10   or two prior to the plant's retirement. The life span approach reflects the

11   unique average lives that are experienced by each year of installation at a

12   water facility by recognizing the period of time between each installation and

13   the final retirement of the plant. Conversely, Staff's approach of applying a

14   single average life or average survivor curve to all installation years of an

15   entire water facility account does not recognize the unique survivor

16   characteristics of each installation year. For example, the Parkville facility

17   began operation in 1960 and there have been subsequent plant additions

18   made each year since 1960 in Account 304.3, Structures and Improvements

19   – Water Treatment. For these plant additions, 1960 through 2014, there is a

20   unique service life and survivor curve for each vintage under the life span

21   approach for a total of 54 different survivor curves.   Under the Staff's

22   approach, there is **one** average service life and survivor curve used to

23   describe the life characteristics of all assets within Account 304.3, Structures

[5] KCPL Case No. E-2014-0370 and Ameren Missouri Case No. E-2014-0258.

1   and Improvements – Water Treatment, at Parkville. Further, the use of a

2   single average life is only applicable for one year, as with each year of

3   betterments and replacements, the overall average life of the water facility

4   changes.   Thus, depreciation based on the use of the life span approach,

5   rather than the use of a single average life, results in a more accurate

6   reflection of the loss in service value of a water facility.

7

8   **Q.   DO AUTHORITATIVE TEXTS ON DEPRECIATION SUPPORT YOUR**

9   **CONCLUSION THAT THE SERVICE VALUE OF WATER FACILITIES**

10   **SHOULD BE ALLOCATED BASED ON THE USE OF THE LIFE SPAN**

11   **APPROACH?**

12   A.   Yes, they do. Authoritative texts on the subject of depreciation support the

13   proposal to use the life span approach for power plants.   Public Utility

14   Depreciation Practices, published in 1996 by the National Association of

15   Regulatory Utility Commissioners states:

16   Life span property generally has the following characteristics:

17   1. Large individual units,
18   2. Forecasted overall life or estimated retirement date,
19   3. Units experience interim retirements, and
20   4. Future additions are integral part of initial installation.
21
22   The following classes of utility property may be most appropriately
23   studied under this method, taking into consideration the availability of plant
24   accounting data, and particularly the number of units of property involved:
25   buildings, electric power plants.[6]
26

---

[6] Public Utility Depreciation Practices.   Page 141.   National Association of Regulatory Utility Commissioners. 1996.

1   <u>Depreciation Systems </u>states:

2

3   Depreciation professionals use the term life span to describe both a
4 unit of property and a group of property that will be retired as a unit.
5 Examples of a unit of property are a hydroelectric dam or the building
6 housing electrical generating equipment. Examples of a group of property
7 that will be retired as a unit include the turbines, generators, and other
8 equipment used to generate electrical power and housed in either the dam
9 or building. The dispersion pattern of retirements from a group of life span
10 property differs from the pattern of other (mass) property, because much
11 of the life span property is retired simultaneously (unlike mass property).
12 The resulting survivor curve is truncated (and instantaneously reaches
13 zero percent surviving) rather than gradually curving to zero percent
14 surviving.[7]

15

16

17 **Q.**   **WHAT METHOD FOR ALLOCATION OF WATER FACILITY SERVICE**

18   **VALUE HAS MAWC PROPOSED IN THIS PROCEEDING?**

19 A.   MAWC has proposed, consistent with authoritative texts and the USoA, the

20   use of the life span method of allocating the service value of water facilities

21   over the life of the facility.

22

23 **Q.**   **IS THE APPROACH STAFF HAS PROPOSED CONSISTENT WITH**

24   **AUTHORITATIVE TEXTS AND THE USOA?**

25 A.   No.   Without a life span component, which Staff excludes, there is no

26   matching of capital recovery to utilization of the assets in a systematic and

27   rational manner over the entire life cycle.   Thus creating intergenerational

28   inequity.

29

---

[7] Depreciation Systems, Wolf, Frank K. and W. Chester Fitch. Page 255. Iowa State University Press.
1994.

1   **Q.   PLEASE DESCRIBE THE ADDITION AND RETIREMENT ACTIVITY THAT**

2   **OCCURS DURING THE COURSE OF A WATER FACILITY'S LIFE SPAN**.

3   A.   The first addition at a water facility is its initial construction, a substantial

4   expenditure. Throughout the life of this initial expenditure, betterments and

5   replacements take place. For example, after the initial installation in 1960,

6   many capital expenditures have taken place at Parkville each year,

7   representing a betterment. Also, many of the capital expenditures included a

8   retirement or replacement of original investment. The retirement of a portion

9   of the original investment represents an interim retirement. This type of

10   activity occurs in almost every year of a water facility's life span in varying

11   degrees of magnitude. Interim plant additions are made for various reasons,

12   at times to replace worn or unreliable components of the facility and other

13   times made to comply with new water quality standards.   After a period of 50,

14   60 or more years, it becomes uneconomic to continue to make improvements

15   to keep the facility running and the entire facility is retired. This retirement

16   includes the original construction as well as all of the interim betterments and

17   replacements.

18

19   **Q.   GIVEN THIS PATTERN OF ADDITIONS AND RETIREMENTS, HOW CAN**

20   **THE   SURVIVOR   CHARACTERISTICS   OF   WATER   FACILITY   BE**

21   **DESCRIBED?**

22   A.   The survivor characteristics of water facilities can be described through the

23   use of interim survivor curves truncated at the date of final retirement of the

24   entire facility.   The interim survivor curve describes the rate of interim

1   retirements from the date of installation to the date of final retirement. These

2   interim retirements are the result of retirements of equipment with lives that

3   are less than the overall life span of the plant. These retirements would be of

4   items such as pumps, motors, control equipment and numerous other items.

5   The interim survivor curve, graphically depicted, begins at 100 percent

6   surviving at the date of installation and decreases gradually throughout most

7   of the life span. At the date of final retirement, the interim survivor curve is

8   truncated, reducing the percent surviving to 0 percent. The age at which

9   truncation occurs is different for *every* year of installation, resulting in a

10   different average service life for each vintage.

11

12 **Q.**   **DO THE FINAL RETIREMENT DATES REPRESENT A DATE CERTAIN**

13   **FOR THE RETIREMENT OF THE PLANTS?**

14 A.   No, it does not. The estimated final retirement dates should not be

15   interpreted as a firm commitment to retire these plants on these dates, but

16   rather, as reasonable estimates based on currently available information.

17   The estimated final retirement dates, like other estimates used for capital

18   recovery purposes, are subject to modification in the future as circumstances

19   dictate. The estimated final retirement dates are based on current information

20   and a consideration of all relevant factors. The nature of using estimates is

21   that there is always a degree of uncertainty associated with them. The only

22   time you can precisely determine the service life of an asset or facility is after

23   it has been retired and you can look back and state with certainty that the

24   pumping equipment was in service for 35 years. However, for purposes of

1   determining appropriate depreciation rates we need to estimate things like

2   service lives and net salvage percents.

3

4 **Q.**   **IS IT NECESSARY FOR MANAGEMENT TO HAVE REPLACEMENT**

5   **PLANS IN EFFECT FOR THESE UNITS IN ORDER TO ESTIMATE A**

6   **FINAL RETIREMENT DATE?**

7 **A.**   No, it would be premature for management to be making such plans at this

8   point in time. Such plans need not occur until the time of retirement

9   approximates the lead time for construction of the replacement water facility.

10   For water facilities, two to three years is a reasonable lead time.

11

12 **Q.**   **HAS MAWC PREVIOUSLY RETIRED WATER FACILITIES?**

13 **A.**   Yes, it has. The St. Joseph water treatment facility was retired in 2000, and

14   others have had major rehabilitations, such as Joplin.

15

16 **Q.**   **DO YOU BELIEVE THAT THE PLANTS CURRENTLY IN SERVICE CAN**

17   **LIVE INDEFINITELY?**

18 **A.**   Absolutely not. Although the sites may be used for a significant period of time

19   into the future, the depreciable assets will be retired as they become

20   uneconomic due to deterioration, regulation, and obsolescence.

21

22 **Q.**   **DO ANY OF THE EXISTING FACILITIES OR SYSTEMS HAVE A SHORT**

23   **TERM PLAN THAT EMPHASIZES THE NEED FOR THE LIFE SPAN**

24   **PROCEDURE?**

1   A.   Yes. As set forth in the Depreciation Study, the Parkville System (Platte

2   County) is scheduled to be retired as of May 2018. In other words, in order to

3   achieve full recovery by time of retirement, the Parkville assets should be

4   depreciated at a rate consistent with a 5-year recovery pattern.

5

6   **Q.**   **HAVE YOU SEGREGATED THE PLANT IN SERVICE AS WELL AS THE**

7   **ASSOCIATED ACCUMULATED DEPRECIATION BY ACCOUNT FOR**

8   **PARKVILLE?**

9   A.   Yes. In each account, the Parkville assets are identified by vintage and the

10   associated accumulated depreciation assigned in order to calculate the

11   remaining rate base to be recovered by May 31, 2018.

12

13   **Q.**   **IS THIS SEGREGATION CONSISTENT WITH THE AGREEMENT FROM**

14   **THE LAST RATE CASE?**

15   A.   Yes. The last rate case requested MAWC to develop remaining life rates with

16   the use of the life span technique for Parkville.

17

18   **Q.**   **IS THIS SEGREGATION THE SAME PROCESS YOU HAVE**

19   **RECOMMENDED FOR ALL OTHER FACILITIES IN ADVANCE OF A**

20   **SPECIFICALLY ESTABLISHED TIME PERIOD?**

21   A.   Yes, it is. Establishing a life span for major structures as early as possible

22   and utilizing the remaining life technique creates a more systematic and

23   rational recovery as opposed to a short-term catch up.

24

1 **Q.** **DO CUSTOMER EQUITY CONSIDERATIONS SUPPORT THE USE OF**

2 **THE LIFE SPAN METHOD FOR WATER FACILITIES?**

3 A. Yes, they do. The life span method provides for a better match of

4 depreciation expense with service value rendered than does the use of a

5 single average survivor curve for all installation years.

6

7 **Q.** **PLEASE EXPLAIN**.

8 A. The life span method develops and uses a unique average service life for

9 each installation year. As a result of the decision to cease operations at a

10 water facility, all property of varying ages are retired concurrently. Therefore,

11 the older installation years have longer average service lives than the

12 younger installation years. Under the life span approach, the original cost of

13 an older installation year is recovered during the average life of that

14 installation year. The original cost of a younger installation year is recovered

15 during its average life. In comparison, the use of a single average service life

16 and survivor curve that is somewhere between the longer lives of the older

17 installation year, and the shorter lives of the younger installation years, result

18 in the over recovery of cost for the older installation years and the under

19 recovery of cost for the younger installation years.

20

21 **Q.** **WHAT IS THE POLICY OF OTHER REGULATORY COMMISSIONS**

22 **REGARDING THE LIFE SPAN APPROACH FOR WATER FACILITIES?**

23 A. Virtually all other regulatory commissions use the life span approach for major

24 facilities such as water treatment plants. Gannett Fleming has assisted

1   utilities in all 50 states, 10 Canadian provinces and 3 Canadian territories and

2   we are not aware of a jurisdiction that denies the life span approach for

3   treatment facilities such as the Missouri Public Service Commission.

IV. WHOLE LIFE VERSUS REMAINING LIFE

7   **Q.   DOES STAFF RECOMMEND THE WHOLE LIFE TECHNIQUE IN THIS**

8   **CASE?**

9   A.   Yes.

10

11   **Q.   DOES THE WHOLE LIFE TECHNIQUE MONITOR THE RELATIONSHIP OF**

12   **ORIGINAL COST TO ACCUMULATED DEPRECIATION?**

13   A   No, it does not.

14

15   **Q.   WHY IS IT IMPORTANT TO MONITOR THIS RELATIONSHIP?**

16   A.   In order to insure full recovery of the service value of assets over the life of

17   the assets, the accumulated depreciation must be compared to the plant

18   investment. The remaining life method insures full recovery - no more, no

19   less, over the life of the investment in a systematic and rational manner.

20

21   **Q.   CAN YOU ILLUSTRATE THE WHOLE LIFE METHODOLOGY RECOVERY**

22   **PATTERN?**

23   A.   Yes. Assuming an account has a twenty-year average service life and zero

24   net salvage percent, then the rate is 5.00%. This rate will not change unless

25   the average service life is adjusted. Additionally, the whole life method does

1   not consider the ratio of the accumulated depreciation to the plant balance. In

2   other words, after 10 years of a 20-year service life, the accumulated reserve

3   should be 50% of the plant balance. However, if it is not due to the actual

4   activity the whole life rate does not adjust to make sure full recovery is

5   achieved after 20 years. Consequently, an unfair recovery pattern would

6   exist for both ratepayers and shareholders.

7

8   **Q.**   **WHY IS THE REMAINING LIFE METHODOLOGY SUPERIOR TO THE**

9   **WHOLE LIFE METHOD?**

10 **A.**   Because the remaining life method insures full recovery, no more, no less,

11   while the whole life method does not. A simple example illustrates why the

12   remaining life method is superior. Assume that there are three assets in an

13   account which live 2, 5 and 8 years; therefore, the average life is 5 years.

14   Each asset costs $100 for a total account cost of $300. Using the whole life

15   method, the rate is 20.0%, so through year 5, the recovery of the 2-year unit

16   is $40, the 5-year unit is $100, and the 8-year unit is $100. A new study is

17   performed after year 5 and the average life is determined to be 8 years, so

18   the whole life rate is 12.5% and the recovery for the final three years is

19     $37.50. Consequently, using the whole life method, recovery is $277.50 of

20   the $300 in original cost, which fails to make the company whole.

21   Under the remaining life methodology, the average service life is still 5

22   years and the initial rate is 20.00%. Thus, the total accruals after 5 years is

23   still $240.00 and the two retirements totaling $200 for an accumulated

24   depreciation total of $40.00. Therefore, the remaining value is $60 to be

1   recovered over 3 years at a rate of 20.00%. Consequently, under the

2   remaining life method, full recovery is achieved at the end of life for the three

3   units.

4

5 **Q.   HAS STAFF AGREED TO REMAINING LIFE RATES FOR OTHER**

6 **UTILITIES IN MISSOURI?**

7 A.   Yes. Staff has agreed to the use of remaining life rates in recent proceedings

8   for Kansas City Power and Light Company as well as Ameren Missouri.

9

10 **Q.   IS THERE ANY REASON MISSOURI AMERICAN WATER COMPANY**

11 **SHOULD BE REQUIRED TO MAINTAIN WHOLE LIFE RATES?**

12 A.   No. As a matter of fact, the use of the remaining life method would eliminate

13   a number of the issues raised by Staff regarding depreciation of Company

14   assets.

15
16 **V.   NEGATIVE RESERVE ADJUSTMENTS AND NEGATIVE RATE BASE**
17

18 **Q.   DO YOU AGREE WITH STAFF'S NEGATIVE RESERVE ADJUSTMENTS**

19 **AND NEGATIVE RATE BASE ISSUES?**

20 A.   No, I do not. These issues are specific to the division or account level of a

21   certain division which does not occur when developing rates at the Company

22   level. Staff has recommended depreciation rates by account for water and

23   sewer assets at the Company level and applied to the division level using the

24   whole life method which does not take into consideration the accumulated

25   depreciation. This is inappropriate. In contrast, the remaining life method

1   does take into account the accumulated depreciation level prior to applying

2   rates to negative rate base or making adjustments to negative reserve.

3

4   **Q.**   **CAN YOU EXPLAIN HOW YOU HAVE ADDRESSED THIS SITUATION?**

5   A.   Yes. First, the Company is recommending in this case, as was done in prior

6   cases, to establish Company-wide depreciation rates and parameters for

7   water and sewer assets. Therefore, all water plant assets as well as all

8   associated accumulated depreciation amounts are combined at the account

9   level in order to properly assign the plant and reserve (accumulated

10   depreciation) amounts to be analyzed and depreciated. This is consistent

11   with group depreciation. The same is done for sewer assets. This process

12   eliminates the need for Staff's proposed negative reserve adjustments as well

13   as the negative rate base issue because the divisions with high reserve levels

14   are offset by divisions with lower reserve levels. As a result, the Company-

15   wide relationship produces a reserve to plant ratio which is then depreciated

16   over the remaining life with a level of rate base which is generally positive for

17   each account and recovered over the remaining life of the Company-wide

18   remaining life. There is one water account with negative rate base, however,

19   the remaining life depreciation rate is 0.

20

21   **Q.**   **WHY SHOULD THIS BE DONE?**

22   A.   First, all the divisions are under the same management so determinations of

23   life and salvage parameters are based on the same informed judgment and

24   combined statistical analyses. Second, the basis of group depreciation and

1   life analyses assumes that some assets will have lives longer than the

2   average and some will be retired before the average.

3

4 **Q.   DID EACH DIVISION HAVE THE SAME LIFE CHARACTERISTICS AND**

5   **ASSET BASE PRIOR TO CONSOLIDATION?**

6 A.   No.

7

8 **Q.   HAS THE USE OF THE WHOLE LIFE METHOD CAUSED THIS**

9   **SITUATION?**

10 A.   Yes. The whole life method is one of the key elements as to why this has

11   occurred. The whole life method calculates rates with no correcting element

12   of the reserve to plant. Thus, if you apply a Company composite life

13   parameter and associated rate to an asset base that is too old, then you will

14   over recover and create negative rate base.

15

16 **Q.   CAN YOU PROVIDE AN EXAMPLE AS TO HOW THIS COULD OCCUR?**

17 A.   Yes. I will use sewer Account 370, Receiving Wells (Account 363 in Staff

18   Report) as an example. This account has a 0 percent net salvage which is

19   recommended by both the Company and Staff, so the life component and

20   depreciation method are the key factors. Staff recommends a 10-year life, so

21   combined with the whole life method, a 10 percent rate is applied to all assets

22   regardless of age or reserve to plant ratio. There is $281,494.25 surviving in

23   this account as of March 31, 2015 with $150,427.07 plant investment older

24   than 10 years. This distribution of the surviving plant balance alone should

1   cause question to maintaining the 10-year life. Using Staff's recommendation

2   of a 10 percent depreciation rate, the amount of $28,149 ($281,494 * .10) will

3   be depreciated each year. Consequently, $15,043 of the $28,149 annual

4   depreciation represents assets that should already be fully recovered using

5   the whole life method and Staff's 10-year life. If this were to continue for

6   many years as Staff recommends by maintaining the 10-year life and whole

7   life method, it will not take long for the entire account to be over recovered

8   and a negative rate base to develop. Therefore, maintaining an average

9   service life that is inappropriate or has changed life characteristics, combined

10   with Staff's recommended whole life method created this situation.

11

12   **Q.   CAN YOU ELABORATE ON THE DIFFERENT ASSET BASES FOR EACH**

13   **DIVISION AS IT RELATES TO ACCOUNT 370, RECEIVING WELLS?**

14   A.   Yes. As of March 31, 2015, there are six wastewater systems which total the

15   $281,494.25 balance. These systems have various vintage balances which

16   Staff is depreciating at a 10 percent rate based on the Staff Report. However,

17   the age of the systems vary quite a bit. The Anna Meadows receiving wells

18   consist of assets of vintage 1990 which means Staff recommends a 10

19   percent rate on assets that are 25 years old. In other words, a 10 percent

20   rate will be applied to $52,480 of plant which most likely has already been

21   fully recovered. Additionally, the Ozark Meadows system has assets in

22   service from 2000, 2005 and 2007 with $7,616.07 of the $8,056.53 surviving

23   plant that is older than 10 years old. The Emerald Point wells are 2013

24   vintage and represent $107,729 of the $281,494.25 total account balance.

1   Consequently, applying a 10 percent rate to each of these divisions without

2   focusing on their age and past recovery level is not appropriate.

3

4 **Q.**   **CAN YOU EXPLAIN HOW THE REMAINING LIFE WOULD HANDLE THIS**

5   **SITUATION?**

6 **A.**   Yes. First, I will address this situation using the same life parameter of 10

7   years. In the remaining life calculation, the dispersion pattern (type curve) is

8   an element of recovery which means some assets live longer than 10 years

9   and others will not make it to 10 years. Therefore, depreciation is calculated

10   over the entire life cycle of the life and curve combination. Additionally, and

11   more importantly, the accumulated depreciation (book reserve) level as a

12   ratio of the plant in service is a component of the calculation. Therefore, the

13   depreciation rate is based on the original cost surviving ($281,494.25) and the

14   book reserve ($101,272). The remaining life rate is determined by recovering

15       $180,222 ($281,494 - $101,272) over the remaining life by vintage. All

16   vintages that are fully depreciated or beyond the full life cycle of the life and

17   curve combination would have a resulting rate of 0 percent. In this account,

18   the resultant composite rate would then be less than 10 percent.

19

20 **Q.**   **IS WHOLE LIFE THE ONLY ISSUE IN THIS EXAMPLE?**

21 **A.**   No. The combination of the whole life method which does not consider the

22   accumulated depreciation level and the outdated service life created this

23   problem.

24

1 **Q. WHY IS THE SERVICE LIFE AN ISSUE?**

2 A. The 10-year service life was based on an old estimate of 10 years which

3 reflected judgment related to the life characteristics of receiving wells many

4 years ago. The initial expectation for receiving wells was a short life cycle,

5 however, the purpose or function of these wells today are much different. All

6 of these wells were acquired since the last study was conducted so Staff's

7 basis for a 10-year life was related to different assets than we have in service

8 today. Consequently, we have learned in this case that receiving wells will

9 last on average 30 years. Therefore, Staff has applied the 10 percent rate to

10 assets that are expected to survive on average three times longer. This type

11 of change in asset base and life characteristics that is applied to each division

12 without identifying the historical surviving age base of all divisions will cause a

13 negative rate base.

14

15 **Q. DOES THIS MEAN THAT THE 10-YEAR LIFE WAS INAPPROPRIATE**

16 **WHEN IT WAS FIRST ESTABLISHED?**

17 **A. No. Actually, it should emphasize two points. First, depreciation**
18 **studies and particularly, life analyses should be updated on a regular basis to**
19 **incorporate new information or a different asset base. Second, applying a**
20 **composite life characteristic of all divisions to separate division plant**
21 **balances without considering the reserve to plant ratio or the age distribution**
22 **of each division is inappropriate.**

VI. GENERAL PLANT AMORTIZATION

Q. **HAS GENERAL PLANT AMORTIZATION BEEN APPROVED IN PRIOR CASES IN MISSOURI?**

A. Yes. In recent Kansas City Power and Light and Ameren Missouri proceedings, General Plant Amortization was approved.

Q. **DOES STAFF RECOMMEND THE SAME LIFE PERIODS THAT THE COMPANY HAS IN THIS CASE?**

A. Yes. Staff recommends depreciation rates that are consistent with the amortization periods recommended in the Company filing for all accounts that amortization accounting is proposed.

Q. **IF THE LIFE PARAMETERS ARE THE SAME, THEN WHAT IS THE ISSUE FOR THESE GENERAL PLANT ACCOUNTS?**

A. The issue seems to be Staff's desire to be able to change the life parameters based on historical indications, however, no effort to review the historical analyses or understand the nature of the assets in the account was performed. Staff has just maintained the same life parameters that were based on the 2008 Study which incorporated proposed amortization periods. This is an important distinction because amortization periods were determined based on an understanding of the nature of assets in each account and their anticipated useful life. Thus, an inconsistency of applying amortization periods, combined with whole life method to the asset base that is maintained on an individual asset basis (specific asset retirements) only

1   creates reserve imbalances and future reserve adjustments. This issue that

2   Staff raises can be avoided with the proper implementation of general plant

3   amortization. This is particularly evident if Staff continues to propose lives

4   with the whole life method that are inconsistent with the surviving balances

5   which has occurred in the Staff Report. In other words, if the lives proposed

6   by Staff are applied to the full surviving plant balance of each account without

7   segregating the vintage balances, then the annual expense will be too high.

8

9 **Q. IS GENERAL PLANT AMORTIZATION A NEW TECHNIQUE?**

10 A.   No. The concept of amortization for General Plant was advanced by the

11   Florida Public Service Commission (FPSC) in 1987 when it initiated a study of

12   retirement units for electric utilities. As a result of this study, the FPSC

13   established a $500 capitalization criteria in 1987 (FPS Rule 25 – 6.0142

14   Uniform Retirement Units for Electric Utilities) and established 5- and 7-year

15   amortization periods for most general plant in 1991 (FPS Rule 25 – 6.04361

16   Subcategorization of Electric Plant for Depreciation Studies and Rate

17   Design).

18

19 **Q. HAS THE FEDERAL ENERGY REGULATORY COMMISSION ("FERC")**

20 **APPROVED OF GENERAL PLANT AMORTIZATION?**

21 A.   Yes. In 1997 FERC established Accounting Release No. 15 (AR-15) to

22   specifically address the merits of amortization accounting for certain general

23   plant accounts.

24

1   **Q.   HAS THE GENERAL PLANT AMORTIZATION METHOD BEEN**

2   **IMPLEMENTED IN OTHER JURISDICTIONS?**

3   A.   Yes. General Plant Amortization is utilized in some form by almost every

4   other jurisdiction in the United States and every province in Canada. This

5   includes electric, gas, water and wastewater utilities; some regulated by state

6   jurisdictions and other also regulated by FERC.

7

8   **Q.   WHAT ARE THE BENEFITS OF GENERAL PLANT AMORTIZATION?**

9   A.   There are many benefits of the general plant amortization as follows:

10   •   Depreciation rates and associated depreciation expense for each asset
11   class will be stable over time.
12   •   Once the method is implemented with an approved amortization
13   period, the recovery of these assets will not change.
14   •   Once the accumulated depreciation is aligned with the amortization
15   method, there will be no need for any further rebalancing and will not
16   require additional ratemaking treatment.
17   •   Ensures that only the exact cost of the asset will be recovered.
18   •   Eliminates the need for extensive record keeping for a class of assets
19   which are high volume and low dollar.
20

21   **Q.   DOES THE GENERAL PLANT AMORTIZATION METHOD ENSURE THAT**

22   **ASSETS ARE RETIRED AT THE END OF THEIR ASSIGNED LIFE?**

23   A.   Yes. As an example, if an asset has an amortization life of 20 years it will

24   automatically be retired once the asset reaches age 20.

25

26   **Q.   DOES THE GENERAL PLANT AMORTIZATION METHOD RESULT IN**

27   **RECOVERY OF THE EXACT COST OF THE ASSET?**

28   A.   Yes. The general plant amortization method ensures that only the exact cost

29   of the asset will be recovered. If an asset cost $ 1,000 then only $ 1,000 will

1   be recovered. This occurs because the asset will automatically be retired at

2   the end of its amortizable life.

3

4 **Q.**   **CAN YOU EXPLAIN HOW THE AMORTIZATION METHOD IS**

5   **IMPLEMENTED?**

6 A.   Yes. First, an average service life or useful life is established for each asset

7   class. The useful life is determined based on the type of asset, the

8   functionality of the asset and the expected period of time the asset can

9   reliably render service. An example of this would be desktop computers. A

10   reasonable useful life is 5 years. Second, all assets are booked by dollar

11   amount and year of installation. Third, each asset or vintage (year of

12   installation) is retired after it has been in service for the full amortization

13   period. In the example of desktop computers, that would be 5 years. This

14   means the assets will be depreciated for 5 years or at a 20% rate. Once the

15   asset (vintage) has reached its 5-year useful life and has been fully

16   depreciated, it is retired off the books. It is understood and accepted in this

17   methodology that some desktop computers will actually survive longer than 5

18   years and some will not stay in service for 5 years. However, the effort to

19   actually inventory all desktop computers each year in order to determine if the

20   5-year life is precise and then to revise the depreciation rate accordingly to

21   represent the actual dispersion pattern is not warranted. The fluctuation in

22   rates is not justified for the percentage of plant in service for all MAWC

23   assets. Additionally, the stable 20% rate is fair to all ratepayers.

24

1 **Q.   DO YOU LOSE A DEGREE OF ACCURACY WITH YOUR GENERAL**

2 **PLANT ASSET RECOVERY?**

3 A.   Not necessarily. If your useful life is properly established, then the recovery

4 patterns will resemble the useful life in theory. Plus, the practice prior to

5 amortization accounting represented many assets on the books longer than

6 truly utilized.

7

8 **Q.   ARE YOU AWARE OF ANY JURISDICTIONS THAT HAVE FOUND THE**

9 **USE OF AMORTIZATION FOR GENERAL PLANT HARMFUL?**

10 A.   No, not at all. I am not aware of any utility that has implemented general

11 plant amortization and since gone back to depreciation, nor am I aware of any

12 regulatory body that has required the reversal of general plant amortization.

13

14 **Q.   WILL GENERAL PLANT AMORTIZATION REQUIRE A PERIODIC**

15 **RESERVE REBALANCING?**

16 A.   No.   Once the reserve is aligned to the surviving plant balance, then full

17 recovery will occur in conjunction with the time the assets are on the books.

18

19 **Q.   DO ALL ASSET CLASSES HAVE THE SAME AMORTIZATION PERIOD**

20 **AND ASSOCIATED RATE?**

21 A.   No. Each asset class has an established useful life or amortization period

22 that best represents the assets in the account.

23

24 **Q.   ARE THE AMORTIZATION PERIODS UTILIZED BY MAWC SIMILAR TO**

25 **OTHERS IN THE INDUSTRY?**

1   A.   Yes. The table below sets forth the industry ranges of amortization periods for

2   the asset classes MAWC currently has in service:

Water		Wastewater	
Account	Amortization Period (Industry Range)	Account	Amortization Period (Industry Range)
340.1	15-20	390	15-20
340.2	4-7	390.2	4-7
340.3	8-15	392	20-25
340.5	10-15	393	20-25
342	20-25	394	15-20
343	20-25	396	10-15
344	15-20	397	15-25
346.1	10-15		
346.2	10-15		
347	15-25		
348	15-25		

3

4   **Q.**   **CAN YOU SUMMARIZE THE POSITIONS RELATED TO GENERAL PLANT**

5   **AMORTIZATION ACCOUNTS?**

6   A.   Yes. I will use water Account 340.10, Office Furniture and Equipment -

7   Furniture, (Account 391.0 in Staff Report) as an example. Staff has

8   recommended a 20-year life and 5 percent rate for all surviving balances as

9   of March 31, 2015. This information is based on the whole life technique and

10   the life of 20 years determined by a reasonable useful of these assets

11   established in the past few cases. The life is not based on historical

12   analyses, but judgment as to what is reasonable for these type of assets.

13   According to Staff's recommendation the 5 percent rate is applied to the

14   entire $1,344,136.90 plant balance as of March 31, 2015 for an annual

15   expense of $67,207. This means assets that are from vintages 1983 through

16   2015 are depreciated at a 5 percent rate. Therefore, Staff continues to

17   support the 20-year life without past statistical analyses. Yet Staff wants the

1 Company to maintain property records of many property units with low dollar

2 value, just in case Staff chooses to conduct statistical analyses in the future to

3 justify a potentially new life. This is a lot of work for very little possible benefit

4 which Staff has shown in their Report that they are not doing a statistical

5 analysis anyway. Not only is Staff's application of lives to recovery

6 inconsistent, but the required effort needed for a small percentage of the plant

7 balance is unnecessary.

8 In contrast, my recommendations match the useful life with the plant

9 recovery, but it reduces property accounting time to monitor many small

10 property units with no benefit. See additional benefits on page 31 of this

11 testimony. I recommend a 20-year amortization period, however, the 5-

12 percent rate is applied only to the vintage assets that are within 20 years,

13 1995 through 2015. The assets that are older than 1995, have a 0 percent

14 rate and will be retired as a component of amortization implementation. The

15 retirement will equally reduce plant and reserve balance since these assets

16 have been fully recovered when properly implementing amortization

17 accounting. In future years, the only retirement recorded in the account is the

18 vintage that exceeds the amortization period. This proper application of

19 amortization accounting produces annual expense in the Study of $46,853 for

20 Account 340.10. In addition to the consistent recovery of the appropriate

21 assets to their useful life, the amount of labor hours to maintain this practice is

22 drastically reduced.

VII. BUSINESS TRANSFORMATION ASSETS

Q. HAS STAFF PROPOSED A RATE FOR BUSINESS TRANSFORMATION (BT) ASSETS?

A. Yes.   Staff proposes a 20-year life and 5 percent rate for Business Transformation assets which represent software applications developed for all American Water entities.

Q. WHAT IS THE BASIS FOR STAFF'S RECOMMENDATION?

A. In the last case, the Company and Staff agreed to a 5 percent rate for these assets before they were put into service in order to have a rate in place when the software was actually placed in service. This rate was agreed upon until a further understanding of the software application was known.

Q. HAVE OTHER AMERICAN WATER ENTITIES INSTALLED THE SAME BT ASSETS AND HAD RATES ESTABLISHED?

A. Yes. I am specifically familiar with three other American Water entities which have had a 10-year amortization period and subsequent 10 percent rate agreed upon.

VIII. CONCLUSION

Q. CAN YOU SUMMARIZE YOUR REBUTTAL TESTIMONY?

A. Yes.   The Depreciation Study proposed by MAWC sets forth the most appropriate methods and procedures for determining depreciation rates for each account at the Company level. The depreciation rates are determined using the most common remaining life method and includes statistical

1   analyses that incorporates the most recent plant activity and Company plans.

2   Additionally, the MAWC Depreciation Study includes the most widely

3   accepted general plant amortization method which the Missouri Staff has

4   accepted in recent cases for other Missouri companies.

5   In contrast, Staff has recommended the utilization of depreciation rates

6   and parameters that were agreed upon in the 2011 rate case which reflected

7   historical data through December 2008. Also, Staff recommends the whole

8   life method that does not monitor or self-correct the reserve variance which is

9   the basis for negative rate base or reserve adjustments. The resulting

10   negative rate base and negative reserve adjustments would not exist at the

11   Company level if properly applying the rates at the designed level. Finally,

12   Staff applies whole life rates based on amortization periods for certain general

13   plant accounts, but does not accept the manner at which those rates are

14   determined.

15

16   **Q.   DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

17   A.   Yes, it does.

JJS-R2

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.20 STRUCTURES AND IMPROVEMENTS - POWER AND PUMPING
ORIGINAL AND SMOOTH SURVIVOR CURVES
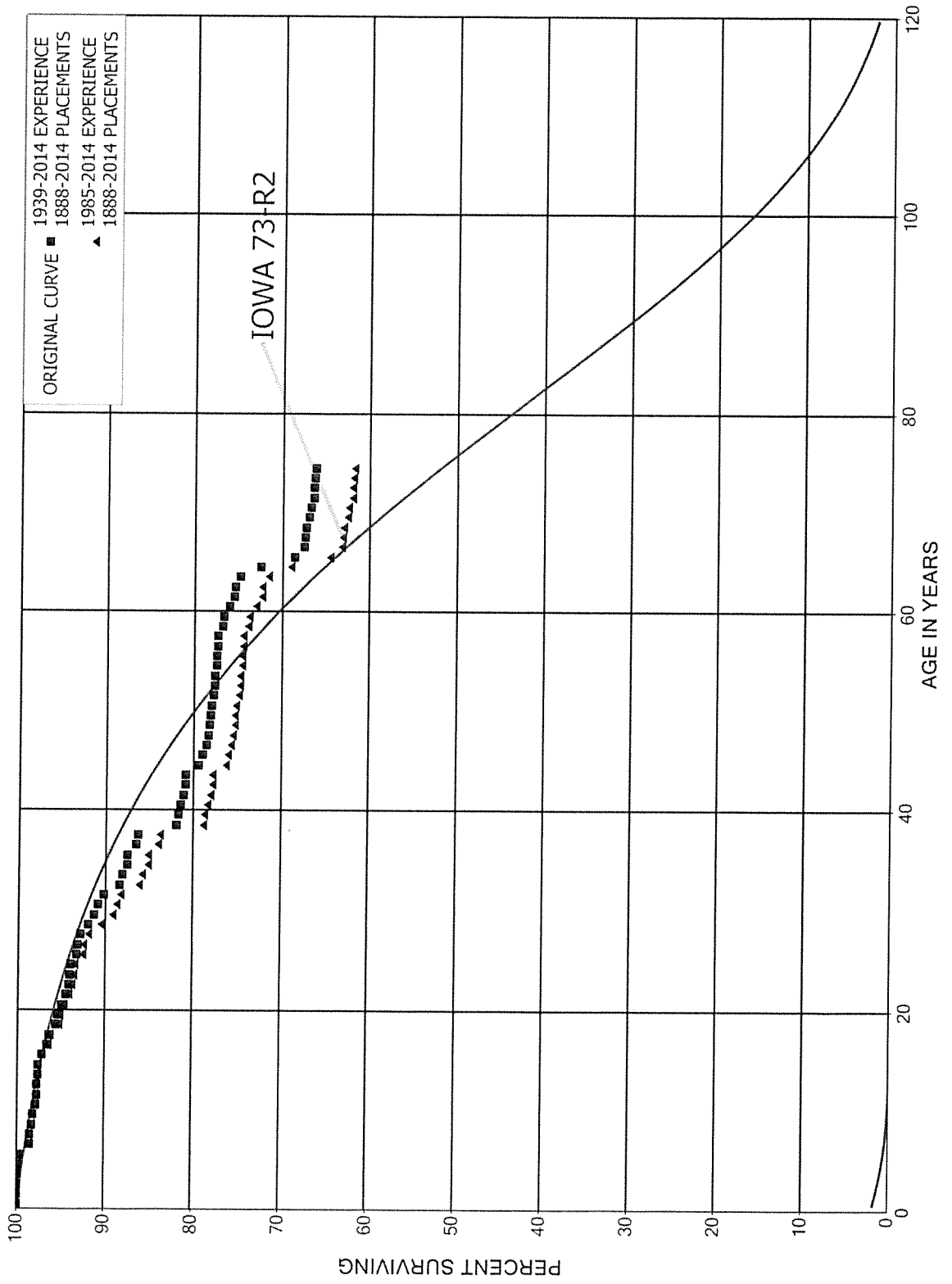
MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.20 STRUCTURES AND IMPROVEMENTS - POWER AND PUMPING

ORIGINAL LIFE TABLE

PLACEMENT BAND 1888-2014   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	19,410,347	409	0.0000	1.0000	100.00
0.5	19,389,884	7,661	0.0004	0.9996	100.00
1.5	19,204,146	1,913	0.0001	0.9999	99.96
2.5	18,662,556	2,938	0.0002	0.9998	99.95
3.5	17,670,199	17,059	0.0010	0.9990	99.93
4.5	17,530,353	16,871	0.0010	0.9990	99.84
5.5	17,347,303	206,337	0.0119	0.9881	99.74
6.5	16,508,082	13,691	0.0008	0.9992	98.55
7.5	15,795,007	35,469	0.0022	0.9978	98.47
8.5	15,299,117	13,175	0.0009	0.9991	98.25
9.5	15,255,174	47,429	0.0031	0.9969	98.17
10.5	15,206,058	14,856	0.0010	0.9990	97.86
11.5	15,165,954	6,093	0.0004	0.9996	97.77
12.5	14,581,093	14,791	0.0010	0.9990	97.73
13.5	14,536,351	8,723	0.0006	0.9994	97.63
14.5	9,900,004	35,356	0.0036	0.9964	97.57
15.5	9,463,902	58,955	0.0062	0.9938	97.22
16.5	8,779,404	21,433	0.0024	0.9976	96.61
17.5	7,459,957	61,174	0.0082	0.9918	96.38
18.5	7,359,418	14,755	0.0020	0.9980	95.59
19.5	7,237,218	30,179	0.0042	0.9958	95.40
20.5	7,083,602	34,609	0.0049	0.9951	95.00
21.5	6,101,201	23,074	0.0038	0.9962	94.53
22.5	6,038,881	9,526	0.0016	0.9984	94.18
23.5	4,946,564	3,341	0.0007	0.9993	94.03
24.5	4,725,922	35,075	0.0074	0.9926	93.97
25.5	4,014,048	3,424	0.0009	0.9991	93.27
26.5	3,830,118	14,405	0.0038	0.9962	93.19
27.5	3,665,426	34,421	0.0094	0.9906	92.84
28.5	3,076,501	23,468	0.0076	0.9924	91.97
29.5	2,911,446	13,236	0.0045	0.9955	91.26
30.5	2,842,169	20,111	0.0071	0.9929	90.85
31.5	2,810,927	57,761	0.0205	0.9795	90.21
32.5	2,687,496	7,663	0.0029	0.9971	88.35
33.5	2,635,948	16,533	0.0063	0.9937	88.10
34.5	2,506,443	2,166	0.0009	0.9991	87.55
35.5	2,385,572	27,041	0.0113	0.9887	87.47
36.5	2,310,506	5,406	0.0023	0.9977	86.48
37.5	2,304,801	116,324	0.0505	0.9495	86.28
38.5	2,188,671	4,102	0.0019	0.9981	81.92

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.20 STRUCTURES AND IMPROVEMENTS - POWER AND PUMPING

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1888-2014   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	2,150,443	6,592	0.0031	0.9969	81.77
40.5	2,134,446	8,951	0.0042	0.9958	81.52
41.5	2,070,590	5,887	0.0028	0.9972	81.18
42.5	2,058,323	722	0.0004	0.9996	80.95
43.5	2,039,281	34,633	0.0170	0.9830	80.92
44.5	1,998,068	11,168	0.0056	0.9944	79.54
45.5	1,955,946	11,845	0.0061	0.9939	79.10
46.5	1,906,049	5,120	0.0027	0.9973	78.62
47.5	1,888,905	3,695	0.0020	0.9980	78.41
48.5	1,848,565	1,076	0.0006	0.9994	78.26
49.5	1,820,794	2,520	0.0014	0.9986	78.21
50.5	1,816,840	6,538	0.0036	0.9964	78.10
51.5	1,784,502	2,304	0.0013	0.9987	77.82
52.5	1,761,015	726	0.0004	0.9996	77.72
53.5	1,720,117	3,421	0.0020	0.9980	77.69
54.5	1,633,068	693	0.0004	0.9996	77.53
55.5	1,629,022	1,505	0.0009	0.9991	77.50
56.5	1,622,407	309	0.0002	0.9998	77.43
57.5	1,588,711	12,957	0.0082	0.9918	77.42
58.5	1,377,336	242	0.0002	0.9998	76.78
59.5	546,475	4,993	0.0091	0.9909	76.77
60.5	470,329	3,758	0.0080	0.9920	76.07
61.5	462,724	160	0.0003	0.9997	75.46
62.5	462,564	3,944	0.0085	0.9915	75.44
63.5	458,193	14,100	0.0308	0.9692	74.79
64.5	436,359	23,348	0.0535	0.9465	72.49
65.5	366,702	6,167	0.0168	0.9832	68.61
66.5	319,781	236	0.0007	0.9993	67.46
67.5	296,199	633	0.0021	0.9979	67.41
68.5	293,522	1,550	0.0053	0.9947	67.26
69.5	284,714	631	0.0022	0.9978	66.91
70.5	274,133	1,444	0.0053	0.9947	66.76
71.5	270,179	157	0.0006	0.9994	66.41
72.5	269,223	264	0.0010	0.9990	66.37
73.5	266,757	552	0.0021	0.9979	66.31
74.5	266,069	36,593	0.1375	0.8625	66.17
75.5	229,473	3,661	0.0160	0.9840	57.07
76.5	222,016	5,100	0.0230	0.9770	56.16
77.5	216,766	236	0.0011	0.9989	54.87
78.5	216,267	126	0.0006	0.9994	54.81

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.20 STRUCTURES AND IMPROVEMENTS - POWER AND PUMPING

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1888-2014   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	216,085	1,722	0.0080	0.9920	54.78
80.5	214,360	675	0.0031	0.9969	54.34
81.5	212,385	672	0.0032	0.9968	54.17
82.5	210,873	7,605	0.0361	0.9639	54.00
83.5	77,235	302	0.0039	0.9961	52.05
84.5	76,933	300	0.0039	0.9961	51.85
85.5	73,249	76	0.0010	0.9990	51.64
86.5	73,173	27	0.0004	0.9996	51.59
87.5	73,112	27	0.0004	0.9996	51.57
88.5	67,333		0.0000	1.0000	51.55
89.5	67,333	1,005	0.0149	0.9851	51.55
90.5	66,328		0.0000	1.0000	50.78
91.5	66,328	7,755	0.1169	0.8831	50.78
92.5	58,574	508	0.0087	0.9913	44.85
93.5	53,269		0.0000	1.0000	44.46
94.5	53,269	1,667	0.0313	0.9687	44.46
95.5	51,603		0.0000	1.0000	43.07
96.5	51,603		0.0000	1.0000	43.07
97.5	51,603		0.0000	1.0000	43.07
98.5	51,603		0.0000	1.0000	43.07
99.5	51,283	2,875	0.0561	0.9439	43.07
100.5	48,408		0.0000	1.0000	40.65
101.5	48,408	6,823	0.1409	0.8591	40.65
102.5	41,585		0.0000	1.0000	34.92
103.5	40,464	2,715	0.0671	0.9329	34.92
104.5	33,508	546	0.0163	0.9837	32.58
105.5	32,891		0.0000	1.0000	32.05
106.5	32,891		0.0000	1.0000	32.05
107.5	32,891		0.0000	1.0000	32.05
108.5	32,891	6,502	0.1977	0.8023	32.05
109.5	26,389		0.0000	1.0000	25.71
110.5	26,389	2,509	0.0951	0.9049	25.71
111.5	16,514		0.0000	1.0000	23.27
112.5	16,514		0.0000	1.0000	23.27
113.5	16,514		0.0000	1.0000	23.27
114.5	10,478		0.0000	1.0000	23.27
115.5	10,478		0.0000	1.0000	23.27
116.5	6,726		0.0000	1.0000	23.27
117.5	6,726		0.0000	1.0000	23.27
118.5	6,726		0.0000	1.0000	23.27

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.20 STRUCTURES AND IMPROVEMENTS - POWER AND PUMPING

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1888-2014   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
119.5	6,726		0.0000	1.0000	23.27
120.5	6,726		0.0000	1.0000	23.27
121.5	6,726	181	0.0270	0.9730	23.27
122.5	2,100		0.0000	1.0000	22.64
123.5	2,100		0.0000	1.0000	22.64
124.5	2,100		0.0000	1.0000	22.64
125.5	2,100	2,100	1.0000		22.64
126.5					

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.20 STRUCTURES AND IMPROVEMENTS - POWER AND PUMPING

ORIGINAL LIFE TABLE

PLACEMENT BAND 1888-2014   EXPERIENCE BAND 1985-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	16,406,458	15	0.0000	1.0000	100.00
0.5	16,513,773	6,499	0.0004	0.9996	100.00
1.5	16,362,554	773	0.0000	1.0000	99.96
2.5	15,944,153	2,938	0.0002	0.9998	99.96
3.5	15,002,088	9,334	0.0006	0.9994	99.94
4.5	15,042,031	16,135	0.0011	0.9989	99.88
5.5	15,026,069	187,693	0.0125	0.9875	99.77
6.5	14,256,960	12,985	0.0009	0.9991	98.52
7.5	13,409,129	32,113	0.0024	0.9976	98.43
8.5	12,925,761	1,394	0.0001	0.9999	98.20
9.5	12,932,345	47,348	0.0037	0.9963	98.19
10.5	12,918,861	12,399	0.0010	0.9990	97.83
11.5	12,952,212	4,467	0.0003	0.9997	97.73
12.5	12,371,781	14,141	0.0011	0.9989	97.70
13.5	12,334,638	8,086	0.0007	0.9993	97.59
14.5	7,709,956	33,390	0.0043	0.9957	97.52
15.5	7,313,380	58,150	0.0080	0.9920	97.10
16.5	6,674,840	21,433	0.0032	0.9968	96.33
17.5	5,381,359	53,900	0.0100	0.9900	96.02
18.5	5,327,104	4,326	0.0008	0.9992	95.06
19.5	5,245,876	24,037	0.0046	0.9954	94.98
20.5	5,111,299	30,502	0.0060	0.9940	94.55
21.5	4,167,406	18,603	0.0045	0.9955	93.98
22.5	4,216,267	8,444	0.0020	0.9980	93.56
23.5	3,147,369	1,439	0.0005	0.9995	93.37
24.5	3,019,808	28,587	0.0095	0.9905	93.33
25.5	2,322,603	3,374	0.0015	0.9985	92.45
26.5	2,146,448	12,853	0.0060	0.9940	92.31
27.5	2,017,903	33,636	0.0167	0.9833	91.76
28.5	1,678,838	22,910	0.0136	0.9864	90.23
29.5	2,395,726	12,377	0.0052	0.9948	89.00
30.5	2,398,304	13,608	0.0057	0.9943	88.54
31.5	2,376,810	57,461	0.0242	0.9758	88.04
32.5	2,253,695	7,513	0.0033	0.9967	85.91
33.5	2,206,522	16,190	0.0073	0.9927	85.62
34.5	2,103,549	1,521	0.0007	0.9993	84.99
35.5	2,030,688	26,941	0.0133	0.9867	84.93
36.5	2,006,916	5,406	0.0027	0.9973	83.81
37.5	2,024,812	116,324	0.0574	0.9426	83.58
38.5	1,904,992	4,102	0.0022	0.9978	78.78

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.20 STRUCTURES AND IMPROVEMENTS - POWER AND PUMPING

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1888-2014   EXPERIENCE BAND 1985-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	1,874,488	6,592	0.0035	0.9965	78.61
40.5	1,863,166	8,911	0.0048	0.9952	78.33
41.5	1,803,303	5,887	0.0033	0.9967	77.96
42.5	1,791,992	722	0.0004	0.9996	77.70
43.5	1,776,109	34,513	0.0194	0.9806	77.67
44.5	1,735,540	4,426	0.0025	0.9975	76.16
45.5	1,701,287	8,233	0.0048	0.9952	75.97
46.5	1,654,155	4,760	0.0029	0.9971	75.60
47.5	1,631,019	3,695	0.0023	0.9977	75.38
48.5	1,591,053	1,076	0.0007	0.9993	75.21
49.5	1,563,464	2,520	0.0016	0.9984	75.16
50.5	1,554,186	6,538	0.0042	0.9958	75.04
51.5	1,523,823	2,304	0.0015	0.9985	74.73
52.5	1,502,888	726	0.0005	0.9995	74.61
53.5	1,596,607	2,831	0.0018	0.9982	74.58
54.5	1,510,149	693	0.0005	0.9995	74.44
55.5	1,509,534	1,505	0.0010	0.9990	74.41
56.5	1,502,919	91	0.0001	0.9999	74.34
57.5	1,469,502	12,957	0.0088	0.9912	74.33
58.5	1,263,905	242	0.0002	0.9998	73.68
59.5	468,621	4,993	0.0107	0.9893	73.66
60.5	392,474	3,758	0.0096	0.9904	72.88
61.5	384,869	160	0.0004	0.9996	72.18
62.5	384,709	3,944	0.0103	0.9897	72.15
63.5	385,460	14,100	0.0366	0.9634	71.41
64.5	363,626	23,348	0.0642	0.9358	68.80
65.5	293,970	6,167	0.0210	0.9790	64.38
66.5	247,048	236	0.0010	0.9990	63.03
67.5	223,466	633	0.0028	0.9972	62.97
68.5	220,789	1,550	0.0070	0.9930	62.79
69.5	212,301	237	0.0011	0.9989	62.35
70.5	207,251	1,444	0.0070	0.9930	62.28
71.5	203,297	157	0.0008	0.9992	61.85
72.5	202,341	264	0.0013	0.9987	61.80
73.5	200,996	254	0.0013	0.9987	61.72
74.5	207,842	36,593	0.1761	0.8239	61.64
75.5	171,864	2,478	0.0144	0.9856	50.79
76.5	173,112		0.0000	1.0000	50.05
77.5	172,962	236	0.0014	0.9986	50.05
78.5	172,463	126	0.0007	0.9993	49.99

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.20 STRUCTURES AND IMPROVEMENTS - POWER AND PUMPING

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1888-2014   EXPERIENCE BAND 1985-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	172,581	1,722	0.0100	0.9900	49.95
80.5	170,856	675	0.0039	0.9961	49.45
81.5	181,936	672	0.0037	0.9963	49.26
82.5	180,424	7,605	0.0422	0.9578	49.07
83.5	46,786		0.0000	1.0000	47.01
84.5	52,822	300	0.0057	0.9943	47.01
85.5	49,138		0.0000	1.0000	46.74
86.5	54,677	27	0.0005	0.9995	46.74
87.5	54,616	27	0.0005	0.9995	46.72
88.5	48,838		0.0000	1.0000	46.69
89.5	48,838	1,005	0.0206	0.9794	46.69
90.5	47,833		0.0000	1.0000	45.73
91.5	47,833	7,523	0.1573	0.8427	45.73
92.5	44,936	508	0.0113	0.9887	38.54
93.5	46,133		0.0000	1.0000	38.10
94.5	46,133	1,667	0.0361	0.9639	38.10
95.5	44,467		0.0000	1.0000	36.73
96.5	51,603		0.0000	1.0000	36.73
97.5	51,603		0.0000	1.0000	36.73
98.5	51,603		0.0000	1.0000	36.73
99.5	51,283	2,875	0.0561	0.9439	36.73
100.5	48,408		0.0000	1.0000	34.67
101.5	48,408	6,823	0.1409	0.8591	34.67
102.5	41,585		0.0000	1.0000	29.78
103.5	40,464	2,715	0.0671	0.9329	29.78
104.5	33,508	546	0.0163	0.9837	27.78
105.5	32,891		0.0000	1.0000	27.33
106.5	32,891		0.0000	1.0000	27.33
107.5	32,891		0.0000	1.0000	27.33
108.5	32,891	6,502	0.1977	0.8023	27.33
109.5	26,389		0.0000	1.0000	21.93
110.5	26,389	2,509	0.0951	0.9049	21.93
111.5	16,514		0.0000	1.0000	19.84
112.5	16,514		0.0000	1.0000	19.84
113.5	16,514		0.0000	1.0000	19.84
114.5	10,478		0.0000	1.0000	19.84
115.5	10,478		0.0000	1.0000	19.84
116.5	6,726		0.0000	1.0000	19.84
117.5	6,726		0.0000	1.0000	19.84
118.5	6,726		0.0000	1.0000	19.84

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.20 STRUCTURES AND IMPROVEMENTS - POWER AND PUMPING

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1888-2014   EXPERIENCE BAND 1985-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
119.5	6,726		0.0000	1.0000	19.84
120.5	6,726		0.0000	1.0000	19.84
121.5	6,726	181	0.0270	0.9730	19.84
122.5	2,100		0.0000	1.0000	19.31
123.5	2,100		0.0000	1.0000	19.31
124.5	2,100		0.0000	1.0000	19.31
125.5	2,100	2,100	1.0000		19.31
126.5					

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.30 STRUCTURES AND IMPROVEMENTS - WATER TREATMENT
ORIGINAL AND SMOOTH SURVIVOR CURVES

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.30 STRUCTURES AND IMPROVEMENTS - WATER TREATMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1898-2014   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	108,502,317	303	0.0000	1.0000	100.00
0.5	106,228,132	1,789	0.0000	1.0000	100.00
1.5	105,777,490	216,414	0.0020	0.9980	100.00
2.5	104,651,117	9,016	0.0001	0.9999	99.79
3.5	102,730,601	29,582	0.0003	0.9997	99.78
4.5	101,766,083	98,562	0.0010	0.9990	99.76
5.5	100,762,388	62,287	0.0006	0.9994	99.66
6.5	83,656,349	20,498	0.0002	0.9998	99.60
7.5	76,156,897	73,845	0.0010	0.9990	99.57
8.5	74,773,243	64,928	0.0009	0.9991	99.48
9.5	74,633,180	73,099	0.0010	0.9990	99.39
10.5	73,785,782	109,115	0.0015	0.9985	99.29
11.5	73,401,629	452,676	0.0062	0.9938	99.15
12.5	67,153,769	37,242	0.0006	0.9994	98.53
13.5	65,246,541	101,894	0.0016	0.9984	98.48
14.5	38,552,876	76,683	0.0020	0.9980	98.33
15.5	38,358,228	60,966	0.0016	0.9984	98.13
16.5	35,545,742	189,417	0.0053	0.9947	97.97
17.5	34,015,500	42,001	0.0012	0.9988	97.45
18.5	32,973,501	89,544	0.0027	0.9973	97.33
19.5	30,993,759	45,839	0.0015	0.9985	97.07
20.5	29,508,330	273,633	0.0093	0.9907	96.92
21.5	21,785,535	58,998	0.0027	0.9973	96.03
22.5	21,323,528	50,361	0.0024	0.9976	95.77
23.5	20,832,548	110,946	0.0053	0.9947	95.54
24.5	20,566,142	46,282	0.0023	0.9977	95.03
25.5	17,724,871	379,962	0.0214	0.9786	94.82
26.5	17,215,899	32,855	0.0019	0.9981	92.78
27.5	16,928,448	19,009	0.0011	0.9989	92.61
28.5	16,125,160	14,758	0.0009	0.9991	92.50
29.5	13,971,571	11,556	0.0008	0.9992	92.42
30.5	13,946,619	202,700	0.0145	0.9855	92.34
31.5	13,739,936	19,819	0.0014	0.9986	91.00
32.5	13,705,195	8,823	0.0006	0.9994	90.87
33.5	13,685,413	43,199	0.0032	0.9968	90.81
34.5	13,625,723	38,012	0.0028	0.9972	90.52
35.5	13,592,936	118,929	0.0087	0.9913	90.27
36.5	13,444,584	57,681	0.0043	0.9957	89.48
37.5	12,397,308	30,973	0.0025	0.9975	89.10
38.5	12,363,885	33,804	0.0027	0.9973	88.87

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.30 STRUCTURES AND IMPROVEMENTS - WATER TREATMENT

ORIGINAL LIFE TABLE, CONT.

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	12,321,898	9,499	0.0008	0.9992	88.63
40.5	12,264,870	9,592	0.0008	0.9992	88.56
41.5	11,292,064	26,503	0.0023	0.9977	88.49
42.5	11,258,916	22,836	0.0020	0.9980	88.29
43.5	8,203,102	40,319	0.0049	0.9951	88.11
44.5	8,144,191	1,111	0.0001	0.9999	87.67
45.5	8,132,693	52,000	0.0064	0.9936	87.66
46.5	4,869,394	30,090	0.0062	0.9938	87.10
47.5	4,515,499	10,265	0.0023	0.9977	86.56
48.5	4,502,638	4,648	0.0010	0.9990	86.37
49.5	4,449,695	10,038	0.0023	0.9977	86.28
50.5	3,538,597	50,566	0.0143	0.9857	86.08
51.5	3,487,743	10,040	0.0029	0.9971	84.85
52.5	3,472,264	6,833	0.0020	0.9980	84.61
53.5	3,465,748	219	0.0001	0.9999	84.44
54.5	3,127,464	22,941	0.0073	0.9927	84.44
55.5	3,010,424	2,892	0.0010	0.9990	83.82
56.5	3,006,278	30,306	0.0101	0.9899	83.74
57.5	2,975,871	109,405	0.0368	0.9632	82.89
58.5	2,610,221	912	0.0003	0.9997	79.85
59.5	1,798,994	15,724	0.0087	0.9913	79.82
60.5	1,777,576	6,447	0.0036	0.9964	79.12
61.5	875,941	222,355	0.2538	0.7462	78.83
62.5	653,566	497	0.0008	0.9992	58.82
63.5	652,545	3,421	0.0052	0.9948	58.78
64.5	648,688		0.0000	1.0000	58.47
65.5	648,687	3,285	0.0051	0.9949	58.47
66.5	645,402	41	0.0001	0.9999	58.17
67.5	602,994	100	0.0002	0.9998	58.17
68.5	602,895	186	0.0003	0.9997	58.16
69.5	602,611	7	0.0000	1.0000	58.14
70.5	601,860	1,084	0.0018	0.9982	58.14
71.5	600,776	192	0.0003	0.9997	58.04
72.5	600,397	1,751	0.0029	0.9971	58.02
73.5	598,643	691	0.0012	0.9988	57.85
74.5	619,945	34,578	0.0558	0.9442	57.78
75.5	266,275	129	0.0005	0.9995	54.56
76.5	264,283	116	0.0004	0.9996	54.53
77.5	261,964	3,342	0.0128	0.9872	54.51
78.5	223,097		0.0000	1.0000	53.81

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.30 STRUCTURES AND IMPROVEMENTS - WATER TREATMENT

ORIGINAL LIFE TABLE, CONT.

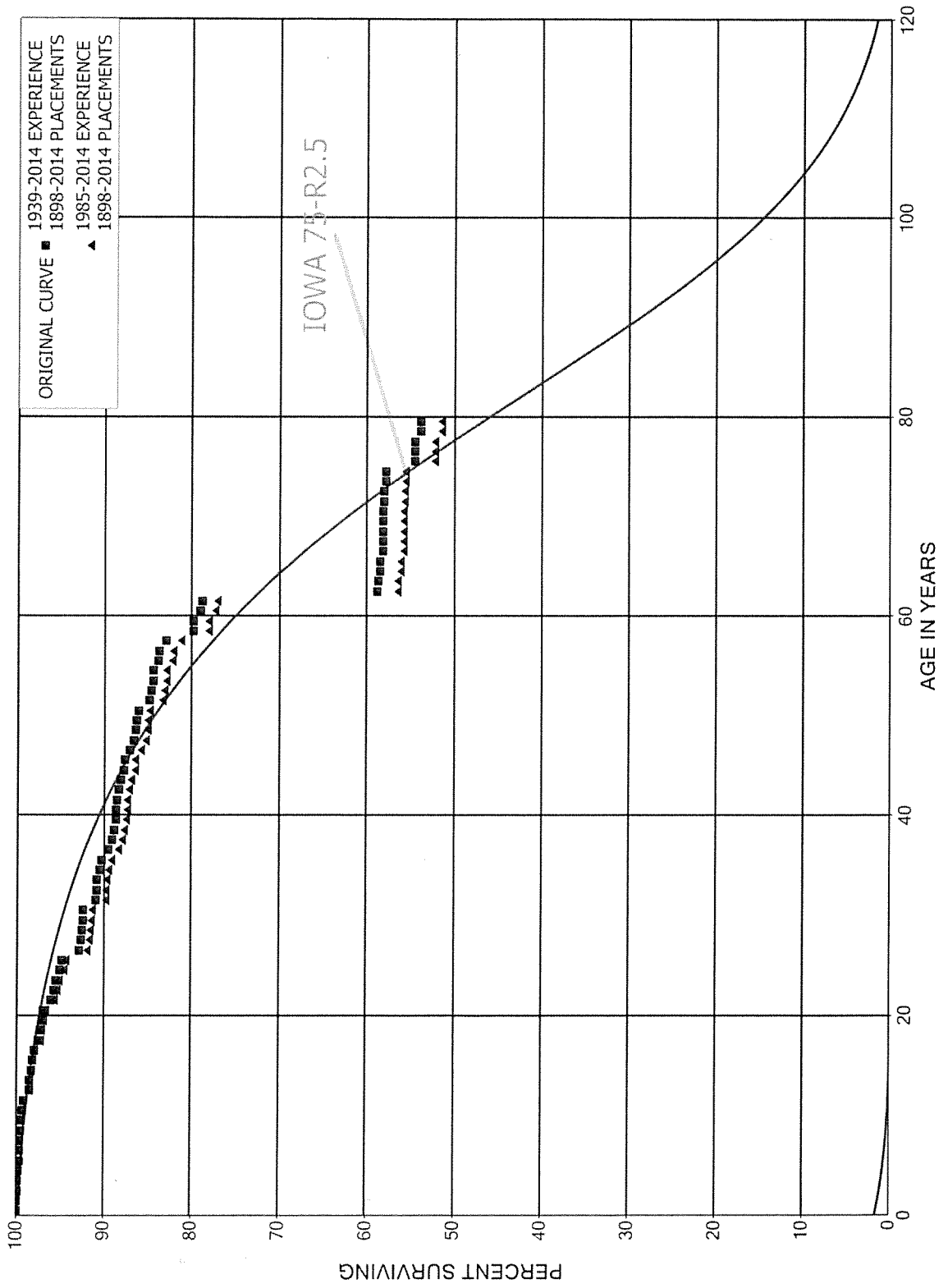| AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	222,745	477	0.0021	0.9979	53.81
80.5	222,111		0.0000	1.0000	53.70
81.5	221,581	773	0.0035	0.9965	53.70
82.5	218,723	663	0.0030	0.9970	53.51
83.5	218,059		0.0000	1.0000	53.35
84.5	218,059		0.0000	1.0000	53.35
85.5	196,065		0.0000	1.0000	53.35
86.5	196,027		0.0000	1.0000	53.35
87.5	121,243	3,965	0.0327	0.9673	53.35
88.5	98,282	172	0.0018	0.9982	51.60
89.5	70,641	342	0.0048	0.9952	51.51
90.5	70,299	395	0.0056	0.9944	51.26
91.5	40,523		0.0000	1.0000	50.98
92.5	40,523		0.0000	1.0000	50.98
93.5	40,523		0.0000	1.0000	50.98
94.5	40,523		0.0000	1.0000	50.98
95.5	40,523		0.0000	1.0000	50.98
96.5	40,523	85	0.0021	0.9979	50.98
97.5	40,438		0.0000	1.0000	50.87
98.5	40,438		0.0000	1.0000	50.87
99.5	40,438		0.0000	1.0000	50.87
100.5	40,438		0.0000	1.0000	50.87
101.5	33,068	2,045	0.0618	0.9382	50.87
102.5	31,024		0.0000	1.0000	47.72
103.5	31,024		0.0000	1.0000	47.72
104.5	31,024		0.0000	1.0000	47.72
105.5	31,024		0.0000	1.0000	47.72
106.5	31,024		0.0000	1.0000	47.72
107.5	31,024		0.0000	1.0000	47.72
108.5	31,024	37	0.0012	0.9988	47.72
109.5	30,987		0.0000	1.0000	47.67
110.5	30,987		0.0000	1.0000	47.67
111.5	1,819	1,210	0.6648	0.3352	47.67
112.5					15.98

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.30 STRUCTURES AND IMPROVEMENTS - WATER TREATMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1898-2014   EXPERIENCE BAND 1985-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	94,546,126		0.0000	1.0000	100.00
0.5	92,303,584	468	0.0000	1.0000	100.00
1.5	91,901,219	215,020	0.0023	0.9977	100.00
2.5	90,762,612	8,805	0.0001	0.9999	99.77
3.5	88,862,658	23,325	0.0003	0.9997	99.76
4.5	88,038,628	98,332	0.0011	0.9989	99.73
5.5	87,100,633	62,110	0.0007	0.9993	99.62
6.5	70,064,001	19,011	0.0003	0.9997	99.55
7.5	63,394,638	69,771	0.0011	0.9989	99.52
8.5	62,038,700	17,004	0.0003	0.9997	99.41
9.5	61,957,369	68,612	0.0011	0.9989	99.38
10.5	61,170,277	100,935	0.0017	0.9983	99.27
11.5	61,706,917	450,295	0.0073	0.9927	99.11
12.5	55,458,857	36,919	0.0007	0.9993	98.39
13.5	56,593,201	100,391	0.0018	0.9982	98.32
14.5	29,933,341	74,615	0.0025	0.9975	98.15
15.5	29,903,782	57,899	0.0019	0.9981	97.90
16.5	30,349,016	187,114	0.0062	0.9938	97.71
17.5	29,171,047	38,301	0.0013	0.9987	97.11
18.5	28,139,904	85,078	0.0030	0.9970	96.98
19.5	26,217,678	43,489	0.0017	0.9983	96.69
20.5	25,664,120	272,859	0.0106	0.9894	96.53
21.5	17,945,495	58,394	0.0033	0.9967	95.50
22.5	17,501,246	44,919	0.0026	0.9974	95.19
23.5	17,018,471	106,145	0.0062	0.9938	94.95
24.5	17,159,151	40,717	0.0024	0.9976	94.36
25.5	14,438,408	377,330	0.0261	0.9739	94.13
26.5	13,935,332	30,382	0.0022	0.9978	91.67
27.5	13,683,520	16,250	0.0012	0.9988	91.47
28.5	13,287,887	13,876	0.0010	0.9990	91.36
29.5	12,053,993	10,037	0.0008	0.9992	91.27
30.5	12,048,492	202,444	0.0168	0.9832	91.19
31.5	12,822,971	7,048	0.0005	0.9995	89.66
32.5	12,812,113	8,823	0.0007	0.9993	89.61
33.5	12,795,891	42,649	0.0033	0.9967	89.55
34.5	12,741,573	36,912	0.0029	0.9971	89.25
35.5	12,680,000	118,929	0.0094	0.9906	88.99
36.5	12,530,916	57,681	0.0046	0.9954	88.16
37.5	11,526,889	28,065	0.0024	0.9976	87.75
38.5	11,497,556	33,804	0.0029	0.9971	87.54

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.30 STRUCTURES AND IMPROVEMENTS - WATER TREATMENT

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1898-2014   EXPERIENCE BAND 1985-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	11,457,440	9,499	0.0008	0.9992	87.28
40.5	11,398,190	9,561	0.0008	0.9992	87.21
41.5	10,425,631	26,503	0.0025	0.9975	87.13
42.5	10,393,047	22,836	0.0022	0.9978	86.91
43.5	7,338,950	40,193	0.0055	0.9945	86.72
44.5	7,280,637	1,111	0.0002	0.9998	86.25
45.5	7,606,458	52,000	0.0068	0.9932	86.23
46.5	4,346,469	27,798	0.0064	0.9936	85.64
47.5	4,014,646	10,265	0.0026	0.9974	85.10
48.5	4,051,478	4,648	0.0011	0.9989	84.88
49.5	3,999,239	10,038	0.0025	0.9975	84.78
50.5	3,088,775	50,566	0.0164	0.9836	84.57
51.5	3,038,451	10,040	0.0033	0.9967	83.18
52.5	3,027,521	6,547	0.0022	0.9978	82.91
53.5	3,232,522	219	0.0001	0.9999	82.73
54.5	2,894,237	22,941	0.0079	0.9921	82.72
55.5	2,777,197	2,392	0.0009	0.9991	82.07
56.5	2,773,590	30,306	0.0109	0.9891	82.00
57.5	2,820,366	109,405	0.0388	0.9612	81.10
58.5	2,473,712	912	0.0004	0.9996	77.96
59.5	1,722,709	15,724	0.0091	0.9909	77.93
60.5	1,701,291	6,447	0.0038	0.9962	77.22
61.5	829,037	222,355	0.2682	0.7318	76.92
62.5	606,662	497	0.0008	0.9992	56.29
63.5	605,641	3,421	0.0056	0.9944	56.25
64.5	601,784		0.0000	1.0000	55.93
65.5	601,783	3,285	0.0055	0.9945	55.93
66.5	598,498	41	0.0001	0.9999	55.62
67.5	556,090	100	0.0002	0.9998	55.62
68.5	556,075	186	0.0003	0.9997	55.61
69.5	555,791	7	0.0000	1.0000	55.59
70.5	555,040	1,084	0.0020	0.9980	55.59
71.5	561,326	192	0.0003	0.9997	55.48
72.5	565,069	413	0.0007	0.9993	55.46
73.5	564,653	691	0.0012	0.9988	55.42
74.5	585,955	34,578	0.0590	0.9410	55.35
75.5	232,285	129	0.0006	0.9994	52.09
76.5	230,293	116	0.0005	0.9995	52.06
77.5	227,974	3,342	0.0147	0.9853	52.03
78.5	189,107		0.0000	1.0000	51.27

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.30 STRUCTURES AND IMPROVEMENTS - WATER TREATMENT

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1898-2014   EXPERIENCE BAND 1985-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	188,756	477	0.0025	0.9975	51.27
80.5	188,122		0.0000	1.0000	51.14
81.5	216,759	773	0.0036	0.9964	51.14
82.5	215,758	663	0.0031	0.9969	50.96
83.5	215,094		0.0000	1.0000	50.80
84.5	215,094		0.0000	1.0000	50.80
85.5	193,100		0.0000	1.0000	50.80
86.5	196,027		0.0000	1.0000	50.80
87.5	121,243	3,965	0.0327	0.9673	50.80
88.5	98,282	172	0.0018	0.9982	49.14
89.5	70,641	342	0.0048	0.9952	49.05
90.5	70,299	395	0.0056	0.9944	48.82
91.5	40,523		0.0000	1.0000	48.54
92.5	40,523		0.0000	1.0000	48.54
93.5	40,523		0.0000	1.0000	48.54
94.5	40,523		0.0000	1.0000	48.54
95.5	40,523		0.0000	1.0000	48.54
96.5	40,523	85	0.0021	0.9979	48.54
97.5	40,438		0.0000	1.0000	48.44
98.5	40,438		0.0000	1.0000	48.44
99.5	40,438		0.0000	1.0000	48.44
100.5	40,438		0.0000	1.0000	48.44
101.5	33,068	2,045	0.0618	0.9382	48.44
102.5	31,024		0.0000	1.0000	45.44
103.5	31,024		0.0000	1.0000	45.44
104.5	31,024		0.0000	1.0000	45.44
105.5	31,024		0.0000	1.0000	45.44
106.5	31,024		0.0000	1.0000	45.44
107.5	31,024		0.0000	1.0000	45.44
108.5	31,024	37	0.0012	0.9988	45.44
109.5	30,987		0.0000	1.0000	45.39
110.5	30,987		0.0000	1.0000	45.39
111.5	1,819	1,210	0.6648	0.3352	45.39
112.5					15.21

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.61 STRUCTURES AND IMPROVEMENTS - OFFICE BUILDINGS

ORIGINAL AND SMOOTH SURVIVOR CURVES

IOWA 36-S0.5

ORIGINAL CURVE ■ 1939-2014 EXPERIENCE
1888-2014 PLACEMENTS

▲ 1985-2014 EXPERIENCE
1888-2014 PLACEMENTS

PERCENT SURVIVING

AGE IN YEARS

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.61 STRUCTURES AND IMPROVEMENTS - OFFICE BUILDINGS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1888-2014   EXPERIENCE BAND 1939-2014

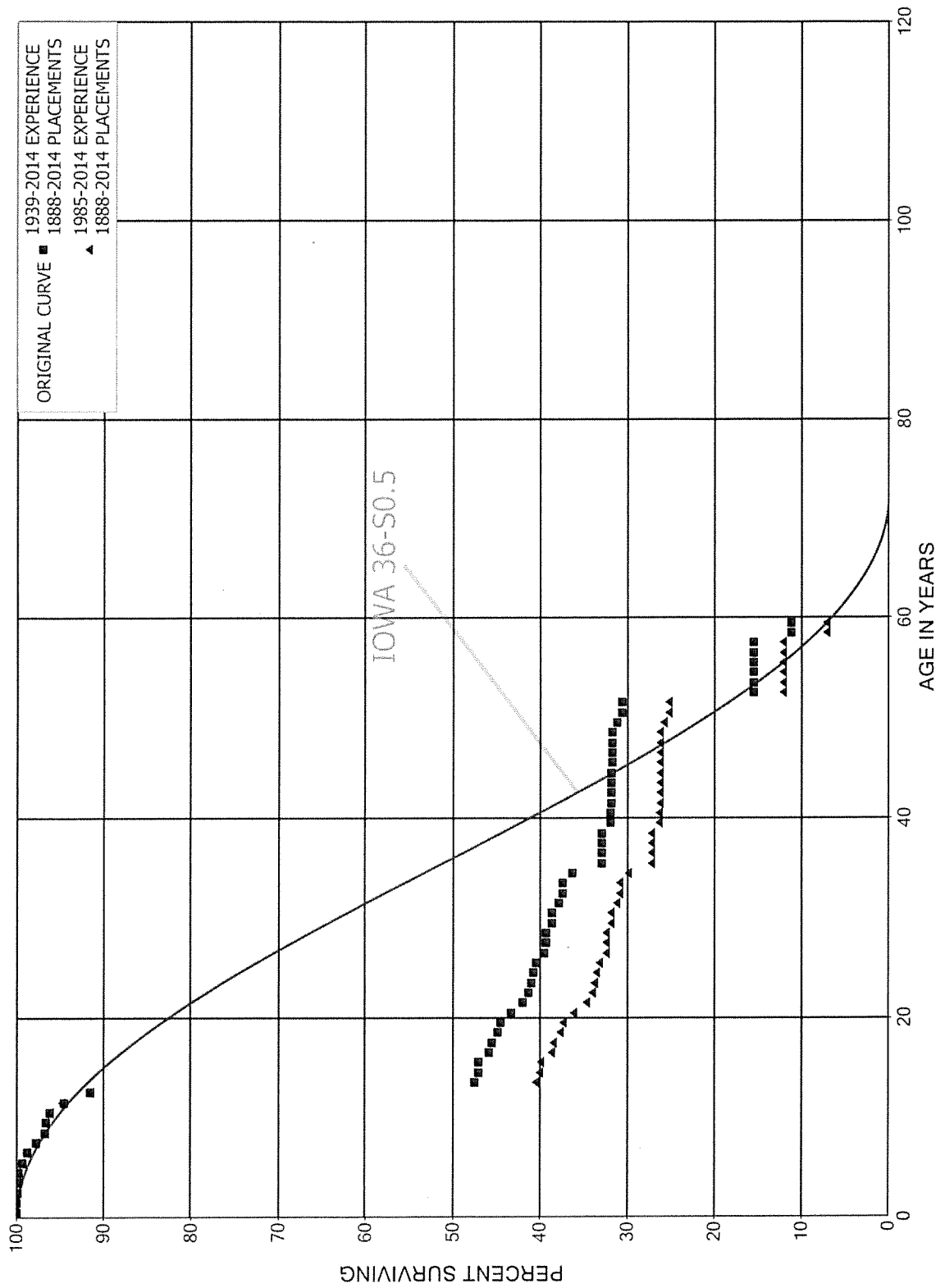| AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	13,873,000		0.0000	1.0000	100.00
0.5	12,285,024		0.0000	1.0000	100.00
1.5	10,807,276	21,731	0.0020	0.9980	100.00
2.5	9,370,646	7,808	0.0008	0.9992	99.80
3.5	8,640,394	2,325	0.0003	0.9997	99.72
4.5	8,410,449	34,022	0.0040	0.9960	99.69
5.5	8,216,818	46,386	0.0056	0.9944	99.29
6.5	2,954,092	28,886	0.0098	0.9902	98.73
7.5	2,020,242	20,916	0.0104	0.9896	97.76
8.5	1,944,685	1,662	0.0009	0.9991	96.75
9.5	1,930,952	8,714	0.0045	0.9955	96.66
10.5	1,918,169	35,366	0.0184	0.9816	96.23
11.5	1,866,625	57,218	0.0307	0.9693	94.45
12.5	1,786,938	858,969	0.4807	0.5193	91.56
13.5	919,713	8,886	0.0097	0.9903	47.55
14.5	902,229	882	0.0010	0.9990	47.09
15.5	894,675	23,406	0.0262	0.9738	47.04
16.5	822,788	4,767	0.0058	0.9942	45.81
17.5	779,483	12,098	0.0155	0.9845	45.55
18.5	653,107	4,939	0.0076	0.9924	44.84
19.5	617,824	16,816	0.0272	0.9728	44.50
20.5	532,968	16,026	0.0301	0.9699	43.29
21.5	490,324	8,348	0.0170	0.9830	41.99
22.5	474,634	3,227	0.0068	0.9932	41.27
23.5	464,494	2,516	0.0054	0.9946	40.99
24.5	381,984	3,195	0.0084	0.9916	40.77
25.5	378,789	8,822	0.0233	0.9767	40.43
26.5	357,115	1,660	0.0046	0.9954	39.49
27.5	355,455	443	0.0012	0.9988	39.30
28.5	298,118	4,967	0.0167	0.9833	39.25
29.5	291,623		0.0000	1.0000	38.60
30.5	289,477	5,708	0.0197	0.9803	38.60
31.5	309,639	3,594	0.0116	0.9884	37.84
32.5	272,208		0.0000	1.0000	37.40
33.5	271,284	8,378	0.0309	0.9691	37.40
34.5	262,907	23,633	0.0899	0.9101	36.24
35.5	231,691	61	0.0003	0.9997	32.99
36.5	219,706		0.0000	1.0000	32.98
37.5	219,706		0.0000	1.0000	32.98
38.5	219,706	6,769	0.0308	0.9692	32.98

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.61 STRUCTURES AND IMPROVEMENTS - OFFICE BUILDINGS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1888-2014   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	212,510		0.0000	1.0000	31.96
40.5	212,510	917	0.0043	0.9957	31.96
41.5	210,289		0.0000	1.0000	31.82
42.5	210,289		0.0000	1.0000	31.82
43.5	131,068		0.0000	1.0000	31.82
44.5	131,068	229	0.0017	0.9983	31.82
45.5	130,542		0.0000	1.0000	31.77
46.5	130,542		0.0000	1.0000	31.77
47.5	130,542		0.0000	1.0000	31.77
48.5	130,430	2,311	0.0177	0.9823	31.77
49.5	118,152	2,365	0.0200	0.9800	31.21
50.5	116,572		0.0000	1.0000	30.58
51.5	65,992	32,433	0.4915	0.5085	30.58
52.5	32,197		0.0000	1.0000	15.55
53.5	32,197		0.0000	1.0000	15.55
54.5	7,347		0.0000	1.0000	15.55
55.5	7,347		0.0000	1.0000	15.55
56.5	7,051		0.0000	1.0000	15.55
57.5	7,002	1,946	0.2780	0.7220	15.55
58.5	5,056		0.0000	1.0000	11.23
59.5	4,492		0.0000	1.0000	11.23
60.5	4,492		0.0000	1.0000	11.23
61.5	4,492	95	0.0211	0.9789	11.23
62.5	4,397	27	0.0061	0.9939	10.99
63.5	4,370		0.0000	1.0000	10.92
64.5	4,370		0.0000	1.0000	10.92
65.5	4,370		0.0000	1.0000	10.92
66.5	4,370		0.0000	1.0000	10.92
67.5	4,370		0.0000	1.0000	10.92
68.5	4,370		0.0000	1.0000	10.92
69.5	4,370		0.0000	1.0000	10.92
70.5	4,370		0.0000	1.0000	10.92
71.5	4,370	407	0.0931	0.9069	10.92
72.5	3,963		0.0000	1.0000	9.91
73.5	3,963		0.0000	1.0000	9.91
74.5	3,963		0.0000	1.0000	9.91
75.5	3,963		0.0000	1.0000	9.91
76.5	3,963		0.0000	1.0000	9.91
77.5	3,963		0.0000	1.0000	9.91
78.5	3,963		0.0000	1.0000	9.91

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.61 STRUCTURES AND IMPROVEMENTS - OFFICE BUILDINGS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1888-2014   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	3,879		0.0000	1.0000	9.91
80.5	3,879		0.0000	1.0000	9.91
81.5	3,879		0.0000	1.0000	9.91
82.5	3,879		0.0000	1.0000	9.91
83.5	3,879		0.0000	1.0000	9.91
84.5	3,879		0.0000	1.0000	9.91
85.5	3,879		0.0000	1.0000	9.91
86.5	3,173		0.0000	1.0000	9.91
87.5	2,306		0.0000	1.0000	9.91
88.5	2,306		0.0000	1.0000	9.91
89.5	2,306		0.0000	1.0000	9.91
90.5	2,306		0.0000	1.0000	9.91
91.5	2,084		0.0000	1.0000	9.91
92.5	2,074		0.0000	1.0000	9.91
93.5	2,074		0.0000	1.0000	9.91
94.5	2,074		0.0000	1.0000	9.91
95.5	2,074		0.0000	1.0000	9.91
96.5	2,074		0.0000	1.0000	9.91
97.5	2,074		0.0000	1.0000	9.91
98.5	2,074		0.0000	1.0000	9.91
99.5	2,074		0.0000	1.0000	9.91
100.5	2,074		0.0000	1.0000	9.91
101.5	2,074		0.0000	1.0000	9.91
102.5	2,074		0.0000	1.0000	9.91
103.5	2,074		0.0000	1.0000	9.91
104.5	2,074		0.0000	1.0000	9.91
105.5	1,176		0.0000	1.0000	9.91
106.5	1,176		0.0000	1.0000	9.91
107.5	1,176		0.0000	1.0000	9.91
108.5	1,176		0.0000	1.0000	9.91
109.5	1,176		0.0000	1.0000	9.91
110.5	1,176		0.0000	1.0000	9.91
111.5	1,176		0.0000	1.0000	9.91
112.5	1,176		0.0000	1.0000	9.91
113.5	1,176		0.0000	1.0000	9.91
114.5	1,176		0.0000	1.0000	9.91
115.5	1,176		0.0000	1.0000	9.91
116.5	1,176		0.0000	1.0000	9.91
117.5	945		0.0000	1.0000	9.91
118.5	945		0.0000	1.0000	9.91

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.61 STRUCTURES AND IMPROVEMENTS - OFFICE BUILDINGS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1888-2014   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
119.5	945		0.0000	1.0000	9.91
120.5	945		0.0000	1.0000	9.91
121.5	945		0.0000	1.0000	9.91
122.5	945		0.0000	1.0000	9.91
123.5	945		0.0000	1.0000	9.91
124.5	945		0.0000	1.0000	9.91
125.5	945		0.0000	1.0000	9.91
126.5					9.91

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.61 STRUCTURES AND IMPROVEMENTS - OFFICE BUILDINGS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1888-2014   EXPERIENCE BAND 1985-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	13,482,818		0.0000	1.0000	100.00
0.5	11,897,404		0.0000	1.0000	100.00
1.5	10,459,004	21,731	0.0021	0.9979	100.00
2.5	9,064,222	7,808	0.0009	0.9991	99.79
3.5	8,340,916	2,176	0.0003	0.9997	99.71
4.5	8,113,002	33,932	0.0042	0.9958	99.68
5.5	7,929,297	46,386	0.0058	0.9942	99.26
6.5	2,678,495	28,886	0.0108	0.9892	98.68
7.5	1,746,747	19,134	0.0110	0.9890	97.62
8.5	1,674,462	1,203	0.0007	0.9993	96.55
9.5	1,662,521	8,385	0.0050	0.9950	96.48
10.5	1,653,713	23,874	0.0144	0.9856	95.99
11.5	1,616,126	57,218	0.0354	0.9646	94.61
12.5	1,538,205	858,969	0.5584	0.4416	91.26
13.5	759,872	8,886	0.0117	0.9883	40.30
14.5	742,470	882	0.0012	0.9988	39.83
15.5	735,081	23,406	0.0318	0.9682	39.78
16.5	663,479	4,001	0.0060	0.9940	38.51
17.5	628,124	12,098	0.0193	0.9807	38.28
18.5	501,859	4,483	0.0089	0.9911	37.54
19.5	479,372	16,238	0.0339	0.9661	37.21
20.5	397,322	16,026	0.0403	0.9597	35.95
21.5	410,164	8,348	0.0204	0.9796	34.50
22.5	437,728	2,539	0.0058	0.9942	33.79
23.5	428,276	2,516	0.0059	0.9941	33.60
24.5	373,061	3,195	0.0086	0.9914	33.40
25.5	369,866	8,822	0.0239	0.9761	33.12
26.5	348,488	284	0.0008	0.9992	32.33
27.5	352,315	443	0.0013	0.9987	32.30
28.5	295,136	4,967	0.0168	0.9832	32.26
29.5	288,307		0.0000	1.0000	31.72
30.5	286,161	5,708	0.0199	0.9801	31.72
31.5	306,323	3,594	0.0117	0.9883	31.08
32.5	268,892		0.0000	1.0000	30.72
33.5	267,995	8,378	0.0313	0.9687	30.72
34.5	259,618	23,633	0.0910	0.9090	29.76
35.5	228,402	61	0.0003	0.9997	27.05
36.5	216,417		0.0000	1.0000	27.04
37.5	216,417		0.0000	1.0000	27.04
38.5	216,417	6,769	0.0313	0.9687	27.04

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.61 STRUCTURES AND IMPROVEMENTS - OFFICE BUILDINGS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1888-2014   EXPERIENCE BAND 1985-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	209,221		0.0000	1.0000	26.20
40.5	209,221	917	0.0044	0.9956	26.20
41.5	206,769		0.0000	1.0000	26.08
42.5	207,176		0.0000	1.0000	26.08
43.5	127,955		0.0000	1.0000	26.08
44.5	127,955	229	0.0018	0.9982	26.08
45.5	127,429		0.0000	1.0000	26.03
46.5	127,429		0.0000	1.0000	26.03
47.5	127,429		0.0000	1.0000	26.03
48.5	127,317	2,311	0.0182	0.9818	26.03
49.5	115,123	2,365	0.0205	0.9795	25.56
50.5	112,598		0.0000	1.0000	25.04
51.5	62,018	32,433	0.5230	0.4770	25.04
52.5	28,223		0.0000	1.0000	11.94
53.5	28,223		0.0000	1.0000	11.94
54.5	3,373		0.0000	1.0000	11.94
55.5	3,373		0.0000	1.0000	11.94
56.5	3,878		0.0000	1.0000	11.94
57.5	4,696	1,946	0.4144	0.5856	11.94
58.5	2,750		0.0000	1.0000	6.99
59.5	2,186		0.0000	1.0000	6.99
60.5	2,186		0.0000	1.0000	6.99
61.5	2,408	95	0.0395	0.9605	6.99
62.5	2,323	27	0.0116	0.9884	6.72
63.5	2,296		0.0000	1.0000	6.64
64.5	2,296		0.0000	1.0000	6.64
65.5	2,296		0.0000	1.0000	6.64
66.5	2,296		0.0000	1.0000	6.64
67.5	2,296		0.0000	1.0000	6.64
68.5	2,296		0.0000	1.0000	6.64
69.5	2,296		0.0000	1.0000	6.64
70.5	2,296		0.0000	1.0000	6.64
71.5	2,296	407	0.1773	0.8227	6.64
72.5	1,889		0.0000	1.0000	5.46
73.5	1,889		0.0000	1.0000	5.46
74.5	1,889		0.0000	1.0000	5.46
75.5	2,787		0.0000	1.0000	5.46
76.5	2,787		0.0000	1.0000	5.46
77.5	2,787		0.0000	1.0000	5.46
78.5	2,787		0.0000	1.0000	5.46

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.61 STRUCTURES AND IMPROVEMENTS - OFFICE BUILDINGS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1888-2014   EXPERIENCE BAND 1985-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	2,703		0.0000	1.0000	5.46
80.5	2,703		0.0000	1.0000	5.46
81.5	2,703		0.0000	1.0000	5.46
82.5	2,703		0.0000	1.0000	5.46
83.5	2,703		0.0000	1.0000	5.46
84.5	2,703		0.0000	1.0000	5.46
85.5	2,703		0.0000	1.0000	5.46
86.5	1,997		0.0000	1.0000	5.46
87.5	1,361		0.0000	1.0000	5.46
88.5	1,361		0.0000	1.0000	5.46
89.5	1,361		0.0000	1.0000	5.46
90.5	1,361		0.0000	1.0000	5.46
91.5	1,139		0.0000	1.0000	5.46
92.5	1,129		0.0000	1.0000	5.46
93.5	1,129		0.0000	1.0000	5.46
94.5	1,129		0.0000	1.0000	5.46
95.5	1,129		0.0000	1.0000	5.46
96.5	2,074		0.0000	1.0000	5.46
97.5	2,074		0.0000	1.0000	5.46
98.5	2,074		0.0000	1.0000	5.46
99.5	2,074		0.0000	1.0000	5.46
100.5	2,074		0.0000	1.0000	5.46
101.5	2,074		0.0000	1.0000	5.46
102.5	2,074		0.0000	1.0000	5.46
103.5	2,074		0.0000	1.0000	5.46
104.5	2,074		0.0000	1.0000	5.46
105.5	1,176		0.0000	1.0000	5.46
106.5	1,176		0.0000	1.0000	5.46
107.5	1,176		0.0000	1.0000	5.46
108.5	1,176		0.0000	1.0000	5.46
109.5	1,176		0.0000	1.0000	5.46
110.5	1,176		0.0000	1.0000	5.46
111.5	1,176		0.0000	1.0000	5.46
112.5	1,176		0.0000	1.0000	5.46
113.5	1,176		0.0000	1.0000	5.46
114.5	1,176		0.0000	1.0000	5.46
115.5	1,176		0.0000	1.0000	5.46
116.5	1,176		0.0000	1.0000	5.46
117.5	945		0.0000	1.0000	5.46
118.5	945		0.0000	1.0000	5.46

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.61 STRUCTURES AND IMPROVEMENTS - OFFICE BUILDINGS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1888-2014   EXPERIENCE BAND 1985-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
119.5	945		0.0000	1.0000	5.46
120.5	945		0.0000	1.0000	5.46
121.5	945		0.0000	1.0000	5.46
122.5	945		0.0000	1.0000	5.46
123.5	945		0.0000	1.0000	5.46
124.5	945		0.0000	1.0000	5.46
125.5	945		0.0000	1.0000	5.46
126.5					5.46

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.70 STRUCTURES AND IMPROVEMENTS - SHOP AND GARAGE
ORIGINAL AND SMOOTH SURVIVOR CURVES

IOWA 48-R1.5

ORIGINAL CURVE ■ 1939-2014 EXPERIENCE
1897-2014 PLACEMENTS
▲ 1985-2014 EXPERIENCE
1897-2014 PLACEMENTS

PERCENT SURVIVING

AGE IN YEARS

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.70 STRUCTURES AND IMPROVEMENTS - SHOP AND GARAGE

ORIGINAL LIFE TABLE

PLACEMENT BAND 1897-2014   EXPERIENCE BAND 1939-2014

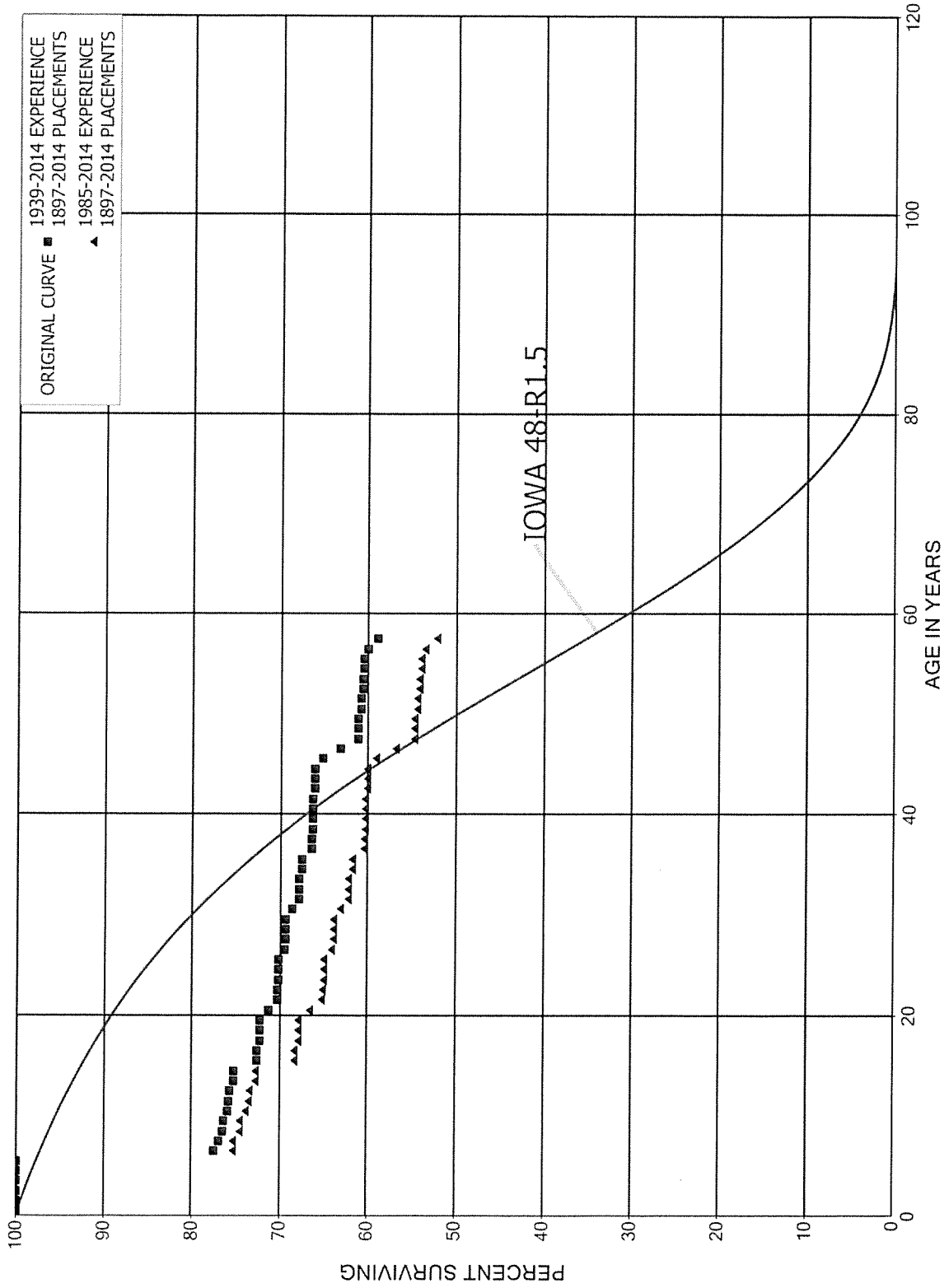| AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	3,110,826		0.0000	1.0000	100.00
0.5	3,110,750		0.0000	1.0000	100.00
1.5	3,107,870		0.0000	1.0000	100.00
2.5	2,270,725		0.0000	1.0000	100.00
3.5	2,251,322		0.0000	1.0000	100.00
4.5	2,042,386		0.0000	1.0000	100.00
5.5	2,024,290	454,741	0.2246	0.7754	100.00
6.5	604,546	4,154	0.0069	0.9931	77.54
7.5	599,443	4,282	0.0071	0.9929	77.00
8.5	583,094	112	0.0002	0.9998	76.45
9.5	582,982	3,690	0.0063	0.9937	76.44
10.5	542,085	1,188	0.0022	0.9978	75.95
11.5	480,469	564	0.0012	0.9988	75.79
12.5	443,640	2,556	0.0058	0.9942	75.70
13.5	453,363		0.0000	1.0000	75.26
14.5	427,787	15,066	0.0352	0.9648	75.26
15.5	412,722		0.0000	1.0000	72.61
16.5	404,034	1,612	0.0040	0.9960	72.61
17.5	394,932		0.0000	1.0000	72.32
18.5	356,322	34	0.0001	0.9999	72.32
19.5	350,721	4,942	0.0141	0.9859	72.32
20.5	344,671	4,630	0.0134	0.9866	71.30
21.5	328,076	429	0.0013	0.9987	70.34
22.5	287,113	425	0.0015	0.9985	70.25
23.5	244,316		0.0000	1.0000	70.14
24.5	244,316		0.0000	1.0000	70.14
25.5	225,049	2,072	0.0092	0.9908	70.14
26.5	222,854	456	0.0020	0.9980	69.50
27.5	222,149		0.0000	1.0000	69.35
28.5	218,496		0.0000	1.0000	69.35
29.5	214,992	2,133	0.0099	0.9901	69.35
30.5	209,493	2,396	0.0114	0.9886	68.67
31.5	204,374		0.0000	1.0000	67.88
32.5	202,841		0.0000	1.0000	67.88
33.5	202,720	1,134	0.0056	0.9944	67.88
34.5	201,586		0.0000	1.0000	67.50
35.5	201,550	3,390	0.0168	0.9832	67.50
36.5	186,223		0.0000	1.0000	66.37
37.5	186,223	227	0.0012	0.9988	66.37
38.5	185,996		0.0000	1.0000	66.29

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.70 STRUCTURES AND IMPROVEMENTS - SHOP AND GARAGE

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1897-2014   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	185,996	79	0.0004	0.9996	66.29
40.5	185,917		0.0000	1.0000	66.26
41.5	186,434	662	0.0035	0.9965	66.26
42.5	185,111		0.0000	1.0000	66.02
43.5	185,111		0.0000	1.0000	66.02
44.5	184,649	2,295	0.0124	0.9876	66.02
45.5	118,311	3,747	0.0317	0.9683	65.20
46.5	114,565	3,545	0.0309	0.9691	63.14
47.5	111,019		0.0000	1.0000	61.18
48.5	111,019		0.0000	1.0000	61.18
49.5	111,019	673	0.0061	0.9939	61.18
50.5	104,841		0.0000	1.0000	60.81
51.5	92,177	284	0.0031	0.9969	60.81
52.5	90,422		0.0000	1.0000	60.62
53.5	73,730	161	0.0022	0.9978	60.62
54.5	73,568		0.0000	1.0000	60.49
55.5	72,105	465	0.0065	0.9935	60.49
56.5	71,601	1,370	0.0191	0.9809	60.10
57.5	49,389		0.0000	1.0000	58.95
58.5	47,820		0.0000	1.0000	58.95
59.5	47,820		0.0000	1.0000	58.95
60.5	46,379	323	0.0070	0.9930	58.95
61.5	46,055	0	0.0000	1.0000	58.54
62.5	46,038		0.0000	1.0000	58.54
63.5	46,038	102	0.0022	0.9978	58.54
64.5	45,613		0.0000	1.0000	58.41
65.5	44,162		0.0000	1.0000	58.41
66.5	44,162	1,399	0.0317	0.9683	58.41
67.5	42,679		0.0000	1.0000	56.56
68.5	42,679	22	0.0005	0.9995	56.56
69.5	42,657	1,034	0.0242	0.9758	56.53
70.5	41,622		0.0000	1.0000	55.16
71.5	41,622		0.0000	1.0000	55.16
72.5	41,622		0.0000	1.0000	55.16
73.5	41,602		0.0000	1.0000	55.16
74.5	41,400	28	0.0007	0.9993	55.16
75.5	17,909		0.0000	1.0000	55.12
76.5	17,909		0.0000	1.0000	55.12
77.5	17,909		0.0000	1.0000	55.12
78.5	17,909		0.0000	1.0000	55.12

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.70 STRUCTURES AND IMPROVEMENTS - SHOP AND GARAGE

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1897-2014   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	17,909		0.0000	1.0000	55.12
80.5	17,909		0.0000	1.0000	55.12
81.5	17,909		0.0000	1.0000	55.12
82.5	17,909		0.0000	1.0000	55.12
83.5	17,909		0.0000	1.0000	55.12
84.5	17,909		0.0000	1.0000	55.12
85.5	17,909		0.0000	1.0000	55.12
86.5	17,909		0.0000	1.0000	55.12
87.5	17,909		0.0000	1.0000	55.12
88.5	16,650		0.0000	1.0000	55.12
89.5	4,695		0.0000	1.0000	55.12
90.5	4,695		0.0000	1.0000	55.12
91.5	4,695		0.0000	1.0000	55.12
92.5	4,695		0.0000	1.0000	55.12
93.5	4,695		0.0000	1.0000	55.12
94.5	4,695		0.0000	1.0000	55.12
95.5	4,695		0.0000	1.0000	55.12
96.5	4,695		0.0000	1.0000	55.12
97.5	4,695		0.0000	1.0000	55.12
98.5	4,695		0.0000	1.0000	55.12
99.5	4,695		0.0000	1.0000	55.12
100.5	4,695		0.0000	1.0000	55.12
101.5	4,695		0.0000	1.0000	55.12
102.5	4,695		0.0000	1.0000	55.12
103.5	4,695		0.0000	1.0000	55.12
104.5	4,695		0.0000	1.0000	55.12
105.5	4,695		0.0000	1.0000	55.12
106.5	4,695		0.0000	1.0000	55.12
107.5	4,695		0.0000	1.0000	55.12
108.5	4,695		0.0000	1.0000	55.12
109.5	4,695		0.0000	1.0000	55.12
110.5	4,695		0.0000	1.0000	55.12
111.5	4,695		0.0000	1.0000	55.12
112.5	4,695		0.0000	1.0000	55.12
113.5	4,695		0.0000	1.0000	55.12
114.5	4,695		0.0000	1.0000	55.12
115.5	4,695		0.0000	1.0000	55.12
116.5	4,695		0.0000	1.0000	55.12
117.5					55.12

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.70 STRUCTURES AND IMPROVEMENTS - SHOP AND GARAGE

ORIGINAL LIFE TABLE

PLACEMENT BAND 1897-2014   EXPERIENCE BAND 1985-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	2,899,995		0.0000	1.0000	100.00
0.5	2,907,491		0.0000	1.0000	100.00
1.5	2,907,333		0.0000	1.0000	100.00
2.5	2,071,722		0.0000	1.0000	100.00
3.5	2,053,004		0.0000	1.0000	100.00
4.5	1,846,492		0.0000	1.0000	100.00
5.5	1,828,431	454,741	0.2487	0.7513	100.00
6.5	424,015		0.0000	1.0000	75.13
7.5	423,178	4,282	0.0101	0.9899	75.13
8.5	406,829	112	0.0003	0.9997	74.37
9.5	406,717	3,690	0.0091	0.9909	74.35
10.5	365,820	1,188	0.0032	0.9968	73.67
11.5	308,381	564	0.0018	0.9982	73.44
12.5	271,617	2,556	0.0094	0.9906	73.30
13.5	269,061		0.0000	1.0000	72.61
14.5	244,405	15,066	0.0616	0.9384	72.61
15.5	298,047		0.0000	1.0000	68.14
16.5	289,359	1,612	0.0056	0.9944	68.14
17.5	283,803		0.0000	1.0000	67.76
18.5	245,192	34	0.0001	0.9999	67.76
19.5	239,592	4,942	0.0206	0.9794	67.75
20.5	239,720	4,630	0.0193	0.9807	66.35
21.5	235,789	429	0.0018	0.9982	65.07
22.5	200,044	425	0.0021	0.9979	64.95
23.5	173,939		0.0000	1.0000	64.81
24.5	174,101		0.0000	1.0000	64.81
25.5	156,298	2,072	0.0133	0.9867	64.81
26.5	154,606	456	0.0030	0.9970	63.95
27.5	175,583		0.0000	1.0000	63.76
28.5	173,499		0.0000	1.0000	63.76
29.5	169,996	2,133	0.0125	0.9875	63.76
30.5	165,938	2,396	0.0144	0.9856	62.96
31.5	160,819		0.0000	1.0000	62.05
32.5	159,303		0.0000	1.0000	62.05
33.5	159,182	1,134	0.0071	0.9929	62.05
34.5	158,418		0.0000	1.0000	61.61
35.5	159,933	3,390	0.0212	0.9788	61.61
36.5	144,606		0.0000	1.0000	60.31
37.5	146,145	227	0.0016	0.9984	60.31
38.5	145,918		0.0000	1.0000	60.21

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.70 STRUCTURES AND IMPROVEMENTS - SHOP AND GARAGE

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1897-2014   EXPERIENCE BAND 1985-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	145,940	79	0.0005	0.9995	60.21
40.5	147,506		0.0000	1.0000	60.18
41.5	143,328	662	0.0046	0.9954	60.18
42.5	142,005		0.0000	1.0000	59.90
43.5	143,004		0.0000	1.0000	59.90
44.5	142,743	2,295	0.0161	0.9839	59.90
45.5	100,080	3,747	0.0374	0.9626	58.94
46.5	96,333	3,545	0.0368	0.9632	56.73
47.5	92,787		0.0000	1.0000	54.64
48.5	92,787		0.0000	1.0000	54.64
49.5	92,787	673	0.0073	0.9927	54.64
50.5	86,609		0.0000	1.0000	54.25
51.5	73,945	284	0.0038	0.9962	54.25
52.5	72,190		0.0000	1.0000	54.04
53.5	55,498	161	0.0029	0.9971	54.04
54.5	55,336		0.0000	1.0000	53.88
55.5	53,873	465	0.0086	0.9914	53.88
56.5	53,369	1,370	0.0257	0.9743	53.42
57.5	31,157		0.0000	1.0000	52.05
58.5	30,847		0.0000	1.0000	52.05
59.5	43,125		0.0000	1.0000	52.05
60.5	41,684	323	0.0078	0.9922	52.05
61.5	41,360	0	0.0000	1.0000	51.64
62.5	41,344		0.0000	1.0000	51.64
63.5	41,344	102	0.0025	0.9975	51.64
64.5	40,918		0.0000	1.0000	51.51
65.5	39,467		0.0000	1.0000	51.51
66.5	39,467	1,399	0.0355	0.9645	51.51
67.5	37,984		0.0000	1.0000	49.69
68.5	37,984	22	0.0006	0.9994	49.69
69.5	37,963	1,034	0.0272	0.9728	49.66
70.5	36,927		0.0000	1.0000	48.31
71.5	36,927		0.0000	1.0000	48.31
72.5	36,927		0.0000	1.0000	48.31
73.5	36,907		0.0000	1.0000	48.31
74.5	36,705	28	0.0008	0.9992	48.31
75.5	13,214		0.0000	1.0000	48.27
76.5	13,214		0.0000	1.0000	48.27
77.5	13,214		0.0000	1.0000	48.27
78.5	13,214		0.0000	1.0000	48.27

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.70 STRUCTURES AND IMPROVEMENTS - SHOP AND GARAGE

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1897-2014   EXPERIENCE BAND 1985-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	13,214		0.0000	1.0000	48.27
80.5	13,214		0.0000	1.0000	48.27
81.5	13,214		0.0000	1.0000	48.27
82.5	13,214		0.0000	1.0000	48.27
83.5	13,214		0.0000	1.0000	48.27
84.5	13,214		0.0000	1.0000	48.27
85.5	13,214		0.0000	1.0000	48.27
86.5	13,214		0.0000	1.0000	48.27
87.5	17,909		0.0000	1.0000	48.27
88.5	16,650		0.0000	1.0000	48.27
89.5	4,695		0.0000	1.0000	48.27
90.5	4,695		0.0000	1.0000	48.27
91.5	4,695		0.0000	1.0000	48.27
92.5	4,695		0.0000	1.0000	48.27
93.5	4,695		0.0000	1.0000	48.27
94.5	4,695		0.0000	1.0000	48.27
95.5	4,695		0.0000	1.0000	48.27
96.5	4,695		0.0000	1.0000	48.27
97.5	4,695		0.0000	1.0000	48.27
98.5	4,695		0.0000	1.0000	48.27
99.5	4,695		0.0000	1.0000	48.27
100.5	4,695		0.0000	1.0000	48.27
101.5	4,695		0.0000	1.0000	48.27
102.5	4,695		0.0000	1.0000	48.27
103.5	4,695		0.0000	1.0000	48.27
104.5	4,695		0.0000	1.0000	48.27
105.5	4,695		0.0000	1.0000	48.27
106.5	4,695		0.0000	1.0000	48.27
107.5	4,695		0.0000	1.0000	48.27
108.5	4,695		0.0000	1.0000	48.27
109.5	4,695		0.0000	1.0000	48.27
110.5	4,695		0.0000	1.0000	48.27
111.5	4,695		0.0000	1.0000	48.27
112.5	4,695		0.0000	1.0000	48.27
113.5	4,695		0.0000	1.0000	48.27
114.5	4,695		0.0000	1.0000	48.27
115.5	4,695		0.0000	1.0000	48.27
116.5	4,695		0.0000	1.0000	48.27
117.5					48.27

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.80 STRUCTURES AND IMPROVEMENTS - MISCELLANEOUS
ORIGINAL AND SMOOTH SURVIVOR CURVES

IOWA 32-S0

ORIGINAL CURVE ■ 1939-2014 EXPERIENCE
1897-2008 PLACEMENTS
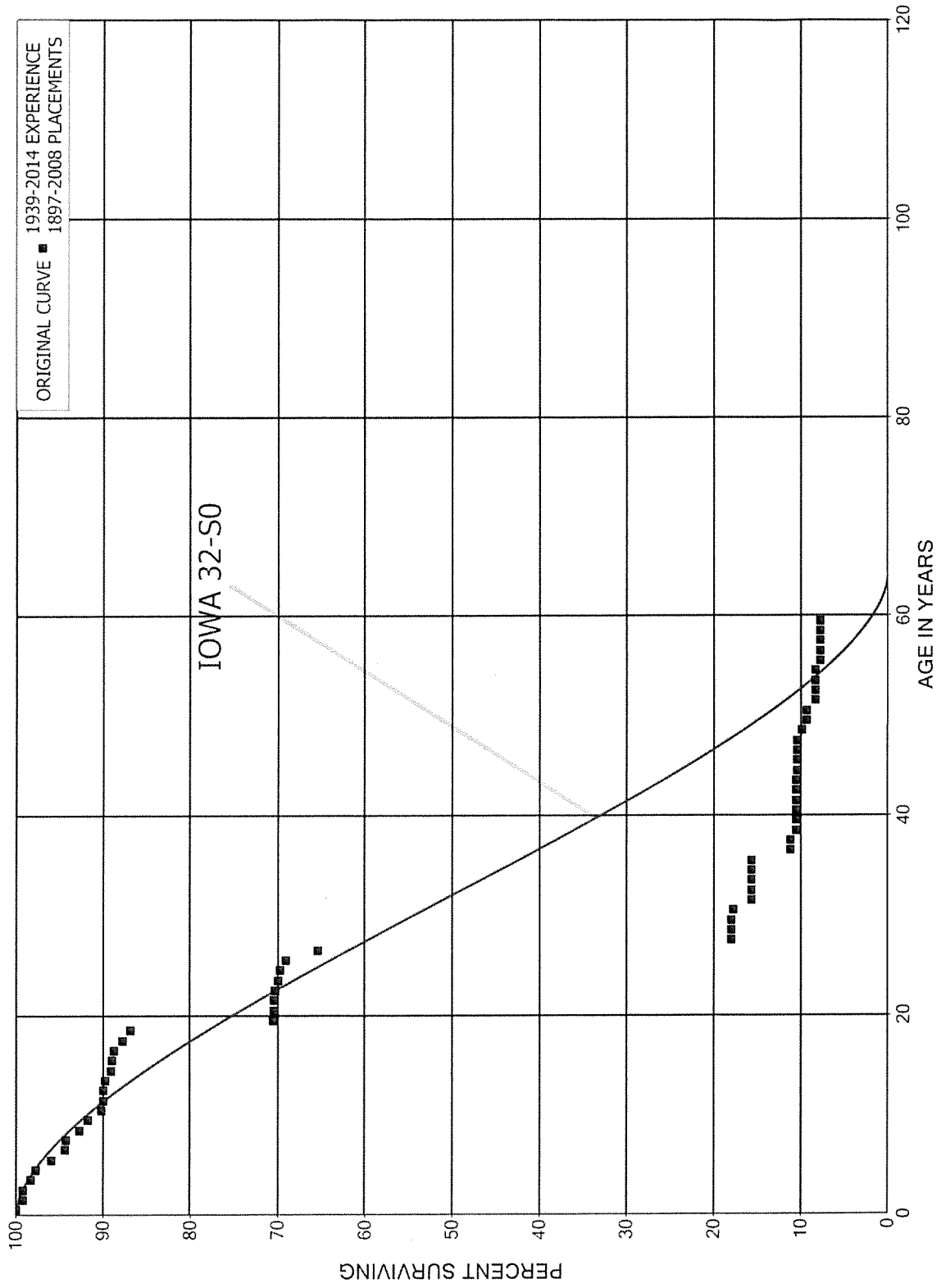
PERCENT SURVIVING

AGE IN YEARS

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.80 STRUCTURES AND IMPROVEMENTS - MISCELLANEOUS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1897-2008   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	4,999,249		0.0000	1.0000	100.00
0.5	5,000,368	38,557	0.0077	0.9923	100.00
1.5	4,963,035	3,932	0.0008	0.9992	99.23
2.5	4,962,205	41,625	0.0084	0.9916	99.15
3.5	4,922,040	27,331	0.0056	0.9944	98.32
4.5	4,894,934	94,174	0.0192	0.9808	97.77
5.5	4,800,760	72,889	0.0152	0.9848	95.89
6.5	4,704,316	9,387	0.0020	0.9980	94.44
7.5	4,629,325	74,138	0.0160	0.9840	94.25
8.5	4,416,670	46,166	0.0105	0.9895	92.74
9.5	4,344,055	75,053	0.0173	0.9827	91.77
10.5	4,301,437	8,690	0.0020	0.9980	90.18
11.5	4,261,310	211	0.0000	1.0000	90.00
12.5	4,234,926	14,491	0.0034	0.9966	90.00
13.5	3,897,623	29,167	0.0075	0.9925	89.69
14.5	2,039,306	2,891	0.0014	0.9986	89.02
15.5	1,830,024	4,344	0.0024	0.9976	88.89
16.5	1,834,303	20,685	0.0113	0.9887	88.68
17.5	1,812,893	17,614	0.0097	0.9903	87.68
18.5	1,854,000	347,947	0.1877	0.8123	86.83
19.5	1,497,692	1,892	0.0013	0.9987	70.53
20.5	661,304	477	0.0007	0.9993	70.44
21.5	660,837	1,075	0.0016	0.9984	70.39
22.5	651,140	3,359	0.0052	0.9948	70.28
23.5	642,900	1,268	0.0020	0.9980	69.92
24.5	582,910	5,530	0.0095	0.9905	69.78
25.5	577,501	31,366	0.0543	0.9457	69.12
26.5	549,770	398,477	0.7248	0.2752	65.36
27.5	151,293	215	0.0014	0.9986	17.99
28.5	151,117	30	0.0002	0.9998	17.96
29.5	150,087	1,754	0.0117	0.9883	17.96
30.5	148,333	17,511	0.1181	0.8819	17.75
31.5	132,112		0.0000	1.0000	15.65
32.5	112,382	150	0.0013	0.9987	15.65
33.5	112,206		0.0000	1.0000	15.63
34.5	112,206		0.0000	1.0000	15.63
35.5	112,206	32,376	0.2885	0.7115	15.63
36.5	80,056		0.0000	1.0000	11.12
37.5	80,056	4,370	0.0546	0.9454	11.12
38.5	75,686		0.0000	1.0000	10.51

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.80 STRUCTURES AND IMPROVEMENTS - MISCELLANEOUS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1897-2008   EXPERIENCE BAND 1939-2014

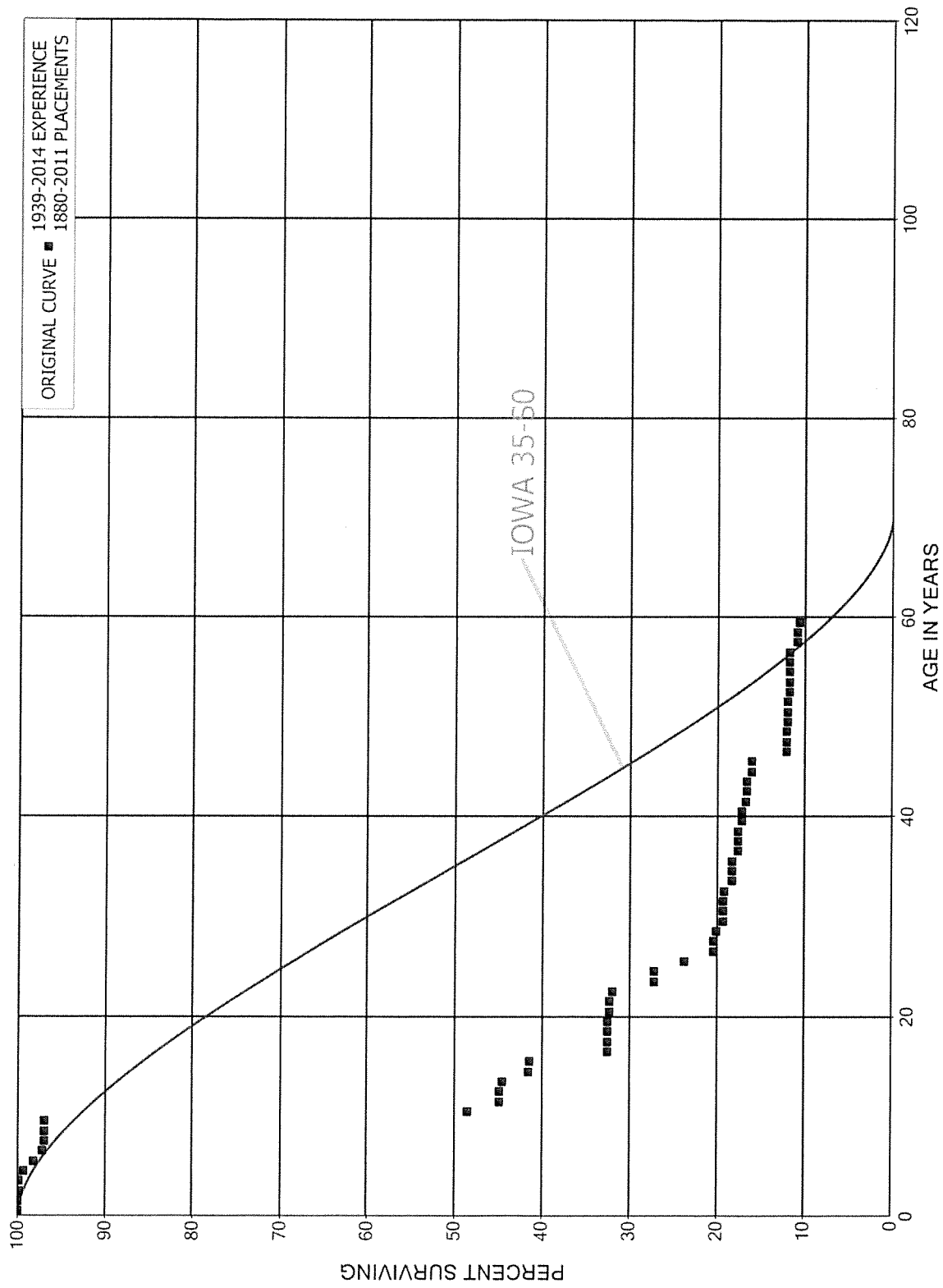| AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	75,686		0.0000	1.0000	10.51
40.5	75,686		0.0000	1.0000	10.51
41.5	76,468		0.0000	1.0000	10.51
42.5	76,468		0.0000	1.0000	10.51
43.5	76,468	602	0.0079	0.9921	10.51
44.5	75,866		0.0000	1.0000	10.43
45.5	75,866		0.0000	1.0000	10.43
46.5	75,866		0.0000	1.0000	10.43
47.5	75,866	4,592	0.0605	0.9395	10.43
48.5	70,594	3,538	0.0501	0.9499	9.80
49.5	67,056		0.0000	1.0000	9.31
50.5	67,056	7,692	0.1147	0.8853	9.31
51.5	59,364		0.0000	1.0000	8.24
52.5	59,364		0.0000	1.0000	8.24
53.5	59,364		0.0000	1.0000	8.24
54.5	54,353	3,181	0.0585	0.9415	8.24
55.5	48,569		0.0000	1.0000	7.76
56.5	48,569		0.0000	1.0000	7.76
57.5	48,569		0.0000	1.0000	7.76
58.5	48,569	296	0.0061	0.9939	7.76
59.5	48,273	68	0.0014	0.9986	7.71
60.5	48,206	52	0.0011	0.9989	7.70
61.5	48,154		0.0000	1.0000	7.69
62.5	48,075		0.0000	1.0000	7.69
63.5	39,414	133	0.0034	0.9966	7.69
64.5	39,281		0.0000	1.0000	7.67
65.5	39,281		0.0000	1.0000	7.67
66.5	39,281	197	0.0050	0.9950	7.67
67.5	39,084		0.0000	1.0000	7.63
68.5	38,358		0.0000	1.0000	7.63
69.5	38,358	580	0.0151	0.9849	7.63
70.5	37,779	38	0.0010	0.9990	7.51
71.5	22,414		0.0000	1.0000	7.51
72.5	22,414	250	0.0112	0.9888	7.51
73.5	22,164		0.0000	1.0000	7.42
74.5	22,164	11,936	0.5385	0.4615	7.42
75.5	10,228	32	0.0031	0.9969	3.42
76.5	9,140		0.0000	1.0000	3.41
77.5	9,140		0.0000	1.0000	3.41
78.5	8,603		0.0000	1.0000	3.41

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 304.80 STRUCTURES AND IMPROVEMENTS - MISCELLANEOUS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1897-2008   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	8,603		0.0000	1.0000	3.41
80.5	8,603		0.0000	1.0000	3.41
81.5	8,603		0.0000	1.0000	3.41
82.5	8,603		0.0000	1.0000	3.41
83.5	8,509		0.0000	1.0000	3.41
84.5	8,509		0.0000	1.0000	3.41
85.5	8,157		0.0000	1.0000	3.41
86.5	8,052		0.0000	1.0000	3.41
87.5	6,488	1,690	0.2605	0.7395	3.41
88.5	4,349		0.0000	1.0000	2.52
89.5	4,349		0.0000	1.0000	2.52
90.5	4,349		0.0000	1.0000	2.52
91.5	4,349		0.0000	1.0000	2.52
92.5	4,349		0.0000	1.0000	2.52
93.5	4,349		0.0000	1.0000	2.52
94.5	4,349		0.0000	1.0000	2.52
95.5	4,349		0.0000	1.0000	2.52
96.5	4,349		0.0000	1.0000	2.52
97.5	4,349		0.0000	1.0000	2.52
98.5	4,349	1,635	0.3759	0.6241	2.52
99.5	2,714		0.0000	1.0000	1.58
100.5	2,714		0.0000	1.0000	1.58
101.5	2,617		0.0000	1.0000	1.58
102.5	2,254	782	0.3467	0.6533	1.58
103.5	1,472		0.0000	1.0000	1.03
104.5	1,451		0.0000	1.0000	1.03
105.5	1,451		0.0000	1.0000	1.03
106.5	1,451		0.0000	1.0000	1.03
107.5	160		0.0000	1.0000	1.03
108.5	160		0.0000	1.0000	1.03
109.5	160		0.0000	1.0000	1.03
110.5	160		0.0000	1.0000	1.03
111.5	160		0.0000	1.0000	1.03
112.5					1.03

MISSOURI AMERICAN WATER COMPANY
ACCOUNT 306 LAKE, RIVER AND OTHER INTAKES
ORIGINAL AND SMOOTH SURVIVOR CURVES

	ORIGINAL CURVE ■	1939-2014 EXPERIENCE
		1880-2011 PLACEMENTS

IOWA 35-50

PERCENT SURVIVING

AGE IN YEARS

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 306 LAKE, RIVER AND OTHER INTAKES

ORIGINAL LIFE TABLE

PLACEMENT BAND 1880-2011   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	8,602,842		0.0000	1.0000	100.00
0.5	8,602,842		0.0000	1.0000	100.00
1.5	8,602,842	10,275	0.0012	0.9988	100.00
2.5	8,592,567	1,900	0.0002	0.9998	99.88
3.5	2,144,721	11,144	0.0052	0.9948	99.86
4.5	2,133,577	24,844	0.0116	0.9884	99.34
5.5	2,108,732	21,193	0.0101	0.9899	98.18
6.5	2,022,771	5,623	0.0028	0.9972	97.20
7.5	1,528,170		0.0000	1.0000	96.93
8.5	1,528,170		0.0000	1.0000	96.93
9.5	1,530,325	764,059	0.4993	0.5007	96.93
10.5	463,308	34,808	0.0751	0.9249	48.53
11.5	428,500	473	0.0011	0.9989	44.89
12.5	428,108	3,268	0.0076	0.9924	44.84
13.5	449,395	29,765	0.0662	0.9338	44.49
14.5	419,630	1,000	0.0024	0.9976	41.55
15.5	418,630	90,407	0.2160	0.7840	41.45
16.5	328,223		0.0000	1.0000	32.50
17.5	328,223		0.0000	1.0000	32.50
18.5	328,223		0.0000	1.0000	32.50
19.5	328,223	1,884	0.0057	0.9943	32.50
20.5	326,339		0.0000	1.0000	32.31
21.5	326,339	3,240	0.0099	0.9901	32.31
22.5	324,808	48,966	0.1508	0.8492	31.99
23.5	275,842		0.0000	1.0000	27.17
24.5	275,876	34,435	0.1248	0.8752	27.17
25.5	241,441	34,435	0.1426	0.8574	23.78
26.5	208,800		0.0000	1.0000	20.39
27.5	209,032	3,635	0.0174	0.9826	20.39
28.5	209,166	8,039	0.0384	0.9616	20.03
29.5	201,731		0.0000	1.0000	19.26
30.5	201,834	147	0.0007	0.9993	19.26
31.5	201,956	784	0.0039	0.9961	19.25
32.5	210,932	10,068	0.0477	0.9523	19.17
33.5	200,865		0.0000	1.0000	18.26
34.5	200,865		0.0000	1.0000	18.26
35.5	216,714	7,268	0.0335	0.9665	18.26
36.5	231,476	100	0.0004	0.9996	17.64
37.5	243,668	954	0.0039	0.9961	17.64
38.5	244,320	6,032	0.0247	0.9753	17.57

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 306 LAKE, RIVER AND OTHER INTAKES

ORIGINAL LIFE TABLE, CONT.

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	239,716		0.0000	1.0000	17.13
40.5	245,052	6,173	0.0252	0.9748	17.13
41.5	250,485	1,000	0.0040	0.9960	16.70
42.5	260,121		0.0000	1.0000	16.64
43.5	260,121	8,667	0.0333	0.9667	16.64
44.5	258,255		0.0000	1.0000	16.08
45.5	258,255	63,877	0.2473	0.7527	16.08
46.5	196,684	146	0.0007	0.9993	12.10
47.5	196,703		0.0000	1.0000	12.10
48.5	196,703	1,593	0.0081	0.9919	12.10
49.5	195,110		0.0000	1.0000	12.00
50.5	195,693		0.0000	1.0000	12.00
51.5	195,693	4,461	0.0228	0.9772	12.00
52.5	191,233		0.0000	1.0000	11.72
53.5	193,382		0.0000	1.0000	11.72
54.5	194,582		0.0000	1.0000	11.72
55.5	194,582		0.0000	1.0000	11.72
56.5	194,582	13,985	0.0719	0.9281	11.72
57.5	150,316		0.0000	1.0000	10.88
58.5	165,962	3,755	0.0226	0.9774	10.88
59.5	162,207		0.0000	1.0000	10.63
60.5	162,207		0.0000	1.0000	10.63
61.5	162,207		0.0000	1.0000	10.63
62.5	162,207		0.0000	1.0000	10.63
63.5	162,207		0.0000	1.0000	10.63
64.5	162,207		0.0000	1.0000	10.63
65.5	162,207		0.0000	1.0000	10.63
66.5	162,207		0.0000	1.0000	10.63
67.5	162,207	2,036	0.0126	0.9874	10.63
68.5	160,171	830	0.0052	0.9948	10.50
69.5	159,341		0.0000	1.0000	10.45
70.5	159,341	4,144	0.0260	0.9740	10.45
71.5	155,197		0.0000	1.0000	10.18
72.5	155,197		0.0000	1.0000	10.18
73.5	155,197	162	0.0010	0.9990	10.18
74.5	155,035	27,126	0.1750	0.8250	10.16
75.5	127,909		0.0000	1.0000	8.39
76.5	127,909		0.0000	1.0000	8.39
77.5	127,909		0.0000	1.0000	8.39
78.5	127,909		0.0000	1.0000	8.39

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 306 LAKE, RIVER AND OTHER INTAKES

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1880-2011   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	127,909		0.0000	1.0000	8.39
80.5	127,909		0.0000	1.0000	8.39
81.5	127,909		0.0000	1.0000	8.39
82.5	127,909		0.0000	1.0000	8.39
83.5	127,909		0.0000	1.0000	8.39
84.5	127,909		0.0000	1.0000	8.39
85.5	127,909		0.0000	1.0000	8.39
86.5	127,909		0.0000	1.0000	8.39
87.5	127,909	2,756	0.0215	0.9785	8.39
88.5	125,153		0.0000	1.0000	8.21
89.5	125,153		0.0000	1.0000	8.21
90.5	125,153	791	0.0063	0.9937	8.21
91.5	124,362	1,086	0.0087	0.9913	8.15
92.5	123,276	269	0.0022	0.9978	8.08
93.5	123,007	9,761	0.0794	0.9206	8.06
94.5	113,246		0.0000	1.0000	7.42
95.5	113,246		0.0000	1.0000	7.42
96.5	113,246	15,850	0.1400	0.8600	7.42
97.5	97,397	19,562	0.2009	0.7991	6.39
98.5	77,633	12,291	0.1583	0.8417	5.10
99.5	65,342	1,640	0.0251	0.9749	4.30
100.5	63,702	1,428	0.0224	0.9776	4.19
101.5	62,273	3,488	0.0560	0.9440	4.09
102.5	58,786	11,837	0.2014	0.7986	3.86
103.5	46,948	14,405	0.3068	0.6932	3.09
104.5	32,543	212	0.0065	0.9935	2.14
105.5	32,331	6,823	0.2110	0.7890	2.13
106.5	25,508		0.0000	1.0000	1.68
107.5	25,508	16	0.0006	0.9994	1.68
108.5	25,492	166	0.0065	0.9935	1.68
109.5	25,326	709	0.0280	0.9720	1.66
110.5	24,617		0.0000	1.0000	1.62
111.5	24,617	380	0.0154	0.9846	1.62
112.5	21,159		0.0000	1.0000	1.59
113.5	21,159		0.0000	1.0000	1.59
114.5	21,159	2,149	0.1016	0.8984	1.59
115.5	19,010	1,200	0.0631	0.9369	1.43
116.5	17,810	167	0.0094	0.9906	1.34
117.5	17,643		0.0000	1.0000	1.33
118.5	17,643		0.0000	1.0000	1.33

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 306 LAKE, RIVER AND OTHER INTAKES

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1880-2011   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
119.5	17,643	14,937	0.8466	0.1534	1.33
120.5	2,706		0.0000	1.0000	0.20
121.5	2,706	2,112	0.7806	0.2194	0.20
122.5	583		0.0000	1.0000	0.04
123.5	583		0.0000	1.0000	0.04
124.5	583		0.0000	1.0000	0.04
125.5	583	561	0.9623	0.0377	0.04
126.5					0.00

MISSOURI AMERICAN WATER COMPANY
ACCOUNT 309 SUPPLY MAINS
ORIGINAL AND SMOOTH SURVIVOR CURVES

ORIGINAL CURVE ■ 1939-2014 EXPERIENCE
1880-2014 PLACEMENTS

IOWA 78-S2

PERCENT SURVIVING

AGE IN YEARS

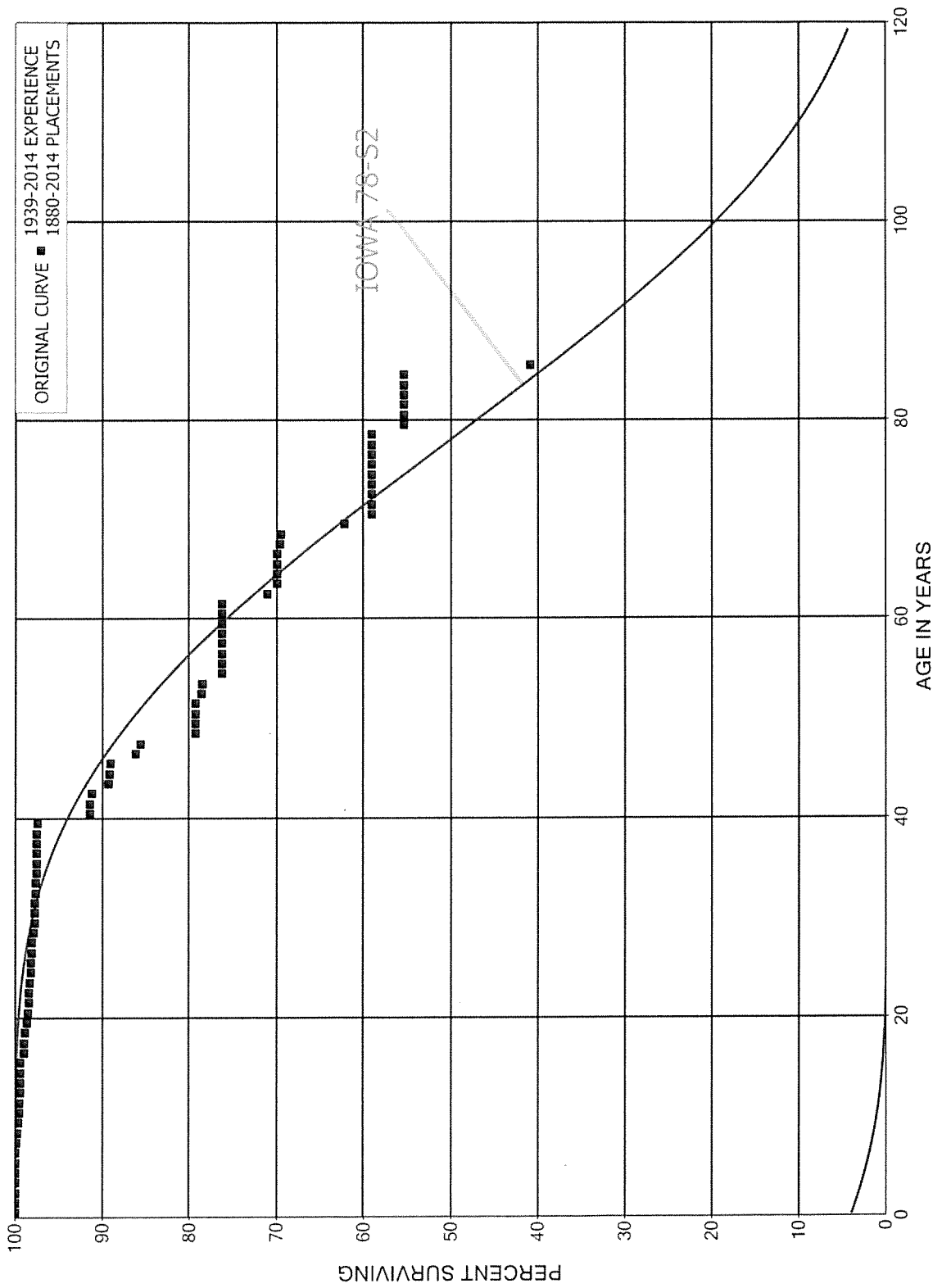MISSOURI AMERICAN WATER COMPANY

ACCOUNT 309 SUPPLY MAINS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1880-2014   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	22,438,182	846	0.0000	1.0000	100.00
0.5	22,318,696		0.0000	1.0000	100.00
1.5	22,309,504	134	0.0000	1.0000	100.00
2.5	22,309,371	1,157	0.0001	0.9999	100.00
3.5	21,529,863	2,020	0.0001	0.9999	99.99
4.5	21,496,565	840	0.0000	1.0000	99.98
5.5	21,280,587	5,982	0.0003	0.9997	99.98
6.5	21,147,222	13,110	0.0006	0.9994	99.95
7.5	17,296,884	30,763	0.0018	0.9982	99.89
8.5	17,289,854	11,476	0.0007	0.9993	99.71
9.5	17,253,504	26,892	0.0016	0.9984	99.64
10.5	17,260,663	9	0.0000	1.0000	99.49
11.5	17,236,375	16,824	0.0010	0.9990	99.49
12.5	17,100,811	900	0.0001	0.9999	99.39
13.5	17,100,164	983	0.0001	0.9999	99.39
14.5	7,213,921	2,071	0.0003	0.9997	99.38
15.5	7,208,446	27,178	0.0038	0.9962	99.35
16.5	7,120,792	3,685	0.0005	0.9995	98.98
17.5	7,086,052	9,709	0.0014	0.9986	98.93
18.5	7,076,226	12,057	0.0017	0.9983	98.79
19.5	7,026,900	9,535	0.0014	0.9986	98.62
20.5	6,957,279	2,948	0.0004	0.9996	98.49
21.5	4,379,408	1,124	0.0003	0.9997	98.45
22.5	4,338,215	7,617	0.0018	0.9982	98.42
23.5	4,127,367	3,032	0.0007	0.9993	98.25
24.5	4,101,685	1,611	0.0004	0.9996	98.18
25.5	4,069,991	2,219	0.0005	0.9995	98.14
26.5	4,044,976	1,244	0.0003	0.9997	98.08
27.5	3,914,714	10,138	0.0026	0.9974	98.05
28.5	3,873,560	2,709	0.0007	0.9993	97.80
29.5	3,068,851		0.0000	1.0000	97.73
30.5	2,735,888	862	0.0003	0.9997	97.73
31.5	2,733,142	1,000	0.0004	0.9996	97.70
32.5	2,649,686	296	0.0001	0.9999	97.66
33.5	2,680,394	2,866	0.0011	0.9989	97.65
34.5	2,609,114		0.0000	1.0000	97.55
35.5	2,605,286	1,115	0.0004	0.9996	97.55
36.5	2,603,789		0.0000	1.0000	97.51
37.5	2,546,497	368	0.0001	0.9999	97.51
38.5	2,540,558	1,159	0.0005	0.9995	97.49

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 309 SUPPLY MAINS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1880-2014   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	2,537,701	156,814	0.0618	0.9382	97.45
40.5	2,377,793	998	0.0004	0.9996	91.43
41.5	2,167,670	3,919	0.0018	0.9982	91.39
42.5	2,121,798	44,180	0.0208	0.9792	91.22
43.5	1,645,251	2,467	0.0015	0.9985	89.32
44.5	1,640,941	1,753	0.0011	0.9989	89.19
45.5	1,637,989	53,362	0.0326	0.9674	89.10
46.5	1,133,315	7,258	0.0064	0.9936	86.19
47.5	1,114,205	82,798	0.0743	0.9257	85.64
48.5	1,031,407	38	0.0000	1.0000	79.28
49.5	1,031,301	366	0.0004	0.9996	79.27
50.5	926,915		0.0000	1.0000	79.25
51.5	910,705	6,852	0.0075	0.9925	79.25
52.5	895,868	2,236	0.0025	0.9975	78.65
53.5	772,261	21,053	0.0273	0.9727	78.45
54.5	689,115		0.0000	1.0000	76.31
55.5	612,923	102	0.0002	0.9998	76.31
56.5	612,821		0.0000	1.0000	76.30
57.5	608,918		0.0000	1.0000	76.30
58.5	527,075	91	0.0002	0.9998	76.30
59.5	355,698	225	0.0006	0.9994	76.29
60.5	349,082		0.0000	1.0000	76.24
61.5	349,082	23,572	0.0675	0.9325	76.24
62.5	315,875	5,138	0.0163	0.9837	71.09
63.5	310,737		0.0000	1.0000	69.94
64.5	310,737		0.0000	1.0000	69.94
65.5	310,737		0.0000	1.0000	69.94
66.5	310,737	1,444	0.0046	0.9954	69.94
67.5	279,842	253	0.0009	0.9991	69.61
68.5	279,589	29,667	0.1061	0.8939	69.55
69.5	248,983	12,300	0.0494	0.9506	62.17
70.5	236,684		0.0000	1.0000	59.10
71.5	236,684		0.0000	1.0000	59.10
72.5	236,684		0.0000	1.0000	59.10
73.5	236,684	59	0.0002	0.9998	59.10
74.5	236,625		0.0000	1.0000	59.08
75.5	236,625		0.0000	1.0000	59.08
76.5	236,625	117	0.0005	0.9995	59.08
77.5	236,507		0.0000	1.0000	59.05
78.5	236,507	14,628	0.0619	0.9381	59.05

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 309 SUPPLY MAINS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1880-2014   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	221,879		0.0000	1.0000	55.40
80.5	221,879		0.0000	1.0000	55.40
81.5	221,879		0.0000	1.0000	55.40
82.5	221,879		0.0000	1.0000	55.40
83.5	221,879		0.0000	1.0000	55.40
84.5	221,321	58,264	0.2633	0.7367	55.40
85.5	163,057		0.0000	1.0000	40.82
86.5	163,057		0.0000	1.0000	40.82
87.5	163,057		0.0000	1.0000	40.82
88.5	163,057	30	0.0002	0.9998	40.82
89.5	163,027	3,205	0.0197	0.9803	40.81
90.5	159,822		0.0000	1.0000	40.01
91.5	159,822	144	0.0009	0.9991	40.01
92.5	159,678		0.0000	1.0000	39.97
93.5	159,678		0.0000	1.0000	39.97
94.5	159,678	34,101	0.2136	0.7864	39.97
95.5	125,577		0.0000	1.0000	31.43
96.5	125,577		0.0000	1.0000	31.43
97.5	125,577		0.0000	1.0000	31.43
98.5	125,577		0.0000	1.0000	31.43
99.5	125,577	729	0.0058	0.9942	31.43
100.5	124,848		0.0000	1.0000	31.25
101.5	124,848		0.0000	1.0000	31.25
102.5	105,799		0.0000	1.0000	31.25
103.5	105,799		0.0000	1.0000	31.25
104.5	105,799	30,331	0.2867	0.7133	31.25
105.5	75,467	39	0.0005	0.9995	22.29
106.5	75,428	3,575	0.0474	0.9526	22.28
107.5	71,853		0.0000	1.0000	21.22
108.5	71,853	293	0.0041	0.9959	21.22
109.5	71,561		0.0000	1.0000	21.14
110.5	71,561		0.0000	1.0000	21.14
111.5	71,561		0.0000	1.0000	21.14
112.5	71,561	42	0.0006	0.9994	21.14
113.5	45,432		0.0000	1.0000	21.13
114.5	45,432	3,911	0.0861	0.9139	21.13
115.5	41,521		0.0000	1.0000	19.31
116.5	41,521	70	0.0017	0.9983	19.31
117.5	41,451		0.0000	1.0000	19.27
118.5	41,451		0.0000	1.0000	19.27

MISSOURI AMERICAN WATER COMPANY

ACCOUNT 309 SUPPLY MAINS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1880-2014   EXPERIENCE BAND 1939-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
119.5	41,451	29,368	0.7085	0.2915	19.27
120.5	12,083		0.0000	1.0000	5.62
121.5	12,083		0.0000	1.0000	5.62
122.5	12,083		0.0000	1.0000	5.62
123.5	5,215		0.0000	1.0000	5.62
124.5	5,215		0.0000	1.0000	5.62
125.5	5,215		0.0000	1.0000	5.62
126.5	5,215		0.0000	1.0000	5.62
127.5	5,215	52	0.0100	0.9900	5.62
128.5	5,162		0.0000	1.0000	5.56
129.5	5,162	4	0.0007	0.9993	5.56
130.5	5,159		0.0000	1.0000	5.56
131.5	5,159		0.0000	1.0000	5.56
132.5	5,159	82	0.0158	0.9842	5.56
133.5	5,077		0.0000	1.0000	5.47
134.5					5.47