Exhibit No.:
Issues: Weather Normalization

Witness: Dennis L. Patterson
Sponsoring Party: MO PSC Staff
Type of Exhibit: Supplemental Direct Testimony
Case No.: WR-2007-0216
Date Testimony Prepared: June 18, 2007

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY OPERATIONS DIVISION

SUPPLEMENTAL DIRECT TESTIMONY

OF

DENNIS L. PATTERSON

MISSOURI-AMERICAN WATER COMPANY

CASE NO. WR-2007-0216

Jefferson City, Missouri
June 2007

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Missouri-American Water Company's request for Authority to Implement a General Rate Increase for Water Service provided in Missouri Service Areas	)))))	Case No. WR-2007-0216

AFFIDAVIT OF DENNIS L. PATTERSON

STATE OF MISSOURI)
) **ss**
COUNTY OF COLE)

Dennis L. Patterson, of lawful age, on his oath states: that he has participated in the preparation of the following Supplemental Direct Testimony in question and answer form, consisting of 9 pages of Supplemental Direct Testimony to be presented in the above case, that the answers in the following Supplemental Direct Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true to the best of his knowledge and belief.

Dennis L. Patterson

Subscribed and sworn to before me this 18th day of June, 2007.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
County of Cole
My Commission Exp. 07/01/2008

Notary Public

My commission expires 07-01-2008

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SUPPLEMENTAL DIRECT TESTIMONY

OF

DENNIS L. PATTERSON

MISSOURI-AMERICAN WATER COMPANY

CASE NO. WR-2007-0216

SUPPLEMENTAL DIRECT TESTIMONY

OF

DENNIS L. PATTERSON

MISSOURI-AMERICAN WATER COMPANY

CASE NO. WR-2007-0216

Q. What is the purpose of your Supplemental Direct Testimony?

A. I will make a material revision to my Direct Testimony

Q. Has Staff evaluated the effects of your revision?

A. Yes. Staff has already included a component in its true-up estimate valuing this change at $500,000. The exact amount will be recalculated as part of the final value of the true-up.

EXECUTIVE SUMMARY

Q. Summarize your Supplemental Direct testimony.

A. I will explain how assembled and analyzed average annual meters-in-use data for the St. Louis operational district, formerly St. Louis County Water (SLCW). I will then explain how I analyzed the growth in customer counts for the corresponding Quarterly Residential customer, and then how I have revised the corresponding projections of customer counts, actual Mgallon sales, and normal Mgallon sales.

Q. Please summarize the factors that convinced you to make the revision.

A. The greatest single factor is the relationship over time of Quarterly Residential customer counts (billed accounts) with respect to annual average meters-in-use in the SLCW operating district of the Company. Specifically, I am now satisfied that the billed accounts totaled 320,060 Quarterly Residential customers in 2002 with excellent reliability, that

average meters-in-use for that year numbered 337,980, and that the ratio of billed quarterly residential accounts to meters-in-use, or 92.92 per cent, was therefore sufficiently reliable for the purpose of projecting billed accounts for subsequent periods, to include through the upcoming true-up date of May 31, 2007. These quantities are illustrated in the graph at Revised Schedule 1-1, attached to my Supplemental Direct Testimony. Revised Schedule 1-1 provides updates to the Schedule 1-1 attached to my original Direct Testimony in this case, replacing this Schedule entirely.

Q. Why was it necessary to examine this relationship and calculate these projections?

A. First, as I noted in my direct testimony, the Company's reports of billed accounts and Mgallon sales from 2002 through 2006 were not consistent from one year to the next, varied greatly within the test year, and appeared to have been underreported overall (see answer at Patterson Direct, p. 2, line 19). Second, the Company's response to my data request for clarification was not helpful in resolving the problem (answer at Patterson Direct, p. 6, line 15, and Ibid: Schedules 1-1 through 1-3).

RESULTS

Q. What are your revised estimates of weather-adjusted Residential and Commercial GCD by service area for the 12 billing months ending December, 2006?

A. These estimates are presented in Revised Schedules 2-1 through 2-9 attached to my Supplemental Direct testimony, which replace the like numbered Schedules attached to my direct testimony. The Revised Schedule 2-1 includes projections of customer counts as well as the projections of actual and normalized annual water sales that result. The table at Revised Schedule 2-2 shows that the projection of the 2006 combined actual Residential

sales, for the districts I analyzed, were 40,068,090 Mgallons, and that the corresponding projection of normalized 2006 Residential sales was 38,176,320 Mgallons, implying a downward weather adjustment of (1,891,771) Mgallons for these districts. Revised Schedules 2-3, 2-4 and 2-5 illustrate the annual changes in projected Residential customer counts; projections of actual and normal Residential GCD; and projections of actual and normal Residential Mgallons respectively. The parts of Schedule 2-1 that pertain to Commercial customers have not been revised, nor have the underlying Schedules 2-6 through 2-9. However, these are included in the Revised Schedules 2-1 through 2-9 for use in Staff's calculations for the upcoming true-up, and are labeled as Revised Schedules 2-6 through 2-9 for consistency.

GENERAL METHODS OF ANALYSIS

Q. Have you revised your general methods of analysis?

A. No. This section of my direct testimony is not revised.

SPECIAL METHODS OF ANALYSIS

Q. Have you revised your special methods of analysis.

A. Yes. I have revised my analysis of SLCW Quarterly Residential annual average customer counts by linking my customer count projections statistically to historical observations of annual average meters-in-use, and then with a calculated ratio to the test year observation meters-in-use and true-up projections of meters-in-use. These customer count projections subsequently affect my projections of annual Mgallon sales under actual and normal weather conditions.

BILLING DATA

Q. Have you made any revisions to the Company's billing data as it appeared in Schedules 3-1 through 3-4 attached to your direct testimony?

A. No.

Q. Have you made any changes to the projections you mention in the question and answer found at Page 12, Line 1 of your Direct Testimony?

A. Yes, I have. These changes pertain to SLCW Quarterly Residential customers. The changes have been introduced above and are discussed in more detail below.

PROJECTION OF CUSTOMER COUNTS

Q. Have you revised any of your projections of customer counts?

A. Yes. I have revised my projections of customer counts for SLCW Quarterly Residential customers.

Q. How did you perform this revision?

A. I performed it in two steps. First, I calculated growth curves for SLCW annual average meters-in-use before and after 2002, which were introduced in my direct testimony and are displayed in detail in the chart at Revised Schedule 1-1 attached to my Supplemental Direct testimony. Second, I calculated growth curves for SLCW Quarterly Residential customer counts before and after 2002 that are based on meters-in-use. The projections from both steps will be explained in greater detail below.

Added: Analysis of Meters-In-Use

Q. How did you calculate the growth curves for SLCW meters-in-use?

A. These meters-in-use growth curves are displayed at Supplemental Schedule 1-1, attached to my Supplemental Direct Testimony. The underlying calculations are displayed

at Supplemental Schedule 1-2, also attached to my Supplemental Direct Testimony. Beginning with observations of SLCW annual average meters-in-use from 1998 through 2006, I fit a stepped function of time through the observations, allowing for an anomalous 2002 billing year and known short billing years at 2003 and 1998.

Q. How did you employ the resulting function of time?

A. I used this function of time to backcast old meters-in-use from 1998 back through previous years, as well as to project old, new and total meters-in-use forward from 2006 for the upcoming true-up.

Q. What was the purpose of the backcasts and projections?

A. The backcasts were intended for crosschecking with old customer counts, while the projections were intended for calculating projections of old, new and total customer counts, both for the test year and for the upcoming true-up. The crosschecks would insure that the correct functional form was used to analyze meters-in-use in past years, which in turn would insure that projections of meters-in-use would be reliable for at least a couple of years past 2006, or well beyond the upcoming true-up period.

Q. How are Supplemental Schedules 1-1 and 1-2 to be used?

A. Supplemental Schedules 1-1 and 1-2 are added to the analyses first presented in my Direct Testimony. The information they contain is used to calculate the Revised Schedules presented in my Supplemental Direct Testimony.

Revised : Projected SLCW Quarterly Residential Customer Counts Are Now Based On SLCW Annual Average Meters-In-Use

Q. What are your revised projections of SLCW Quarterly Residential customer counts after 2001?

A. The revised projections of SLCW Quarterly Residential customer counts are illustrated at Supplemental Schedule 2, and appear in detail at Revised Schedule 4-7, attached to my Supplemental Direct Testimony. Please note that observed customer counts were first smoothed for the years 1993 through 2001, because the years 1995 and 1998 were obviously undercounted (Supplemental Schedule 2). Then, old customer counts were projected through 2006 into 2007 and 2008, or beyond the upcoming true-up period. Next, I added 2002 observed new customers to projected 2002 old customers (the 2002 Crosscheck point at Supplemental Schedule 2). The 2002 new customers are from the table at Page 9 of my Direct Testimony, and from Schedule ELS-3SR of Dr. Spitznagel's Surrebuttal Testimony in the Company's Rate Case WR-2003-0500, which have been included in my working papers and submitted with my direct testimony in the current case. Next, the ratio of (2002 old plus new customers) to (2002 meters-in-use) was calculated as 92.92%. Finally, this ratio was used to calculate projections of (old plus new customers) for the years 2003 through 2006, as well as for 2007 and 2008, or beyond the upcoming true-up.

Q. Why do you believe that this method is reliable?

A. First, the statistical fit of old customer counts to pre-2002 observations meters-in-use is quite good, so that customer count projections after 2001 would be quite reliable. Second, the consistency of newer observations of meters-in-use with older observations is visually obvious and statistically reliable, given only the prior information that new service

area and new meters-in-use were added in 2002. Third, the number of customers added in 2002 is from a reliable source (the sworn testimony of a Company witness). It follows that the ratio of (2002 old plus new customers) to (2002 average meters-in-use) is also very reliable. Finally, it would be logical to assume that the growth in meters-in-use represents appropriate purchases by the Company for installation in the residences and businesses of new customers. Only an increase in customer numbers could justify an increase in meters-in-use.

Q. The customer counts you project in your revised analyses are larger than those you projected in your direct testimony. Why do you feel that this projection is appropriate?

A. The ratio calculated above is smaller than the ratios of (old customers only) to (old meters-in-use) in the years prior to 2002, which consistently average nearly 95 per cent. This indicates that the meters-in-use method of projecting customer counts through 2006 is more conservative than the counts that precede them, and that it therefore benefits the Company to use this method. This may be a consequence of calculating the projection ratio with data from the billing year 2002, where meters-in-use appear to be somewhat larger than succeeding years. Finally, it is interesting to note that the average of the Company's various estimates of 2006 customer counts (340,687, 318,372 and 315,905) is 324,988 customers, not greatly different from the 325,487 customers that result from my calculations.

WEATHER DATA

Q. Have you revised any of the weather data used in your analyses?

A. No. As a consequence, the Schedules 5-1 through 5-4 attached to my direct testimony remain effective, together with their underlying working papers.

WEATHER VARIABLE

Q. Have you revised your discussion of the weather variable, Shortfall?

A. No.

WEATHER RESPONSE IN GCD, BILLING ADJUSTMENTS, TRENDS AND SHIFTS

Q. Have you revised your calculations of weather response for SLCW Quarterly Residential customers?

A. Yes. I first calculated revised customer numbers for the old customer base for the years after 1992, as represented at Revised Schedule 4-7 and illustrated at Supplemental Schedule 2, which are attached to my Supplemental Direct testimony. I then combined the revised customer numbers with historical observations for 1990 through 1992. I next calculated GCD observations using customer numbers from the pooled data just described, and using Dr. Spitznagel's annual Mgallon observations for the years 1990 through 2001. Finally, I calculated weather response parameters using "old" GCD observations from resulting data set for the years 1990 through 2001. These results are presented at Revised Schedule 6-7, attached to my Supplemental Direct testimony. The parameters apply to observations and projections of the old customer base, which does not include new customers that were added in 2002.

Q. Did your regression analysis include terms for effects other than the weather?

A. Yes. The regression model included a trend to account for a small but significant downward conservation effect of about (0.433) GCD per year, as well as for three instances of compensating billing corrections. A conservation trend is known in the industry, and the absence of billing corrections would be very unusual.

PROJECTIONS OF NORMAL WEATHER GCD AND NORMAL WEATHER SALES

Q. How did you perform your revised calculations of usage per customer for the years after 2001 for SLCW Quarterly Residential customers?

A. These calculations are presented at Revised Schedule 7-7, attached to my Supplemental Direct testimony. The calculations continue to make use of the knowledge that a new customer added in 2002 exhibited about 75% of the usage of the average "old" customer. Revised normal weather Mgallons were also calculated as the product of revised projections of customer counts, revised normal weather GCD and nominal annual billing days, expressed as Mgallons (Revised Schedule 7-7). I have provided the revised calculations to Staff Witness Roberta M. Grissum, and have made them available to the Company in my revised working papers.

SUMMARY

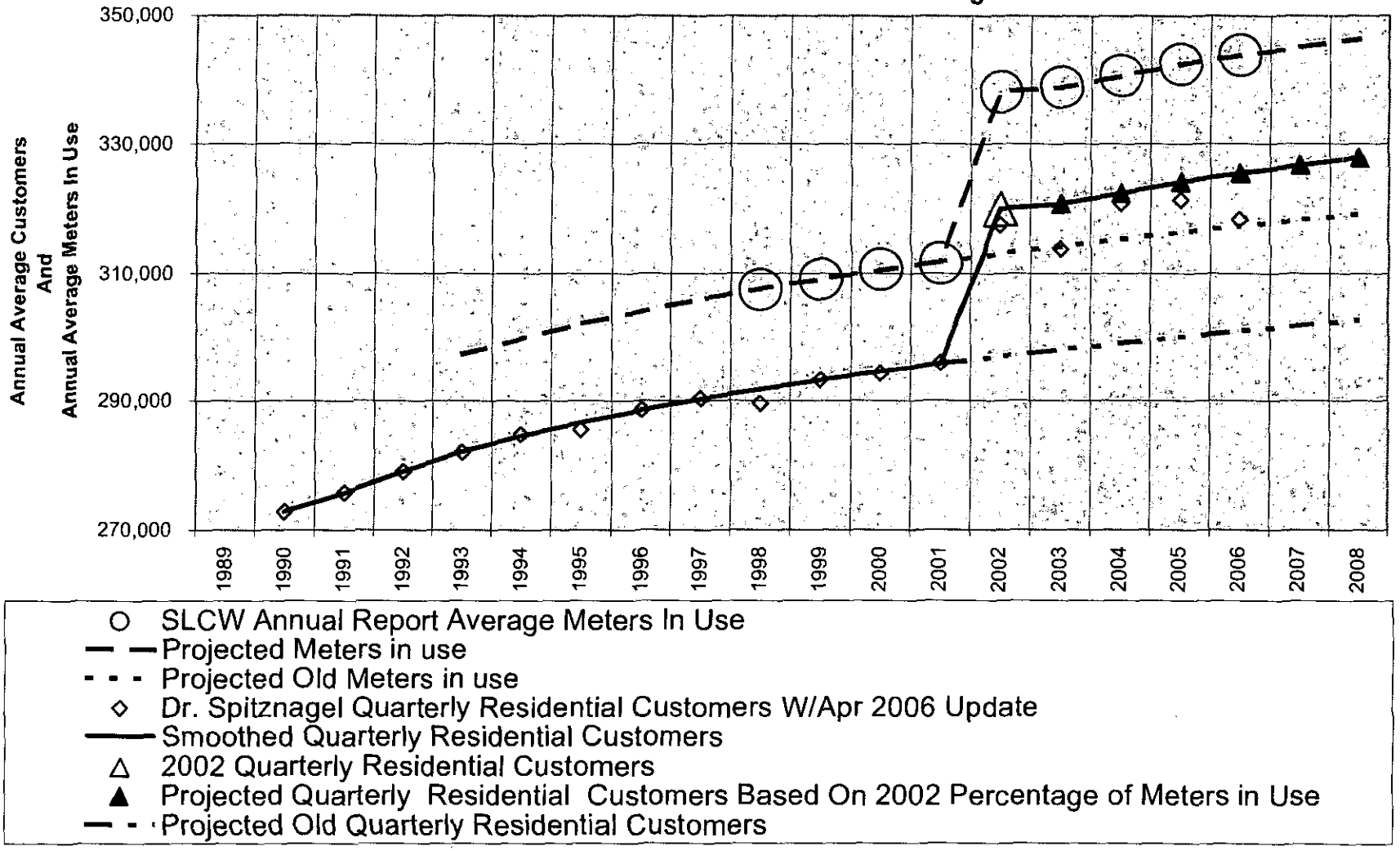
Q. Please provide your revised Summary.

A. I have now assembled and analyzed average annual meters-in-use data for the SLCW operational district of the Company, that I have used that information to analyze the growth in customer counts for the corresponding Quarterly Residential customers, and that I have revised the corresponding projections of customer counts, actual Mgallon sales, and normal Mgallon sales. In other respects, the Summary I filed in my original Direst testimony continues to apply to my results.

Q. Does this conclude your Supplemental Direct testimony?

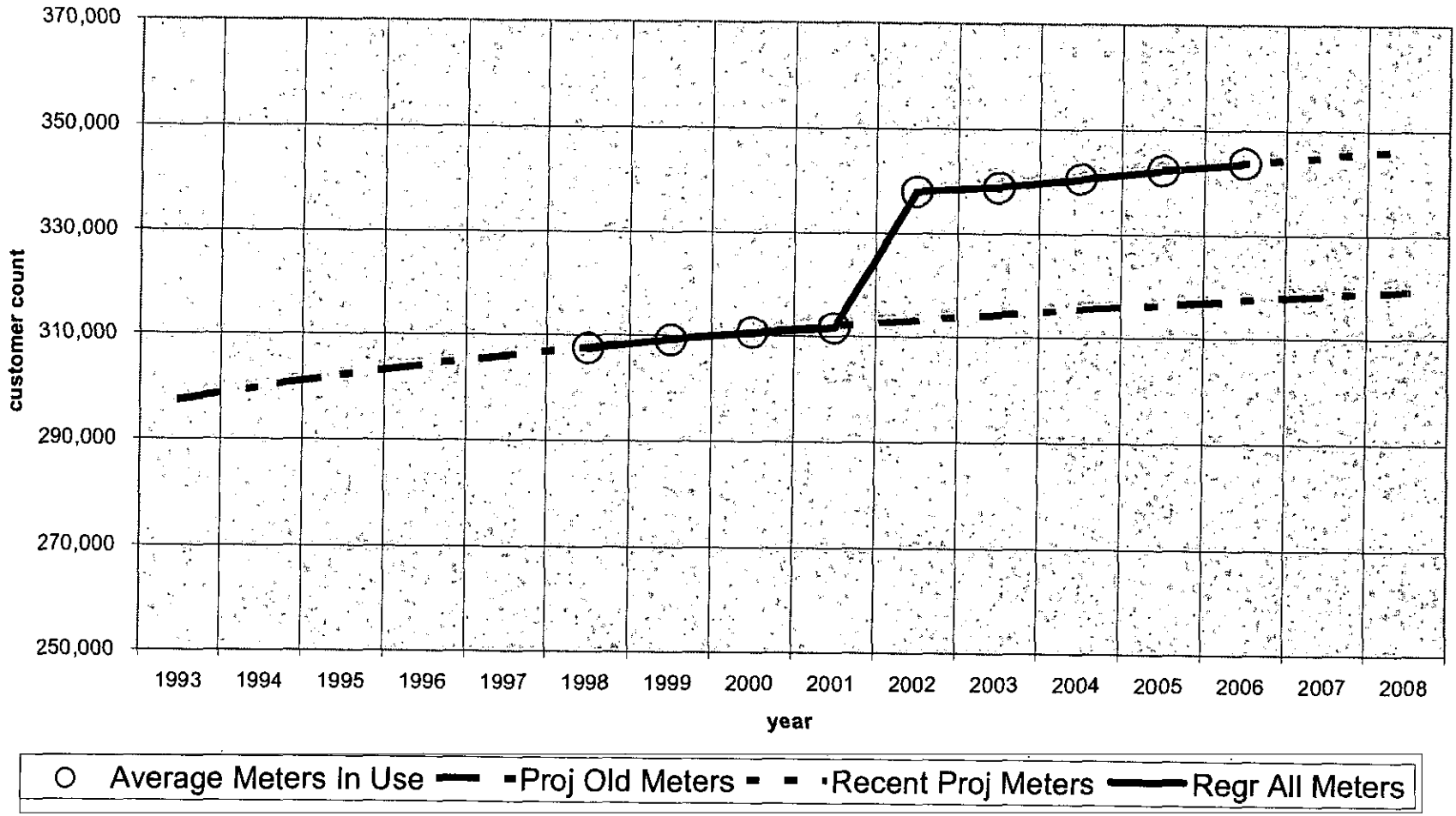
A. Yes, it does.

Missouri-American Water Company
St. Louis County Operational District (SLCW)
Total Residential and Commercial Customers Vs. Annual Average Meters In Use



Revised Schedule 1-1

Mid American Water Company
Case No. WR-2003-0500
Projections of Existing and Added Customers
On Exponential Growth Curves



Supplemental Schedule 1-1

	St. Louis Quarterly Residential				Yr of log fr 1986							
Year	Meters In Use At Beginning Of Year	Meters In Use At End Of Year	Average Meters In Use	inewmtr	LOGN(Year-1986)	newlog	I2003	Regr All Meters	Proj Old Meters	Proj New Meters	Recent Proj Meters	Projected Meters
1980												
1981												
1982												
1983												
1984												
1985												
1986												
1987												
1988												
1989												
1990												
1991												
1992	Meters In Use At Beginning Of Year	Meters In Use At End Of Year	Average Meters In Use	inewmtr	LOGN(Year-1986)	newlog	I2003	Regr All Meters	Proj Old Meters	Proj New Meters	Recent Proj Meters	Projected Meters
1993				0	1.946	0.000	0		297,223	0		297223
1994				0	2.079	0.000	0		299791	0		299791
1995				0	2.197	0.000	0		302056	0		302056
1996				0	2.303	0.000	0		304082	0		304082
1997				0	2.398	0.000	0		305915	0		305915
1998	306619.0	308,238	307,429	0	2.485	0.000	-0.5	307,328	307589	0		307589
1999	308238.0	309,873	309,056	0	2.565	0.000	0	309,128	309128	0		309128
2000	309858.0	311,368	310,613	0	2.639	0.000	0	310,553	310553	0		310553
2001	311368.0	311,707	311,538	0	2.708	0.000	-0.5	311,619	311880	0		311880
2002	337970.0	337,990	337,980	1	2.773	2.773	1	338,006	313121	24859	337980	337980
2003	337990.0	339,628	338,809	1	2.833	2.833	-0.5	338,923	314287	24522	338809	338809
2004	339628.0	341,506	340,567	1	2.890	2.890	-0.5	340,524	315386	25181	340567	340567
2005	341506.0	343,165	342,336	1	2.944	2.944	0	342,300	316426	25909	342336	342336
2006	343165.0	344,418	343,792	1	2.996	2.996	0	343,737	317412	26379	343792	343792
2007				1	3.045	3.045	0	345,104	318351	26753	345104	345104
2008				1	3.091	3.091	0	346,407	319245	27162	346407	346407

SUMMARY OUTPUT

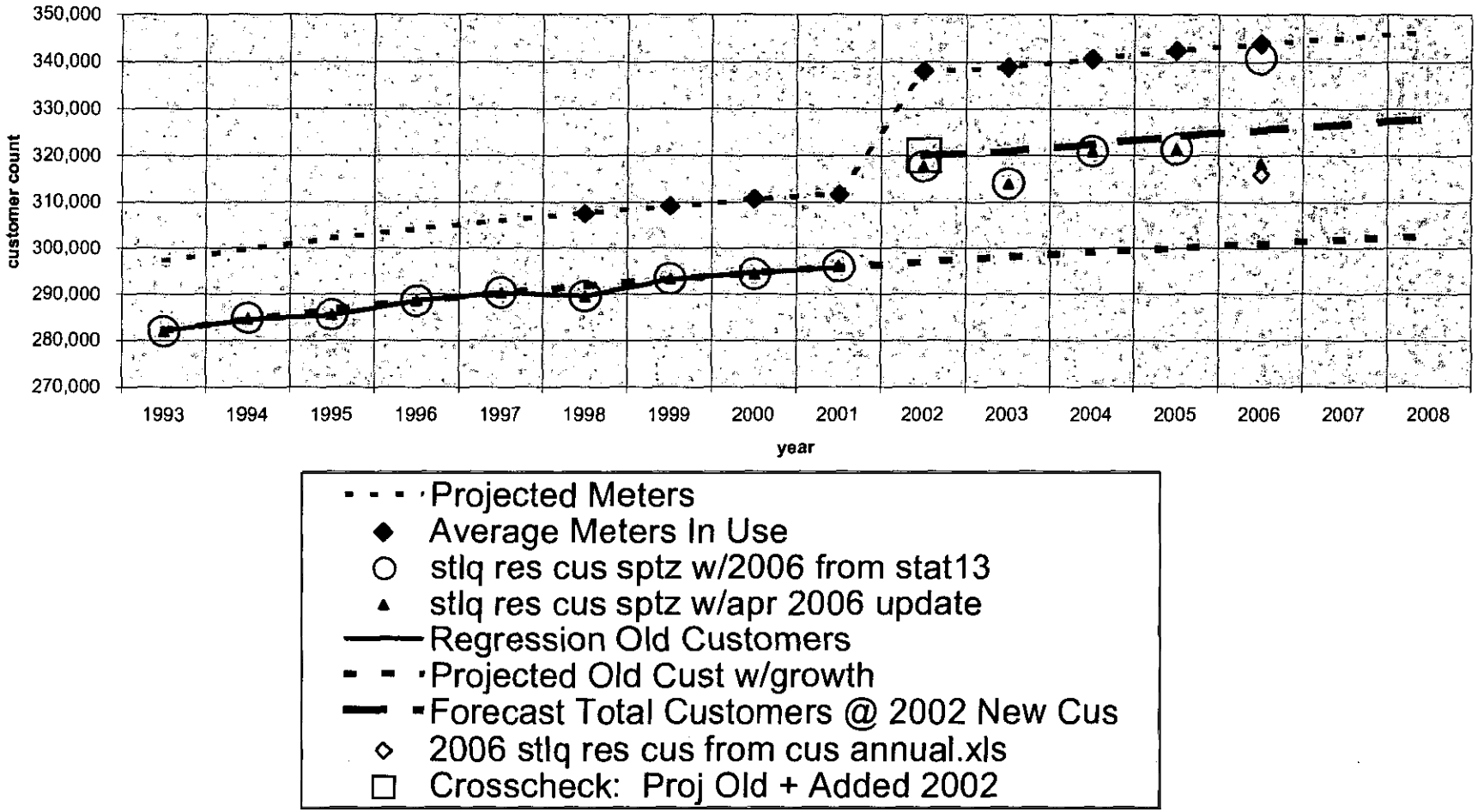
Regression Statistics	
Multiple R	0.999989574
R Square	0.999979148
Adjusted R Square	0.999966637
Standard Error	95.21307747
Observations	9

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	2173747909	724582636.2	79927.22173	4.04473E-12
Residual	5	45327.65061	9065.530122		
Total	8	2173793236			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	259801.2519	1110.721935	233.9030533	2.71044E-11	256946.0503	262656.4536
X Variable 1	19231.08258	429.0878313	44.8185224	1.044E-07	18128.0772	20334.08797
X Variable 2	8787.277322	50.50819821	173.9772479	1.19039E-10	8657.441865	8917.112779
X Variable 3	521.3439728	74.24395555	7.022039288	0.000903578	330.4938093	712.1941363

Mid American Water Company
Case No. WR-2003-0500
St. Louis County Water Quarterly Residential Customers
Projections of Existing and Added Customers
On Exponential Growth Curves



Supplemental Schedule 2

Missouri-American Water Company Case No. WR-2007-0216
Staff's Weather Normalized Usage Per Customer Per Day
For The Company's Four Largest Operations
Based On 1971-2000 Normal Weather

District	Billing	Center Of 12-Month Period	Residential Customers	Residential GCD	Residential Mgallons	Commercial Customers	Commercial GCD	Commercial Mgallons	Combined Customers	Combined Mgallons
Joplin	Monthly	30-Jun-06	20,251	173.37	1,282,326	3,125	860.29	982,024	23,376	2,264,350
St. Charles	Monthly	30-Jun-06	28,406	273.63	2,839,002	956	1237.30	431,969	29,361	3,270,971
St. Joseph	Monthly	30-Jun-06	28,431	159.62	1,657,531	2,950	787.00	847,844	31,380	2,505,375
St. Louis County	Quarterly	30-Jun-06	325,487	272.51	32,397,461	17,927	1169.24	7,655,947	343,414	40,053,409
Sums		**30-Jun-06**	**402,574**	**259.63**	**38,176,320**	**24,957**	**1087.99**	**9,917,785**	**427,532**	**48,094,105**
Joplin	Monthly	31-Dec-06	20,393	170.94	1,273,173	3,127	860.29	982,457	23,520	2,255,630
St. Charles	Monthly	31-Dec-06	28,598	273.63	2,858,225	963	1231.75	433,191	29,561	3,291,417
St. Joseph	Monthly	31-Dec-06	28,511	158.12	1,646,572	2,913	780.35	830,365	31,424	2,476,937
St. Louis County	Quarterly	31-Dec-06	326,099	272.27	32,429,149	17,968	1181.92	7,756,743	344,067	40,185,892
Sums		**31-Dec-06**	**403,602**	**259.18**	**38,207,119**	**24,970**	**1096.75**	**10,002,756**	**428,572**	**48,209,875**
Joplin	Monthly	31-May-07	20,512	168.92	1,265,546	3,128	860.29	982,818	23,640	2,248,364
St. Charles	Monthly	31-May-07	28,758	273.63	2,874,245	969	1227.12	434,210	29,727	3,308,455
St. Joseph	Monthly	31-May-07	28,578	156.87	1,637,440	2,883	774.81	815,798	31,461	2,453,238
St. Louis County	Quarterly	31-May-07	326,610	272.06	32,455,555	18,001	1192.49	7,840,739	344,611	40,296,294
Sums		**31-May-07**	**404,459**	**258.80**	**38,232,786**	**24,981**	**1104.05**	**10,073,565**	**429,439**	**48,306,351**
Joplin	Monthly	30-Jun-07	20,536	168.52	1,264,020	3,128	860.29	982,890	23,664	2,246,910
St. Charles	Monthly	30-Jun-07	28,790	273.63	2,877,449	970	1226.20	434,413	29,760	3,311,863
St. Joseph	Monthly	30-Jun-07	28,592	156.62	1,635,613	2,877	773.70	812,885	31,468	2,448,498
St. Louis County	Quarterly	30-Jun-07	326,712	272.02	32,460,836	18,008	1194.61	7,857,539	344,720	40,318,375
Sums		**30-Jun-07**	**404,630**	**258.73**	**38,237,919**	**24,983**	**1105.51**	**10,087,727**	**429,613**	**48,325,646**

Revised Schedule 2-1

Missouri-American Water Company
Case No. WR-2007-0216
Projected Actual Residential Sales For Joplin, St. Charles, St. Joseph and St. Louis County Quarterly Customers

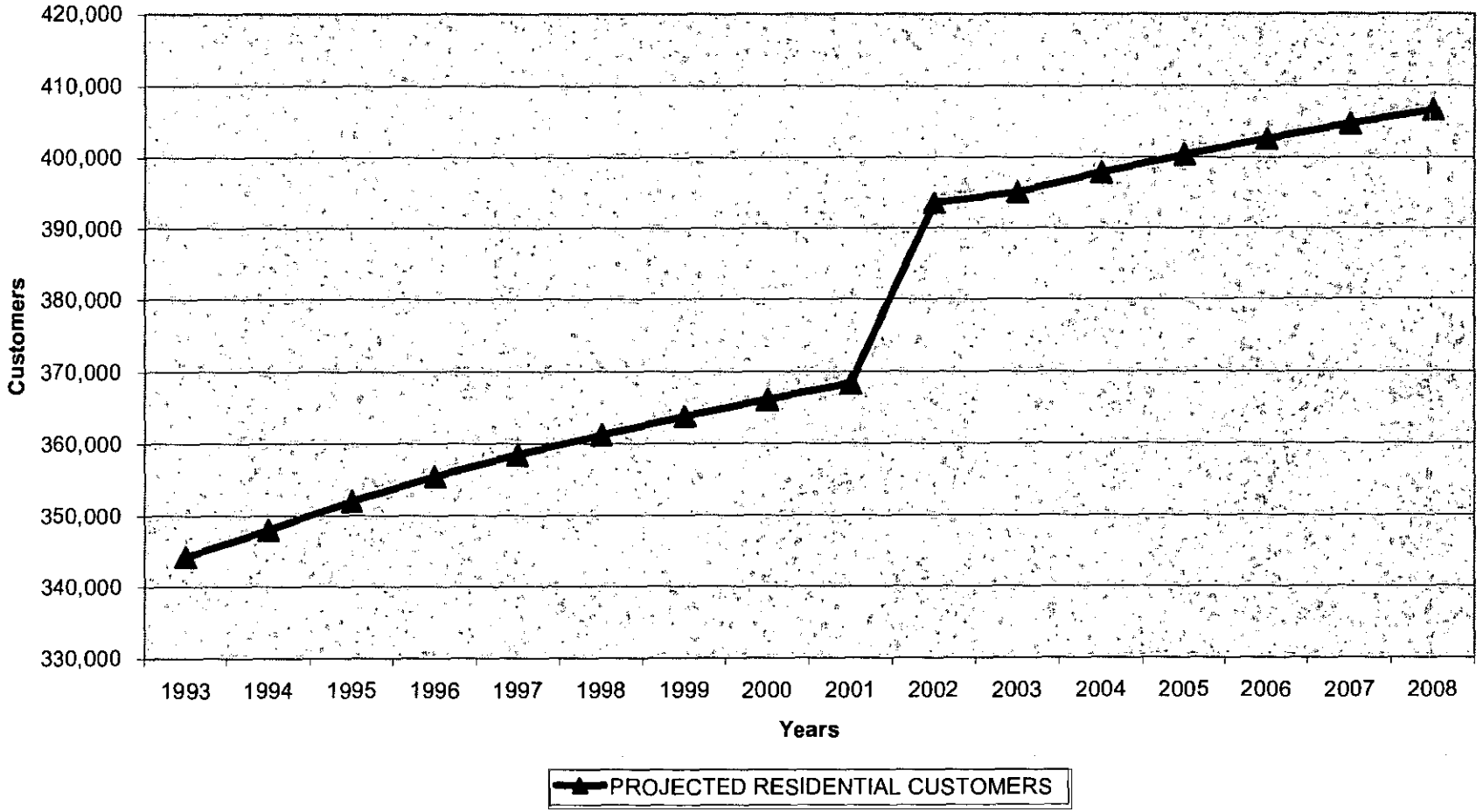
BILLING YEAR	PROJECTED ACTUAL RESIDENTIAL MGALLONS	PROJECTED RESIDENTIAL CUSTOMERS	NOMINAL BILLING DAYS	PROJECTED ACTUAL RESIDENTIAL GCD
1993	31,298,906	344,238	365.25	248.93
1994	34,470,747	347,934	365.25	271.25
1995	33,866,451	352,015	365.25	263.40
1996	34,075,642	355,447	365.25	262.47
1997	35,397,641	358,456	365.25	270.36
1998	33,484,463	361,200	365.25	253.81
1999	36,334,549	363,744	365.25	273.48
2000	35,390,446	366,075	365.25	264.68
2001	36,135,008	368,317	365.25	268.61
2002	38,007,014	393,521	365.25	264.43
2003	36,588,614	395,068	365.25	253.56
2004	37,795,298	397,813	365.25	260.12
2005	39,633,006	400,339	365.25	271.04
2006	40,068,090	402,574	365.25	272.50
2007	**38,237,919**	**404,630**	**365.25**	**258.73**
2008	**38,292,509**	**406,632**	**365.25**	**257.82**

Missouri-American Water Company
Case No. WR-2007-0216
Projected Normal Residential Sales For Joplin, St. Charles, St. Joseph and St. Louis County Quarterly Customers

BILLING YEAR	PROJECTED NORMAL RESIDENTIAL MGALLONS	PROJECTED RESIDENTIAL CUSTOMERS	NOMINAL BILLING DAYS	PROJECTED NORMAL RESIDENTIAL GCD
1993	34,094,019	344,238	365.25	271.16
1994	34,419,338	347,934	365.25	270.84
1995	34,779,128	352,015	365.25	270.50
1996	35,077,531	355,447	365.25	270.19
1997	35,334,363	358,456	365.25	269.88
1998	35,532,805	361,200	365.25	269.33
1999	35,709,593	363,744	365.25	268.78
2000	35,864,771	366,075	365.25	268.23
2001	35,968,379	368,317	365.25	267.37
2002	37,829,658	393,521	365.25	263.19
2003	37,869,053	395,068	365.25	262.44
2004	37,992,986	397,813	365.25	261.48
2005	38,097,818	400,339	365.25	260.54
2006	38,176,320	402,574	365.25	259.63
2007	**38,237,919**	**404,630**	**365.25**	**258.73**
2008	**38,292,509**	**406,632**	**365.25**	**257.82**

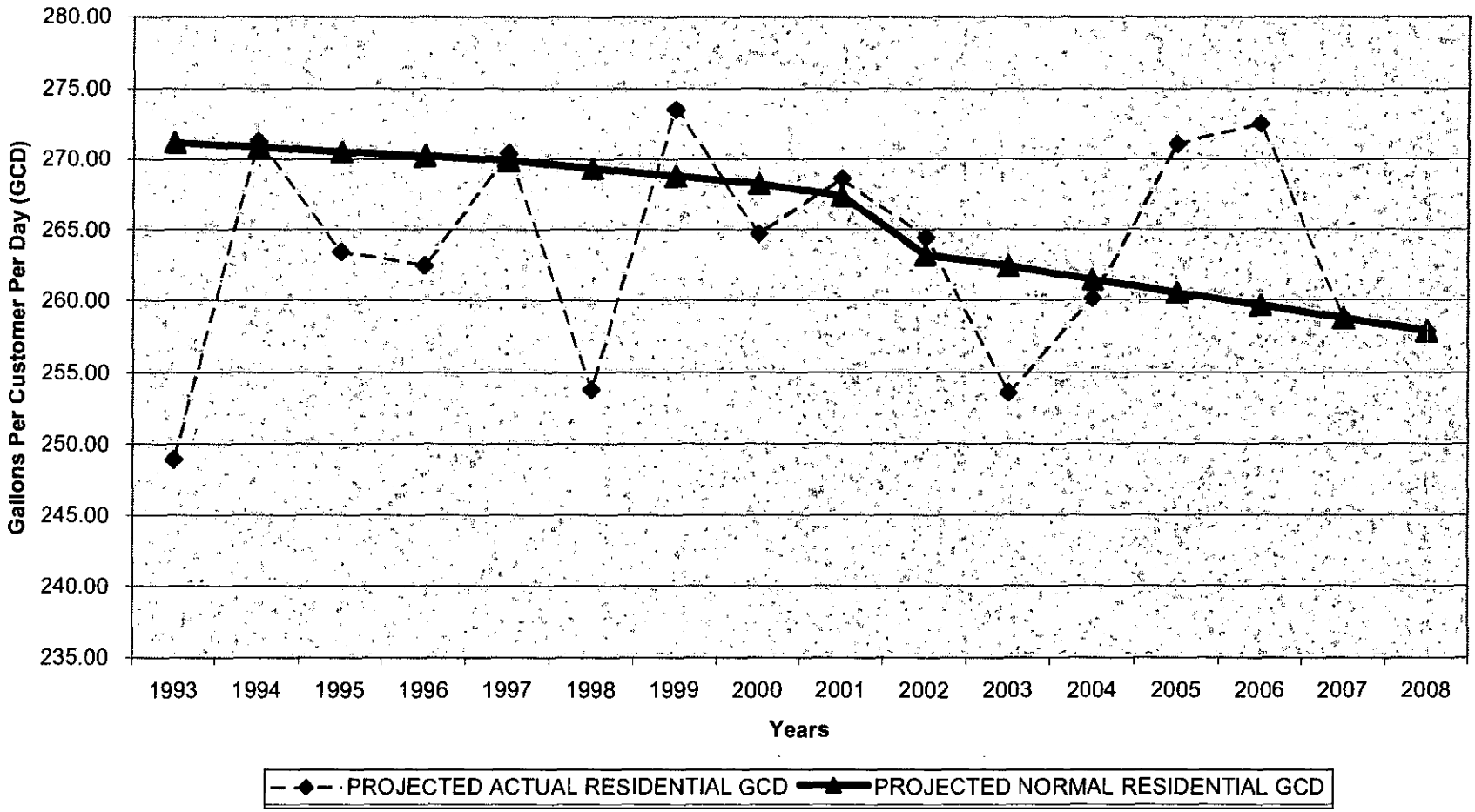
Revised Schedule 2-2

Missouri-American Water Company
Case No. WR-2007-0216
Projected Residential Customers For Joplin, St. Charles,
St. Joseph and St. Louis County Quarterly Customers



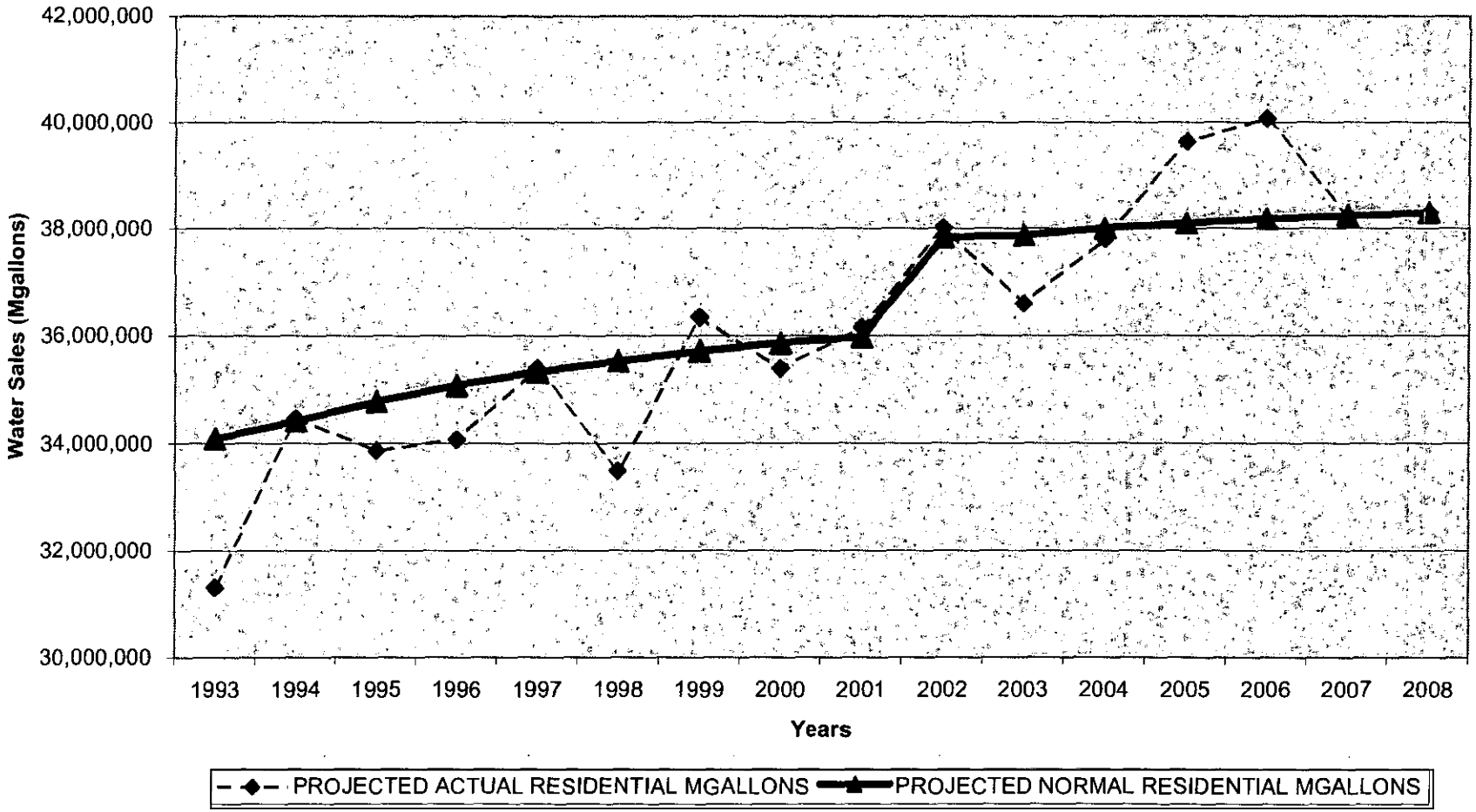
Revised Schedule 2-3

Missouri-American Water Company
Case No. WR-2007-0216
Projected Residential Gallons Per Customer Per Day (GCD) For
Joplin, St. Charles, St. Joseph and St. Louis County Quarterly Customers



Revised Schedule 2-4

Missouri-American Water Company
Case No. WR-2007-0216
Projected Residential Water Sales (Mgallons) For Joplin, St. Charles,
St. Joseph and St. Louis County Quarterly Customers



Revised Schedule 2-5

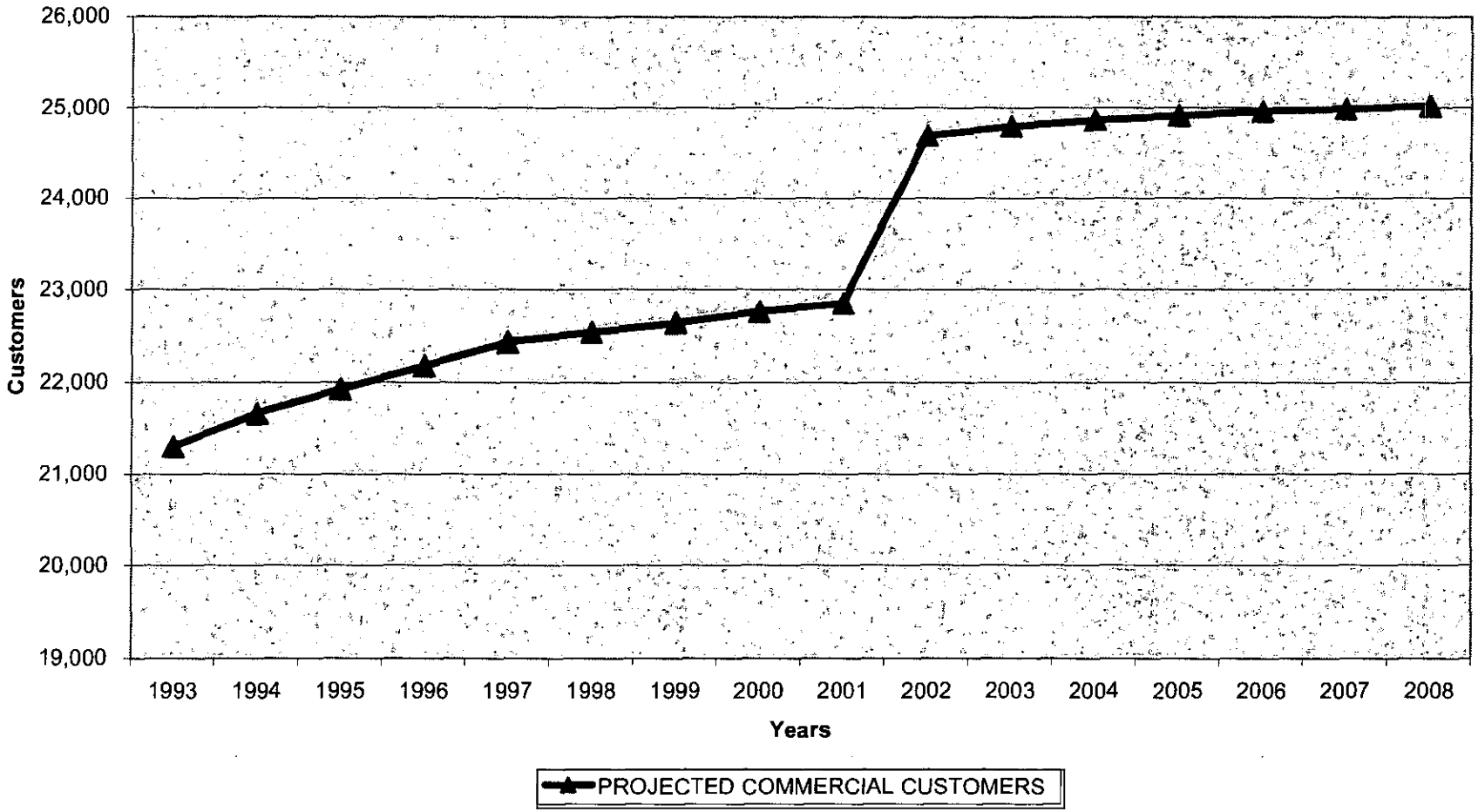
Missouri-American Water Company
Case No. WR-2007-0216
Projected Actual Commercial Sales For Joplin, St. Charles, St. Joseph and St. Louis County Quarterly Customers

BILLING YEAR	PROJECTED ACTUAL COMMERCIAL MGALLONS	PROJECTED COMMERCIAL CUSTOMERS	NOMINAL BILLING DAYS	PROJECTED ACTUAL COMMERCIAL GCD
1993	7,378,578	21,299	365.25	948.46
1994	7,442,177	21,662	365.25	940.63
1995	7,364,809	21,921	365.25	919.84
1996	7,483,560	22,177	365.25	923.90
1997	7,793,334	22,428	365.25	951.38
1998	7,940,788	22,533	365.25	964.84
1999	8,407,152	22,634	365.25	1,016.95
2000	8,372,268	22,757	365.25	1,007.26
2001	8,544,983	22,851	365.25	1,023.81
2002	9,266,618	24,691	365.25	1,027.51
2003	9,035,434	24,793	365.25	997.76
2004	9,553,265	24,857	365.25	1,052.24
2005	10,004,639	24,911	365.25	1,099.57
2006	10,554,922	24,957	365.25	1,157.88
2007	**10,087,727**	**24,983**	**365.25**	**1,105.51**
2008	**10,264,342**	**25,018**	**365.25**	**1,123.30**

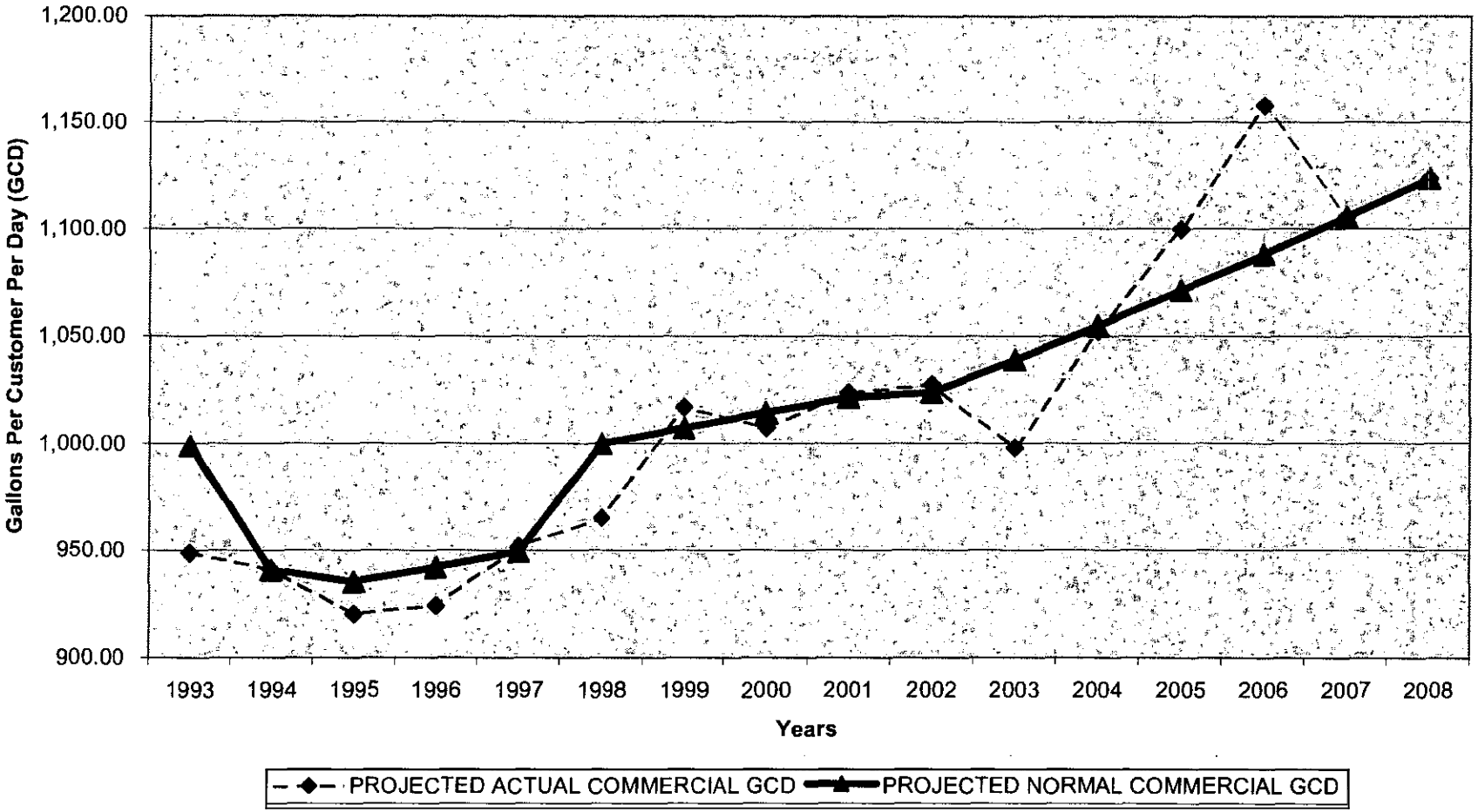
Missouri-American Water Company
Case No. WR-2007-0216
Projected Normal Commercial Sales For Joplin, St. Charles, St. Joseph and St. Louis County Quarterly Customers

BILLING YEAR	PROJECTED NORMAL COMMERCIAL MGALLONS	PROJECTED COMMERCIAL CUSTOMERS	NOMINAL BILLING DAYS	PROJECTED NORMAL COMMERCIAL GCD
1993	7,770,415	21,299	365.25	998.83
1994	7,441,380	21,662	365.25	940.53
1995	7,485,618	21,921	365.25	934.93
1996	7,627,773	22,177	365.25	941.70
1997	7,774,542	22,428	365.25	949.08
1998	8,228,731	22,533	365.25	999.82
1999	8,327,544	22,634	365.25	1,007.32
2000	8,432,329	22,757	365.25	1,014.48
2001	8,527,235	22,851	365.25	1,021.69
2002	9,235,313	24,691	365.25	1,024.04
2003	9,409,002	24,793	365.25	1,039.02
2004	9,576,462	24,857	365.25	1,054.80
2005	9,745,917	24,911	365.25	1,071.14
2006	9,917,785	24,957	365.25	1,087.99
2007	**10,087,727**	**24,983**	**365.25**	**1,105.51**
2008	**10,264,342**	**25,018**	**365.25**	**1,123.30**

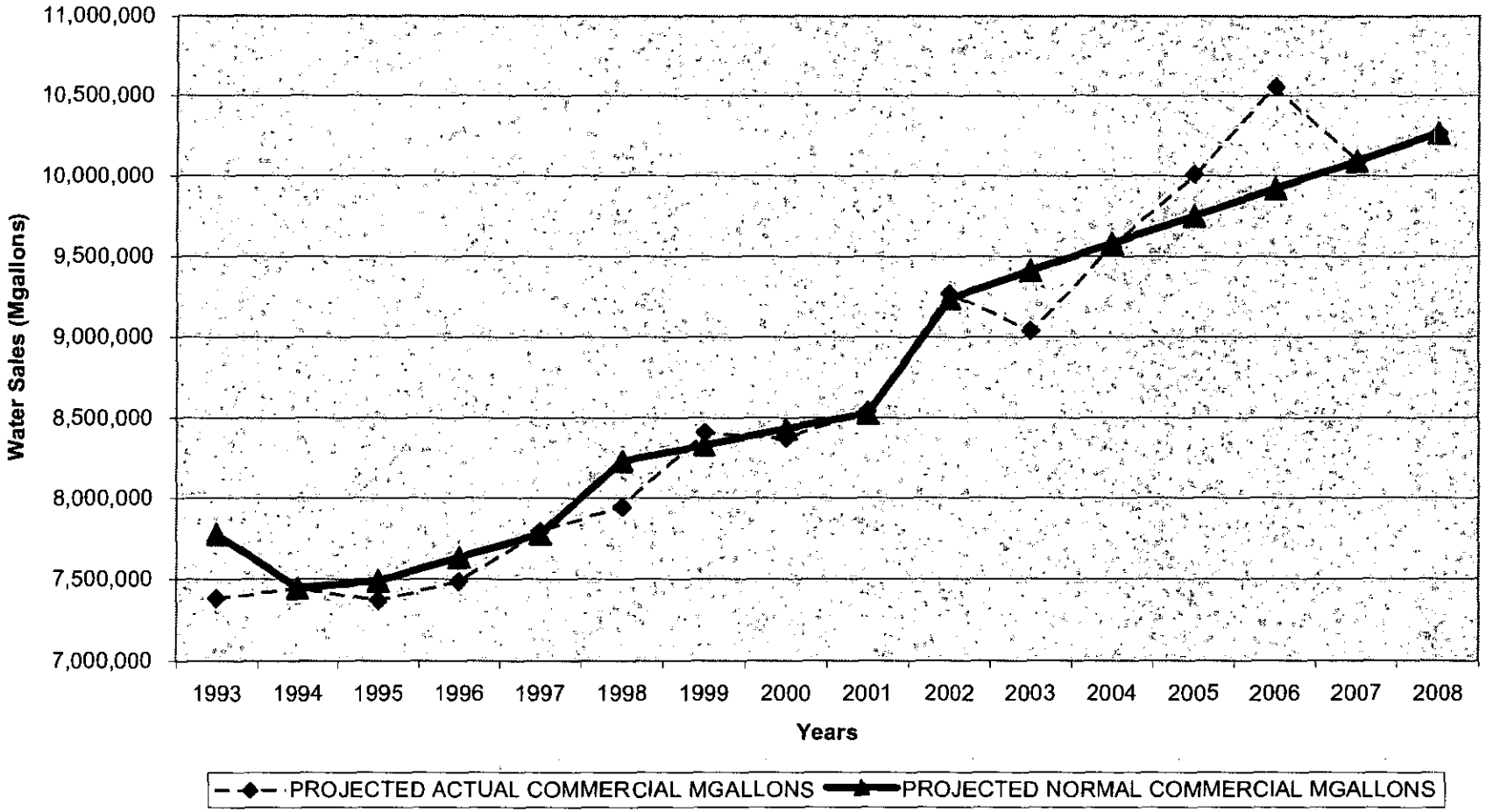
Missouri-American Water Company
Case No. WR-2007-0216
Projected Commercial Customers For Joplin, St. Charles,
St. Joseph and St. Louis County Quarterly Customers



Missouri-American Water Company
Case No. WR-2007-0216
Projected Commercial Water Gallons Per Customer Per Day For Joplin, St. Charles, St. Joseph and St. Louis County Quarterly Customers



Missouri-American Water Company
Case No. WR-2007-0216
Projected Commercial Water Sales (Mgallons) For Joplin, St. Charles, St. Joseph and St. Louis County Quarterly Customers



Revised Schedule 2-9

St. Louis Quarterly Residential

Year	stlq res cus aptz w/2006 from stat1	stlq res cus aptz w/apr 2006 update	2006 stlq res cus from cus annual.xls	Inewcus	Proj Old Meters	Proj New Meters	Projected Meters	Dummies	2002 Florissant & Webster Groves	Projected Old Cust w/growth	Calc New Cust	Regression Old Customers	Forecast Total Customers @ 2002 New Cus	Smoothed Total Customers	Crosscheck: Proj Old + Added 2002
1980															
1981															
1982															
1983															
1984															
1985															
1986															
1987															
1988															
1989															
1990															
1991															
1992	stlq res cus aptz w/2006 from stat1	stlq res cus aptz w/apr 2006 update	2006 stlq res cus from cus annual.xls	Inewcus	Proj Old Meters	Proj New Meters	Projected Meters	Dummies		Projected Old Cust w/growth	Calc New Cust	Regression Old Customers	Forecast Total Customers @ 2002 New Cus	Smoothed Total Customers	Crosscheck: Proj Old + Added 2002
1993	281890.5	281,891		0	297,223	0	297,223	0.0		282089	0	282089		282,089	
1994	284722.0	284,722		0	299,791	0	299,791	0.0		284491	0	284491		284,491	
1995	285442.8	285,443		0	302,056	0	302,056	0.5		286610	0	285474		286,810	
1996	288511.5	288,512		0	304,082	0	304,082	0.5		288505	0	286505		286,505	
1997	290306.0	290,306		0	305,915	0	305,915	0.0		290220	0	290220		290,220	
1998	289530.3	289,530		0	307,589	0	307,589	1.0		291785	0	289514		291,785	
1999	293280.3	293,280		0	309,128	0	309,128	0.0		293225	0	293225		293,225	
2000	294285.5	294,286		0	310,553	0	310,553	0.0		294558	0	294558		294,558	
2001	295906.0	295,906		0	311,880	0	311,880	0.0		295799	0	295799		295799	
2002	317639.3	317,639		1	313,121	24,659	337,980		23100	298960	23100		320060	320,060	320060
2003	313914.0	313,914		1	314,287	24,522	338,809			298051	22787		320838	320,838	
2004	320881.0	320,881		1	315,386	25,181	340,567			299079	23399		322478	322,478	
2005	321348.5	321,347		1	316,426	25,909	342,336			300051	24078		324128	324,128	
2006	340686.8	318,372	315,905	1	317,412	26,379	343,792			300974	24513		325487	325,487	
2007				1	318,351	26,753	345,104			301882	24880		326712	326,712	
2008				1	319,246	27,162	346,407			302689	25240		327929	327,929	

324,988

92.92%

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.999462184
R Square	0.998924657
Adjusted R Square	0.998566209
Standard Error	177.9875882
Observations	8

ANOVA

	df	SS	MS	F	Significance F
Regression	2	176569764	88284881.99	2786.807391	1.24349E-09
Residual	5	190077.4893	31879.58155		
Total	8	176759841.5			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4060.994162	3858.104513	1.052587909	0.333062263	-5379.447476	13501.4358	-5379.447476	13501.4358
Projected Meters	0.935417597	0.012636848	74.0230301	4.09124E-10	0.90449635	0.966338844	0.90449635	0.966338844
Dummies	-2270.492847	178.1386601	-12.74564907	1.43142E-05	-2708.382445	-1834.603249	-2708.382445	-1834.603249

Revised Schedule 4-7

ST LOUIS COUNTY WATER COMPANY (QUARTERLY RESIDENTIAL) WR-2007-0216

YYYY	GCD(Old Cus)	SHORT	NSHORT	DNSHORT	Trend 2006	old swaps	Regression Line	Residual	Dummy Adj	Wx Adjusted	wx adjusted 2006	Hot&Dry: 1988	Cool&Wet: 199
1990	278.8	5.62	6.43	-0.81	(15.00)	-	279.07	(0.22)	271.94	284.61		309.03	260.55
1991	293.7	8.21	6.43	1.78	(14.00)	(1.00)	293.54	0.16	290.41	284.54		308.97	260.49
1992	290.5	6.47	6.43	0.04	(13.00)	1.50	289.58	0.91	278.00	284.85		309.27	260.79
1993	255.6	3.06	6.43	-3.37	(12.00)	(1.00)	255.88	(0.26)	253.65	283.24		307.66	259.18
1994	286.1	6.48	6.43	0.05	(11.00)	1.00	286.98	(0.87)	278.07	282.18		306.60	258.12
1995	274.8	5.38	6.43	-1.04	(10.00)	-	275.16	(0.32)	270.26	282.28		306.71	258.23
1996	277.6	5.26	6.43	-1.17	(9.00)	1.00	277.37	0.22	269.36	282.37		306.80	258.32
1997	280.2	6.67	6.43	0.24	(8.00)	(1.00)	279.89	0.28	279.44	281.99		306.41	257.93
1998	264.3	4.01	6.43	-2.42	(7.00)	-	263.97	0.28	260.41	281.54		305.97	257.49
1999	287.2	7.14	6.43	0.71	(6.00)	0.50	287.67	(0.46)	282.77	280.36		304.79	256.31
2000	274.3	5.74	6.43	-0.68	(5.00)	(0.50)	273.71	0.59	272.81	280.97		305.39	256.91
2001	281.1	6.63	6.43	0.20	(4.00)	-	281.39	(0.31)	279.16	278.62		304.04	255.56
2002		6.42	6.43	-0.01	(3.00)	-	279.40				279.48	303.91	255.43
2003		4.92	6.43	-1.51	(2.00)	-	268.28				279.04	303.46	254.98
2004		6.26	6.43	-0.16	(1.00)	-	277.43				278.59	303.02	254.54
2005		8.09	6.43	1.66	-	-	290.03				278.15	302.57	254.09
2006		8.40	6.43	1.98	-	-	291.81				277.70	302.12	253.65
2007		6.43	6.43	0.00	1.00	-					277.26		
2008		6.43	6.43	0.00	2.00	-					276.81		

	Max h2o Gain	Drainage Rate	H2O Needs (In)
5.00	0.42	2.00%	0.07

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.998949
R Square	0.9979
Adjusted R Square	0.997112
Standard Error	0.578721
Observations	12

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	1273.165	424.3885	1267.141	4.783E-11
Residual	8	2.679344	0.334918		
Total	11	1275.845			

	Coefficients	*standard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	277.7019	0.539939	514.3205	2.29E-19	276.45676	278.946955	276.4567604	278.947
DNSHORT	7.139574	0.126838	56.37791	1.09E-11	6.8475463	7.431600786	6.847546299	7.431601
Trend 2006	-0.445485	0.048431	-9.19799	1.58E-05	-0.5571459	-0.33378332	-0.55714587	-0.33378
old swaps	3.558829	0.209324	17.0015	1.45E-07	3.0761261	4.041532362	3.076126112	4.041532

Revised Schedule 6-7

MISSOURI-AMERICAN WATER COMPANY RATE CASE NO. WR-2007-0216

PROJECTIONS OF CUSTOMER COUNTS, ACTUAL AND NORMAL GCD AND ACTUAL AND NORMAL MGALLONS FOR ST LOUIS COUNTY QUARTERLY RESIDENTIAL CUSTOMERS

YYYY	Staff Forecast GCD (Normal Wx, Old+New Cus Behavior)	Staff Forecast GCD (Hist Wx, Old+New Cus Behavior)	Historical Old Customer Count + Est New Cust Count (Smoothed 1993 Fwd)	Staff Forecast Mgal (Normal Wx, Old+New Cus, Old+New Cus Behaviors)	Staff Forecast Mgal (Hist Wx, Old+New Cus, Old+New Cus Behaviors)	SHORT	NSHORT	DNSHORT	Projected Meters	MAWC Wx Normalized GCD	MAWC Cust Count, No Smoothing	Forecast MWAC MGAL (Spitz N Wx, Spitz Cus Count)	Backcast MWAC MGAL (Spitz N Wx, Smoothed Old + New Cus Count)
1970						5.68	6.43	-0.75					
1971	285.27	293.01	272,751	28,419,755	29,190,469	7.51	6.43	1.08					
1972	285.27	291.07	272,751	28,419,755	28,997,248	7.24	6.43	0.81					
1973	285.27	282.11	272,751	28,419,755	28,104,579	5.98	6.43	-0.44					
1974	285.27	281.65	272,751	28,419,755	28,058,770	5.92	6.43	-0.51					
1975	285.27	273.90	272,751	28,419,755	27,286,442	4.83	6.43	-1.59					
1976	285.27	298.34	272,751	28,419,755	29,721,751	8.26	6.43	1.83					
1977	285.27	290.02	272,751	28,419,755	28,892,799	7.09	6.43	0.67					
1978	285.27	283.88	272,751	28,419,755	28,280,458	6.23	6.43	-0.20					
1979	285.27	290.49	272,751	28,419,755	28,938,875	7.16	6.43	0.73					
1980	285.27	300.27	272,751	28,419,755	29,913,204	8.53	6.43	2.10					
1981	285.27	272.34	272,751	28,419,755	27,131,159	4.62	6.43	-1.81					
1982	285.27	271.62	272,751	28,419,755	27,059,927	4.52	6.43	-1.91					
1983	285.27	290.03	272,751	28,419,755	28,893,164	7.09	6.43	0.67					
1984	285.27	288.13	272,751	28,419,755	28,704,427	6.83	6.43	0.40					
1985	285.27	276.35	272,751	28,419,755	27,530,921	5.18	6.43	-1.25					
1986	285.27	291.40	272,751	28,419,755	29,029,934	7.28	6.43	0.86					
1987	285.27	298.15	272,751	28,419,755	29,702,724	8.23	6.43	1.80					
1988	285.27	309.70	272,751	28,419,755	30,852,826	9.85	6.43	3.42					
1989	285.27	285.35	272,751	28,419,755	28,426,906	6.44	6.43	0.01					
1990	284.83	279.07	272,751	28,375,376	27,801,840	5.62	6.43	-0.81					
1991	284.38	297.09	275,713	28,638,587	29,918,586	8.21	6.43	1.78					
1992	283.94	284.24	278,976	28,932,127	28,963,007	6.47	6.43	0.04					
1993	283.49	259.44	282,089	29,209,107	26,730,473	3.06	6.43	-3.37	297,223				
1994	283.05	283.42	284,491	29,411,547	29,450,246	6.48	6.43	0.05	299,791				
1995	282.60	275.16	286,610	29,583,963	28,804,873	5.38	6.43	-1.04	302,056	-	285,443	-	-
1996	282.16	273.81	288,505	29,732,659	28,853,140	5.26	6.43	-1.17	304,082	-	288,512	-	-
1997	281.71	283.45	290,220	29,862,136	30,045,997	6.67	6.43	0.24	305,915	-	290,306	-	-
1998	281.27	263.97	291,785	29,975,717	28,132,967	4.01	6.43	-2.42	307,589	-	289,530	-	-
1999	280.82	285.89	293,225	30,075,932	30,618,967	7.14	6.43	0.71	309,128	-	293,280	-	-
2000	280.37	275.48	294,558	30,164,745	29,638,676	5.74	6.43	-0.68	310,553	-	294,286	-	-
2001	279.93	281.39	295,799	30,243,715	30,401,088	6.63	6.43	0.20	311,880	-	295,906	-	-
2002	274.48	274.40	320,060	32,087,140	32,077,696	6.42	6.43	-0.01	337,980	-	317,639	-	-
2003	274.12	263.55	320,838	32,123,159	30,884,590	4.92	6.43	-1.51	338,809	-	313,914	-	-
2004	273.58	272.44	322,478	32,223,342	32,089,186	6.26	6.43	-0.16	340,567	-	320,881	-	-
2005	273.02	284.68	324,128	32,322,357	33,702,861	8.09	6.43	1.66	342,336	-	321,347	-	-
2006	**272.51**	286.35	325,487	32,397,461	34,042,943	8.40	6.43	1.98	343,792	-	318,372	-	-
2007	272.02	272.02	326,712	32,460,836	32,460,836	6.43	6.43	0.00	345,164	-	318,372	0	0
2008	271.52	271.52	327,929	32,522,169	32,522,169	6.43	6.43	0.00	346,407	-	318,372	0	0

Revised Schedule 7-7