Exhibit No. 2.1

Report on
Capacity Factors by Customer Class
for the
Illinois American Water Company

January 2009

Contents

Report on Capacity Factors by Customer Class

Introduction

Water rates are designed to recognize both the annual amount of water provided to a customer class and the relative peak demands placed on the system by each respective customer class. Peak system demands are typically expressed on a maximum day and maximum hour basis. Water treatment plants, pumping facilities, and transmission main systems must generally be designed to meet the maximum day requirements of the water system, and customer classes that require this extra capacity above average daily or base capacity needs must pay a proportionate share of the maximum day related costs. Similarly, adequate system storage capacity and distribution mains must typically be sufficient to meet the maximum hour demands on the system, and those customers that require this extra capacity above maximum day requirements must pay a proportionate share of the maximum hour related costs. A means of reasonably providing that each customer class pays its proportionate share of the system's base, maximum day extra capacity and maximum hour extra capacity costs is to conduct studies to determine the relative maximum day and maximum hour demands placed on the system by the various customer classes.

A method of determining relative customer class demands is to relate customer demands from billing system information to historic maximum day and maximum hour demands of the system, as set forth in Appendix A of the American Water Works Association (AWWA) Manual M1 titled "Principles of Water Rates, Fees, and Charges", Fifth Edition. The Illinois Commerce Commission (Commission) granted a "Joint Motion for Clarification" in which Illinois American Water Company (IAWC) and other parties sought approval for use of this methodology for purposes of this study. The method has been used to estimate capacity factors by customer class in this report for each of the six water rate areas consisting of: (1) Southern, Peoria, Streator, Pontiac, South Beloit (SPSPSB); (2) Champaign; (3) Chicago Metro; (4) Lincoln; (5) Pekin; and (6) Sterling. To clarify the reasonableness of capacity factors developed using this approach, the factors were compared to actual system demands and the results of prior IAWC rate case studies, including a study completed for Docket 07-0507, the "Docket 07-0507 Study". In the Docket 07-0507 Study, areas of the IAWC Interurban District serving typical customers in each customer class were isolated and demand meters provided daily and hourly measures of demand for each customer class for the year 2007.

Purpose

The purpose of this report is to present our findings of a detailed study of capacity factors by customer class. The report determines capacity factors by customer class for each district and, where required, consolidates those customer class capacity factors into a weighted average set of capacity

factors for each rate area. The procedures used in this study are based on the methodology outlined in Appendix A of AWWA's Manual M1.

Scope

This report develops proposed cost allocation factors for each of the six rate areas based on an analysis of historic maximum day and maximum hour demands to average day system ratios. It also develops customer class capacity factors based on the system demands for each district and analyses of monthly billed usage patterns for each customer class within the respective districts. These capacity factor values are tested for reasonableness using an acceptable range of diversity factors commonly indicated for other water utilities. Representative districts of each rate area were visited as part of this study to obtain first hand information about each system's operating statistics and characteristics about the customers and customer classes served in each rate area.

General Methodology

As previously noted, the methodology for estimating customer class demand factors follows the methodology outlined in AWWA's Manual M1, which is the water industry's standard manual for cost allocation and cost of service based rate design. A recent historic year was selected for analysis of customer demands in each district based on system data that produced the highest system maximum day to average day ratio for each respective district. Monthly customer class billing data for the selected year was analyzed to determine the average day usage within that year's maximum month for each customer class as well as the annual average day usage for each customer class. The system demands and relative customer class relationships between the average day for the maximum month and the average day for the year, combined with customer class adjustments for maximum day usage variations, were used to estimate maximum day demands by customer class for each district. Similarly, the relationships between each system's maximum hour and maximum day demands, combined with maximum hour to maximum day variation adjustments by customer class, were applied to the maximum day capacity factors to determine maximum hour capacity factors by customer class. These maximum day and maximum hour capacity factors by class were applied to projected average daily water usage by customer class for the twelve month period ending June 30, 2009, as previously prepared for Docket 07-0507, (test year) and summed to determine the maximum day and maximum hour non-coincidental demands for each district or consolidated rate area.

Coincidental demands for each district were determined by applying the historic maximum system coincidental demand ratios to test year average daily usage by customer class. Diversity factors were developed by dividing the maximum day and maximum hour non-coincidental demands by the respective coincidental demands for each system. Customer class capacity factors were viewed to be reasonable if the overall system maximum day and maximum hour diversity factors fell within a range of 1.10 to 1.40 as specified in the AWWA Manual M1. All rate areas with the exception of the Chicago Metro rate area have diversity factors within the specified range. The composite diversity factor for the Chicago Metro rate area approaches 1.0 because the rate area is primarily composed of residential customers and thus there is only a small difference between system

coincidental demand and residential class demand due to the small amount of commercial and other customers served in this rate area. Thus, for this rate area, a 1.0 diversity factor is deemed reasonable.

Summary of Findings and Results

Detailed analyses of historic system operating data and monthly billed water usage by customer class result in the capacity ratios summarized in Columns 1 through 6 of Table A. These ratios represent the additional maximum day and hour capacities above each customer classes' average daily usage requirements. For example, residential customers in the SPSPSB rate area require 205 percent of their average daily billed water usage to meet their maximum day demand and 255 percent of their average daily usage requirement to meet their maximum hour demand requirement.

Applying the indicated capacity ratios to test year average daily usage by customer class and comparing the resulting total maximum day and maximum hour non-coincidental demands to coincidental demands produces the diversity ratios shown in Column 7 of Table A which generally fall within the 1.10 to 1.40 range deemed typical for water utilities by the AWWA Manual M1. An exception to these criteria is the Chicago Metro rate area whose composite diversity factor approaches 1.0 due to a predominance of residential customers being served in the area and very little customer class diversity. In this situation, the non-coincidental system demand is almost equal to the residential class demands imposed on the regional system so there is very little difference between system demands and the residential customer class demands. This comparison verifies that the proposed capacity factors are reasonable in relation to the historic maximum day and maximum hour demands actually experienced by each rate area.

Table A
Customer Class Capacity Factors

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Customer Class Capacity Factors						
Line No	Rate Area	Residential	Commercial	Industrial	Other Public Authority	Other Water Utilities	Large Customers	Diversity Factors
		Maximum Day Capacity Factors						
1	SPSPSB	205%	175%	155%	180%	190%	140%	1.26
2	Champaign	215%	190%	135%	165%	185%	165%	1.21
3	Chicago Metro	220%	210%	140%	235%	155%		1.03
4	Lincoln	185%	155%	135%	135%			1.20
5	Pekin	220%	185%	145%	190%			1.21
6	Sterling	195%	180%	140%	170%			1.25
		Maximum Hour Capacity Factors						
7	SPSPSB	255%	200%	170%	190%	210%	150%	1.26
8	Champaign	265%	205%	140%	170%	190%	170%	1.22
9	Chicago Metro	315%	280%	170%	285%	155%		1.01
10	Lincoln	255%	190%	160%	160%			1.21
11	Pekin	280%	210%	160%	205%			1.22
12	Sterling	300%	250%	185%	220%			1.27

Plant Operating Statistics

Plant operating statistics were obtained from operating supervisors of districts within the six water rate areas. Historically, this data represents the average annual pumpage of each system and the maximum recorded daily pumpage. On-site interviews of operation personnel and follow-up investigations modified this data to eliminate main breaks and other abnormalities that influenced the reported maximum day pumpage. Maximum hour pumpage records for the maximum day were used in conjunction with analyses of the drawdown of applicable reservoirs during the maximum day to determine total maximum hour demand for each system. All operating supervisors reported that system maximum hour demands typically occur during the system's maximum day of water usage.

Historic Maximum Day to Average Day Ratios

To determine the historic year to use for developing system cost allocation factors and for analyzing customer class usage data, a comparison of historic maximum day to average day ratios for each system was prepared. Data reviewed for this analysis included the most recent six full years of data or calendar years 2003 through 2008. Table 1 below shows the development of system maximum day to average day ratios for each of the four districts that equate to a separate rate area as well as the largest district (Interurban and West Suburban) within each of the two rate areas (SPSPSB and Chicago Metro) composed of several districts. As indicated by Table 1, the largest maximum day demand does not always occur in the same year as the highest maximum day to average day ratio. The Champaign, Lincoln, and Pekin rate areas have maximum day to average day ratios occurring in different years than their respective highest maximum day demands.

A similar analysis for the largest districts in each of the SPSPSB and Chicago Metro rate areas was also conducted. For the SPSPSB rate area, the highest maximum day to average day ratios occurred in 2005 for Cairo and Streator; 2006 for Alton and Peoria; 2007 for Interurban and South Beloit; and 2008 for Pontiac. Some data was available for the relatively new Saunemin District (acquired by IAWC in 2004) but this district is so small (less than 0.05 percent of total SPSPSB average annual flow) that its impact would not alter the weighted average results of the other seven districts within the SPSPSB rate area. Therefore, data related to the Saunemin District is not considered in this report. Historic data for the six largest districts in the Chicago Metro rate area was deemed to be representative of the 24 districts within the rate area. Therefore, these six districts, which comprise about 85 to 90 percent of the rate area's total average day demands, were considered in the cost allocation factor analyses. These districts include Chicago Suburban, Fernway, Homer Township, Valley View, Waycinden, and West Suburban. The highest maximum day to average day ratio for each of these districts was indicated to be in 2005.

Table 1
Historic Maximum Day and Average Day Demands

Year	SPSPSB	Champaign	Chicago	Lincoln	Pekin	Sterling
	(a)		(b)			
			Maximum Day Demand - mgd			
2003	58.93	31.57	11.07	3.20	10.41	2.36
2004	55.32	28.74	9.29	2.79	10.38	2.22
2005	59.79	32.19	**15.06**	**3.40**	**10.84**	**2.45**
2006	56.40	33.32	9.88	3.09	10.35	2.11
2007	**59.94**	**34.01**	12.65	3.11	10.57	2.00
2008	50.79	29.43	9.61	2.61	9.11	1.95
			Average Day Demand - mgd			
2003	44.50	20.90	6.04	2.77	7.23	1.68
2004	43.87	21.29	6.32	2.59	7.31	1.57
2005	45.10	22.14	6.86	2.76	7.43	1.63
2006	43.94	21.00	6.35	2.49	7.06	1.65
2007	44.92	22.03	6.87	2.37	7.24	1.74
2008	41.83	20.73	6.48	2.18	6.55	1.64
			Ratio of Maximum Day to Average Day Demand			
2003	1.32	1.51	1.83	1.16	1.44	1.40
2004	1.26	1.35	1.47	1.08	1.42	1.41
2005	1.33	1.45	**2.20**	1.23	1.46	**1.50**
2006	1.28	**1.59**	1.56	1.24	**1.47**	1.28
2007	**1.33**	1.54	1.84	**1.31**	1.46	1.15
2008	**1.21**	1.42	1.48	**1.20**	1.39	1.19

mgd - million gallons per day

(a) Coincidental demands for the two water treatment plants serving the Interurban District.
(b) Demands for the West Suburban District within the Chicago Metro rate group.

Operating Statistics Summary

Plant operating statistics required for developing base extra capacity cost allocation factors and customer class capacity factors are summarized in Table 2. Line 1 of Table 2 shows the historic year indicated to have the highest maximum day to average day ratio for each rate area. Lines 2 through 6 shows data obtained from pumpage records for the years indicated by Line 1. Average day (AD) pumpage is shown on Line 2 in million gallons per day (mgd); maximum month of pumpage for the selected year is shown in thousand gallons (Mg) on Line 3; the estimated average day for the maximum month on Line 4; maximum day (MD) demand pumped on Line 5; and maximum hour (MH) pumped on Line 6. A review of water storage records available from the Supervisory Control and Data Acquisition (SCADA) system was made by IAWC staff to estimate the amount of storage drawdown (Line 7) during the maximum hour of pumpage. This flow was added to the maximum

hour of pumpage shown on Line 6 to determine the total maximum hour demand shown on Line 8 of Table 2. The ratio of the system's maximum hour (Line 8) to maximum day (Line 5) demand is shown on Line 9. The maximum day (Line 5) to average day for the maximum month (Line 4) ratio is shown on Line 10. Ratios that can be used for cost allocation purposes are shown on Lines 11 and 12 of Table 2. The maximum day to average day ratio shown on Line 11 is determined by dividing the maximum day demand (Line 5) by the average day demand (Line 2). Similarly, the maximum hour to average day ratio shown on Line 12 is determined by dividing the maximum hour demand (Line 8) by average day demand (Line 2).

Table 2
Summary of Operating Statistics

Line No.	Description	SPSPSB	Champaign	Chicago	Lincoln	Pekin	Sterling
				(a)			
1	Year of Maximum MD/AD Ratio	2005 - 2008	2006	2005	2007	2006	2005
2	AD Pumpage - mgd		21.004		2.373	7.055	1.632
3	Maximum Month - Mg		883,176		78,814	306,181	63,820
4	AD for Maximum Month -mgd		29.439		2.542	10.206	2.127
5	MD Demand - mgd		33.320		3.114	10.353	2.448
6	MH Pumped - mgd		33.350		3.937	11.976	3.004
7	MH Storage Contribution - mgd		4.689		0.000	0.106	0.577
8	MH Demand - mgd		38.039		3.937	12.082	3.581
9	MH/MD Ratio		1.142		1.264	1.167	1.463
10	MD/AD for Maximum Month	1.134	1.132	1.529	1.225	1.014	1.151
11	MD/AD Ratio	1.472	1.586	2.113	1.312	1.467	1.500
12	MH/AD Ratio	1.706	1.811	3.025	1.659	1.713	2.194

AD - Average Day
MD - Maximum Day
MH - Maximum Hour

mgd - million gallons per day
Mg - 1,000 gallons

(a) Demand ratios are based on the weighted average of noncoincidental demands in the six largest service areas.

Consolidated SPSPSB Demands

Since the SPSPSB rate area includes several districts but applies a single rate structure for all of its customers, it is necessary to develop a single set of demand ratios for determining cost allocation and customer class capacity ratios. The weighted average of the respective coincidental system demands of each district can be used to determine demand ratios for the SPSPSB rate area. Table 2a below shows the operating statistics of the seven largest districts in the rate area. System data for the South Beloit District is based on historical information collected for the Beloit system when it was owned by the Alliant Energy Company. As previously indicated, information for the very small Saunemin District near Pontiac was ignored since its typical average daily pumpage of 0.04 mgd does not influence the weighted averages developed in Table 2a. The weighted averages developed in this table are also shown in Table 2.

Table 2a
Summary of SPSPSB Operating Statistics

Line No	Description	Southern Division						
		Alton	Cairo	Interurban	Peoria	Streator	Pontiac	South Beloit
1	Year of Maximum MD/AD Ratio	2006	2005	2007	2006	2005	2008	2007
2	AD Pumpage - mgd	8.742	0.871	44.918	22.945	2.319	1.674	0.826
3	Maximum Month - Mg	360,302	37,247	1,748,955	975,141	92,952	62,053	36,317
4	AD for Maximum Month -mgd	12.010	1.330	56.418	32.505	3.098	2.002	1.172
5	MD Demand - mgd	13.729	1.990	59.942	38.012	3.427	2.757	1.320
6	MH Pumped - mgd	15.300	2.450	62.509	39.090	3.859	2.928	2.030
7	MH Storage Contribution - mgd	0.000	(0.088)	6.765	4.601	0.596	0.360	0.000
8	MH Demand - mgd	15.300	2.362	69.274	43.691	4.455	3.288	2.030
9	MH/MD Ratio	1.114	1.187	1.156	1.149	1.300	1.193	1.538
10	MD/AD for Maximum Month	1.143	1.496	1.062	1.169	1.106	1.377	1.127
11	MD/AD Ratio - Wt. Avg. = 1.472	1.570	2.285	1.334	1.657	1.478	1.647	1.598
12	MH/AD Ratio - Wt. Avg. = 1.706	1.750	2.712	1.542	1.904	1.921	1.964	2.458

AD - Average Day
MD - Maximum Day
MH - Maximum Hour

mgd - million gallons per day
Mg - 1,000 gallons

Consolidated Chicago Metro Demands

The Chicago Metro rate area includes 24 districts. The six largest districts were determined to be representative of the entire rate area since their non-coincidental maximum day demands are about 85 percent of the area's combined maximum day demands and average daily demands are about 89 percent of the area's total average day demand. A summary of the operating statistics for the six largest districts and development of weighted average demand ratios is shown below in Table 2b. The weighted averages developed in this table are also shown in Table 2.

Table 2b
Summary of Chicago Metro Operating Statistics

Line No	Description	Chicago Suburban	Fernway	Homer Township	Valley View	Waycinden	West Suburban
1	Year of Maximum MD/AD Ratio	2005	2005	2005	2005	2005	2005
2	AD Pumpage - mgd	1.958	0.592	2.436	0.754	0.609	6.856
3	Maximum Month - Mg	74,180	24,520	123,460	31,198	22,701	289,794
4	AD for Maximum Month -mgd	2.393	0.791	4.115	1.006	0.732	9.660
5	MD Demand - mgd	3.130	1.139	6.100	1.410	1.068	15.055
6	MH Pumped - mgd	3.508	1.558	7.154	2.010	1.767	18.654
7	MH Storage Contribution - mgd	0.072	0.000	2.274	0.000	0.259	2.684
8	MH Demand - mgd	3.580	1.558	9.428	2.010	2.026	21.338
9	MH/MD Ratio	1.144	1.368	1.546	1.426	1.897	1.417
10	MD/AD for Maximum Month	1.308	1.440	1.482	1.401	1.458	1.559
11	MD/AD Ratio - Wt. Avg. = 2.113	1.599	1.924	2.504	1.870	1.754	2.196
12	MH/AD Ratio - Wt. Avg. = 3.025	1.828	2.632	3.870	2.666	3.327	3.112

AD - Average Day
MD - Maximum Day
MH - Maximum Hour

mgd - million gallons per day
Mg - 1,000 gallons

Cost Allocation Factors

Water systems include a variety of service facilities; each designed and operated to fulfill a given function. In order to provide adequate service to its customers at all times, IAWC must be capable of not only providing the total amount of water used, but also supplying water at maximum rates of demand.

Since all customers do not exert their maximum demand for water at the same time, capacities of water facilities are designed to meet the peak coincidental demands that all classes of customers, as a whole, place on the system. For every water service facility on the system, there is an underlying average demand, or uniform rate of usage exerted by the customers for which the base cost component applies. For those facilities designed solely to meet average day demand, costs are allocated 100 percent to the base cost component. Extra capacity requirements associated with coincidental demands in excess of average annual daily use are further related to maximum daily and maximum hourly demands.

Analysis of historical system maximum day and maximum hour demands to average day demands results in appropriate ratios for the allocation of capital costs and operating expenses to base and extra capacity cost components. Maximum day to average day ratios shown on Line 11 of Table 2 and maximum hour to average day ratios shown on Line 12 of Table 2 can be used to develop cost allocation factors. Table 3 shows the resulting cost allocation factors based on the ratios presented in Table 2.

Table 3
Cost Allocation Factors

Line No	Description	SPSPSB	Champaign	Chicago	Lincoln	Pekin	Sterling
	Indicated Cost Allocation Factors						
	Maximum Day Allocation						
1	Base	67.93%	63.05%	47.33%	76.22%	68.17%	66.67%
2	Maximum Day	32.07%	36.95%	52.67%	23.78%	31.83%	33.33%
	Maximum Hour Allocation						
3	Base	58.62%	55.22%	33.06%	60.28%	58.38%	45.58%
4	Maximum Day	27.67%	32.36%	36.79%	18.81%	27.26%	22.79%
5	Maximum Hour	13.71%	12.42%	30.15%	20.91%	14.36%	31.63%

A maximum day to average day ratio of 1.472, as shown in Table 2 for SPSPSB, indicates that 67.93 (1/1.472) percent of the capacity of facilities designed and operated to meet maximum day demand is required for average or base use. Accordingly, the remaining 32.07 ([1.472-1]/1.472) percent is required for maximum day extra capacity requirements. A maximum hour to average day ratio of 1.706, as shown in Table 2 for SPSPSB, indicates that 58.62 (1/1.706) percent of the capacity of facilities designed and operated for maximum hour demand is needed for average or base use, while 27.67 ([1.472-1]/1.706) percent is utilized for maximum day extra capacity uses, and the

remaining 13.71 ([1.706-1.472]/1.706) percent is required to meet maximum hour extra capacity in excess of maximum day demands.

Coincidental maximum day to average day and maximum hour to average day demand ratios used in this section to develop cost allocation factors are also used to determine diversity factors. Diversity factors are determined by dividing total maximum day and maximum hour non-coincidental demands (the sum of the products of each customer class's annual average usage times the respective proposed customer class capacity factors) by total maximum day and maximum hour coincidental demands and are used as a basis for verifying the reasonableness of non-coincidental customer class capacity factors. Therefore, both cost allocations and units of service used to allocate costs to customer classes can be tied back to the historic system peak demands actually experienced by each water system.

Customer Class Capacity Factors

Customer class capacity factors developed in this report are determined on a non-coincidental demand basis, i.e., maximum day and maximum hour demands for all customer classes do not occur at the same time. The rationale for the use of non-coincidental customer class demands for allocation of costs among the various customer classes can be explained by way of example as discussed in Appendix A of the AWWA Manual M1. For example, if it is assumed that a water utility was going to build a separate water system for each of its customer classes, then the separate water systems would need to be sized to meet the base, maximum day extra capacity and maximum hour extra capacity demand requirements of each customer class. The costs associated with each of the individual water systems would be the responsibility of the respective customer class. However, this would result in a combined set of systems having more capacity and associated costs than actually required since a water utility can build a single system which recognizes the diversities of the magnitude and timing of the demands of the various customer classes. The use of diversified coincidental demands of all customer classes enables the utility to size and build a much smaller overall water system. An appropriate method of allocating costs related to the smaller, more efficient, and less costly water system among the individual customer classes would be to allocate the costs associated with this smaller system on the basis of the non-coincidental demands of each customer class previously considered for their separate water systems. This method allows all customer classes to proportionately share in the economies of scale and cost savings associated with this smaller, integrated, and diverse water system.

Billed Usage

The first step in determining customer class capacity factors is to analyze customer class annual and monthly usage patterns for a historic year when the water system experienced the highest maximum day to average day ratio. Table 4 summarizes annual water usage by customer class for the years having the highest system maximum day to average day demand ratios. Since the districts in the SPSPSB rate area peaked in different years but are considered as one rate area, calendar year 2007 was used in the analysis for the SPSPSB rate area. Calendar year 2007 showed the highest maximum day to average day ratio for the Interurban District which is the largest district in the rate area. Use of a single year allows the districts to be weighted together on a common basis to develop weighted average customer class capacity factors for the rate area.

Prior to calendar year 2007, accounting cycles were set on quarterly cycles consisting of three monthly billing periods of 4, 4, and 5 weeks. Under this billing and accounting procedure, part of the December usage from one year would not be reflected until January of the following year. IAWC reverted to a traditional calendar year accounting basis in 2006. As such December 2006 includes a full month of billed usage and calendar year 2007 includes a full year of billed usage.

Usage in 2005 includes part of the usage from December 2004 but does not include part of the December 2005 usage. Since customer growth was modest in 2005, it is assumed that the December 2004 usage recognized in January 2005 was approximately equal to usage in December

Table 4
Billed Annual Water Usage

Line No	Rate Area/District	Residential	Commercial	Industrial	Other Public Authority	Other Water Utilities	Large Customers	Total
		Mg	Mg	Mg	Mg	Mg	Mg	Mg
	SPSPSB - 2007							
1	Alton	957,039	516,047	216,540	91,258	817,574		2,598,458
2	Cairo	51,569	20,144	133,061	33,197			237,971
3	Interurban	3,764,226	1,479,462	1,320,108	443,141	4,710,925	1,444,907	13,162,769
4	Peoria	3,157,472	1,828,648	602,305	402,532	169,791		6,160,748
5	Streator	396,151	86,136	43,242	9,679			535,208
6	Pontiac	266,102	89,430	17,724	125,760		44,762	543,778
7	South Beloit	154,387	86,429	4,760	3,052			248,628
8	Total SPSPSB	8,746,946	4,106,296	2,337,740	1,108,619	5,698,290	1,489,669	23,487,560
9	Champaign - 2006 (a)	3,078,542	1,184,866	655,974	212,012	228,458	1,231,361	6,591,211
	Chicago Metro - 2005							
10	Chicago Suburban	500,298	66,706		6,167	54,714		627,885
11	Fernway	167,505	17,707		1,342			186,554
12	Homer Township	693,369	55,989		3,100			752,458
13	Valley View	194,650	8,840		2,469			205,959
14	Waycinden	112,000	65,347					177,347
15	West Suburban	1,601,100	428,727	28,324	56,304			2,114,455
16	Total Chicago Metro	3,268,922	643,316	28,324	69,382	54,714		4,064,658
17	Lincoln - 2007	284,905	144,442	93,796	204,383			727,526
18	Pekin - 2006 (a)	820,479	246,005	1,066,536	179,805			2,312,824
19	Sterling - 2005 (b)	362,651	118,327	17,392	18,493			516,863

Mg - 1,000 gallons

(a) Recognizes annual usage adjustments for conversion from 4/4/5 billing cycle to monthly billing cycle.

(b) Usage carried over from December 2004 due to the 4/4/5 billing cycle is assumed equal to December 2005 usage recognized in January 2006.

2005 that was recognized in January 2006. Therefore, it is reasonable to expect usage in calendar year 2005 represents a full year of billed water usage for purposes of this report. However, since the conversion was made in 2006, January 2006 includes part of December 2005 usage and all of December 2006 usage. Therefore, 2006 annual usage needs to be adjusted for the December 2005 usage recognized in 2006. This adjustment was estimated to be equal to half the usage reported in December 2006. Therefore, since 2006 exhibited the highest system maximum day to average day demand ratio for the Champaign and Pekin rate areas for a recent six-year period, 2006 annual billed usage for these two rate areas was adjusted by subtracting half of the December 2006 usage from recorded 2006 annual usage.

The billed usage and associated billed days for the maximum month of the selected year having the highest maximum day to average day ratio can be used to determine the minimum maximum day requirement for each customer class. Table 5 summarizes the maximum month of

billed usage and associated number of days billed for each district and rate area during the maximum month for the years indicated in Table 4.

Table 5
Maximum Monthly Usage and Days Billed

Line No	RateArea/District	Residential	Commercial	Industrial	Other Public Authority	Other Water Utilities	Large Customers
				Maximum Month			
	SPSPSB						
1	Alton	98,772	59,453	22,121	13,429	94,375	
2	Cairo	5,793	2,229	16,136	3,327		
3	Interurban	402,417	155,572	138,045	46,667	552,023	147,690
4	Peoria	338,090	194,515	89,187	61,133	18,959	
5	Streator	37,976	8,393	4,104	1,431		
6	Pontiac	26,038	9,226	1,926	11,524		6,297
7	South Beloit	18,931	10,193	582	402		
8	Champaign	614,586	239,379	61,310	41,724	27,373	137,258
	Chicago Metro						
9	Chicago Suburban	51,068	8,719		1,280	7,436	
10	Fernway	21,194	1,380		131		
11	Homer Township	98,087	7,024		508		
12	Valley View	23,948	1,065		376		
13	Waycinden	11,085	8,027				
14	West Suburban	199,113	64,492	3,779	8,730		
15	Lincoln	50,916	25,639	9,083	20,873		
16	Pekin	94,370	25,945	98,971	21,792		
17	Sterling	37,670	13,817	1,573	2,142		
				Days Billed within Maximum Month			
	SPSPSB						
18	Alton	31	31	29	31	31	
19	Cairo	33	33	36	33		
20	Interurban	29	29	32	33	26	32
21	Peoria	30	30	32	30	26	
22	Streator	31	30	31	31		
23	Pontiac	32	29	29	32		29
24	South Beloit	31	32	33	32		
25	Champaign	56	55	32	55	30	31
	Chicago Metro						
26	Chicago Suburban	29	31		32	33	
27	Fernway	29	30		31		
28	Homer Township	32	34		28		
29	Valley View	30	29		29		
30	Waycinden	31	32				
31	West Suburban	31	31	44	30		
32	Lincoln	59	59	33	35		
33	Pekin	31	29	30	30		
34	Sterling	31	32	30	32		

Maximum Day Demands

Maximum day capacity factors for each customer class can be determined based on billed usage relationships between the average day for the maximum month and average annual usage for a selected year, the system's relationships between the maximum day demand and the average day of the maximum month pumped within a selected year, and adjustments to account for customer usage variations. Table 6 shows the average day billed usage during the maximum month as determined by dividing the billed usage during the maximum month for each customer class by the respective number of days billed, as presented in Table 5. Table 6 also shows the average day billed usage for each customer class determined by dividing the average annual usage shown in Table 4 by 365 days.

The ratio of the average day usage of each customer class during the maximum month divided by the average annual usage of each customer class from Table 6 represents the minimum maximum day capacity factor for each customer class. Table 7 summarizes the minimum maximum day capacity factors for each customer class and district. A comparison of these factors with capacity factors used in prior cost of service calculations shows that a few of the prior capacity factors may be understated. This includes industrial customers in Peoria, other public authority customers in Peoria, and Chicago Metro, and the Large Other Public Authority customer class in Champaign.

Adjustment factors used to adjust the minimum maximum day capacity factors shown in Table 7 to capacity factors representative of the system's coincidental maximum day demand is summarized in Table 8. The first column of this table shows the system's maximum day demand divided by the average day for the month of maximum pumpage to the system as previously summarized by Line 10 of Table 2. Column 2 of Table 8 presents adjustment factors by district required to adjust the minimum maximum day residential capacity factors for daily usage variations during the maximum month as illustrated in the figure below.

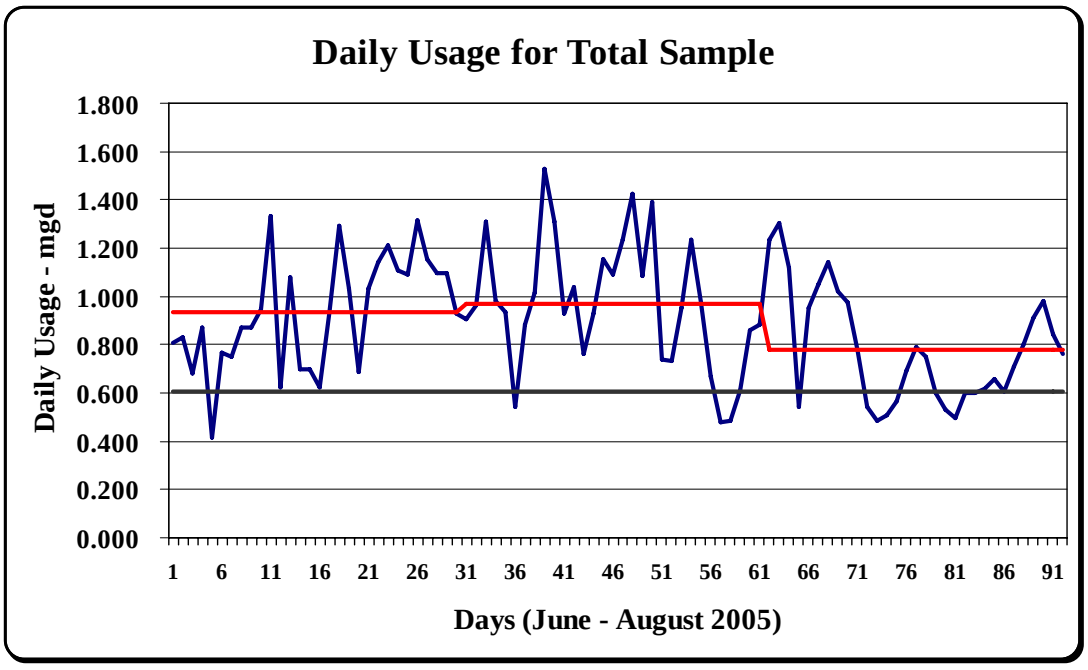

Table 6
Average Day Billed Usage

Line No	Rate Area/District	Residential	Commercial	Industrial	Other Public Authority	Other Water Utilities	Large Customers
		Average Day Usage during Maximum Month - Mg/day					
	SPSPSB						
1	Alton	3,186.2	1,917.8	762.8	433.2	3,044.4	
2	Cairo	175.5	67.5	448.2	100.8		
3	Interurban	13,876.4	5,364.6	4,313.9	1,414.2	21,231.7	4,615.3
4	Peoria	11,269.7	6,483.8	2,787.1	2,037.8	729.2	
5	Streator	1,225.0	279.8	132.4	46.2		
6	Pontiac	813.7	318.1	66.4	360.1		217.1
7	South Beloit	610.7	318.5	17.6	12.6		
8	Champaign	10,974.8	4,352.3	1,915.9	758.6	912.4	4,427.7
	Chicago Metro						
9	Chicago Suburban	1,761.0	281.3		40.0	225.3	
10	Fernway	730.8	46.0		4.2		
11	Homer Township	3,065.2	206.6		18.1		
12	Valley View	798.3	36.7		13.0		
13	Waycinden	357.6	250.8				
14	West Suburban	6,423.0	2,080.4	85.9	291.0		
15	Lincoln	863.0	434.6	275.2	596.4		
16	Pekin	3,044.2	894.7	3,299.0	726.4		
17	Sterling	1,215.2	431.8	52.4	66.9		
		Average Day Usage - Mg/day					
	SPSPSB						
18	Alton	2,622.0	1,413.8	593.3	250.0	2,239.9	
19	Cairo	141.3	55.2	364.6	91.0		
20	Interurban	10,312.9	4,053.3	3,616.7	1,214.1	12,906.6	3,958.6
21	Peoria	8,650.6	5,010.0	1,650.2	1,102.8	465.2	
22	Streator	1,085.3	236.0	118.5	26.5		
23	Pontiac	729.0	245.0	48.6	344.5		122.6
24	South Beloit	423.0	236.8	13.0	8.4		
25	Champaign	8,434.4	3,246.2	1,797.2	580.9	625.9	3,373.6
	Chicago Metro						
26	Chicago Suburban	1,370.7	182.8		16.9	149.9	
27	Fernway	458.9	48.5		3.7		
28	Homer Township	1,899.6	153.4		8.5		
29	Valley View	533.3	24.2		6.8		
30	Waycinden	306.8	179.0				
31	West Suburban	4,386.6	1,174.6	77.6	154.3		
32	Lincoln	780.6	395.7	257.0	560.0		
33	Pekin	2,247.9	674.0	2,922.0	492.6		
34	Sterling	993.6	324.2	47.6	50.7		

Mg/Day - 1,000 gallons/day

Table 7
Minimum Maximum Day Capacity Factors

Line No	Rate Area/District	Residential	Commercial	Industrial	Other Public Authority	Other Water Utilities	Large Customers
	SPSPSB						
1	Alton	121.5%	135.6%	128.6%	173.3%	135.9%	
2	Cairo	124.2%	122.4%	123.0%	110.8%		
3	Interurban	134.6%	132.3%	119.3%	116.5%	164.5%	116.6%
4	Peoria	130.3%	129.4%	168.9%	184.8%	156.8%	
5	Streator	112.9%	118.6%	111.7%	174.1%		
6	Pontiac	111.6%	129.8%	136.8%	104.5%		177.1%
7	South Beloit	144.4%	134.5%	135.2%	150.2%		
8	Champaign	130.1%	134.1%	106.6%	130.6%	145.8%	131.2%
	Chicago Metro						
9	Chicago Suburban	128.5%	153.9%		236.7%	150.3%	
10	Fernway	159.3%	94.8%		114.9%		
11	Homer Township	161.4%	134.7%		213.6%		
12	Valley View	149.7%	151.6%		191.7%		
13	Waycinden	116.5%	140.1%				
14	West Suburban	146.4%	177.1%	110.7%	188.6%		
15	Lincoln	110.6%	109.8%	107.1%	106.5%		
16	Pekin	135.4%	132.7%	112.9%	147.5%		
17	Sterling	122.3%	133.2%	110.0%	132.1%		

Table 8
Residential Daily Variation

Line No.	Rate Area	(1) System Minimum Max Day	(2) Indicated Residential Daily Variation	(3) Rounded Residential Daily Variation
		(a)	1.578 / (1)	(2)
1	SPSPSB (b)	1.134	1.392	1.4
2	Champaign	1.132	1.394	1.4
3	Chicago (b)	1.529	1.032	1.0
4	Lincoln	1.225	1.288	1.3
5	Pekin	1.014	1.556	1.6
6	Sterling	1.151	1.371	1.4

(a) Represents the system's maximum day demand divided by the average daily flow pumped during the year's maximum month (Table 2).

(b) Weighted average of districts analyzed (Tables 2a & 2b).

The graph of daily usage fluctuations is based on actual daily pumpage records of 2,161 residential accounts within four Chicago Metro districts. The four districts sampled included Liberty Ridge West, Liberty Ridge East, Arrowhead, and Alpine Heights. These districts were selected because they were either entirely residential or primarily residential districts. Residential customers served in the four districts represent 99.3 percent of the total customers in the sample with the remaining 15 (0.7 percent) customers within the sample being commercial customers. The lower horizontal line in the figure represents the sample average annual usage of 0.604 million gallons per day (mgd) while the upper horizontal line represents the average day usage for each month within the three-month summer period of 2005. As indicated, the maximum month occurs in July and has an average daily usage of 0.969 mgd. The maximum daily flow for this period occurred on July 9, 2005 with a flow of 1.529 mgd or 1.578 times the average day for the maximum month (July) of calendar year 2005. However, since the daily variation adjustment is used in conjunction with the system's maximum day to average day within the maximum month ratio, the residential variation should typically be less than indicated by the figure on Page 14. Therefore, Column 2 of Table 8 divides the 1.578 maximum day to average day for the maximum month ratio for residential customers by the systems minimum maximum day demand (Column 1 of Table 8) to determine the residential daily variation adjustment in each rate area.

In addition, the variations in demands of the other customer classes should typically be lower than those for the residential customer class because the system's maximum day to average day within the maximum month ratio would typically be a weighted average of all customer classes. This would indicate the need for lower daily variation adjustments for other customer classes. However, in this case, when the sample is almost entirely composed of residential customers, the system's coincidental maximum day demand and the residential non-coincidental class demand should be about the same or be close to a 1.0 ratio as indicated in Table 8 for Chicago Metro. Column 3 of Table 8 shows rounded residential adjustment factors used in subsequent analyses.

Table 9 shows the percentages applied to the residential daily variation adjustment to estimate daily variations for other customer classes. These percentages, shown in a bold font, were developed based on comparisons of customer class capacity factors from prior studies for the two largest rate areas and the Docket 07-0507 Study. Greater weight was given to the capacity factors applied in Docket 02-0690 (which are the same capacity factors used in Docket 00-0340) since they were historically used to design prior water rates on a cost of service basis whereas across-the-board rate increases were developed for Docket 07-0507 and applied to rates developed in Docket 02-0690.

Multiplying the system maximum day to average day ratios from Tables 2, 2a, and 2b by the minimum maximum day customer class capacity factors developed in Table 7 and by the residential daily variation adjustments developed in Table 8 as adjusted for the customer class variations presented in Table 9 will develop capacity factors for all of IAWC's customer classes with the exception of the residential and commercial customers in the Champaign and Lincoln rate areas that are billed on a bimonthly basis. Since the average day for the two maximum months must be considered for these customer groups, the resulting ratio will not be as high as it would be if monthly billing data were available. Bimonthly billing adjustments were estimated by reviewing monthly billing data for other districts as if they were billed on a bimonthly basis.

Table 9
Maximum Day Variations

Line No	Customer Class	(1) Maximum Day Prior Studies	(2) Maximum Day 2007 Study	(3) Percent of Residential Prior Studies	(4) Percent of Residential 2007 Study
	Residential			**100.0%**	
1	SPSPSB	210%	220%	100.0%	100.0%
2	Champaign	225%	220%	100.0%	100.0%
	Commercial			**85.0%**	
3	SPSPSB	175%	150%	83.3%	68.2%
4	Champaign	180%	150%	80.0%	68.2%
	Industrial			**80.0%**	
5	SPSPSB	165%	170%	78.6%	77.3%
6	Champaign	150%	170%	66.7%	77.3%
	Other Public Authority			**80.0%**	
7	SPSPSB	175%	140%	83.3%	63.6%
8	Champaign	190%	140%	84.4%	63.6%
	Sale for Resale			**80.0%**	
9	SPSPSB	165%	130%	78.6%	59.1%
10	Champaign	150%	130%	66.7%	59.1%

Table 10 shows a summary of the calculations required to determine capacity factors for the residential customer class. Similar calculations can be made for the other customer classes by substituting the values shown in Columns 2 and 4 of Table 10 with the applicable customer class information from Tables 7 and 9 respectively. The results of such additional calculations are shown in Table 11. Weighted average capacity factors for the SPSPSB and Chicago Metro rate areas as shown on Lines 8 and 17 of Table 11 are determined by applying the capacity factors for each district within the respective rate area to the average daily usage of each customer class for a common year to determine total non-coincidental maximum day demand by customer class and then dividing these values by the average daily usage for each respective customer class. The common year selected for these weighted averages was 2007 for the SPSPSB rate area and 2005 for the Chicago Metro rate area. All of the six largest districts within the Chicago Metro rate area experienced the highest maximum day to average day ratios in 2005 whereas districts within the SPSPSB rate area experienced peak ratios in different years. The 2007 year was selected for the SPSPSB rate area because it was the year when Interurban, the largest district in the rate area, experience the highest maximum day to average day ratio. All values shown in Table 11 have been rounded to the nearest five percent.

The customer class capacity factors shown in Table 11 appear to represent typical customer class demand relationships found in other water systems where residential customers generally have the highest demands, with lower demands exerted by commercial customers and still lower demands typically exerted by industrial customers. Maximum day capacity factors for the Other Public

Table 10
Residential Maximum Day Capacity Factors

Line No	Rate Area/District	(1) System Max Day to Avg Day Ratio (a)	(2) Minimum Max Day Capacity Factors	(3) Residential Daily Variation	(4) Customer Class Variation	(5) Bimonthy Billing Adjustment	(6) Residential Capacity Factors
		(Table 2)	(Table 7)	(Table 8)	(Table 9)	(b)	(1) x (2) x (3) x (4) x (5)
	SPSPSB	(Table 2a)					
1	Alton	1.143	121.5%	1.4	100.0%	1.0	195%
2	Cairo	1.496	124.2%	1.4	100.0%	1.0	260%
3	Interurban	1.062	134.6%	1.4	100.0%	1.0	200%
4	Peoria	1.169	130.3%	1.4	100.0%	1.0	215%
5	Streator	1.106	112.9%	1.4	100.0%	1.0	175%
6	Pontiac	1.377	111.6%	1.4	100.0%	1.0	215%
7	South Beloit	1.127	144.4%	1.4	100.0%	1.0	230%
8	Champaign	1.132	130.1%	1.4	100.0%	1.05	215%
	Chicago Metro	(Table 2b)					
9	Chicago Suburban	1.308	128.5%	1.0	100.0%	1.0	170%
10	Fernway	1.440	159.3%	1.0	100.0%	1.0	230%
11	Homer Township	1.482	161.4%	1.0	100.0%	1.0	240%
12	Valley View	1.401	149.7%	1.0	100.0%	1.0	210%
13	Waycinden	1.458	116.5%	1.0	100.0%	1.0	170%
14	West Suburban	1.559	146.4%	1.0	100.0%	1.0	230%
15	Lincoln	1.225	110.6%	1.3	100.0%	1.05	185%
16	Pekin	1.014	135.4%	1.6	100.0%	1.0	220%
17	Sterling	1.151	122.3%	1.4	100.0%	1.0	195%

(a) Represents the system's maximum day demand divided by the average daily flow pumped during the year's maximum month.

(b) Only residential and commercial customers in the Champaign and Lincoln districts are billed on a bimonthly basis.

Authority customer class may be influenced by irrigation needs from some customers such as high schools and municipal golf courses which are included in this customer class.

Table 11
Maximum Day Capacity Factors

Line No	RateArea/District	Residential	Commercial	Industrial	Other Public Authority	Other Water Utilities	Large Customers
		(Table 10)					
	SPSPSB						
1	Alton	195%	185%	165%	220%	175%	
2	Cairo	260%	220%	205%	185%		
3	Interurban	200%	165%	140%	140%	195%	140%
4	Peoria	215%	180%	220%	240%	205%	
5	Streator	175%	155%	140%	215%		
6	Pontiac	215%	215%	210%	160%		275%
7	South Beloit	230%	180%	170%	190%		
8	Weighted Average	**205%**	**175%**	**155%**	**180%**	**190%**	**140%**
9	Champaign	**215%**	**190%**	**135%**	**165%**	**185%**	**165%**
10	Chicago Metro						
11	Chicago Suburban	170%	170%		250%	155%	
12	Fernway	230%	115%		130%		
13	Homer Township	240%	170%		255%		
14	Valley View	210%	180%		215%		
15	Waycinden	170%	175%				
16	West Suburban	230%	235%	140%	235%		
17	Weighted Average	**220%**	**210%**	**140%**	**235%**	**155%**	
18	Lincoln	**185%**	**155%**	**135%**	**135%**		
19	Pekin	**220%**	**185%**	**145%**	**190%**		
20	Sterling	**195%**	**180%**	**140%**	**170%**		

Maximum Hour Demands

Once the maximum day capacity factors by customer class are determined, the customer class maximum hour capacity factors can be derived based on the maximum day customer class capacity factors, the relationship of the system's maximum hour to maximum day ratio and hourly variation adjustments by customer class. The hourly variation adjustments recognize that the residential customer class typically drives the peak hourly demand in the system with lesser influences by the other customer classes. Therefore, the residential customer class likely exerts a greater hourly demand on the system than indicated by the system's maximum hour to maximum day ratio and other customer classes exert an equal or lesser demand on the system than indicated by the system's maximum hour to maximum day ratio.

Table 12 shows an analysis of data collected during the Docket 07-0507 Study. Column 1 of this table shows the daily demand for the days indicated and Columns 2 and 3 show the maximum hour demands and time when those hourly demands were realized. Dividing the maximum hour demand (Column 2), expressed on a daily flow rate basis, by the daily demand (Column 1) derives the maximum hour to maximum day ratios shown in Column 4 of Table 12. The relationship of each customer classes maximum hour to maximum day demands to those for the residential customer class

Table 12
2007 Interurban Measured Demands

Line No	Customer Class	(1) Maximum Day	(2) Maximum Hour	(3) Time	(4) Ratio of Max Hour to Max Day	(5) Percent of Residential
		Ccf/Day	Ccf/Hour		(2) x 24 / (1)	(4) / (4)
	Residential (8/13/2007)					
1	R1 (High Density)	4,131	288.39	4:00 pm	1.675	
2	R2 (Medium Density)	6,867	810.33	8:00 pm	2.832	
3	R3 (Low Density)	20,385	2,502.39	4:00 am	2.946	
4	Total Coincidental	31,383	2,938.34	5:00 am	2.247	100.0%
	Commercial (8/5/2007)					
5	Total	18,541	1,533.47	12:00 pm	1.985	88.3%
	Industrial (7/3/2007)					
6	Total	114,600	8,050	5:00 pm	1.686	75.0%
	Public Customers (8/7/2007)					
7	Total	65,150	4,450	1:00 pm	1.639	73.0%
	Sale for Resale (8/12/2007)					
8	Total	356,358	21,464	9:00 am	1.446	64.3%

are shown in Column 5 of Table 12 and can be used with prior relationships to determine customer class relative contributions to system coincidental maximum hour demands.

Table 13 shows maximum day (Column 1) and maximum hour (Column 2) customer class capacity factors used prior to 2007 for the two largest rate areas. The maximum hour to maximum day customer class ratios (Column 3) used in prior cost of service studies is determined by dividing Column 2 by Column 1. The relationship of these ratios to residential customers is shown in Column 4 and compared to the results from Table 12 for the Docket 07-0507 Study, as shown in Column 5 of Table 13. Values shown in bold font in Table 13 were selected for subsequent analysis based on the indicated relationships from the prior studies, including consideration of actual measured data from the Docket 07-0507 Study. More weight was given to the capacity factors previously used in Dockets 02-0690 and 00-0340 to establish water rates that were subsequently increased across-the-board in Docket 07-0507. This weighting is also appropriate due to the focus in the Docket 07-0507 Study on only customers within the Interurban District. In addition, the maximum hour variation adjustments must recognize that maximum hour capacity factors should be higher than the previously established maximum day capacity factors for each customer class.

Table 13
Maximum Hour Variations

Line No	Customer Class	(1) Prior Studies Maximum Day	(2) Prior Studies Maximum Hour	(3) MH/MD Ratio	(4) Percent of Residential Maximum Hour	(5) Percent of Residential Interurban Study(a) (Table 12)
	Residential				**100.0%**	
1	SPSPSB	210%	300%	143%	100.0%	100.0%
2	Champaign	225%	300%	133%	100.0%	
	Commercial				**90.0%**	
3	SPSPSB	175%	210%	120%	84.0%	88.3%
4	Champaign	180%	250%	139%	104.2%	
	Industrial				**85.0%**	
5	SPSPSB	165%	200%	121%	84.8%	75.0%
6	Champaign	150%	200%	133%	100.0%	
	Other Public Authority				**85.0%**	
7	SPSPSB	175%	210%	120%	84.0%	73.0%
8	Champaign	190%	250%	132%	98.7%	
	Sale for Resale				**85.0%**	
9	SPSPSB	165%	200%	121%	84.8%	64.3%
10	Champaign	150%	150%	100%	75.0%	

MD - Maximum Day
MH - Maximum Hour
(a) Maximum hour to maximum day relationships derived from Table 12.

Table 14 shows the calculations required to derive residential maximum hour capacity factors. The maximum day capacity factors developed in Table 10 and shown in Table 11, absent of the nearest five percent rounding adjustment, are also shown in Column 1 of Table 14 and multiplied by the system coincidental maximum hour to maximum day ratios presented on Line 9 of Tables 2, 2a, and 2b and by the residential hourly adjustments (Column 3) and the customer class variation adjustments (Column 4) presented in Table 13 to derive the residential maximum hour capacity factors shown in Column 5 of Table 14.

The residential hourly variation adjustments indicated in Column 3 of Table 14 represent adjustments to the system's coincidental maximum hour demands to recognize that the system coincidental maximum hour demands are not equally shared by all customer classes. The residential hourly variation values are calculated by dividing the test year total non-coincidental maximum day demand (determined by multiplying the customer class maximum day capacity factors shown in Table 11 by the average day usage for the test year) by the sum of the products of the maximum hour variations presented in Table 13 times the non-coincidental maximum day demands of each respective customer class. Using the Champaign test year units of service shown in Table 16 as an example, the residential hourly variation calculation for the Champaign District would be: [49,775 /

Table 14
Residential Maximum Hour Capacity Factors

Line No	Rate Area/District	(1) Max Day Capacity Factors	(2) System Max Hour to Max Day Ratio	(3) Residential Hourly Variation	(4) Customer Class Variation	(5) Capacity Factors
		(Table 10)	(Table 2)	(a)	(Table 13)	(1) x (2) x (3) x (4)
	SPSPSB		(Table 2a)			
1	Alton	194.5%	1.114	1.086	100.0%	235%
2	Cairo	260.2%	1.187	1.116	100.0%	345%
3	Interurban	200.1%	1.156	1.110	100.0%	255%
4	Peoria	213.3%	1.149	1.056	100.0%	260%
5	Streator	174.8%	1.300	1.038	100.0%	235%
6	Pontiac	215.2%	1.193	1.071	100.0%	275%
7	South Beloit	227.7%	1.538	1.030	100.0%	360%
8	Champaign	216.5%	1.142	1.064	100.0%	265%
	Chicago Metro		(Table 2b)			
9	Chicago Suburban	168.0%	1.144	1.026	100.0%	195%
10	Fernway	229.3%	1.368	1.006	100.0%	315%
11	Homer Township	239.2%	1.546	1.006	100.0%	370%
12	Valley View	209.7%	1.426	1.006	100.0%	300%
13	Waycinden	170.0%	1.897	1.039	100.0%	335%
14	West Suburban	228.2%	1.417	1.027	100.0%	330%
15	Lincoln	184.8%	1.264	1.083	100.0%	255%
16	Pekin	219.8%	1.167	1.092	100.0%	280%
17	Sterling	197.0%	1.463	1.037	100.0%	300%

(a) Calculated by dividing the test year 2009 total non-coincidental maximum day demand by the sum of the products derived by multiplying maximum day class demands for 2009 by their respective customer class variations from Table 13.

(26,980 x 1.00 + 8,185 x 0.90 + 2,816 x 0.85 +1,218 x 0.85 + 7,331 x 0.85 + 3,245 x 0.85) = 1.0644. For this example, residential customers are anticipated to have a maximum hour to maximum day relationship that is 6.44 percent higher than the system's coincidental relationship while commercial customers are anticipated to have a maximum hour to maximum day relationship that is about 95.8 percent (1.0644 x 0.90) of the system average and all other customer classes are anticipated to have a maximum hour to maximum day demand ratio that is about 90.5 percent (1.0644 x 0.85) of the system's maximum hour to maximum day ratio. As indicated by Table 14, this variation adjustment can vary by district depending on the relative magnitude of the maximum day demands for the various customer classes.

A summary of estimated maximum hour capacity factors by customer class for each district considered by this report is shown in Table 15. Values for each customer class were determined in the same manner as those for residential customers determined in Table 14. The only calculation differences would be the substitution of maximum day capacity factors from Table 11 into Column 1 and customer class variations from Table 13 into Column 4 of Table 14.

Table 15
Maximum Hour Capacity Factors

Line No	Rate Area/District	Residential	Commercial	Industrial	Other Public Authority	Other Water Utilities	Large Customers
		(Table 14)					
	SPSPSB						
1	Alton	235%	200%	170%	230%	180%	
2	Cairo	345%	260%	230%	210%		
3	Interurban	255%	195%	155%	150%	215%	150%
4	Peoria	260%	195%	230%	250%	210%	
5	Streator	235%	190%	160%	245%		
6	Pontiac	275%	245%	230%	175%		295%
7	South Beloit	360%	255%	230%	255%		
8	Weighted Average	**255%**	**200%**	**170%**	**190%**	**210%**	**150%**
9	Champaign	**265%**	**205%**	**140%**	**170%**	**190%**	**170%**
	Chicago Metro						
10	Chicago Suburban	195%	180%		245%	155%	
11	Fernway	315%	145%		155%		
12	Homer Township	370%	235%		335%		
13	Valley View	300%	235%		260%		
14	Waycinden	335%	310%				
15	West Suburban	330%	305%	170%	290%		
16	Weighted Average	**315%**	**280%**	**170%**	**285%**	**155%**	
17	Lincoln	**255%**	**190%**	**160%**	**160%**		
18	Pekin	**280%**	**210%**	**160%**	**205%**		
19	Sterling	**300%**	**250%**	**185%**	**220%**		

Comparison of Non-coincidental Class Demands to System Coincidental Demands

A reasonableness test of calculated customer class capacity factors can be performed by comparing the sum of the non-coincidental customer class demands to the coincidental demand. The total non-coincidental demand is determined by applying the customer class capacity factors summarized in Tables 11 and 15 to the respective average annual usage by customer class projected for the test year. Coincidental demand is equal to the total projected test year usage for all customer classes multiplied by the system's highest maximum day and maximum hour ratios during a recent six-year period as previously presented on Lines 11 and 12 of Table 2. The ratio of the non-coincidental to coincidental demands is considered reasonable per the AWWA Manual M1 if it falls within a range of 1.1 to 1.40.

Table 16 presents a summary of test year units of service for the Champaign District. These units of service include the average day usage by customer class and the maximum day extra capacity and maximum hour extra capacity required for cost allocations to customer classes under the base extra capacity allocation methodology. Maximum day and maximum hour demands are determined by applying the respective capacity factors determined in Tables 11 and 15 to the average daily usage for the test year as shown in Column 2 of Table 16.

Table 16
ChampaignTest Year 2009 Units of Service

Line No	Customer Class	(1) Water Usage Annual	(2) Water Usage Average Day	(3) Maximum Day Capacity Factor	(4) Maximum Day Total Capacity	(5) Maximum Day Extra Capacity	(6) Maximum Hour Capacity Factor	(7) Maximum Hour Total Capacity	(8) Maximum Hour Extra Capacity
		Ccf	Ccf/day (2) / 365	(Table 11)	Ccf/day (2) x (3)	Ccf/day (4) - (2)	(Table 15)	Ccf/day (2) x (6)	Ccf/day (7) - (4)
1	Residential	4,580,562	12,549	215%	26,980	14,431	265%	33,255	6,275
2	Commercial	1,572,507	4,308	190%	8,185	3,877	205%	8,831	646
3	Industrial	761,486	2,086	135%	2,816	730	140%	2,920	104
4	Other Public Authority	269,248	738	165%	1,218	480	170%	1,255	37
5	Univ of Illinois	1,621,522	4,443	165%	7,331	2,888	170%	7,553	222
6	Other Water Utilities	640,073	1,754	185%	3,245	1,491	190%	3,333	88
7	Total	9,445,398	25,878		49,775	23,897		57,147	7,372
8	Total noncoincidental demand				49,775			57,147	
9	Total coincidental demand				41,052			46,866	
10	Ratio non to coincidental demand (Diversity Factor)				1.21			1.22	
11	Diversity Factor Typical Range for Utilities				1.10 - 1.40			1.10 - 1.40	

Ccf - Hundred cubic feet
Ccf/Day - Hundred cubic feet/Day

The maximum day diversity factor is equal to total non-coincidental demand of 49,775 hundred cubic feet (Ccf) in Column 4 divided by average daily usage of 25,878 Ccf (Column 2) multiplied by the system maximum day to average day demand ratio of 1.586 from Table 2. This results in a maximum day diversity factor of 1.21 (49,775 / (25,878 x 1.586). A similar calculation for the maximum hour diversity factor using the weighted average maximum hour to average day ratio of 1.811 from Table 2 results in a maximum hour diversity factor of 1.22 (57,147 / (25,878 x 1.811). As indicated by Lines 10 and 11 of this table, both the maximum day and maximum hour diversity ratios fall within the range of reasonableness.

Similar calculations for the other districts produce maximum day and maximum hour diversity factors within the range considered reasonable by the AWWA Manual M1 except for the Metro Chicago rate area as indicated in Table 17. Since the districts included in the Chicago Metro rate area are primarily composed of residential customers, the diversity ratio approaches 1.0 due to little customer class diversity and thus falls outside of the typical diversity ratio range of other water utilities with a greater diversity of customer classes.

Table 17
Diversity Ratios

Line No	Rate Area	Diversity Ratios Maximum Day	Diversity Ratios Maximum Hour
1	SPSPSB	1.26	1.26
2	Champaign	1.21	1.22
3	Chicago Metro	1.03	1.01
4	Lincoln	1.20	1.21
5	Pekin	1.21	1.22
6	Sterling	1.25	1.27

Calculation Review

As a means of summarizing the calculation methodology used in this report, a numeric example for the Champaign rate area has been prepared with references to tables previously presented in this report. Table 18 below shows the values and references used to determine that rate areat's maximum day and maximum hour capacity factors for the residential customer class. The same calculation methodology is used for all other customer classes.

Table 18
Example Capacity Factor Calculation for Residential Customer Class in Champaign Rate Area

Line No.	Description	Value	Reference
	System Operating Statistics		
1	Average Day for Year - mgd	21.004	Table 2, Line 2
2	Average Day in Maximum Month - mgd	29.439	Table 2, Line 4
3	Maximum Day (MD) - mgd	33.320	Table 2, Line 5
4	Maximum Hour (MH) - mgd	38.039	Table 2, Line 8
	Billing Data		
5	Maximum Month of Billed Residential Usage - Mg	614,586	Table 5, Line 8
6	Days Billed in Maximum Month	56	Table 5, Line 25
7	Annual Billed Residential Usage - Mg	3,078,542	Table 4, Line 9
	Maximum Day Residential Capacity Factor		
8	Average Day in Maximum Month (ADMM) - Mg/Day	10,975	Line 5 / Line 6
9	Average Annual Day (AD) - Mg/Day	8,434	Line 7 / 365
10	Class ADMM/AD	1.301	Line 8 / Line 9
11	System MD/ADMM	1.132	Line 3 / Line 2
12	Class Indicated Minimum MD/AD	1.473	Line 10 x Line 11
13	Residential Daily Variation Adjustment	1.4	Table 8 (1.578 / Line 11)
14	Customer Class Variation Adjustment	100%	Table 9
15	Residential Bimonthly Billing Adjustment (a)	1.050	Estimate
16	Class Adjusted MD/AD	2.165	Lines 12 x 13 x 14 x 15
17	Rounded Maximum Day Capacity Factor (nearest 5%)	**215%**	Line 16 rounded as %
	Maximum Hour Residential Capacity Factor		
18	System MH/MD	1.142	Line 4 / Line 3
19	Residential Hourly Variation Adjustment (b)	1.064	Table 14
20	Customer Class Variation Adjustment	100%	Table 13
21	Class Adjusted MH/AD	2.630	Lines 16 x 18 x 19 x 20
22	Rounded Maximum Hour Capacity Factor (nearest 5%)	**265%**	Line 20 rounded as %

mgd - million gallons per day
Mg - 1,000 gallons

(a) Only residential and commercial customers in the Champaign and Lincoln districts are billed on a bimonthly basis.
(b) Total non-coincidental capacity demand divided by the sum of each customer class maximum day demand times the applicable maximum day variation shown in Table 9.

Comparison with Prior Studies

Another test of reasonableness for the proposed customer class capacity factors is to compare them to customer class capacity factors used in prior studies as shown in Table 19. Factors used prior to the 2007 rate hearing were taken from exhibits filed in Docket 00-0340 and exhibits filed in Docket 02-0690 while those used in the 2007 rate hearing were taken from exhibits filed for Docket 07-0507.

The proposed maximum day capacity factors are very similar to those used in prior studies. The maximum day capacity factors for other public authorities, including the large other public utility in the Champaign rate area, are generally higher than previously applied. The proposed maximum hour capacity factors are generally lower than used in previous studies, however, the proposed maximum hour capacity ratios result in maximum hour diversity ratios that fall within the middle of the 1.10 to 1.40 range noted in the AWWA Manual M1. Therefore, since the results are generally consistent with prior studies and are based on actual system operating data as verified for reasonableness by diversity ratios generally in the middle of AWWA's suggested range of diversity ratios, the capacity factors developed by this study are deemed reasonable.

Table 19
Comparison of Customer Class Capacity Factors

Line No	Customer Class	Maximum Day / Average Day Ratios: Prior to 2007	Maximum Day / Average Day Ratios: 2007 Uniform	Maximum Day / Average Day Ratios: Proposed	Maximum Hour / Average Day Ratios: Prior to 2007	Maximum Hour / Average Day Ratios: 2007 Uniform	Maximum Hour / Average Day Ratios: Proposed
	SPSPSB Customer Class Demand Summary						
1	Residential	210%	220%	205%	300%	600%	255%
2	Commercial	175%	150%	175%	210%	430%	200%
3	Industrial	165%	170%	155%	200%	300%	170%
4	Large Industrial	133%		140%	148%		150%
5	Other Public Authority	175%	140%	180%	210%	280%	190%
6	Other Water Utilities	165%	130%	190%	200%	200%	210%
7	Diversity Factor	1.23	1.19	1.26	1.38	2.40	1.26
	Champaign Customer Class Demand Summary						
8	Residential	225%	220%	215%	300%	600%	265%
9	Commercial	180%	150%	190%	250%	430%	205%
10	Industrial	150%	170%	135%	200%	300%	140%
11	Other Public Authority	190%	140%	165%	250%	280%	170%
12	Large Other Public Auth.	125%	130%	165%	150%	150%	170%
13	Other Water Utilities	150%	130%	185%	150%	200%	190%
14	Diversity Factor	1.19	1.14	1.21	1.36	2.40	1.22
	Chicago Metro Customer Class Demand Summary						
15	Residential	225%	220%	220%	300%	600%	315%
16	Commercial	180%	150%	210%	250%	430%	280%
17	Industrial	0%	170%	140%	0%	300%	170%
18	Other Public Authority	0%	140%	235%	0%	280%	285%
19	Other Water Utilities	0%	130%	155%	0%	200%	155%
20	Diversity Factor	1.02	0.97	1.03	0.96	1.85	1.01
	Lincoln Customer Class Demand Summary						
21	Residential	225%	220%	185%	275%	600%	255%
22	Commercial	170%	150%	155%	200%	430%	190%
23	Industrial	150%	170%	135%	175%	300%	160%
24	Other Public Authority	150%	140%	135%	175%	280%	160%
25	Diversity Factor	1.38	1.33	1.20	1.30	2.59	1.21
	Pekin Customer Class Demand Summary						
26	Residential	275%	220%	220%	400%	600%	280%
27	Commercial	200%	150%	185%	250%	430%	210%
28	Industrial	150%	170%	145%	200%	300%	160%
29	Other Public Authority	150%	140%	190%	200%	280%	205%
30	Diversity Factor	1.34	1.24	1.21	1.59	2.40	1.22
	Sterling Customer Class Demand Summary						
31	Residential	225%	220%	195%	300%	600%	300%
32	Commercial	180%	150%	180%	250%	430%	250%
33	Industrial	150%	170%	140%	200%	300%	185%
34	Other Public Authority	200%	140%	170%	250%	280%	220%
35	Diversity Factor	1.40	1.31	1.25	1.28	2.41	1.27
36	Targeted Diversity Range		1.10 - 1.40			1.10 - 1.40	