

## **10-Year Permit Plan Approval Benchmarks – Supplemental Information for Metro Area Water Supply Advisory Committee**

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As discussed at the August 24th, Metro Area Water Supply Advisory Committee Meeting, the DNR is now allowing water suppliers to use an approved Water Emergency and Conservation Plan (E & C Plan) to request approval for increased water volumes and/or new wells that are planned over the ten year life of the plan. Requesting permit approvals as part of the E & C Plan is optional and would most likely benefit growing communities that anticipate large increases in water use or a number of new wells over the next ten years. To qualify for the ten year permit approval certain benchmarks or conservation measures are required along with adequate documentation on the need for increased water volumes and new wells. This memo is intended to provide additional information regarding the establishment of the benchmarks as requested during the meeting on the 24<sup>th</sup>.

### **BACKGROUND**

Communities in the Twin Cities metropolitan area with public water supply systems are required to submit a Water Emergency and Conservation/Water Supply Plan every ten years. In conjunction with the submittal of this plan, public water suppliers may seek approval for a 10-year water appropriation permit, allowing increased water volumes and new well installations that are planned over the life of the plan. Permit approvals are based on conservation plans designed to meet the on the following:

- Unaccounted water less than 10%
- Residential per capita water use less than 75 gallons per day
- Peak demands – maximum day to average day ratio less than 2.6
- Conservation or conservation neutral rate structure
- Approved well monitoring plan
- Sustainability – adequacy of the resource to sustain current and projected demands while addressing all impacts and limits on natural resources and other water users

### **BENCHMARKS**

During the winter of 2004-2005, the DNR and Metropolitan Council convened an ad hoc advisory group with representatives from the American Water Works Association – Minnesota Section, Water Utility Council to solicit comments on the 10- year permit concept. Participants were primarily from suburban utilities with one engineering consultant.

It was made clear from the discussions with the advisory group that the proposed benchmarks would be challenging for some growing communities to attain. Therefore, the process developed requires that communities either be at or below each benchmark *or* commit to conservation programs that address the water use related to a given benchmark in order to qualify for the 10-year permit.

The following is a brief description of each benchmark, including a discussion of how each benchmark was established.

### **Unaccounted Water (water withdrawals minus sales) - Less than 10%**

Unmetered customers, unmetered municipal facilities and activities, leaks, main breaks and inaccurate meters all contribute to the amount of unaccounted for water in public water systems. Depending on the system and how well water use is metered, the amount of unaccounted for water can vary. The American Water Works Association recommends that no more than 10% of the water appropriated be unaccounted for within the system. The DNR collects information on the amount of water appropriated and water sold from public water suppliers annually. The difference between the two is the amount of unaccounted for water within a system. In 2002, the average percent unaccounted for water for the TCMA was 10%. For more information on the range of unaccounted for water by community in the TCMA in 2002 see Attachment A.

### **Residential Per Capita Water Use less than 75 gallons/day**

Outdoor residential per capita water use varies throughout the country depending on a number of variables, such as the length of the growing season, temperatures, precipitation levels, type of development and type of vegetation. According the United States Environmental Protection Agency (EPA), on average, indoor residential water use per capita is about 65- 69 gallons/day throughout the country (assumes minimal to no indoor water conservation). Likewise, the EPA estimates that outdoor water use ranges from about 7% to 44% of total residential water use depending on the climate of the region.

In a report published by the Council in 2004, *Water Use and Planning in the Metropolitan Area*, 75 gallons/day was reported as the average residential per capita water use in the metropolitan area in 2002. While not published in the report, Council staff estimated that in 2002 about 14% of residential use was attributed to outdoor uses. This is likely on the low end due to 2002 being a relatively wet year. Since a complete set of data was available for that year, 2002 was used to develop the residential per capita water use. In comparison, available data between 2000 and 2005 indicate that the 2002 data was on the low end of the typical range, again, likely due to 2002 being a relatively wet year. For specific data for years 2002, 2003 and 2005 see Attachment B.

**Table 1 Average metro residential per capita water use by 2000 - 2005**

<b>Year</b>	<b>Average residential per capita water use (gallons/day)</b>	<b>Annual precipitation (inches)</b>
2000	83	30.48
2001	86	34.23
2002	75	38.45
2003	88	22.69
2004	81	27.39
2005	75	33.41
<b>Average</b>	<b>81</b>	

### **Peak Demands – Maximum Day to Average Day Ratio Less than 2.6**

According to several studies published throughout the country, maximum day to average day ratios typically range from 1.5 to 3.0. According the Council's 2004 report, the metropolitan area average ratio in 2002 was 2.6. Similar to the residential per capita benchmark, 2002 data

was used for this benchmark due to the completeness of the dataset and may be low due to the relatively wet year. For specific data 2002 data see Attachment C.

**Rate Structures** – *A conservation or conservation neutral rate structure is required that does not include any volume of water in the service or base charge (lifeline exceptions allowed).*

Increasingly, public water suppliers throughout the country are using conservation and conservation neutral rate structures to promote more efficient water use among residential customers. Conservation rate structures often incorporate the cost-of-service principals as well as motivating customers to reduce wasteful water use through increasing block or seasonal rates.

Currently all but two communities within metro area currently use conservation or conservation neutral rate structures.

**Monitoring Plan** – *A monitoring plan approved by DNR that includes monthly water level readings in production wells and/or observation that may be required. Monitoring data must be submitted to DNR once each year or upon request.*

Records of water levels should be maintained for all production wells and source water reservoirs/basins so as to monitor the impacts of pumping on a particular resource and nearby natural resource features. Water levels should be taken monthly for a production well or observation well that is representative of the wells online in each water source formation.

Most communities in metropolitan area monitor their production wells on a regular basis. Some communities do have observation wells that they monitor as a condition of their current appropriation permit. Other communities may need to add observation wells.

**Sustainability** – *All impacts and limits on natural resources and other water users must be satisfied.*

The DNR defines sustainable water use as: the use of water to provide for the needs of society, now and in the future, without unacceptable social, economic or environmental consequences. With this definition in mind, certain measures may need to be in place to avoid adverse impacts from withdrawals. Those measures may include: monitoring well levels for all production wells and source water reservoirs/basins; establishing resource protection thresholds or the developing mitigation measures or plans in areas where natural resource features such as calcareous fens, wetlands, trout streams, rivers or surface water basins are or could be influenced by water withdraws by public water systems; evaluating the adequacy of the resource to sustain current and projected demands; and preparing source water protection plans.

**Attachment A: Unaccounted Water – Less than 10%**

(2002)

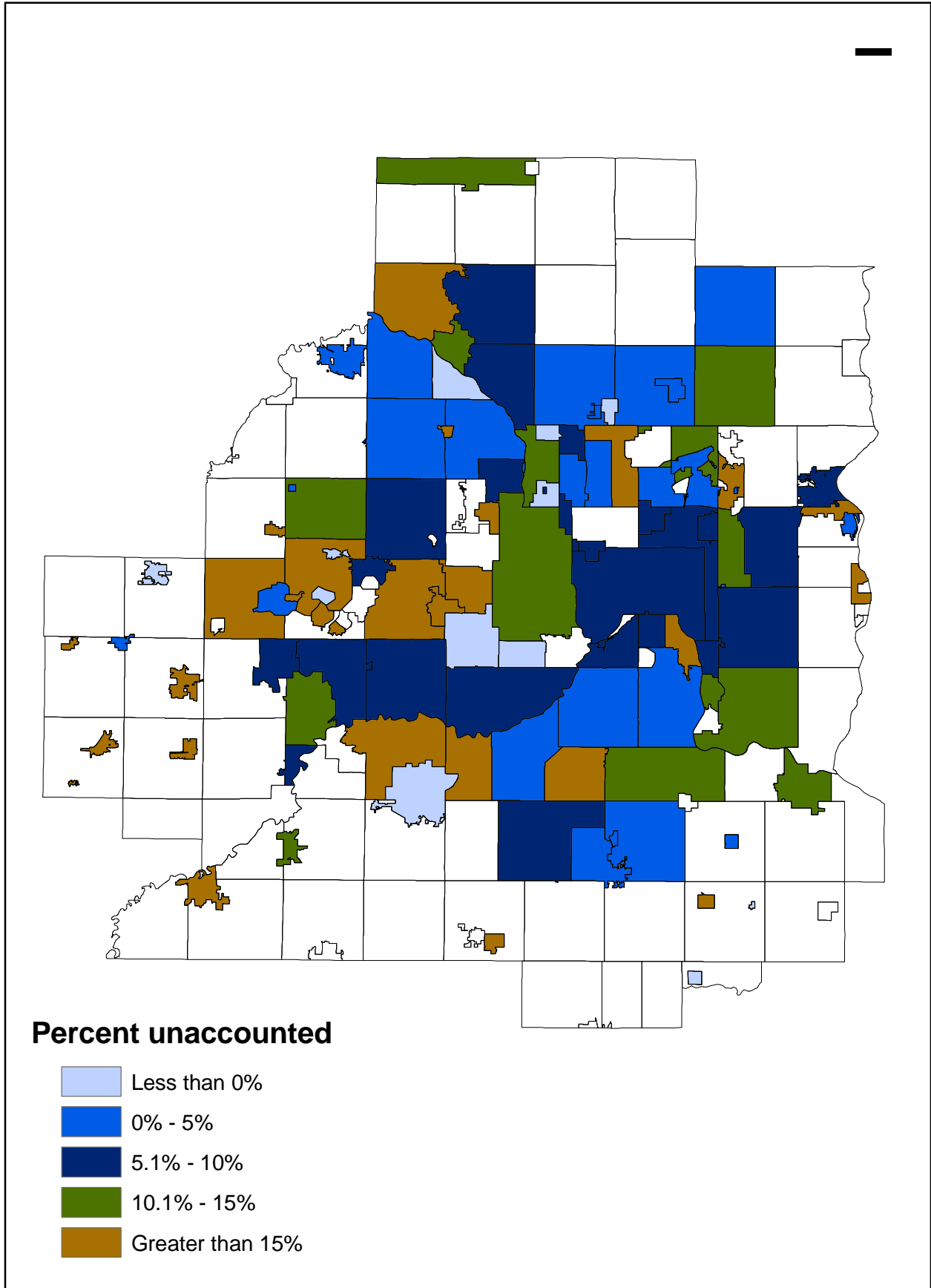
## Percent Unaccounted Water 2002

<b>Community</b>	<b>Percent Unaccounted</b>	<b>Community</b>	<b>Percent Unaccounted</b>
ANDOVER	8.0	LONG LAKE	-1.9
ANOKA	13.8	LORETTO	3.8
APPLE VALLEY	21.8	MAHTOMEDI	15.4
ARDEN HILLS	0.0	MAPLE GROVE	3.7
BAYPORT	1.0	MAPLE PLAIN	15.1
BELLE PLAINE	30.7	MAPLEWOOD	8.6
BLAINE	4.3	MAYER	1.1
BLOOMINGTON	5.1	MEDINA	14.1
BROOKLYN CENTER	5.3	MENDOTA	8.6
BROOKLYN PARK	4.6	MENDOTA HEIGHTS	8.6
BURNSVILLE	4.7	MINNEAPOLIS	11.5
CARVER	6.7	MINNETONKA	18.2
CENTERVILLE	0.2	MINNETONKA BEACH	-14.2
CHAMPLIN	-1.8	MINNETRISTA	29.6
CHANHASSEN	8.2	MOUND	4.7
CHASKA	13.4	MOUNDS VIEW	8.6
CIRCLE PINES	-2.7	NEW BRIGHTON	3.9
COLOGNE	28.0	NEW GERMANY	28.8
COLUMBIA HEIGHTS	-0.5	NEW TRIER	-2.4
COON RAPIDS	6.1	NEWPORT	8.1
COTTAGE GROVE	13.5	NORTH ST PAUL	6.7
DAYTON	0.0	NORWOOD YOUNG AMERICA	18.8
EAGAN	2.1	OAK PARK HEIGHTS	16.0
EDEN PRAIRIE	7.9	OAKDALE	11.6
EDINA	-26.0	ORONO	18.6
ELKO	32.7	OSSEO	51.5
EMPIRE TOWNSHIP	4.7	PLYMOUTH	9.7
EXCELSIOR	23.8	PRIOR LAKE	-2.9
FALCON HEIGHTS	8.6	RAMSEY	22.0
FARMINGTON	3.5	RANDOLPH	-31.6
FOREST LAKE	1.5	RICHFIELD	-6.0
FRIDLEY	11.7	ROBBINSDALE	19.5
HAMBURG	30.9	ROGERS	1.1
HAMPTON	17.3	ROSEMOUNT	11.6
HASTINGS	11.0	SAVAGE	15.4
HILLTOP	9.5	SHAKOPEE	16.6
HOPKINS	26.0	SHOREVIEW	15.1
HUGO	10.1	SOUTH ST PAUL	15.7
INVER GROVE HEIGHTS	3.7	SPRING LAKE PARK	-9.4
JORDAN	11.2	SPRING PARK	18.1
LAKE ELMO	7.6	ST PAUL PARK	11.5
LAKELAND	16.2	ST. ANTHONY	7.7
LAKEVILLE	7.0	ST. FRANCIS	12.4
LANDFALL	0.0	ST. LOUIS PARK	17.4
LAUDERDALE	8.6	ST. PAUL	8.6
LEXINGTON	0.0	STILLWATER	9.6
LINO LAKES	4.2	TONKA BAY	23.7
LITTLE CANADA	7.7	VADNAIS HEIGHTS	2.9

## Percent Unaccounted Water 2002

<b>Community</b>	<b>Percent Unaccounted</b>
VERMILLION	0.0
VICTORIA	7.4
WACONIA	16.0
WATERTOWN	-12.7
WAYZATA	5.9
WEST ST. PAUL	8.6
WHITE BEAR LAKE	12.0
WHITE BEAR TOWNSHIP	0.0
WILLERNIE	0.0
WOODBURY	6.4

# Percent Unaccounted Water 2002



**Attachment B: Residential Per Capita Water Use –  
75 gallons per day**

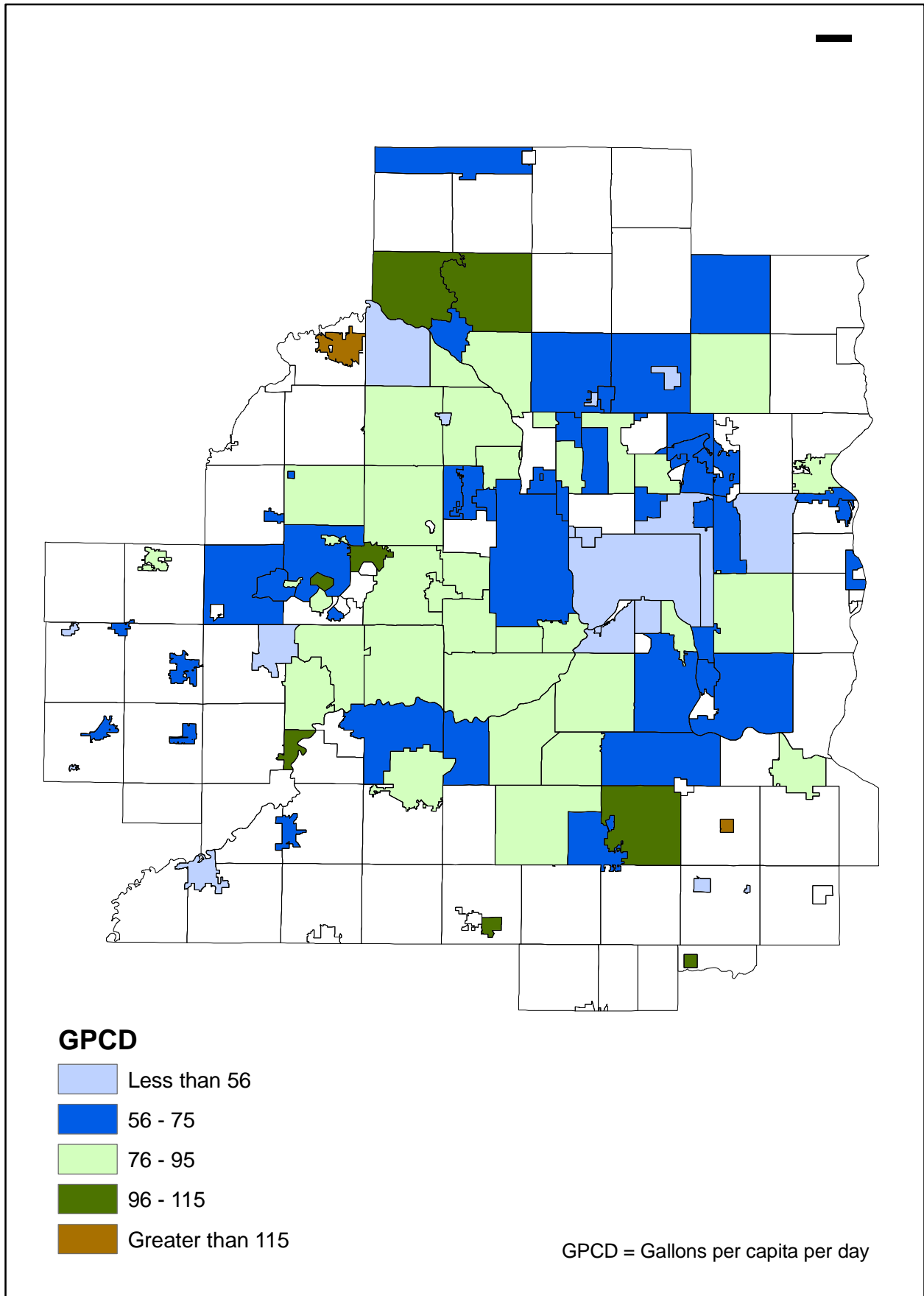
(2002, 2003 and 2005)

## Residential Per Capita Water Use 2002

(Annual precipitation = 38.45 inches)

<b>Community</b>	<b>GPCD</b>	<b>Community</b>	<b>GPCD</b>	<b>Community</b>	<b>GPCD</b>
Andover	111	Long Lake	80	Vermillion	154
Anoka	59	Loretto	70	Victoria	53
Apple Valley	82	Mahtomedi	73	Waconia	59
Arden Hills	67	Maple Grove	83	Watertown	89
Bayport	68	Maple Plain	60	Wayzata	112
Belle Plaine	45	Maplewood	51	West St. Paul	51
Blaine	75	Mayer	68	White Bear Lake	67
Bloomington	82	Medina	78	White Bear Twp.	72
Brooklyn Center	80	Mendota	51	Willernie	66
Brooklyn Park	82	Mendota Heights	51	Woodbury	80
Burnsville	90	Minneapolis	73		
Carver	96	Minnetonka	89	<b>Average</b>	<b>75</b>
Centerville	55	Minnetonka Beach	104		
Champlin	93	Minnetrsta	66		
Chanhassen	79	Mound	62		
Chaska	77	Mounds View	70		
Circle Pines	71	New Brighton	85		
Cologne	62	New Germany	49		
Columbia Heights	60	New Hope	67		
Coon Rapids	95	New Trier	45		
Cottage Grove	70	Newport	59		
Crystal	66	North St. Paul	71		
Dayton	54	Norwood Young America	57		
Eagan	86	Oak Park Heights	64		
Eden Prairie	87	Oakdale	68		
Edina	88	Orono	64		
Elko	101	Osseo	50		
Empire Twp.	100	Plymouth	80		
Excelsior	69	Prior Lake	91		
Falcon Heights	51	Ramsey	99		
Farmington	64	Randolph	115		
Forest Lake	66	Richfield	78		
Fort Snelling (unorg.)	77	Robbinsdale	70		
Hamburg	49	Rogers	118		
Hampton	54	Rosemount	65		
Hastings	79	Savage	69		
Hilltop	67	Shakopee	69		
Hopkins	83	Shoreview	80		
Hugo	85	South St. Paul	86		
Inver Grove Heights	74	Spring Lake Park	94		
Jordan	66	Spring Park	77		
Lake Elmo	55	St. Anthony	72		
Lakeland	61	St. Francis	60		
Lakeville	84	St. Louis Park	79		
Landfall	89	St. Paul	51		
Lauderdale	51	St. Paul Park	64		
Lexington	50	Stillwater	95		
Lino Lakes	70	Tonka Bay	85		
Little Canada	70	Vadnais Heights	84		

# Residential Per Capita Water Use 2002

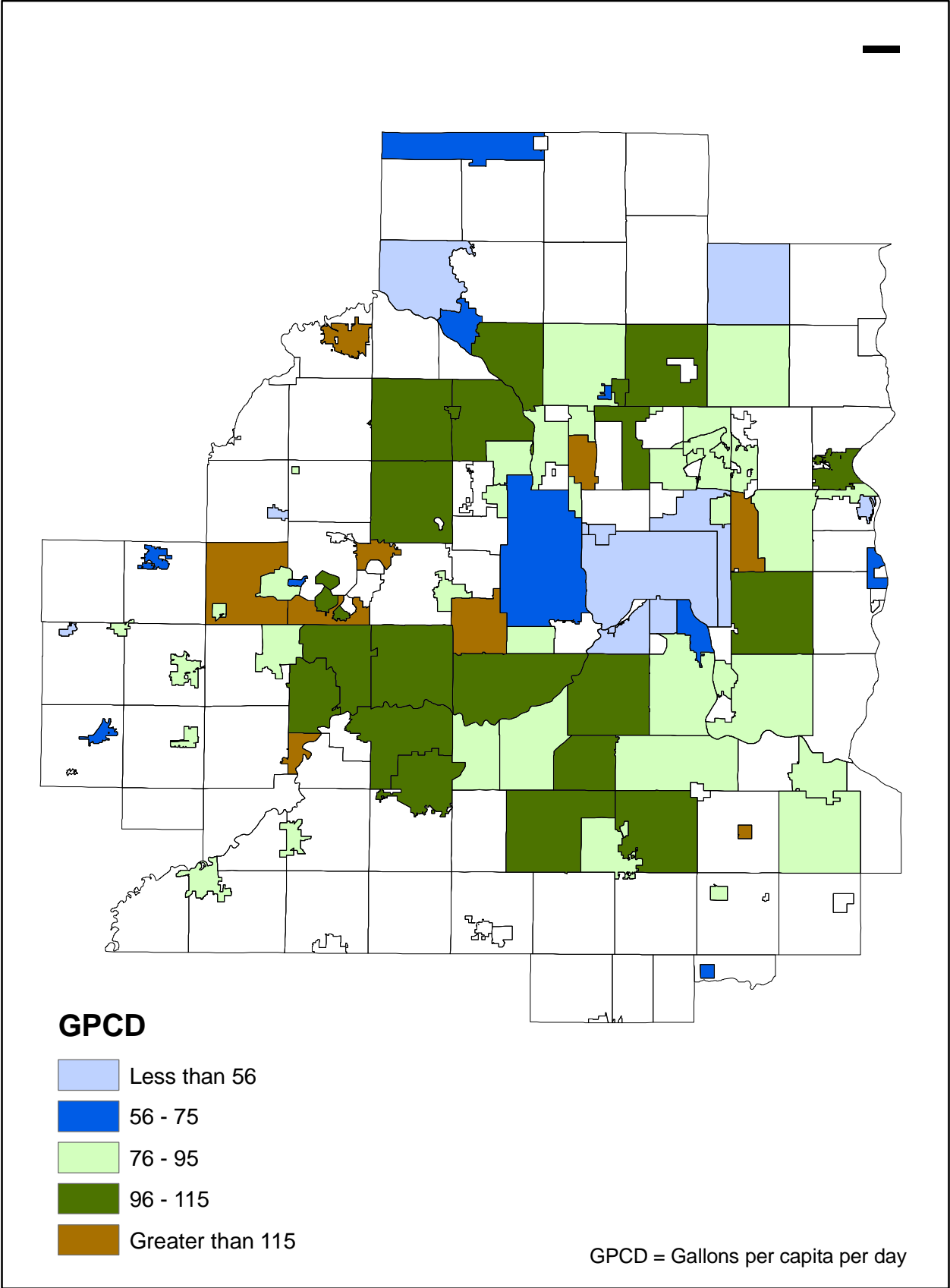


## Residential Per Capita Water Use 2003

(Annual precipitation = 22.69 inches)

Community	GPCD	Community	GPCD
Anoka	69	Minnetrista	127
Apple Valley	110	Mound	79
Bayport	44	Mounds View	78
Belle Plaine	83	New Brighton	122
Blaine	95	New Germany	40
Bloomington	110	North St. Paul	87
Brooklyn Center	91	Norwood Young America	66
Brooklyn Park	111	Oak Park Heights	85
Burnsville	90	Oakdale	116
Carver	152	Osseo	103
Chanhassen	96	Plymouth	98
Chaska	101	Prior Lake	100
Circle Pines	96	Ramsey	36
Cologne	76	Randolph	73
Coon Rapids	106	Richfield	85
Cottage Grove	82	Robbinsdale	79
Eagan	98	Rogers	176
Eden Prairie	102	Rosemount	80
Edina	125	Savage	86
Empire Twp.	109	Shakopee	98
Excelsior	100	Shoreview	103
Falcon Heights	54	Shorewood	132
Farmington	77	South St. Paul	71
Forest Lake	40	Spring Park	72
Fridley	88	St. Anthony	81
Hampton	79	St. Bonifacius	89
Hastings	95	St. Francis	67
Hopkins	86	St. Paul	54
Hugo	86	St. Paul Park	76
Inver Grove Heights	86	Stillwater	101
Jordan	91	Tonka Bay	102
Lake Elmo	77	Vadnais Heights	87
Lakeland	56	Vermillion	141
Lakeville	107	Victoria	77
Lauderdale	54	Waconia	77
Lexington	62	Watertown	61
Lino Lakes	100	Wayzata	174
Loretto	92	West St. Paul	54
Mahtomedi	86	White Bear Lake	79
Maple Grove	106	White Bear Twp.	93
Maple Plain	49	Woodbury	97
Maplewood	54		
Marshan Twp.	78	<b>Average</b>	<b>88</b>
Mayer	92		
Mendota	54		
Mendota Heights	54		
Minneapolis	75		
Minnetonka Beach	110		

# Residential Per Capita Water Use 2003

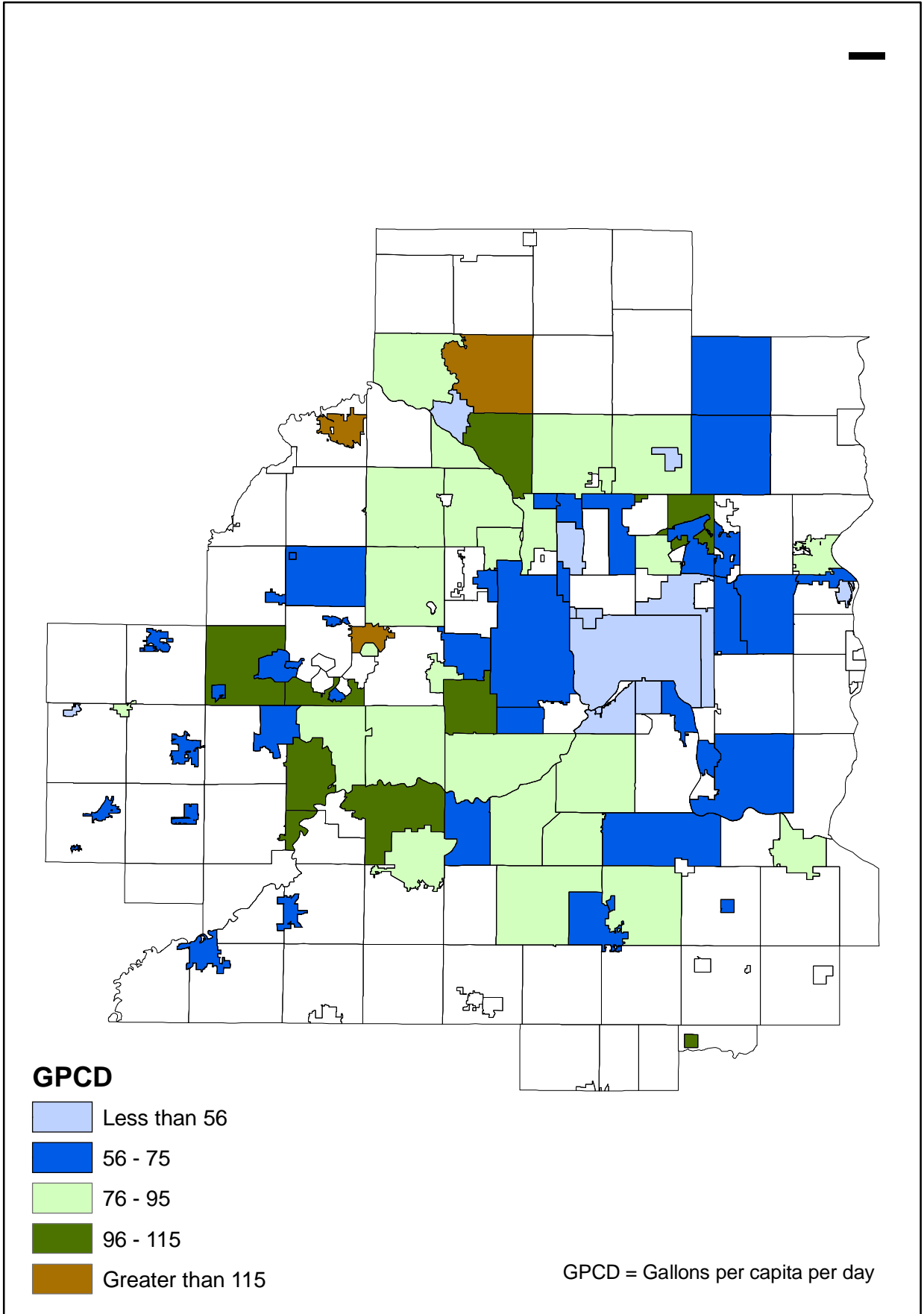


## Residential Per Capita Water Use 2005

(Annual precipitation = 33.41 inches)

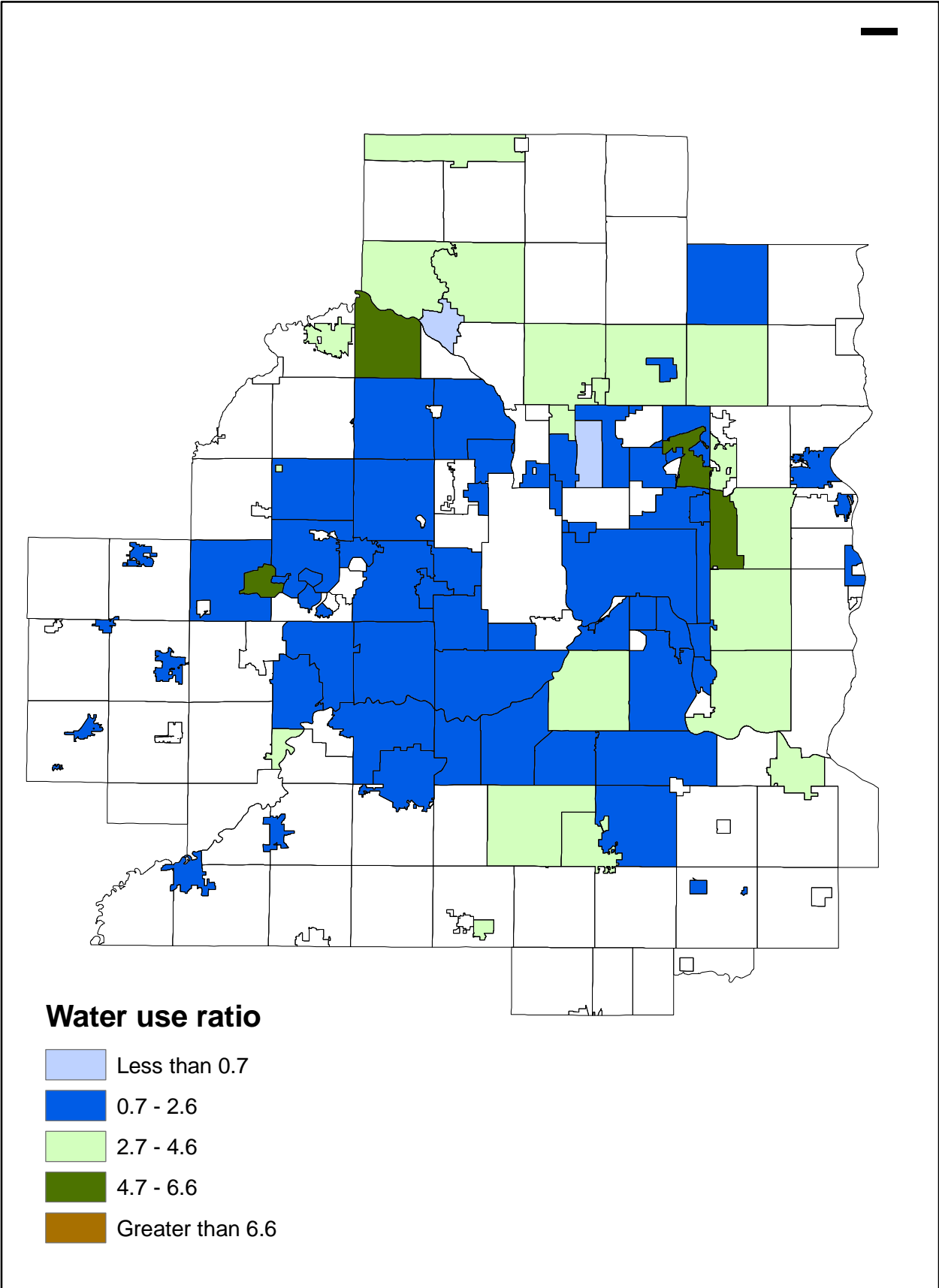
<u>Community</u>	<u>GPCD</u>	<u>Community</u>	<u>GPCD</u>
Andover	116	Mendota	49
Anoka	45	Mendota Heights	49
Apple Valley	83	Minneapolis	58
Bayport	34	Minnetrista	99
Belle Plaine	73	Mound	63
Blaine	80	Mounds View	74
Bloomington	82	New Brighton	44
Brooklyn Center	83	New Germany	42
Brooklyn Park	91	Norwood Young America	59
Burnsville	82	Oak Park Heights	62
Carver	107	Oakdale	58
Centerville	51	Plymouth	82
Champlin	92	Prior Lake	78
Chanhassen	79	Ramsey	94
Chaska	96	Randolph	98
Circle Pines	81	Richfield	66
Cologne	64	Robbinsdale	69
Coon Rapids	97	Rogers	118
Cottage Grove	73	Rosemount	71
Eagan	88	Savage	70
Eden Prairie	89	Shakopee	101
Edina	112	Shoreview	64
Empire Twp.	87	Shorewood	99
Excelsior	62	South St. Paul	64
Falcon Heights	49	Spring Lake Park	67
Farmington	75	Spring Park	70
Forest Lake	58	St. Anthony	69
Fridley	79	St. Bonifacius	70
Hamburg	58	St. Louis Park	73
Hastings	82	St. Paul	49
Hopkins	77	St. Paul Park	66
Hugo	61	Stillwater	85
Jordan	68	Vadnais Heights	86
Lake Elmo	60	Vermillion	68
Lakeville	89	Victoria	75
Lauderdale	49	Waconia	72
Lino Lakes	83	Watertown	67
Long Lake	64	Wayzata	167
Loretto	64	West St. Paul	49
Mahtomedi	75	White Bear Lake	67
Maple Grove	95	White Bear Twp.	104
Maple Plain	59	Woodland	82
Maplewood	49		
Mayer	89		
Medina	61	<b>Average</b>	<b>75</b>

# Residential Per Capita Water Use 2005



**Attachment C: Peak Demands – Maximum Day to  
Average Day Water Use Ratio Less than 2.6% (2002)**

# Maximum Day to Average Day Water Use Ratio 2002



**Maximum Day to Average Day Water Use Ratio  
2002**

<b>Community</b>	<b>Water use ratio</b>	<b>Community</b>	<b>Water use ratio</b>
Andover	3.2	Minnetonka Beach	2.3
Anoka	0.0	Minnetrista	1.3
Apple Valley	2.6	Mound	4.9
Arden Hills	0.0	Mounds View	2.7
Bayport	2.2	New Brighton	2.2
Belle Plaine	2.0	New Trier	1.5
Blaine	3.5	Newport	1.6
Bloomington	2.1	North St.	2.4
Brooklyn Center	2.0	Norwood Young America	1.5
Brooklyn Park	2.5	Oakdale	5.8
Burnsville	1.9	Orono	2.0
Carver	2.7	Plymouth	2.1
Centerville	2.5	Prior Lake	2.4
Chanhassen	2.2	Ramsey	4.5
Chaska	2.4	Richfield	1.7
Circle Pines	2.8	Robbinsdale	1.6
Columbia	1.2	Rogers	3.0
Cottage Grove	3.7	Rosemount	2.6
Dayton	5.7	Savage	2.5
Eagan	3.1	Shakopee	2.3
Eden Prairie	2.3	Shoreview	2.4
Edina	1.9	South St. Paul	2.5
Elko	2.7	Spring Park	1.5
Empire Twp.	1.9	St. Anthony	1.7
Excelsior	1.9	St. Francis	2.8
Falcon Heights	2.5	St. Louis	1.9
Farmington	2.8	St. Paul	2.6
Forest Lake	1.6	St. Paul Park	2.5
Hamburg	1.7	Stillwate	2.5
Hampton	2.3	Tonka Bay	2.6
Hastings	2.7	Vadnais Heights	2.1
Hopkins	1.4	Waconia	2.1
Hugo	2.8	Watertown	1.8
Inver Grove Heights	1.9	Wayzata	1.9
Jordan	1.9	West St.	2.5
Lake Elmo	3.2	White Bear Lake	2.4
Lakeland	2.5	White Bear Twp.	5.8
Lakeville	2.9	Woodbury	3.6
Lauderdale	2.5		
Lino Lake	2.8	<b>Average</b>	<b>2.6</b>
Loretto	3.2		
Mahtomedi	2.9		
Maple Grove	2.6		
Maplewood	2.5		
Mayer	1.9		
Medina	1.7		
Mendota	2.5		
Mendota Heights	2.5		
Minnetonka	1.7		