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Appendix A-1: Nonpoint Source Pollutants

Appendix A-1 identifies common nonpoint source pollutants and their sources. In addition, the table identifies typical impacts from the pollutants.

Stormwater Pollutant	Examples of Sources	Related Impacts
Nutrients: Nitrogen, Phosphorus	Animal waste, fertilizers, failing septic systems	Algal growth, reduced clarity, other problems associated with eutrophication (oxygen deficit, release of nutrients and metals from sediments)
Sediments: Suspended and Deposited	Construction sites, other disturbed and/or non-vegetated lands, eroding banks, road sanding	Increased turbidity, reduced clarity, lower dissolved oxygen, deposition of sediments, smothering of aquatic habitat including spawning sites, sediment and benthic toxicity
Organic Materials	Leaves, grass clippings	Oxygen deficit in receiving water body, fish kill
Pathogens: Bacteria Viruses	Animal waste, failing septic systems	Human health risks via drinking water supplies, contaminated swimming beaches
Hydrocarbons: Oil and Grease, PAHs (Napthalenes, Pyrenes)	Industrial processes, automobile wear, emissions and fluid leaks, waste oil	Toxicity of water column and sediment, bioaccumulation in aquatic species and through food chain
Metals: Lead, Copper, Cadmium, Zinc, Mercury, Chromium, Aluminum, others	Industrial processes, normal wear of auto brake linings and tires, automobile emissions and fluid leaks, metal roofs	Toxicity of water column and sediment, bioaccumulation in aquatic species and through the food chain, fish kill
Pesticides: PCBs, Synthetic Chemicals	Pesticides (herbicides, insecticides, fungicides, rodenticides, etc.), industrial processes	Toxicity of water column and sediment, bioaccumulation in aquatic species and through the food chain, fish kill
Chlorides	Road salting and uncovered salt storage	Toxicity of water column and sediment
Trash and Debris	Litter washed through storm drain networks	Degradation of the beauty of surface waters, threat to wildlife

Appendix A-2: Priority Lakes List

Lakes on the priority lakes list were chosen based on their size, and whether they had a high regional recreation value (boat access and an adjacent park), whether they were a primary water supply lake, or whether they had exceptional water clarity (a typical summer average water clarity greater than 3 meters).

Lake Name	County	Area (acres)	Recreation	Water Supply	Good Water Clarity
Centerville	Anoka	472.8	Y	Y	
Coon	Anoka	1532.8	Y		
Crooked	Anoka	118.9	Y		
East Twin	Anoka	96.8			Y
George	Anoka	491.5	Y		
Ham	Anoka	180.5	Y		
Linwood	Anoka	570.3	Y		
Martin	Anoka	249.4	Y		
Otter	Anoka	294.6	Y		
Peltier	Anoka	573.4	Y	Y	
Rice	Anoka	370.2	Y		
Round	Anoka	263.5	Y		
Ann	Carver	116.3	Y		
Auburn	Carver	287.2	Y		
Eagle	Carver	179.9	Y		
Hydes	Carver	219.4	Y		
Lotus	Carver	242.2	Y		
Maria	Carver	168.8	Y		
Minnewashta	Carver	686.0	Y		
Parley	Carver	255.9	Y		
Patterson	Carver	234.3	Y		
Piersons	Carver	291.6	Y		
Rice	Carver	239.3	Y		
Riley	Carver	295.4	Y		
Steiger	Carver	169.7	Y		
Tiger	Carver	385.6	Y		
Waconia	Carver	3088.1	Y		
Wassermann	Carver	166.2	Y		
Zumbra-Sunny	Carver	225.4	Y		
Byllesby	Dakota	750.4	Y		
Crystal	Dakota	287.1	Y		
Lac Lavon	Dakota	67.0			Y

Lake Name	County	Area (acres)	Recreation	Water Supply	Good Water Clarity
Marion	Dakota	573.1	Y		
Orchard	Dakota	236.0	Y		
Spring Lake / U.S. Lock & Dam #2 Pool	Dakota	5869.8	Y		
Bryant	Hennepin	176.1	Y		
Bush	Hennepin	189.0	Y		Y
Calhoun	Hennepin	414.8	Y		
Christmas	Hennepin	268.2			Y
Dutch	Hennepin	173.8	Y		
Eagle	Hennepin	294.2	Y		
Fish	Hennepin	234.8	Y		
Harriet	Hennepin	338.5	Y		
Independence	Hennepin	834.1	Y		
Little Long	Hennepin	85.6			Y
Long	Hennepin	297.9	Y		
Medicine	Hennepin	922.3	Y		
Minnetonka	Hennepin	14185.0	Y		
Mitchell	Hennepin	114.4	Y		
Nokomis	Hennepin	200.4	Y		
Nordmyr (Normandale)	Hennepin	108.4	Y		
Pike	Hennepin	57.4	Y		
Rebecca	Hennepin	265.6	Y		
Staring	Hennepin	163.2	Y		
Weaver	Hennepin	149.2	Y		
Whaletail	Hennepin	518.1	Y		
Bald Eagle	Ramsey	1044.0	Y		
Charley	Ramsey	35.2		Y	
Deep	Ramsey	71.6		Y	
Johanna	Ramsey	210.6	Y		
Josephine	Ramsey	114.1	Y		
Owasso	Ramsey	371.2	Y		
Phalen	Ramsey	197.4	Y		
Pleasant	Ramsey	601.7		Y	
Snail	Ramsey	148.0	Y		
Sucker	Ramsey	61.7		Y	
Turtle	Ramsey	439.1	Y		
Vadnais	Ramsey	603.4		Y	
Cedar	Scott	793.6	Y		

Lake Name	County	Area (acres)	Recreation	Water Supply	Good Water Clarity
Cleary	Scott	146.4	Y		
Fish	Scott	175.9	Y		
Lower Prior	Scott	966.9	Y		
O'Dowd	Scott	317.9	Y		
Spring	Scott	593.0	Y		
Thole/Schneider	Scott	161.3	Y		
Upper Prior	Scott	387.4	Y		
Battle Creek	Washington	105.9	Y		
Big Carnelian	Washington	451.6	Y		Y
Big Marine	Washington	1889.6	Y		
Bone	Washington	222.6	Y		
Clear	Washington	429.2	Y		
DeMontreville	Washington	157.0	Y		Y
Elmo	Washington	294.3	Y		Y
Forest	Washington	2282.9	Y		
Jane	Washington	152.7	Y		Y
Little Carnelian	Washington	156.7			Y
Olson	Washington	87.0			Y
Oneka	Washington	393.3	Y		
South Twin	Washington	54.2			Y
Square	Washington	201.9	Y		Y
Sylvan	Washington	107.3			Y
West Boot	Washington	64.4			Y
White Bear	Washington	2416.7	Y		

Appendix A-3: MPCA NPDES Phase I and II Metropolitan Area Communities

The following table lists the communities required to meet MPCA NPDES Phase I and II permit requirements as of April 2005.

Anoka County	*Carver County*	*Dakota County*	*Ramsey County*
Andover	Carver	Apple Valley	Arden Hills
Anoka	Carver County	Burnsville	Falcon Heights
Anoka County	Chanhassen	Dakota County	Gem Lake
Blaine	Chaska	Eagan	Lauderdale
Burns Township	Chaska Township	Empire Township	Little Canada
Centerville	Laketown Township	Farmington	Maplewood
Circle Pines	Victoria	Inver Grove Heights	Mounds View
Columbia Heights		Lakeville	New Brighton
Coon Rapids		Lilydale	North Oaks
East Bethel		Mendota	North St. Paul
Fridley		Mendota Heights	Ramsey County
Ham Lake		Rosemount	Roseville
Hilltop		South St. Paul	St. Anthony
Lexington		Sunfish Lake	St. Paul
Lino Lakes		West St. Paul	Shoreview
Oak Grove			Vadnais Heights
Ramsey			White Bear Lake
Spring Lake Park			White Bear Township

Hennepin County		*Scott County*	**Washington County**
Bloomington	Medicine Lake	Credit River Township	Birchwood
Brooklyn Center	Medina	Jackson Township	Cottage Grove
Brooklyn Park	Minneapolis	Louisville Township	Dellwood
Champlin	Minnetonka	Prior Lake	Grant
Corcoran	Minnetonka Beach	Savage	Hugo
Crystal	Minnetrista	Scott County	Lake Elmo
Dayton	Mound	Shakopee	Landfall
Deephaven	New Hope	Spring Lake Township	Mahtomedi
Eden Prairie	Orono		Newport
Edina	Osseo		Oakdale
Excelsior	Plymouth		Pine Springs
Fort Snelling	Richfield		St. Paul Park
Golden Valley	Robbinsdale		Washington County
Greenwood	St. Bonifacius		West Lakeland
Hennepin County	St. Louis Park		Willernie
Hopkins	Shorewood		Woodbury
Independence	Spring Park		
Long Lake	Tonka Bay		
Loretto	Wayzata		
Maple Grove	Woodland		
Maple Plain			

Appendix B-1: Wastewater Treatment Facilities

a. Sewered Population, Household, and Employment Forecasts (MDS)

Location	Population			Households			Employment		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
Blue Lake WWTP									
Carver	4,680	4,630	4,560	1,800	1,850	1,900	200	200	230
Chanhassen	26,800	34,500	38,000	9,900	12,800	14,800	13,030	15,200	15,600
Chaska	27,000	33,000	35,700	10,000	12,500	14,000	12,800	15,100	16,600
Dahlgren Township	700	12,450	15,000	250	4,560	5,650	500	2,000	2,800
Deephaven	3,900	3,900	3,900	1,450	1,500	1,500	1,000	1,100	1,200
Eden Prairie	61,154	62,500	63,000	24,200	25,500	26,500	55,000	62,000	65,000
Excelsior	2,500	2,700	2,800	1,250	1,330	1,400	1,980	2,250	2,450
Greenfield	143	240	280	53	85	100	0	0	0
Greenwood	760	770	780	320	330	330	220	230	250
Independence	603	780	1,000	232	260	300	0	0	0
Laketown Township	650	600	0	222	222	0	0	0	0
Long Lake	2,100	2,250	2,450	900	1,000	1,100	2,600	2,700	2,700
Maple Plain	2,553	2,570	2,600	922	950	1,000	2,350	2,800	3,300
Medina	930	986	1,023	325	340	350	0	0	0
Minnetonka	51,500	51,500	53,500	22,300	23,111	24,000	53,800	56,000	58,600
Minnetonka Beach	640	658	658	236	238	238	210	210	210
Minnetrista	4,000	6,750	10,500	1,600	2,700	4,200	820	1,150	1,330
Mound	10,400	11,000	11,400	4,350	4,600	4,800	1,860	2,020	2,170
Orono	5,800	7,000	7,300	2,256	2,950	3,020	1,230	1,420	1,500
Prior Lake	27,500	40,000	39,500	10,500	16,000	17,000	12,000	15,100	17,200
Shakopee	39,500	48,500	52,000	15,000	19,500	21,500	17,800	21,300	22,800
Shorewood	7,850	8,000	8,100	2,750	2,870	2,960	990	1,160	1,180
Spring Park	1,850	2,000	2,100	1,000	1,080	1,130	1,330	1,690	1,800
St. Bonifacius	2,850	2,750	2,900	1,100	1,100	1,200	520	600	700
Tonka Bay	1,800	1,800	1,800	744	760	780	200	240	280

Location	Population			Households			Employment		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
Victoria	10,700	19,600	28,000	4,000	7,200	10,200	2,000	3,600	5,100
Waconia	10,600	20,000	25,000	4,500	8,000	10,000	7,000	9,900	13,000
Wayzata	4,300	4,500	4,700	2,100	2,200	2,200	6,200	6,400	6,550
Woodland	75	75	90	23	25	30	0	0	0
Totals	313,838	386,009	418,641	124,283	155,561	171,188	195,640	224,370	242,550
Eagles Point WWTP									
Cottage Grove	33,700	44,600	53,000	11,800	16,200	20,000	8,450	9,950	11,450
Lake Elmo	1,416	6,330	12,030	515	2,175	4,375	0	4,950	12,000
Woodbury	33,166	47,232	56,486	12,876	19,600	23,536	14,150	21,400	24,200
Totals	71,066	98,872	120,706	26,226	38,180	47,616	22,600	33,750	44,850
Empire WWTP									
Apple Valley	59,667	67,053	69,153	21,557	25,350	26,680	16,030	19,260	21,010
Elko	2,650	6,400	10,200	970	2,350	3,900	200	550	750
Empire Township	2,050	4,100	5,950	700	1,400	2,100	250	300	340
Farmington	20,500	27,100	32,000	7,500	10,500	12,500	6,600	8,400	9,900
Lakeville	53,425	70,700	80,200	18,115	25,609	30,255	10,700	11,900	12,960
New Market	3,050	6,700	10,600	1,150	2,500	4,100	200	350	500
Rosemount	20,800	28,110	33,800	7,300	10,500	12,800	8,400	10,100	12,200
Totals	162,142	210,163	241,903	57,292	78,209	92,335	42,380	50,860	57,660
Hastings WWTP									
Hastings	23,000	27,500	30,000	8,800	11,000	12,500	8,700	8,950	9,400
Metropolitan WWTP									
Andover	25,480	33,130	35,699	8,993	11,693	12,693	4,200	4,800	5,200
Anoka	19,000	19,800	20,800	7,900	8,500	9,000	14,400	15,200	16,200
Arden Hills	11,200	13,500	22,500	3,800	4,600	8,000	15,200	17,100	20,000
Birchwood	950	930	930	360	370	370	0	0	0
Blaine	64,800	76,100	78,000	24,000	29,300	31,200	20,870	22,440	23,900

Location	Population			Households			Employment		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
Brooklyn Center	29,500	30,500	29,500	11,800	12,200	12,100	18,150	18,550	19,000
Brooklyn Park	73,860	80,500	85,000	28,168	32,000	35,000	26,900	29,100	32,000
Centerville	3,700	4,100	4,700	1,340	1,600	1,850	520	630	670
Champlin	23,700	24,500	25,800	8,500	9,200	10,000	3,700	5,100	6,200
Circle Pines	5,400	5,300	5,400	2,050	2,100	2,200	2,250	2,400	2,450
Columbia Heights	20,000	21,400	21,700	8,600	9,200	9,300	6,600	6,750	7,000
Columbus Township	0	1,040	1,620	0	350	560	250	420	520
Coon Rapids	65,650	66,000	65,000	25,560	26,500	27,000	24,200	26,000	27,800
Corcoran	5,200	13,000	16,500	1,800	4,500	5,500	2,500	5,100	6,100
Crystal	22,700	22,800	23,500	9,700	10,100	10,500	6,600	7,250	8,050
Dayton (pt.)	2,615	18,000	27,400	1,000	7,000	10,500	3,900	5,750	6,850
Edina	49,000	50,000	51,500	21,600	22,000	22,500	57,100	60,000	62,400
Falcon Heights	6,100	6,100	6,100	2,350	2,400	2,500	3,900	4,050	4,200
Forest Lake	19,227	25,205	31,675	7,540	10,082	12,670	7,910	9,000	10,400
Fridley	27,000	26,900	27,500	11,600	11,900	12,300	30,200	33,000	35,300
Gem Lake	116	360	490	44	140	190	180	300	330
Golden Valley	22,700	23,000	24,000	9,000	9,200	9,600	31,650	33,100	34,500
Grey Cloud Township	750	3,000	6,532	250	1,000	2,400	0	0	0
Hassan Township	0	2,082	0	0	718	0	0	0	0
Hilltop	770	770	770	410	410	410	350	420	470
Hopkins	17,827	18,527	18,900	8,518	8,818	9,000	13,600	14,800	16,300
Hugo	15,640	25,900	36,867	5,900	9,900	14,400	2,050	2,270	3,350
Inver Grove Heights	31,439	37,000	39,520	13,043	15,500	16,000	9,250	10,900	12,100
Lake Elmo	0	2,400	2,270	0	825	825	1,000	1,000	1,000
Landfall	700	700	700	300	300	300	60	70	90
Lauderdale	2,400	2,600	2,600	1,160	1,250	1,250	730	750	800
Lexington	2,250	2,250	2,300	910	950	1,000	880	1,050	1,120
Lilydale	930	930	930	580	580	580	480	500	550
Lino Lakes	15,500	24,500	28,955	5,000	8,000	9,500	2,950	3,300	3,550

Location	Population			Households			Employment		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
Little Canada	10,900	11,900	12,800	4,900	5,300	5,700	6,400	6,850	7,250
Mahtomedi	7,970	8,000	8,000	2,850	3,000	3,100	1,870	2,350	2,500
Maple Grove	63,500	75,359	84,000	24,500	30,144	34,000	32,450	42,900	45,900
Maplewood	37,500	38,100	39,300	15,600	16,500	17,500	36,600	41,000	44,500
Medicine Lake	420	440	470	180	190	200	60	70	70
Medina	2,270	5,514	8,477	793	1,900	2,900	5,500	6,700	7,900
Mendota	210	230	270	90	100	120	130	150	170
Mendota Heights	12,000	12,000	12,100	4,600	4,800	5,000	9,100	9,800	10,300
Minneapolis	402,000	423,000	435,000	172,000	181,000	187,000	353,400	369,700	384,400
Mounds View	12,900	13,000	13,400	5,350	5,600	6,000	7,400	8,900	9,400
New Brighton	22,700	22,500	22,800	9,400	9,800	10,000	12,850	14,400	15,600
New Hope	21,500	22,000	22,500	9,100	9,600	9,800	13,850	14,500	15,100
Newport	3,800	4,407	4,890	1,573	1,849	2,130	3,900	5,200	6,500
North Oaks	779	1,125	1,500	303	450	600	1,060	1,100	1,070
North St. Paul	12,555	12,700	13,400	5,083	5,400	6,000	5,900	7,500	8,500
Oakdale	28,000	28,400	30,000	11,300	12,000	13,000	9,250	10,600	11,900
Osseo	2,600	2,850	3,300	1,090	1,200	1,400	2,700	2,950	3,050
Plymouth	73,000	76,000	78,500	29,000	31,500	33,300	59,900	63,400	64,500
Ramsey	21,164	38,839	42,644	7,500	14,000	16,000	6,700	9,100	11,300
Richfield	37,700	41,300	45,000	16,500	18,000	19,500	17,100	17,600	18,100
Robbinsdale	15,200	16,600	16,500	6,500	7,000	7,000	8,100	8,800	9,600
Roseville	36,000	37,000	38,300	15,500	16,000	16,500	42,450	44,700	46,100
Shoreview	28,500	29,000	29,000	10,960	11,300	11,300	14,200	15,800	16,800
South St. Paul	19,900	20,000	20,700	8,300	8,600	9,000	8,050	8,300	8,500
Spring Lake Park	6,700	6,700	6,910	2,750	2,800	3,000	4,600	4,800	4,850
St. Anthony	9,100	9,400	10,000	4,000	4,300	4,600	4,350	5,000	5,450
St. Louis Park	47,000	49,300	51,500	22,000	23,000	24,000	46,200	50,500	52,500
St. Paul	305,000	320,000	331,000	120,000	127,000	133,000	196,600	210,000	220,600

Location	Population			Households			Employment		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
St. Paul Park	5,700	6,400	7,100	2,160	2,500	2,900	1,400	1,600	1,600
Vadnais Heights	13,800	14,300	16,800	5,600	6,100	7,400	7,950	8,500	9,100
West St. Paul	20,100	21,100	21,700	8,900	9,300	9,600	10,700	12,000	13,000
White Bear Lake	26,940	27,585	27,710	11,225	11,494	11,800	13,390	14,350	15,070
White Bear Township	12,700	13,100	13,100	4,700	4,900	5,000	4,150	5,900	6,800
Willernie	550	550	570	230	240	250	140	140	150
Woodbury	25,572	26,268	27,514	10,130	10,900	11,464	11,800	12,800	12,800
Totals	1,932,334	2,117,839	2,243,223	786,443	872,060	931,607	1,271,930	1,382,060	1,462,280
Seneca WWTP									
Apple Valley	2,060	2,060	2,060	820	820	820	720	840	990
Bloomington	87,500	90,500	93,000	37,700	39,200	40,000	118,600	126,200	137,500
Burnsville	60,800	62,400	64,400	24,952	26,778	28,500	37,700	41,200	43,300
Eagan	67,000	68,000	69,000	26,500	28,000	29,000	48,300	52,000	54,200
Lakeville	4,675	6,600	8,600	1,585	2,391	3,245	1,200	1,300	1,440
Savage	31,000	39,000	42,700	10,700	14,500	16,000	6,000	6,850	8,700
Totals	253,035	268,560	279,760	102,257	111,689	117,565	212,520	228,390	246,130
St. Croix Valley WWTP									
Bayport	4,606	5,322	6,000	1,138	1,298	1,500	5,200	5,700	6,300
Oak Park Heights	5,500	5,400	5,700	2,175	2,300	2,500	3,900	4,500	5,100
Stillwater	18,300	20,550	19,200	7,254	7,800	8,300	11,550	12,500	13,600
Totals	28,406	31,272	30,900	10,567	11,398	12,300	20,650	22,700	25,000
East Bethel WWTP		7,800	13,300		2,900	5,100		1,800	3,000

Appendix B-1: Wastewater Treatment Facilities

b. Wastewater Flow Projections

The following wastewater flow projections are based on the projected sewered population, household and employment projections as shown for each community in Appendix B1-b using 75 gpd per person and 25 gpd per employee from new development to project future flows. Communities may use the flow projection method that is most appropriate to them, and indicate methodology and assumptions used as part of their comprehensive plans. Metropolitan Council Environmental Services will use the projected sewered population, household and employment information to estimate system flows and schedule needed improvements to the Metropolitan Disposal System.

Community Flow Projections

	2010 (MGD)	2020 (MGD)	2030 (MGD)
Andover	1.63	2.17	2.32
Anoka	2.04	2.07	2.11
Apple Valley	4.87	5.37	5.44
Arden Hills	1.28	1.47	2.26
Bayport	0.67	0.72	0.78
Birchwood	0.08	0.08	0.08
Blaine	5.06	5.82	5.87
Bloomington	10.26	10.42	10.63
Brooklyn Center	2.97	2.97	2.82
Brooklyn Park	5.80	6.16	6.37
Burnsville	5.82	5.84	5.87
Carver	0.33	0.32	0.32
Centerville	0.28	0.30	0.34
Champlin	1.70	1.73	1.78
Chanhassen	2.92	3.49	3.71
Chaska	2.94	3.39	3.58
Circle Pines	0.45	0.43	0.43
Columbia Heights	1.53	1.58	1.56
Columbus Township	0.01	0.09	0.13
Coon Rapids	6.19	6.00	5.86
Corcoran	0.45	1.10	1.39
Cottage Grove	2.42	3.19	3.78
Crystal	2.26	2.21	2.22
DahlgrenTownship	0.07	0.98	1.20
Dayton (pt.)	0.29	1.49	2.23
Deephaven	0.45	0.44	0.43
Eagan	6.90	6.87	6.82
East Bethel		0.63	1.07
Eden Prairie	5.53	5.65	5.60
Edina	6.45	6.46	6.49
Elko	0.18	0.47	0.75
Empire Township	0.14	0.29	0.43
Excelsior	0.29	0.31	0.31
Falcon Heights	0.91	0.89	0.88

	2010 (MGD)	2020 (MGD)	2030 (MGD)
Farmington	1.92	2.42	2.79
Forest Lake	2.00	2.52	3.01
Fridley	5.07	5.05	5.07
Gem Lake	0.03	0.05	0.06
Golden Valley	3.20	3.19	3.24
Greenfield	0.01	0.02	0.02
Greenwood	0.06	0.06	0.06
Hassan Township	0.00	0.27	0.00
Hastings	2.04	2.33	2.48
Hilltop	0.10	0.10	0.09
Hopkins	1.85	1.88	1.90
Hugo	1.18	1.95	2.79
Independence	0.02	0.03	0.05
Inver Grove Heights	2.39	2.77	2.92
Lake Elmo	0.13	0.80	1.40
Laketown Township	0.07	0.06	0.00
Lakeville	5.48	6.83	7.59
Landfall	0.06	0.06	0.06
Lauderdale	0.29	0.30	0.30
Lexington	0.13	0.13	0.13
Lilydale	0.10	0.10	0.10
Lino Lakes	1.24	1.89	2.20
Little Canada	1.30	1.36	1.41
Long Lake	0.28	0.29	0.30
Mahtomedi	0.59	0.58	0.55
Maple Grove	6.02	7.03	7.60
Maple Plain	0.32	0.33	0.34
Maplewood	4.57	4.62	4.69
Medicine Lake	0.05	0.05	0.05
Medina	0.55	0.82	1.07
Mendota	0.02	0.02	0.02
Mendota Heights	1.64	1.63	1.61
Minneapolis	57.54	57.82	58.52
Minnetonka	6.70	6.60	6.66
Minnetonka Beach	0.07	0.07	0.06
Minnetrista	0.34	0.55	0.83
Mound	1.03	1.05	1.05
Mounds View	1.46	1.47	1.47
New Brighton	2.29	2.25	2.23
New Hope	2.20	2.19	2.18
New Market	0.22	0.50	0.80
Newport	0.37	0.44	0.50
North Oaks	0.09	0.12	0.15
North St. Paul	1.38	1.40	1.44

	2010 (MGD)	2020 (MGD)	2030 (MGD)
Oak Park Heights	0.69	0.69	0.71
Oakdale	2.81	2.79	2.86
Orono	0.63	0.70	0.71
Osseo	0.23	0.25	0.28
Plymouth	8.20	8.31	8.33
Prior Lake	2.58	3.55	3.52
Ramsey	1.62	2.98	3.30
Richfield	3.99	4.17	4.35
Robbinsdale	1.45	1.53	1.50
Rogers	0.74	0.86	1.62
Rosemount	1.92	2.15	2.59
Roseville	4.47	4.50	4.54
Savage	2.55	3.11	3.38
Shakopee	4.13	4.83	5.07
Shoreview	2.96	2.96	2.91
Shorewood	0.80	0.79	0.78
South St. Paul	3.55	3.51	3.50
Spring Lake Park	0.68	0.67	0.67
Spring Park	0.32	0.34	0.34
St. Anthony	1.01	1.02	1.06
St. Bonifacius	0.23	0.22	0.23
St. Louis Park	6.47	6.62	6.70
St. Paul	30.63	31.23	31.46
St. Paul Park	0.61	0.65	0.69
Stillwater	2.53	2.68	2.57
Tonka Bay	0.24	0.23	0.23
Vadnais Heights	1.35	1.36	1.52
Victoria	0.85	1.56	2.23
Waconia	1.01	1.77	2.13
Wayzata	0.63	0.64	0.65
West St. Paul	2.43	2.48	2.49
White Bear Lake	2.91	2.91	2.86
White Bear Township	1.11	1.16	1.15
Willernie	0.05	0.06	0.05
Woodbury	5.16	6.34	7.06

Appendix B-2: System Plan Requirements

The Council looks for provisions in a community's comprehensive plan that provide for wastewater service commensurate with the needs of expected future development. The Council's requirements for the wastewater, surface water management and water supply sections of a comprehensive plan are listed below.

Under state law, local governments are required to submit both a wastewater plan element to their comprehensive plan as well as a comprehensive sewer plan (CSP) describing service needs from Metropolitan Council Environmental Services (MCES). Before any local government unit in the metropolitan area may proceed with a sewer extension, the CSP must be consistent with the Council's Wastewater Systems Plan and be approved by the Council. In the past, the required information in the CSP has been broader in scope than the information required for the comprehensive plan and has provided more detailed engineering information. To simplify this process and allow the Council to review both documents simultaneously, the Council has combined the required elements of both plans into the following criteria:

a. Wastewater Plan Elements

This section is divided into two parts:

Requirements for communities that are served by MCES's regional system, also known as the Metropolitan Disposal System (MDS).

Requirements for all other communities (and/or parts of communities) in the region.

Requirements for Areas Served by the Regional System

1. Adopted community forecast of households and employment in five-year increments to 2030, based on the Council's 2030 forecasts with any subsequent negotiated modifications.
2. A map or maps showing the following information:
   a. The community's existing sanitary sewer system identifying lift stations, waste disposal sites, existing connections points to the MDS, and the future connection points for new growth if needed.
   b. Inter-community connections and any proposed changes in government boundaries based on orderly annexation agreements.
   c. The location of all private and public wastewater treatment plants.
   d. The map should designate each existing or future connection point to the MDS as a local sewer service district.
3. A table or tables that provide the following information:
   a. Capacity and design flows for existing trunk sewers and lift stations.
   b. Information on the number of existing and potential connections by local sewer service district, and projected flow volume in five-year increments through 2030 and build out. There is no preferred method for projecting interceptor flows. Communities may use the method that is most appropriate, and indicate methodology and assumptions used.
   c. Proposed time schedule for the construction of new trunk sewer systems that require connections to the MDS.

d. Accompanying information on the type and capacity of the treatment facilities, whether municipally or privately owned, copies of their appropriate National Pollutant Discharge Elimination System (NPDES) or State Disposal System (SDS) permit.

4. City goals, policies and strategies for preventing and reducing excessive infiltration and inflow (I/I) in the local sewer system, including:
   a. Requirements and standards for minimizing inflow and infiltration and the disconnection of illegal sump pump and foundation drain connections to the sanitary sewer system. Copies of ordinances prohibiting the discharge of foundation drains and/or roof leaders to the sanitary disposal system as well as copies of ordinances requiring the disconnection of existing foundation drains, sump pumps and roof leaders from the sanitary disposal system should be included.
   b. Information on the extent, source and significance of existing I/I problems along with an analysis of costs for remediation.
   c. Implementation plan including program strategy, priorities, scheduling, and financing mechanisms for eliminating and preventing excessive I/I from entering the system.

Requirements for Areas Not Served by the Regional System

1. Adopted community forecast of households and employees in 10-year increments to 2030 (based on Council's 2030 forecasts with any subsequent negotiated modifications).
2. Description of community's management program for on-site sewage treatment to comply with MPCA 7080, and a copy of the community's current on-site ordinance.
3. Map showing the locations of existing public and private treatment systems, if any, including package treatment plants and group on-site systems.
4. Map identifying location of on-site sewage disposal systems. Location of known non-conforming systems or systems with known problems should be identified.
5. Description of conditions under which private, community treatment systems (for example, package treatment plants, community drainfields) would be allowed. Examples of such conditions should include allowable land uses, installation requirements, management requirements, and local government responsibilities.
6. Capacity of and existing flows to public and private treatment systems.
7. Brief description of the community's sewer system plan (proposed to 2030) including the following information:
   a. Projected flows in 2010, 2020 and 2030.
   b. Local objectives, policies and strategies for preventing and reducing excessive infiltration and inflow including sump pumps and drain tile in the local sewer system.
   c. Proposed timing and financing of any expanded/new wastewater treatment facilities.
   d. Copies of facility planning reports for the upgrading of the wastewater treatment plants.

8. Map showing the service areas through 2030, staging plan if available, and any proposed changes in governmental boundaries affecting the community, including any areas designated for orderly annexation.

b. Local Surface Water Management Plan Elements

Background

In the Twin Cities Metropolitan Area, all cities and townships are covered by one or more watershed management organization (WMO). WMOs are required to prepare plans to address watershed management issues (see Minn. Stat. Sec. 103B.201). Cities and townships are required to prepare local water management plans that are consistent with all applicable WMO plans (see Minn. Stat. 103B.235). In addition, Phase I and II NPDES MS4 permit communities are required to prepare stormwater pollution prevention plans (SWPPPs). Some MS4 communities are listed as nondegradation communities and required to provide information in their SWPPP related to nondegradation. With the multitude of planning requirements, there is a need to coordinate and consolidate all of these different planning documents. Comprehensive local water management plans (plans that address all of the water management planning requirements out there) are crucial in helping the region meet its goal of no adverse impact on area waterbodies.

In 1995, the Metropolitan Land Planning Act was amended to require that each city and township's comprehensive plan include a local water management plan. Local water management plans need to be consistent with the requirements in Minnesota Statutes 103B and in the Metropolitan Land Planning Act. Local water management plans are reviewed by the Metropolitan Council (Council) as part of the local comprehensive planning process prior to their approval by the WMO and adoption by the city or township. Local water management plans are crucial in helping the region meet the challenge of cost-effective management of water quality and quantity.

Local Water Plan Requirements

Minnesota Rules Chapter 8410 (Metropolitan Area Local Water Management), requires the local water management plans to address the specific elements. In the Council's *2030 Regional Development Framework*, the Council adopted a water management goal for the region, "the quality of water leaving the metropolitan area is as good as the water quality entering the metropolitan area, and in compliance with federal and state regulations." To meet this goal, the Council has linked the control of pollution from point and nonpoint sources. The 2030 *Water Resources Management Policy Plan* states that if a community does not have a local water management plan as part of its 2008 comprehensive plan update, the comprehensive plan will be found incomplete for review. If the community has a plan that does not meet Council requirements for local water management plans, the Council will likely find the plan to have an impact on our system, thus requiring a plan modification.

The following list is an expansion of the requirements under Chapter 8410. The list is intended to clarify, through additional detail, what communities should do to ensure that their local water management plan is consistent with the Council's *2030 Water Resources Management Policy Plan.*

1. Purpose of plan
2. Water resource management related agreements
3. Executive summary
4. Land and water resources inventory (For this requirement and others that follow, communities are encouraged to use as much of the WMO plan as they can. The community should be aware that not all WMO plans will contain the level of detail needed for the community and in those instances, the community will need to provide additional information).
5. Establishment of policies and goals
   A. All communities need a strong policy statement to show that they are committed to a goal of no adverse impact (nondegradation) for area water resources.
   B. All communities need goals for their lakes consistent with Watershed Management Organization plan goals.
   C. The Council's *2030 Regional Development Framework* classified communities as urban planning areas (developing and developed areas) and rural planning areas (rural centers, agricultural, diversified rural and rural residential areas). Communities classified as developed or developing and MS4 communities in the rural planning area need to include actions that show the community is committed to the goal of no adverse impact or nondegradation goal for area water resources. Actions should include:
      i. Adopting erosion and sediment control ordinances that are consistent with NPDES Construction Stormwater permit and MS4 permit requirements
      ii. Preparing wetland management plans (refer to 8G for more details of what should be in a wetland management plan)
      iii. Adopting ordinances that control peak runoff (Suggested guidance - Minnesota Stormwater Manual)
      iv. Adopting best management practices for development that will result in TSS and TP reductions of 80% and 50% respectively
      v. Adopting best management practices for redevelopment that will result in TSS and TP reductions (Suggested guidance - Minnesota Stormwater Manual)
      vi. Including funding mechanisms that support implementation and enforcement
   D. Developing and developed communities that are a Phase I or Phase II NPDES MS4 permit community need to integrate their Stormwater Pollution Prevention Plan policies and goals into their local water management plan, in accordance with MPCA requirements and schedules.
   E. Developed and developing communities listed as nondegradation communities as part of their NPDES MS4 permit need to revise their Stormwater Pollution Prevention Plan to include the required information for nondegradation. Nondegradation policies and goals should be summarized or integrated into their local water management plans.
   F. Rural planning area (rural centers, agricultural, diversified rural and rural residential) communities need to include actions that show the community is

committed to the goal of no adverse impact (nondegradation goal) for area water resources. Actions should include:

i. Adopting erosion and sediment control ordinances that are consistent with NPDES Construction Stormwater permit and MS4 permit requirements where applicable
ii. Preparing wetland management plans (refer to 8G for more details of what should be in a wetland management plan)
iii. Adopting ordinances that control peak runoff
iv. Including funding mechanisms that support implementation and enforcement

6. Assessment of problems and corrective actions for problems identified
   A. All communities need to assess the water quality and quantity related problems in their community, prioritize the problems and include actions to adequately solve the problems that were identified.
   B. All communities must acknowledge and list any impaired waters within their jurisdiction as shown on the current MPCA 303d Impaired Waters list. A TMDL is a calculation that determines the allowable pollutant load that can be discharged into the impaired water such that the water is not impaired. A community that discharges water to an impaired waterbody within or adjacent to the community, needs to explain how and if it intends to be involved with the development of the Total Maximum Daily Load (TMDL) study.
      i. If a TMDL study is not completed, the city should identify the priority it places on addressing impaired waters and how the city intends to participate in the development or implementation of TMDL studies.
      ii. If the city is not directly involved in the TMDL study, the city should show how it intends to implement the study findings once the study is completed by the responsible party.
      iii. If a TMDL study is completed for the impaired water, the community needs to include an implementation strategy including funding mechanisms that will allow them to carry out the TMDL requirements.
      More information on the MPCA's TMDL program can be found on the MPCA's web site at http://www.pca.state.mn.us/water/tmdl/index.html.

7. Financial considerations
   A. All communities need to include a 5-year CIP that includes funds to solve the problems identified in number 6 above.
   B. All communities need to include funding in their CIP or operating budget for ongoing maintenance of their stormwater infrastructure.

8. Implementation priorities and program
   A. Developed, developing and any MS4 communities in the rural planning area need to provide information on how they intend to manage stormwater:
      i. Include an erosion and sediment control ordinance consistent with NPDES Construction Stormwater permit and MS4 permit requirements
      ii. Identify ways to control runoff rates (suggested guidance - Minnesota Stormwater Manual) so that land-altering activities do not increase peak stormwater flow from the site for a 24-hour precipitation event with a return frequency of 1or 2, 10, and 100 years.

iii. Require criteria for wet detention basin minimum pollutant removal efficiency to protect and improve stormwater runoff quality. Best management practices for development and redevelopment should result in TSS and TP reductions (suggested guidance - Minnesota Stormwater Manual).
iv. Require infiltration of the first ½ inch of runoff from the impervious areas created by new projects where there are A and B soils. Use of infiltration techniques is prohibited in some potential stormwater hotspot areas, e.g. vehicle fueling areas (suggested guidance - Minnesota Stormwater Manual).
v. Recommend adding a soil amendment and requiring soil ripping 1 ½- 2 feet after mass grading is complete for all soil types.
vi. Require infiltration in wellhead protections areas to be based on the community's wellhead protection plan and at the discretion of the local government.
vii. Require pretreatment of stormwater prior to discharge into all lakes and streams.

B. Rural planning area communities, excluding MS4 communities, need to provide information on how they intend to manage stormwater:
   i. Include an erosion and sediment control ordinance consistent with NPDES Construction Stormwater permit requirements
   ii. Identify ways to control runoff rates so that land-altering activities do not increase peak stormwater flow from the site for a 24-hour precipitation event with a return frequency of 1or 2 years
   iii. Require criteria for wet detention basin minimum pollutant removal efficiency to protect and improve stormwater runoff quality for areas where development is occurring. Best management practices for redevelopment (suggested guidance - Minnesota Stormwater Manual) should result in TSS and TP reductions.

C. All communities with designated trout streams must identify actions in their plan to address the thermal pollution effects from development.

D. All communities with special waters, such as outstanding resource value waters, need to meet state requirements for development near these waters (see Appendix A part B.1-8 of the Minnesota Construction General Permit for a list of these waters and Appendix A part C.1-5 for specific requirements).

E. All communities need to consider the use of stormwater practices that promote infiltration/filtration and decrease impervious areas (better site design and integrated stormwater management), where practical.

F. All communities need to include information on the types of best management practices to be used to improve stormwater quality and quantity and the maintenance schedule for the best management practices.

G. All communities need to include a wetland management plan or a process and timeline to prepare a plan. At a minimum, the wetland management plan should incorporate a function and value assessment for wetlands. Other items to address in the plan include the pretreatment of stormwater prior to discharge into all wetland types, and the use of native vegetation as buffers for high quality wetlands. Buffers should be consistent with the functions and values identified in the plan.

H. Developed and developing communities that are a Phase II NPDES MS4 permit community need to include information on how the community is meeting the permit conditions for required Stormwater Pollution Prevention Plans:
    i. Public education and outreach
    ii. Public participation/involvement
    iii. Illicit discharge detection and elimination
    iv. Construction site runoff control
    v. Post-construction runoff control
    vi. Pollution prevention/good housekeeping.
    vii. Activities planned to be undertaken along with numerical goals, strategies, and timelines
    viii. Funding source for the various required activities.

I. Developed and developing communities which are required to revise their Stormwater Pollution Prevention Plan to include the required nondegradation information as part of their NPDES MS4 permit need to summarize or integrate the nondegradation information into the local water management plan.

9. Amendment procedures: Each local plan must include year the plan extends to and establishes the process by which amendments may be made.

c. Water Supply Plan Elements

The Metropolitan Land Planning Act requires all communities in the metropolitan area that have a municipal water supply system to prepare a water supply plan. The Council's water supply guidelines are based on Minn. Stat. Sec. 473.859, Subd. 3 (4). The Council's and the Minnesota Department of Natural Resources' guidelines for water supply plans follow.

DEPARTMENT OF NATURAL RESOURCES - DIVISION OF WATERS and METROPOLITAN COUNCIL
WATER EMERGENCY AND CONSERVATION PLANS

These guidelines are divided into four parts. The first three parts, Water Supply System Description and Evaluation, Emergency Response Procedures and Water Conservation Planning apply statewide. Part IV, relates to comprehensive plan requirements that apply only to communities in the Seven-County Twin Cities Metropolitan Area. If you have questions regarding water emergency and conservation plans, please call (651) 296-0512 or (651) 297-2835 or e-mail your question to wateruse@dnr.state.mn.us. Metro Communities can also direct questions to the Metropolitan Council at watersupply@metc.state.mn.us or (651) 602-1066.

DNR Water Appropriation Permit Number(s)	
Name of Water Supplier	
Address	
Contact Person	
Title	
Phone Number	
E-Mail Address	

PART I. WATER SUPPLY SYSTEM DESCRIPTION AND EVALUATION

The first step in any water supply analysis is to assess the current status of demand and supplies. Information in Part I, can be used in the development of Emergency Response Procedures and Conservation Plans.

A. ANALYSIS OF WATER DEMAND.

Fill in Table 1 for the past 10 years water demand. If your customer categories are different than the ones listed in Table 1, please note the changes below.

TABLE 1 Historic Water Demand

Year	Total Population	Population Served	Total Connections	Residential Water Sold (MG)	C/I/I Water Sold (MG)	Wholesale Deliveries (MG)	Total Water Sold (MG)	Total Water Pumped (MG)	Percent Unmetered/ Unaccounted	Average Demand (MGD)	Maximum Demand (MGD)	Residential gallons/ capita/day	Total gallons/ capita/day

MG – Million Gallons **MGD** – Million Gallons per Day **C/I/I-** Commercial, Industrial, Institutional

Residential. Water used for normal household purposes, such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens.

Institutional. Hospitals, nursing homes, day care centers, and other facilities that use water for essential domestic requirements. This includes public facilities and public metered uses. You may want to maintain separate institutional water use records for emergency planning and allocation purposes.

Commercial. Water used by motels, hotels, restaurants, office buildings, commercial facilities, both civilian and military.

Industrial. Water used for thermoelectric power (electric utility generation) and other industrial uses such as steel, chemical and allied products, food processing, paper and allied products, mining, and petroleum refining.

Wholesale Deliveries. Bulk water sales to other public water suppliers.

Unaccounted. Unaccounted for water is the volume of water withdrawn from all sources minus the volume sold.

Residential Gallons per Capita per Day = total residential sales in gallons/population served/365 days **Total Gallons per Capita per Day** = total water withdrawals/population served/365 days

NOTE: Non-essential water uses defined by Minnesota Statutes 103G.291, include lawn sprinkling, vehicle washing, golf course and park irrigation and other non-essential uses. Some of the above categories also include non-essential uses of water.

Water Use Trends. Discuss factors that influence trends in water demand (i.e. growth, weather, industry, conservation). If appropriate, include a discussion of other factors that affect daily water use, such as use by non-resident commuter employees or large water consuming industry.

TABLE 2 Large Volume Users - List the top 10 largest users.

Customer	**Gallons per year**	**% of total annual use**

B. TREATMENT AND STORAGE CAPACITY.

TABLE 3(A) Water Treatment

Water Treatment Plant Capacity	Gallons per day
Describe the treatment process used (ie, softening, chlorination, fluoridation, Fe/Mn removal, reverse osmosis, coagulation, sedimentation, filtration, others). Also, describe the annual amount and method of disposal of treatment residuals, if any.	

TABLE 3(B) Storage Capacity - List all storage structures and capacities.

Total Storage Capacity		**Average Day Demand** (average of last 5 years)
Gallons		Gallons per day
Type of Structure	Number of Structures	Gallons
Elevated Storage		
Ground Storage		
Other:		

C. WATER SOURCES. List all groundwater, surface water and interconnections that supply water to the system. Add or delete lines to the tables as needed.

TABLE 4(A) Total Water Source Capacity for System (excluding emergency connections)

Total Capacity of Sources	Gallons per minute
Firm Capacity (largest pump out of service)	Gallons per minute

TABLE 4(B) Groundwater Sources - Copies of water well records and well maintenance information should be included with the public water supplier's copy of the plan in Attachment . If there are more wells than space provided or multiple well fields, please use the List of Wells template (see Resources) and include as Attachment .

Well # or name	Unique Well Number	Year Installed	Well & Casing Depth (ft)	Well Diameter (in)	Capacity (GPM)	Geologic Unit	Status

Status: Active use, Emergency, Standby, Seasonal, Peak use, etc. GPM – Gallons per Minute
Geologic Unit: Name of formation(s), which supplies water to the well

TABLE 4(C) Surface Water Sources

Intake ID	Resource name	Capacity (GPM/MGD)

GPM – Gallons per Minute MGD – Million Gallons per Day

TABLE 4(D) Wholesale or Retail Interconnections - List interconnections with neighboring suppliers that are used to supply water on a regular basis either wholesale or retail.

Water Supply System	Capacity (GPM/MGD)	Wholesale or retail

GPM – Gallons per Minute MGD – Million Gallons per Day

TABLE 4(E) Emergency Interconnections - List interconnections with neighboring suppliers or private sources that can be used to supply water on an emergency or occasional basis. Suppliers that serve less than 3,300 people can leave this section blank, but must provide this information in Section II C.

Water Supply System	Capacity (GPM/MGD)	Note any limitations on use

GPM – Gallons per Minute MGD – Million Gallons per Day

D. DEMAND PROJECTIONS.

TABLE 5 Ten Year Demand Projections

Year	Population Served	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Projected Demand (MGY)

MGD – Million Gallons per Day MGY – Million Gallons per Year

Projection Method. Describe how projections were made, (assumptions for per capita, per household, per acre or other methods used).

E. RESOURCE SUSTAINABILITY

Sustainable water use: use of water to provide for the needs of society, now and in the future, without unacceptable social, economic, or environmental consequences.

Monitoring. Records of water levels should be maintained for all production wells and source water reservoirs/basins. Water level readings should be taken monthly for a production well or observation well that is representative of the wells completed in each water source formation. **If water levels are not currently measured each year, a monitoring plan that includes a schedule for water level readings must be submitted as Attachment .**

TABLE 6 Monitoring Wells - List all wells being measured.

Unique well number	**Type of well (production, observation)**	**Frequency of Measurement (daily, monthly etc.)**	**Method of Measurement (steel tape, SCADA etc.)**

Water Level Data. Summarize water level data including seasonal and long-term trends for each ground and/or surface water source. If water levels are not measured and recorded on a routine basis then provide the static water level (SWL) when the well was constructed and a current water level measurement for each production well. Also include all water level data taken during well and pump maintenance.
Attachment : Provide monitoring data (graph or table) for as many years as possible.

Ground Water Level Monitoring – DNR Waters in conjunction with federal and local units of government maintain and measure approximately 750 observation wells around the state. Ground water level data are available online www.dnr.state.mn.us/waters. Information is also available by contacting the Ground Water Level Monitoring Manager, DNR Waters, 500 Lafayette Road, St. Paul, MN 55155-4032 or call (651) 296-4800.

Natural Resource Impacts. Indicate any natural resource features such as calcareous fens, wetlands, trout streams, rivers or surface water basins that are or could be influenced by water withdrawals from municipal production wells. Also indicate if resource protection thresholds have been established and if mitigation measures or management plans have been developed.

Sustainability. Evaluate the adequacy of the resource to sustain current and projected demands. Describe any modeling conducted to determine impacts of projected demands on the resource.

Source Water Protection Plans. The emergency procedures in this plan are intended to comply with the contingency plan provisions required in the Minnesota Department of Health's (MDH) Wellhead Protection (WHP) Plan and Surface Water Protection (SWP) Plan.	
Date WHP Plan Adopted:	
Date for Next WHP Update:	
SWP Plan:	☐ In Process ☐ Completed ☐ Not Applicable

F. CAPITAL IMPROVEMENT PLAN (CIP)

Adequacy of Water Supply System. Are water supply installations, treatment facilities and distribution systems adequate to sustain current and projected demands? ☐ Yes ☐ No If no, describe any potential capital improvements over the next ten years and state the reasons for the proposed changes (CIP Attachment).

Proposed Water Sources. Does your current CIP include the addition of new wells or intakes? ☐ Yes ☐ No If yes, list the number of new installations and projected water demands from each for the next ten years. Plans for new production wells must include the geologic source formation, well location, and proposed pumping capacity.

Water Source Alternatives. If new water sources are being proposed, describe alternative sources that were considered and any possibilities of joint efforts with neighboring communities for development of supplies.

Preventative Maintenance. Long-term preventative programs and measures will help reduce the risk of emergency situations. Identify sections of the system that are prone to failure due to age, materials or other problems. This information should be used to prioritize capital improvements, preventative maintenance, and to determine the types of materials (pipes, valves, couplings, etc.) to have in stock to reduce repair time.

PART II. EMERGENCY RESPONSE PROCEDURES

Water emergencies can occur as a result of vandalism, sabotage, accidental contamination, mechanical problems, power failures, drought, flooding, and other natural disasters. The purpose of emergency planning is to develop emergency response procedures and to identify actions needed to improve emergency preparedness. In the case of a municipality, these procedures should be in support of, and part of, an all-hazard emergency operations plan. If your community already has written procedures dealing with water emergencies we recommend that you use these guidelines to review and update existing procedures and water supply protection measures.

Federal Emergency Response Plan

Section 1433(b) of the Safe Drinking Water Act as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188, Title IV – Drinking Water Security and Safety) requires community water suppliers serving over 3,300 people to prepare an Emergency Response Plan. **Community water suppliers that have completed the Federal Emergency Response Plan and submitted the required certification to the U.S. Environmental Protection Agency have satisfied Part II, Sections A, B, and C of these guidelines and need only provide the information below regarding the emergency response plan and source water protection plan and complete Sections D (Allocation and Demand Reduction Procedures), and E (Enforcement).**

Provide the following information regarding your completed Federal Emergency Response Plan:

Emergency Response Plan	Contact Person	Contact Number
Emergency Response Lead		
Alternate Emergency Response Lead		
Emergency Response Plan Certification Date		

Operational Contingency Plan. An operational contingency plan that describes measures to be taken for water supply mainline breaks and other common system failures as well as routine maintenance is recommended for all utilities. Check here ☐ if the utility has an operational contingency plan. At a minimum a contact list for contractors and supplies should be included in a water emergency telephone list.

Communities that have completed Federal Emergency Response Plans should skip to Section D.

EMERGENCY RESPONSE PROCEDURES

A. Emergency Telephone List. A telephone list of emergency contacts must be included as Attachment to the plan (complete template or use your own list). The list should include key utility and community personnel, contacts in adjacent communities, and appropriate local, state and federal emergency contacts. Please be sure to verify and update the contacts on the emergency telephone list on a regular basis (once each year recommended). In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the warning point for that community. Responsibilities and services for each contact should be defined.

B. Current Water Sources and Service Area. Quick access to concise and detailed information on water sources, water treatment, and the distribution system may be needed in an emergency. System operation, water well and maintenance records should be maintained in a central secured location so that the records are accessible for emergency purposes and preventative maintenance. A detailed map of the system showing the treatment plants, water sources, storage facilities, supply lines, interconnections, and other information that would be useful in an emergency should also be readily available. Check here ☐ if these records and maps exist and staff can access the documents in the event of an emergency.

C. Procedure for Augmenting Water Supplies. List all available sources of water that can be used to augment or replace existing sources in an emergency. In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the warning point for that community. Copies of cooperative agreements should be maintained with your copy of the plan and include in Attachment . Be sure to include information on any physical or

chemical problems that may limit interconnections to other sources of water. Approvals from the MN Department of Health are required for interconnections and reuse of water.

TABLE 7 (A) Public Water Supply Systems – List interconnections with other public water supply systems that can supply water in an emergency.

Water Supply System	Capacity (GPM/MGD)	Note any limitations on use

GPM – Gallons per Minute MGD – Million Gallons per Day

TABLE 7 (B) - Private Water Sources – List other sources of water available in an emergency.

Name	Capacity (GPM/MGD)	Note any limitations on use

GPM – Gallons per Minute MGD – Million Gallons per Day

D. Allocation and Demand Reduction Procedures. The plan must include procedures to address gradual decreases in water supply as well as emergencies and the sudden loss of water due to line breaks, power failures, sabotage, etc. During periods of limited water supplies public water suppliers are required to allocate water based on the priorities established in Minnesota Statutes 103G.261.

Water Use Priorities (Minnesota Statutes 103G.261)

First Priority. Domestic water supply, excluding industrial and commercial uses of municipal water supply, and use for power production that meets contingency requirements.

NOTE: Domestic use is defined (MN Rules 6115.0630, Subp. 9), as use for general household purposes for human needs such as cooking, cleaning, drinking, washing, and waste disposal, and uses for on-farm livestock watering excluding commercial livestock operations which use more than 10,000 gallons per day or one million gallons per year.

Second Priority. Water uses involving consumption of less than 10,000 gallons per day.

Third Priority. Agricultural irrigation and processing of agricultural products.

Fourth Priority. Power production in excess of the use provided for in the contingency plan under first priority.

Fifth Priority. Uses, other than agricultural irrigation, processing of agricultural products, and power production.

Sixth Priority. Non-essential uses. These uses are defined by Minnesota Statutes 103G.291 as lawn sprinkling, vehicle washing, golf course and park irrigation, and other non-essential uses.

List the statutory water use priorities along with any local priorities (hospitals, nursing homes, etc.) in Table 8. Water used for human needs at hospitals, nursing homes and similar types of facilities should be designated as a high priority to be maintained in an emergency. Local allocation priorities will need to address water used for human needs at other types of facilities such as hotels, office buildings, and manufacturing plants. The volume of water and other types of water uses at these facilities must be carefully considered. After reviewing the data, common sense should dictate local allocation priorities to protect domestic requirements over certain types of economic needs. In Table 8, list the priority ranking, average day demand and demand reduction potential for each customer category (modify customer categories if necessary).

Table 8 Water Use Priorities

Customer Category	Allocation Priority	Average Day Demand (GPD)	Demand Reduction Potential (GPD)
Residential	1		
Institutional			
Commercial			
Industrial			
Irrigation			
Wholesale			
Non-essential	6		
	TOTALS		

GPD – Gallons per Day

Demand Reduction Potential. The demand reduction potential for residential use will typically be the base demand during the winter months when water use for non-essential uses such as lawn watering do not occur. The difference between summer and winter demands typically defines the demand reduction that can be achieved by eliminating non-essential uses. In extreme emergency situations lower priority water uses must be restricted or eliminated to protect first priority domestic water requirements. Short-term demand reduction potential should be based on average day demands for customer categories within each priority class.

Triggers for Allocation and Demand Reduction Actions. Triggering levels must be defined for implementing emergency responses, including supply augmentation, demand reduction, and water allocation. Examples of triggers include: water demand >100% of storage, water level in well(s) below a certain elevation, treatment capacity reduced 10% etc. Each trigger should have a quantifiable indicator and actions can have multiple stages such as mild, moderate and severe responses. Check each trigger below that is used for implementing emergency responses and for each trigger indicate the actions to be taken at various levels or stages of severity in Table 9.

- ☐ Water Demand
- ☐ Treatment Capacity
- ☐ Storage Capacity
- ☐ Groundwater Levels
- ☐ Surface Water Flows or Levels
- ☐ Pump, Booster Station or Well Out of Service
- ☐ Governor's Executive Order – Critical Water Deficiency (required by statute)
- ☐ Water Main Break
- ☐ Loss of Production
- ☐ Security Breach
- ☐ Contamination
- ☐ Other (list in Table 9)

Table 9 Demand Reduction Procedures

Condition	Trigger(s)	Actions
Stage 1 (Mild)		
Stage 2 (Moderate)		
Stage 3 (Severe)		
Critical Water Deficiency **(M.S. 103G.291)**	Executive Order by Governor & as provided in above triggers	Stage 1: Restrict lawn watering, vehicle washing, golf course and park irrigation and other nonessential uses Stage 2: Suspend lawn watering, vehicle washing, golf course and park irrigation and other nonessential uses

Note: The potential for water availability problems during the onset of a drought are almost impossible to predict. Significant increases in demand should be balanced with preventative measures to conserve supplies in the event of prolonged drought conditions.

Notification Procedures. List methods that will be used to inform customers regarding conservation requests, water use restrictions, and suspensions. Customers should be aware of emergency procedures and responses that they may need to implement.

E. Enforcement. Minnesota Statutes require public water supply authorities to adopt and enforce water conservation restrictions during periods of critical water shortages.

Public Water Supply Appropriation During Deficiency.
Minnesota Statutes 103G.291, Subdivision 1.

Declaration and conservation.

(a) If the governor determines and declares by executive order that there is a critical water deficiency, public water supply authorities appropriating water must adopt and enforce water conservation restrictions within their jurisdiction that are consistent with rules adopted by the commissioner.

(b) The restrictions must limit lawn sprinkling, vehicle washing, golf course and park irrigation, and other nonessential uses, and have appropriate penalties for failure to comply with the restrictions.

An ordinance that has been adopted or a draft ordinance that can be quickly adopted to comply with the critical water deficiency declaration must be included in the plan (include with other ordinances in Attachment 7 for Part III, Item 4). Enforcement responsibilities and penalties for non-compliance should be addressed in the critical water deficiency ordinance.

Sample regulations are available at www.dnr.state.mn.us/waters

Authority to Implement Water Emergency Responses. Emergency responses could be delayed if city council or utility board actions are required. Standing authority for utility or city managers to implement water restrictions can improve response times for dealing with emergencies. Who has authority to implement water use restrictions in an emergency?

☐ Utility Manager ☐ City Manager ☐ City Council or Utility Board

☐ Other (describe):

Emergency Preparedness. If city or utility managers do not have standing authority to implement water emergency responses, please indicate any intentions to delegate that authority. Also indicate any other measures that are being considered to reduce delays for implementing emergency responses.

PART III. WATER CONSERVATION PLAN

Water conservation programs are intended to reduce demand for water, improve the efficiency in use and reduce losses and waste of water. Long-term conservation measures that improve overall water use efficiencies can help reduce the need for short-term conservation measures. Water conservation is an important part of water resource management and can also help utility managers satisfy the ever-increasing demands being placed on water resources.

Minnesota Statutes 103G.291, requires public water suppliers to implement demand reduction measures before seeking approvals to construct new wells or increases in authorized volumes of water. Minnesota Rules 6115.0770, require water users to employ the best available means and practices to promote the efficient use of water. Conservation programs can be cost effective when compared to the generally higher costs of developing new sources of supply or expanding water and/or wastewater treatment plant capacities.

A. Conservation Goals. The following section establishes goals for various measures of water demand. The programs necessary to achieve the goals will be described in the following section.

Unaccounted Water (calculate five year averages with data from Table 1)	
Average annual volume unaccounted water for the last 5 years	gallons
Average percent unaccounted water for the last 5 years	percent
AWWA recommends that unaccounted water not exceed 10%. Describe goals to reduce unaccounted water if the average of the last 5 years exceeds 10%.	

Residential Gallons Per Capita Demand (GPCD)	
Average residential GPCD use for the last 5 years (use data from Table 1)	GPCD
In 2002, average residential GPCD use in the Twin Cities Metropolitan Area was 75 GPCD. Describe goals to reduce residential demand if the average for the last 5 years exceeds 75 GPCD.	

Total Per Capita Demand: From Table 1, is the trend in overall per capita demand over the past 10 years ☐ increasing or ☐ decreasing? If total GPCD is increasing, describe the goals to lower overall per capita demand or explain the reasons for the increase.

Peak Demands (calculate average ratio for last five years using data from Table 1)	
Average maximum day to average day ratio	
If peak demands exceed a ratio of 2.6, describe the goals for lowering peak demands.	

B. Water Conservation Programs. Describe all short-term conservation measures that are available for use in an emergency and long-term measures to improve water use efficiencies for each of the six conservation program elements listed below. Short-term demand reduction measures must be included in the emergency response procedures and must be in support of, and part of, a community all-hazard emergency operation plan.

1. **Metering.** The American Water Works Association (AWWA) recommends that every water utility meter all water taken into its system and all water distributed from its system at its customer's point of service. An effective metering program relies upon periodic performance testing, repair, repair and maintenance of all meters. AWWA also recommends that utilities conduct regular water audits to ensure accountability.
Complete Table 10 (A) regarding the number and maintenance of customer meters.

TABLE 10 (A) Customer Meters

	Number of Connections	**Number of Metered Connections**	**Meter testing schedule (years)**	**Average age/meter replacement schedule (years)**
Residential				/
Institutional				/
Commercial				/
Industrial				/
Public Facilities				/
Other				/
TOTALS				

Unmetered Systems. Provide an estimate of the cost to install meters and the projected water savings from metering water use. Also indicate any plans to install meters.

TABLE 10 (B) Water Source Meters

	Number of Meters	Meter testing schedule (years)	Average age/meter replacement schedule (years)
Water Source (wells/intakes)			/
Treatment Plant			/

2. **Unaccounted Water.** Water audits are intended to identify, quantify, and verify water and revenue losses. The volume of unaccounted-for water should be evaluated each billing cycle. The AWWA recommends a goal of ten percent or less for unaccounted-for water. Water audit procedures are available from the AWWA and MN Rural Water Association.

Frequency of water audits: ☐ each billing cycle ☐ yearly ☐ other:

Leak detection and survey: ☐every year ☐ every years ☐ periodic as needed
Year last leak detection survey completed:

Reducing Unaccounted Water. List potential sources and efforts being taken to reduce unaccounted water. If unaccounted water exceeds 10% of total withdrawals, include the timeframe for completing work to reduce unaccounted water to 10% or less.

3. **Conservation Water Rates.** Plans must include the current rate structure for all customers and provide information on any proposed rate changes. Discuss the basis for current price levels and rates, including cost of service data, and the impact current rates have on conservation.

Billing Frequency: ☐ Monthly ☐ Bimonthly ☐ Quarter
☐ Other (describe):

Volume included in base rate or service charge: gallons or cubic feet

Conservation Rate Structures

☐ Increasing block rate: rate per unit increases as water use increases
☐ Seasonal rate: higher rates in summer to reduce peak demands
☐ Service charge or base fee that does not include a water volume

Conservation Neutral Rate Structure

☐ Uniform rate: rate per unit is the same regardless of volume

Non-conserving Rate Structures

☐ Service charge or base fee that includes a large volume of water
☐ Declining block rate: rate per unit decreases as water use increases
☐ Flat rate: one fee regardless of how much water is used (unmetered)

Other (describe):

Water Rates Evaluated: ☐ every year ☐ every years ☐ no schedule
Date of last rate change:

Declining block (the more water used, the cheaper the rate) and flat (one fee for an unlimited volume of water) rates should be phased out and replaced with conservation rates. Incorporating a seasonal rate structure and the benefits of a monthly billing cycle should also be considered along with the development of an emergency rate structure that could be quickly implemented to encourage conservation in an emergency.

Current Water Rates. Include a copy of the actual rate structure in Attachment or list current water rates including base/service fees and volume charges below.

Non-conserving Rate Structures. Provide justification for the rate structure and its impact on reducing demands or indicate intentions including the timeframe for adopting a conservation rate structure.

4. **Regulation.** Plans should include regulations for short-term reductions in demand and long-term improvements in water efficiencies. Sample regulations are available from DNR Waters. Copies of adopted regulations or proposed restrictions should be included in Attachment of the plan. Indicate any of the items below that are required by local regulations and also indicate if the requirement is applied each year or just in emergencies.

☐ Time of Day: no watering between am/pm and am/pm
(reduces evaporation) ☐ year around ☐ seasonal ☐ emergency only
☐ Odd/Even: (helps reduce peak demand) ☐ year around ☐ seasonal ☐ emergency only
☐ Water waste prohibited (no runoff from irrigation systems)
Describe ordinance:
☐ Limitations on turf areas for landscaping (reduces high water use turf areas)
Describe ordinance:
☐ Soil preparation (such as 4”-6” of organic soil on new turf areas with sandy soil)
Describe ordinance:
☐ Tree ratios (plant one tree for every square feet to reduce turf evapotranspiration)
Describe ordinance:
☐ Prohibit irrigation of medians or areas less than 8 feet wide
Describe ordinance:
☐ Permit required to fill swimming pool ☐ every year ☐ emergency only
☐ Other (describe):

State and Federal Regulations (mandated)

☐ **Rainfall sensors on landscape irrigation systems.** Minnesota Statute 103G.298 requires “All automatically operated landscape irrigation systems shall have furnished and installed technology that inhibits or interrupts operation of the landscape irrigation system during periods of sufficient moisture. The technology must be adjustable either by the end user or the professional practitioner of landscape irrigation services.”

☐ **Water Efficient Plumbing Fixtures.** The 1992 Federal Energy Policy Act established manufacturing standards for water efficient plumbing fixtures, including toilets, urinals, faucets, and aerators.

Enforcement. Are ordinances enforced? ☐ Yes ☐ No If yes, indicate how ordinances are enforced along with any penalties for non-compliance.

5. **Education and Information Programs.** Customers should be provided information on how to improve water use efficiencies a minimum of two times per year. Information should be provided at appropriate times to address peak demands. Emergency notices and educational materials on how to reduce water use should be available for quick distribution during an emergency. If any of the methods listed in the table below are used to provide water conservation tips, indicate the number of times that information is provided each year and attach a list of education efforts used for the last three years.

Current Education Programs	**Times/Year**
Billing inserts or tips printed on the actual bill	
Consumer Confidence Reports	
Local news papers	
Community news letters	
Direct mailings (water audit/retrofit kits, showerheads, brochures)	
Information at utility and public buildings	
Public Service Announcements	
Cable TV Programs	
Demonstration projects (landscaping or plumbing)	
K-12 Education programs (Project Wet, Drinking Water Institute)	
School presentations	
Events (children's water festivals, environmental fairs)	
Community education	
Water Week promotions	
Information provided to groups that tour the water treatment plant	
Website (include address:)	
Targeted efforts (large volume users, users with large increases)	
Notices of ordinances (include tips with notices)	
Emergency conservation notices (recommended)	
Other:	

List education efforts for the last three years in Attachment of the plan. Be sure to indicate whether educational efforts are on-going and which efforts were initiated as an emergency or drought management effort.

Proposed Education Programs. Describe any additional efforts planned to provide conservation information to customers a minimum of twice per year (required if there are no current efforts).

A packet of conservation tips and information can be obtained by contacting DNR Waters or the Minnesota Rural Water Association (MRWA). The American Water Works Association (AWWA) www.awwa.org or www.waterwiser.org also has excellent materials on water conservation that are available in a number of formats. You can contact the MRWA 800/367-6792, the AWWA bookstore 800/926-7337 or DNR Waters 651/296-0512 for information regarding educational materials and formats that are available.

6. **Retrofitting Programs.** Education and incentive programs aimed at replacing inefficient plumbing fixtures and appliances can help reduce per capita water use as well as energy costs. It is recommended that communities develop a long-term plan to retrofit public buildings with water efficient plumbing fixtures and that the benefits of retrofitting be included in public education programs. You may also want to contact local electric or gas suppliers to see if they are interested in developing a showerhead distribution program for customers in your service area.

A study by the AWWA Research Foundation (Residential End Uses of Water, 1999) found that the average indoor water use for a non-conserving home is 69.3 gallons per capita per day (gpcd). The average indoor water use in a conserving home is 45.2 gpcd and most of the decrease in water use is related to water efficient plumbing fixtures and appliances that can reduce water, sewer and energy costs. In Minnesota, certain electric and gas providers are required (Minnesota Statute 216B.241) to fund programs that will conserve energy resources and some utilities have distributed water efficient showerheads to customers to help reduce energy demands required to supply hot water.

Retrofitting Programs. Describe any education or incentive programs to encourage the retrofitting of inefficient plumbing fixtures (toilets, showerheads, faucets, and aerators) or appliances (washing machines).

Plan Approval. Water Emergency and Conservation Plans must be approved by the Department of Natural Resources (DNR) every ten years. Please submit plans for approval to the following address:

DNR Waters
Water Permit Programs Supervisor
500 Lafayette Road
St. Paul, MN 55155-4032

or Submit electronically to wateruse@dnr.state.mn.us.

Adoption of Plan. All DNR plan approvals are contingent on the formal adoption of the plan by the city council or utility board. Please submit a certificate of adoption (example available) or other action adopting the plan.

Metropolitan Area communities are also required to submit these plans to the Metropolitan Council. Please see PART IV. ITEMS FOR METROPOLITAN AREA PUBLIC SUPPLIERS.

METROPOLITAN COUNCIL

PART IV. ITEMS FOR METROPOLITAN AREA PUBLIC SUPPLIERS

Minnesota Statute 473.859 requires water supply plans to be completed for all local units of government in the seven-county Metropolitan Area as part of the local comprehensive planning process. Much of the required information is contained in Parts I-III of these guidelines. However, the following additional information is necessary to make the water supply plans consistent with the Metropolitan Land Use Planning Act upon which local comprehensive plans are based. Communities should use the information collected in the development of their plans to evaluate whether or not their water supplies are being developed consistent with the Council's Water Resources Management Policy Plan.

Policies. Provide a statement(s) on the principles that will dictate operation of the water supply utility: for example, "It is the policy of the city to provide good quality water at an affordable rate, while assuring this use does not have a long-term negative resource impact."

Impact on the Local Comprehensive Plan. Identify the impact that the adoption of this water supply plan has on the rest of the local comprehensive plan, including implications for future growth of the community, economic impact on the community and changes to the comprehensive plan that might result.

A. Demand Projections

Year	Total Community Population	Population Served	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Projected Demand (MGY)
2010					
2020					
2030					
Ultimate					

Population projections should be consistent with those in the Metropolitan Council's *2030 Regional Development Framework* or the Communities 2008 Comprehensive Plan update**.** If population served differs from total population, explain in detail why the difference (ie, service to other communities, not complete service within community etc.).

PLAN SUBMITTAL AND REVIEW OF THE PLAN

The plan will be reviewed by the Council according to the sequence outlined in Minnesota Statutes 473.175. Prior to submittal to the Council, the plan must be submitted to adjacent governmental units for a 60-day review period. Following submittal, the Council determines if the plan is complete for review within 15 days. If incomplete, the Council will notify the community and request the necessary information. When complete the Council will complete its review within 60 days or a mutually agreed upon extension. The community officially adopts the plan after the Council provides its comments.

Plans can be submitted electronically to the Council; however, the review process will not begin until the Council receives a paper copy of the materials. Electronic submissions can be via a CD, 3 ½" floppy disk or to the email address below. Metropolitan communities should submit their plans to:

Reviews Coordinator
Metropolitan Council
390 N. Robert Street
St. Paul, MN 55101

electronically to:
watersupply@metc.state.mn.us

Appendix C: Summary of Policies and Implementation Strategies

List of All *Water Resources Management Policy Plan* Policies and Implementation Strategies

Water Supply

Policies

- The Metropolitan Council will work with state agencies and communities to promote and support the efficient use of water resources to ensure that supplies are adequate for the region's projected growth.
- The Council will work with regional partners to protect the water supply system for the region.

Implementation Strategies

- The Council will update the regional water supply plan at least every 10 years. Elements of the regional water supply plan will include:
  - An evaluation of existing and expected water use and supply in the metropolitan area.
  - An assessment of water supplies available in the metropolitan area.
  - An assessment of alternatives to meeting water demands in areas where it is determined that there are potential limitations on future withdrawals.
- The Council will review local water supply plans as required by state statute for consistency with Council and DNR plan requirements and Council policy.
- The Council will establish subregional task forces as needed and lead discussions among communities that may face water supply limitations. The Council will assist these communities to explore options and develop plans to meet projected demand.
- The Council will participate in regional planning efforts for drought and emergency conditions.
- The Council will work with partners to develop an institutional framework for coordinated regional and subregional water supply planning and management.
- The Council will promote water conservation measures in communities throughout the region.
- The Council will encourage public and private entities to pursue environmentally sound and cooperative water use practices, joint planning efforts and implementation efforts.
- The Council will investigate reusing wastewater effluent and, when cost-effective, implement reuse.
- The Council will work with local governments, regulatory agencies, water suppliers and water users to assess the use, capacity, quality and vulnerability of the regional water supply system along with identifying prime areas for recharge.
- The Council will promote development practices and patterns that protect the integrity of the region's water supply through the review of comprehensive plans, water supply plans, local stormwater management plans, and other environmental review documents.
- The Council will promote the use of best management practices for stormwater runoff to protect and improve water quality and maximize groundwater recharge.

Surface Water Management

Policies

- The Council will provide technical assistance and resource assessment information to assist others in their efforts to implement practices that will protect water resources (wetlands, lakes, streams, rivers, and natural drainage courses). Best management practices help to maintain and improve water quality, control runoff rates and volumes to reduce streambank erosion and flooding, and preserve designated beneficial uses.
- The Council will review local comprehensive plans, watershed management plans, local surface water management plans, local stormwater ordinances, environmental permits and other environmental documents to ensure that the local units of government are fulfilling their nonpoint source reduction requirements and therefore not impacting the metropolitan disposal system.

Implementation Strategies

- The Council will continue to monitor and assess lakes, streams, and rivers to measure the progress in achieving the goal of no adverse impact on water resources in the region.
- The Council will work with watershed organizations, local units of government, state and federal agencies, and other stakeholders to promote the protection of area lakes, wetlands, streams, and rivers with a special emphasis on priority lakes to achieve the goal of no adverse impact on water quality in the region.
- The Council will encourage and support the use of the most effective nonpoint source pollution reduction technologies. These include low impact development practices and best management practices aimed at protecting water quality and maintaining stormwater runoff rates and volumes at or below predevelopment conditions.
- The Council will review environmental documents to ensure that actions of others are not causing a wastewater system impact.
- The Council will develop target pollution loads for the major watershed basins by 2008 and work in conjunction with the MPCA in the development of Total Maximum Daily Loads (TMDLs) to reduce the effects of nonpoint source pollution on the region's wetlands, lakes, streams and rivers.

Wastewater Service

Policies

- The Metropolitan Council will use the wastewater system plan to support the orderly and economic development of the metropolitan area, including the long-term service area of communities. The long-term service area will be generally defined by a community or watershed boundary. A community's comprehensive plan and plan amendments are expected to meet the forecasts and densities specified in the Council's *2030 Regional Development Framework*. Inconsistencies will provide the Council with grounds for finding that the community's plan is more likely than not to have a substantial impact on, or contain a substantial departure from, the metropolitan system plan, thus requiring modifications to the local comprehensive plan.
- In order to provide cost-effective and efficient use of existing and planned infrastructure on a regional basis, local land-use planning must be consistent with the Council's adopted long-range policy plans, system plans and capital improvement programs for regional wastewater service, and all communities currently served by the Metropolitan Disposal System must remain in the system.

- The Metropolitan Council will not allow connections to the Metropolitan Disposal System within the rural planning area. The Council may provide capacity for the long-term needs of the rural and agricultural planning areas.
- The Council will not provide additional capacity within its interceptor system to serve excessive inflow and infiltration.
- The Council will establish inflow and infiltration goals for all communities discharging wastewater to the Metropolitan Disposal System based on the designed peak-hour capacity of the interceptor(s) serving the community. Communities that have excessive inflow and infiltration in their sanitary sewer systems will be required to eliminate the excessive inflow and infiltration within a reasonable time period.
- Interceptors and related facilities that are no longer a necessary part of the Metropolitan Disposal System will be reconveyed, abandoned, or sold pursuant to related statutes.
- The Metropolitan Council, the delegated pretreatment authority, will implement and enforce the Council's Waste Discharge Rules for the Metropolitan Disposal System.
- The Council will ensure that the MCES treatment plants will continue to meet the stringent permit conditions imposed by the Minnesota Pollution Control Agency.
- The Council will accept septage, biosolids, and other hauled liquid waste at designated sites. All hauled liquid wastes from within the region will be accepted at the full cost of service.
- The Council will design and adopt fees and charges using a regional cost-of-service basis:
  - Municipal wastewater charges will be allocated to communities uniformly, based on flow.
  - Industrial wastewater strength and load charge rates will each be uniform, and proportionate to the volume and strength of discharges.
  - Load charges for septage, portable toilet waste, holding tank wastewater and out-of-region wastes will be uniform for each type of load, and based on the volume of the load and the average strength of the types of loads.
  - Service Availability Charges (SAC) will be uniform within the urban service area of the region. SAC for a Rural Growth Center where a treatment facility is owned by the Council will be based on the reserve capacity of the plant and the Council's debt service specific to the Center. SAC for a Rural Growth Center where interceptor facility(s) are owned by the Council, will be the urban SAC charge plus a charge based on the reserve capacity of the specific interceptor(s) and the Council's debt service specific to the Center.
- The Council will seek customer input prior to, and give at least three months notice of, any material changes in the design of fees and charges.
- The Council will maintain wastewater rates for MCES that enable the division to:
  - Meet wastewater regulatory requirements;
  - Implement MCES infrastructure rehabilitation and repair needs; and
  - Provide wastewater capacity for growth consistent with the Council's *2030 Regional Development Framework.*

- The Council will continue to use the Council's review authority under the Metropolitan Land Planning Act to ensure that communities that permit the construction of private wastewater treatment systems within their communities (community systems and individual sewage treatment systems) ensure that these systems are installed, maintained, managed, and regulated by the community consistent with Minnesota Pollution Control Agency rules.
- The community is responsible for permitting all private wastewater treatment systems. The Council will not provide financial support to assist communities if these systems fail.
- The Council will allow the community to connect a failing private wastewater treatment system to the Metropolitan Disposal System, where there is available capacity, at the community's expense.

Implementation Strategies

- The Council will provide a level of wastewater service commensurate with the needs of the growing metropolitan area, and in an environmentally sound manner.
- The Council will provide sufficient sewer infrastructure capacity to meet the 20-year growth projections and long-term service area needs identified in local comprehensive plans. Any capital improvements that the Council needs to provide will be scheduled so that the infrastructure is available at least two years prior to the need identified in the approved comprehensive plan.
- New wastewater treatment plants, owned and operated by MCES, will be built to serve developing communities if they meet established criteria.
- The Council may implement early land acquisition and work closely with communities to preserve utility corridors when it is necessary to expand its facilities or locate new facilities needed to implement the wastewater system plan.
- The Council will continue to provide wastewater services to communities based on the definition of a metropolitan interceptor.
- Existing wastewater treatment plants in rural centers (centers that do not want significant growth) will not be owned and operated by the Metropolitan Council.
- Existing wastewater treatment plants owned and operated by Rural Growth Centers (centers that want to grow) will be acquired and operated by MCES upon request and established Council criteria. The request for acquisition must be made to the Council through a comprehensive plan amendment.
- If it is determined that a Rural Growth Center's wastewater treatment plant (WWTP) should be phased out and served by the Metropolitan Disposal System (MDS), then the Council will construct an interceptor from the existing treatment plant site or point of collection to a connection point within the existing MDS. The Rural Growth Center will be responsible to decommission the WWTP and take over the ownership of the interceptor from the WWTP or point of collection to their corporate limits.
- If comprehensive plans demonstrate that a Rural Growth Center will become contiguous to urban development, the Rural Growth Center will be reclassified under the *2030 Regional Development Framework* as a developing community.
- When proposed redevelopment is consistent with the 2030 growth projections, the Council will support redevelopment by funding improvements to the MDS for those communities that meet the established criteria.

- When the proposed redevelopment exceeds the 2030 growth projections, the Metropolitan Council will consider cost-sharing improvements to the MDS for those communities that meet the established criteria if a cost-effective solution is available. Cost sharing will be determined on a case-by-case basis. Cost sharing will attempt to limit undue hardship for communities.
- The Council will consider the financial implications and the community will share the cost of providing the additional services when construction of new regional facilities provides added benefits to local communities in addition to the expected regional benefits, and when additional costs are incurred by MCES to provide the local benefits.
- Service will not be provided until the Council, in consultation with the appropriate community, designates the area as a developing community and the community amends its comprehensive plan accordingly.
- The Council will continue to use the current design standards for interceptors.
- The Council will develop inflow and infiltration goals for all communities based on the designed peak-hour capacity of the interceptor(s) serving the community as well as guidelines for the preparation of the local inflow and infiltration programs.
- The Council will ask all communities served by the MDS to begin the development and implementation of an inflow and infiltration program as soon as practicable and require the communities to include that program within their next comprehensive plan.
- Peak inflow during wet weather conditions will be measured by either the MCES metering system or by installation of temporary monitoring equipment in the sanitary sewer system.
- The Council will require the community to reduce its inflow and infiltration to reach the design flow standard for each connection point to the MDS by no later than 2012.
- The Council will limit increases in service within those communities where excessive inflow and infiltration jeopardizes MCES's ability to convey wastewater without an overflow or backup occurring, or limits the capacity in the system to the point where the Council can no longer provide additional wastewater services. MCES will work with those communities on a case-by-case basis.
- MCES will work with communities to initiate an inflow and infiltration reduction program. Either option A or B listed below will be acceptable.

  Option A – The Council will initiate an inflow and infiltration financial assistance/surcharge program. In order to provide financial assistance in 2008, the Council will initiate the surcharge program in 2007. This program will allow MCES to surcharge communities exceeding their inflow and infiltration goals in order to collect revenue for the community to use for solving its inflow and infiltration problem.

  Option B – The Council will allow communities with an inflow and infiltration reduction program in place to continue with their programs and not participate in MCES's surcharge program. This will allow communities to undertake activities for inflow and infiltration reduction using local funds, as long as those funds are equal to or greater than the surcharge program funds.

- Starting in 2013, the Council will limit future increases in wastewater service within those communities that have not met their inflow and infiltration goal(s), until the problem is solved. MCES will work with communities not meeting goals on a case-by-case basis.
- Starting in 2013, the Council will institute a wastewater rate demand charge program for those communities that have not met their inflow and infiltration goal(s). The intent of the program will be to help defray the cost of providing attenuation within the MDS to avoid overloading downstream facilities. MCES will continue to review communities' progress and work with them on a case-by-case basis.
- The Council will work with the Public Facilities Authority to make funds available for inflow and infiltration improvements.
- The Council will declare interceptors that no longer function in the role of a metropolitan interceptor as being no longer needed to be part of the Metropolitan Disposal System and convey the interceptor and ancillary facilities to the appropriate local governmental unit.
- To achieve the efficient and effective use of the MDS, the Council regulates the quantity and quality of waste discharges into public sewers.
- The Council will continue to maintain the high quality of service of its wastewater system while meeting requirements of its environmental permits, supporting growth in a timely fashion and maintaining a reasonable cost for service.
- The Council will continue to accept septage, biosolids and other hauled liquid wastes at designated sites for communities located within the metropolitan area. The Council may accept septage from communities beyond the seven-county metropolitan area as system capacity allows.
- Upon Council approval, the system-wide plan for hauled liquid waste acceptance will be implemented in order to provide this service in the most efficient and cost-effective manner.
- The Council, through the comprehensive planning process, requires that communities demonstrate that they have the capability to ensure that these systems (private wastewater treatment systems) are operated effectively within the standards required by the Minnesota Pollution Control Agency.
- The Council will support State rules for individual sewage treatment systems and work with local governments to assist in their implementation.
- The Council will support the Minnesota Pollution Control Agency's regulatory approach to community treatment systems.
- The Council will require that copies of individual sewage treatment system ordinances and information on the management programs be submitted to the Council as part of the comprehensive planning process.

Appendix D: Definitions

Agricultural Preservation Area: Agricultural Preservation Areas are large, contiguous land areas planned and zoned to maintain agriculture as the primary long-term land use. Communities containing large Permanent Agricultural Areas are located on the region's best soils. This soils resource supports agriculture as the most important element of the local economy, and a community's choice of this land-use designation signals its intent to ensure that the agricultural economy remains strong. To support these local aspirations, the Council forecasts nominal growth for this policy area, indicating the Council's expectation that no nonfarm-related housing development should occur in these areas.

Aquifer: A saturated geologic formation that will yield a sufficient quantity of water to serve as a private or public water supply.

Assessment: An appraisal, judgement or evaluation based on information provided by inventories and informed by specified criteria.

Best Management Practices: Recommendations pertaining to the development and maintenance of varied land uses, aimed at limiting the effects of development, such as soil erosion and stormwater runoff, on the natural environment. See the Council's *Urban Small Sites Best Management Practices Manual* for specific examples of best management practices.

Cesspool: An underground pit or seepage tank into which raw sewage is discharged and from which the liquid seeps into the surrounding soil, bedrock, or other soil materials.

Chapter (of *Metropolitan Development Guide*): Any one of the four regional systems policy plans (transportation, water quality, recreation open space, and aviation) or the *Regional Development Framework.*

Clustering: A technique to allow a reasonable amount of land development while conserving rural character, such as farmland, natural areas, and open views.

Community Drainfields: See *on-site septic systems.*

Comprehensive Plan: A plan for the development of an area, which recognizes the physical, economic, social, political, aesthetic, and related factors of the community involved. (Compare with *local comprehensive plan.*)

Conservation: The management of natural resources to prevent waste, destruction or degradation.

Density: The number of dwelling units per net residential acre of land.

Design Average Flow: The design average flow is calculated as the product of the long-term service area times 800 gallons per acre per day. This value represents an annual average flow from a service area for long-term development.

Design Peak-to-Average Flow: The design peak-to-average ratio is the ratio of the peak-hour flow used for hydraulic design divided by the design-average flow.

Design Peak-Hour Flow: The design peak-hour flow is calculated as the product of the design-average flow times the MCES specified peak-to-average ratio.

Developable Land: Land that is suitable as a location for structures and that can be developed free of hazards to, and without disruption of, or significant impact on, natural resource areas including surface waters, wetlands, floodplains, parks, steep slopes.

Diversified Rural Area: Sparsely developed parts of the region outside of Rural Settlements, Rural Residential Areas and the Permanent Agriculture Area that contain the widest variety of farm and nonfarm land uses in patterns often referred to as "rural character." These are the parts of the region designated as appropriate locations for a mix of large-lot residential and clustered housing with agriculture and other uses, including facilities and services of value to the metropolitan area but requiring a rural location (nurseries, campgrounds, etc.).

Excessive I/I:
a) I/I that results in the communities wet-weather flows to be in violation of the Metropolitan Council's established I/I goals for the community.

b) I/I that causes the peak hourly flow to exceed the value determined by multiplying the average flow by the value of the peak-to-average ratio used by MCES to design interceptors and pump stations.

Failing System: Any system that discharges sewage to a seepage pit, cesspool, drywell, or leaching pit, and any system with less than three feet of soil or sand between the bottom of the distribution medium and the saturated soil level or bedrock. In addition, any system posing an imminent threat to public health or safety shall be considered failing.

Forecast: In the *Framework*, a calculation of growth in population, households and jobs based on data about current conditions (e.g., the 2000 Census) that is extrapolated into the future.

Groundwater: The supply of freshwater in an aquifer.

Growth Strategy: The Council's selection of an urban growth and development pattern for the region and the measures to implement it.

Household: The group that consists of all the people who occupy a housing unit.

Imminent threat to public health or safety: Situations with the potential to immediately and adversely impact or threaten public health and safety.

Individual On-Site Septic System: See *on-site septic treatment systems.*

Individual Sewage Treatment System (ISTS): A system for disposing and treating human and domestic waste, such as a septic tank and soil absorption system or other system allowed by the state and city. This includes community drainfields, where a common on-site system serves several properties.

Infill: Development or redevelopment of land that has been bypassed, remained vacant, and/or is underused.

Infiltration: The seepage of groundwater into sewer pipes through cracks or joints in the pipes.

Inflow: Flow from a single point into sewer pipes, such as discharges from sump pumps and foundation drains, or stormwater that enters openings in the sewer access covers.

Infrastructure: Fixed facilities, such as sewer lines and roadways, that serve existing and new development and redevelopment.

Investments, Regional Investments: Investments made by the Metropolitan Council into regional infrastructure.

Land Planning Act, Metropolitan Land Planning Act: The sections of Minnesota Statutes directing the Council to adopt long-range, comprehensive policy plans for transportation, airports, wastewater services, and parks and open space. It authorizes the Council to review the comprehensive plans of local governments.

Land Supply: Available amount of developable land.

Local Comprehensive Plan: Plans prepared by cities, townships and, in some cases, counties, for local land use and infrastructure.

Local Government: Municipal units of government, such as counties, cities and townships.

MDS: Metropolitan Disposal System.

Measured Wet-Weather Peak-to-Average Ratio: The observed peak-hour flow during wet weather divided by the target annual flow.

Metropolitan Area, Metro Area: See *region.*

Metropolitan Development Guide: The collection of regional plans that includes the *Regional Development Framework* and the plans for the four regional systems: transportation, wastewater service, airports, and parks and open space.

Metropolitan Urban Service Area (MUSA): The area in which the Metropolitan Council ensures that regional services and facilities under its jurisdiction are provided.

Multifamily Housing: Residential structure with two or more separate dwelling units.

NPDES: National Pollutant Discharge Elimination System.

Observed Peak-Hour Flow: The observed peak-hour flow is the highest flow rate over one hour duration during a 24-hour period that has been measured and reported.

Observed Peak-to-Average Ratio: The observed peak-to-average ratio is the observed peak-hour flow divided by the annual average flow.

On-Site Septic System: See individual sewage treatment systems.

Ordinance: A law or regulation set forth and adopted by a governmental authority, usually a city or county.

Policy: A specific statement of guiding actions that expresses the general direction that the Metropolitan Council intends to follow in order to meet its goals.

Policy Plan: See *system plans.*

Predevelopment conditions: Runoff rates and volumes that are consistent with the rates and volumes of the property's current uses before the property is changed by development or redevelopment.

Redevelopment: The process by which an existing building, structure, or developed area is adaptively reused, rehabilitated, restored, renovated and/or expanded.

Region: Area pertaining to the Metropolitan Council's jurisdiction, including the seven counties of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington.

Regional Infrastructure: Infrastructure pertaining to any of the Council's four systems: wastewater services, transportation, parks and open space, and airports. (See also *regional systems.*)

Regional Parks System: The regional parks system includes 75 parks and park reserves, trails and special recreation areas. Parks are operated by 10 partnering agencies--cities and counties. The agencies work with the Metropolitan Council to acquire and develop parks and trails to protect natural resources and to provide outdoor recreation for public enjoyment.

Regional Recreation Open Space: According to Minn. Stat. 473.121, Subd. 14, land and water areas, or interests therein, and facilities determined by the Metropolitan Council to be of regional importance in providing for a balanced system of public outdoor recreation for the metropolitan area including, but not limited to, park reserves, major linear parks and trails, large recreation parks, and conservatories, zoos, and other special use facilities.

Regional Systems: Systems for which the Metropolitan Council is the responsible planning and/or operating authority. The systems consist of wastewater services, transportation, parks and open space, and airports.

Reinvestment: An investment in redevelopment, infill or adaptive reuse.

River Defense Network: The River Defense Network is a group of local, regional, state and federal agencies as well as other public and private organizations that worked together to purchase a series of spill response equipment along the Mississippi River upstream of the Minneapolis, St. Paul and St. Cloud municipal water intakes. The River Defense Network also conducted modeling to characterize the flow in the Mississippi River to use for predicting travel times of spills.

Runoff: The rainfall, snowmelt, or irrigation water flow that has not evaporated or infiltrated into the soil, but flows over the ground surface.

Septage: Solids and liquids removed during periodic maintenance of an individual sewage treatment system, or solids and liquids which are removed from toilet waste-treatment devices such as a holding tank.

Septic System : See *on-site septic treatment systems.*

Seven-County Area: See *region.*

Sewershed: The area tributary to the MCES interceptor system at a single point is a sewershed.

Stormwater: Surplus surface water generated by rainfall and snowmelt that does not seep into the earth but flows overland to rivers, lakes or streams.

Surcharging: To fill beyond the capacity of the pipe; overflow.

Surface Water: Water on the earth's surface exposed to the atmosphere such as rivers, lakes and creeks.

Sustainable Development: Development that maintains or enhances economic opportunity and community well-being while protecting and/or restoring the natural environment upon which people and economies depend. Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs.

System Plans: Long-range comprehensive policy plans for the regional systems - transportation, airports, wastewater services, and parks and open space.

System Statements: Statements sent to communities that include system plan information used to guide the preparation of the local comprehensive plan.

Upper Mississippi River Source Water Protection Planning Group: The Upper Mississippi River Source Water Protection Planning Group is comprised of the cities of St. Paul, Minneapolis, and St. Cloud, the Minnesota Department of Health, the Minnesota Pollution Control Agency, the Metropolitan Council, Minnesota Rural Water, and other interested parties. The Group is working together to develop source water protection plans for the cities of Minneapolis, St. Paul and St. Cloud. The purpose of the plans is to protect the water quality of the surface water resources that supply municipal water to the three communities.

Urban Area: The area consisting of two *Framework*-defined planning areas—Developed Communities and Developing Communities—occupying about 50 percent of the region's land area.

Urban Reserve: A transition area beyond the current MUSA line identified in a local comprehensive plan that is being held in a rural condition until it is included in the urban area.

Wastewater: Water carrying waste from homes and commercial and industrial facilities.

Wastewater Treatment Plant: A facility designed for the collection, removal, treatment, and disposal of wastewater generated within a given service area.

Wet-Weather Peak Ratio: Average of three highest peak days divided by the average daily flow.