Potential Future Wastewater Treatment Plants

To support long-term sewered development of the region, five new wastewater treatment plants are envisioned in the northwest, northeast, southeast, and southwest areas. These areas also face water supply challenges due to the absence of the Prairie du Chien Jordan aquifer. Consequently, new wastewater treatment plants are proposed to be wastewater reclamation plants that produce treated water that is suitable for nonpotable uses, such as toilet flushing and irrigation, which will reduce the water demand on the groundwater aquifers. In the northeast area, groundwater recharge with treated wastewater also appears feasible.

Crow River. The Council and the City of Rogers have been working to locate a new wastewater reclamation plant in western Rogers. This plant will eventually serve Rogers, eastern Corcoran, and western Dayton, and provide long-term capacity relief for the Elm Creek Interceptor.

Carver County. The potential wastewater generation for the long-term service area of the Blue Lake Plant could exceed the build-out capacity of the plant site sometime after 2040. One option to address this possibility is a service area revision that diverts wastewater from western communities to a new regional wastewater reclamation plant in Carver County. This new plant should be located so that it could serve development along the corridor between Chaska and Cologne.

Scott County. The Scott County 2030 comprehensive plan, prepared in coordination with the regional wastewater system plan, designates portions of western Scott County for potential long-term sewered development. This area will be served by a future regional wastewater reclamation plant located in the Louisville Township area. This plant also could provide capacity relief for the Blue Lake Plant.

Northeast Area. The long-term northeast wastewater service area has the potential to generate wastewater flows that slightly exceed the capacity of the interceptors serving this area. Rather than constructing an extensive capacity-relief interceptor system, a potentially feasible alternative is to construct a wastewater reclamation plant with groundwater recharge and wastewater reuse.

Hastings. A new Hastings Plant is planned to replace the existing plant located near downtown. The new plant will be expandable, with a long-term service area that includes portions of Marshan, Nininger, and Vermillion townships. The plant site has been acquired.

Table 3: Planned Capacity of Regional Wastewater Treatment Plants (million gallons per day)

Plant	Current Capacity	Current Flow (2010-2014 Average)	Planned Capacity 2040	Planned Capacity Long-Term
Blue Lake	32	26	40	50
Carver County	-	-	-	10
Crow River (Rogers)	-	-	3	6
Eagles Point	10	4.4	10	20
East Bethel	0.4	new	0.8	2
Empire	24	10	24	50
Hastings	2.3	1.5	4	10
Metropolitan	251	178	251	280
New Germany	-	-	0.1	0.2
Northeast	-	-	3	3
Seneca	34	24	34	40
St. Croix Valley	4.5	3.0	4.5	4.5
Scott County	-	-	-	25
Total	358	247	372	500
Service Population	-	2,500,000	3,400,000	6,000,000

Note: Column numbers may not add up to corresponding totals because of rounding.

Capital Improvement Program

Wastewater Flow Projections

Sewered population and employment forecasts, and the associated average wastewater flow projections, are shown in Tables 4 and 5 by wastewater treatment plant service area. (Forecasts and projections by community are found in Appendices Table A-3 and A-4). Wastewater flow projections are based on 60 gallons per day (gpd) per person and 15 gpd per employee from new development, and gradual reduction of wastewater flow from existing development, which reflects water conservation and reduction of inflow and infiltration.

Sanitary sewers are designed to handle daily and seasonal variations in generated wastewater flow. The Appendix also presents wastewater flow variation factors, which increase as average flow decreases. Table A-1 presents flow variation factors for sewer design. These factors reflect that sanitary sewers (local and regional) have been designed for average residential, commercial, and industrial flow of 100 gallons per capita per day. Currently actual average flow is approximately 85 gallons per capita per day. To establish infiltration and inflow mitigation goals, the design flow variation factors have been adjusted upward (divided by 0.85), which reflects available capacity for infiltration and inflow. These factors are presented in Table A-2.

Table 4: Sewered Population and Employment Forecasts, 2040

Wastewater Treatment Plant	2010 Pop.	2040 Pop.	2010 Emp.	2040 Emp.
Blue Lake	265,280	420,530	156,540	235,730
Crow River (Rogers)	0	18,740	0	13,000
Eagles Point	68,050	106,090	12,520	23,060
East Bethel	0	7,380	0	2,000
Empire	131,120	215,580	35,170	5,110
Hastings	22,070	28,800	8,530	10,500
Metropolitan	1,770,220	2,191,940	1,067,250	1,366,990
New Germany	370	700	50	90
Northeast	0	23,550	0	8,880
St. Croix Valley	26,170	33,070	16,480	22,500
Seneca	237,580	285,550	173,230	228,450
Total	2,520,860	3,331,930	1,469,770	1,968,310

Note: Column numbers may not add up to corresponding totals because of rounding.

Table 5: Treatment Plant Flow Projections (million gallons per day)

Wastewater Treatment Plant	2010	2020	2030	2040
Blue Lake	27.61	29.82	32.96	35.64
Crow River (Rogers)	0.00	0.00	1.90	2.11
Eagles Point	4.94	5.71	6.36	6.93
East Bethel	0.00	0.08	0.23	0.47
Empire	9.98	11.31	12.84	14.48
Hastings	1.49	1.53	1.65	1.78
Metropolitan	171.10	178.19	181.90	185.32
New Germany	0.00	0.05	0.06	0.06
Northeast	0.00	0.00	1.91	2.12
St. Croix Valley	3.01	3.16	3.21	3.24
Seneca	22.65	23.56	23.97	24.32
Total	240.78	253.41	266.99	276.47

Note: Column numbers may not add up to corresponding totals because of rounding.

Capital Improvement Plan

This section of the system plan presents a capital improvement plan for the 2016- 2040 period. Costs to meet future regulatory requirements are intentionally excluded. The three objectives of the capital improvement plan are:

- Preserve the infrastructure investment through rehabilitation/replacement. Note: Interceptor rehabilitation also reduces inflow and infiltration and thereby recovers system capacity.
- Strategically expand the system capacity through treatment plant and interceptor expansions and interceptor extensions.
- Improve the quality of service by reusing wastewater, increasing system reliability, and conserving and generating energy.

Table 6 presents a general description of projected capital improvement needs for the wastewater treatment plants and interceptor system. Capital cost estimates are presented using an inflation factor of 3%. For comparison, Table 7 presents the estimated current replacement value of the regional wastewater system.

Total projected capital cost for 2016 to 2040 is estimated at $5 billion. On an annual spending basis, with adjustment for inflation, this equals the average level of spending from 1970 to 2015. Projected capital investment by type of infrastructure is 65% interceptors and 35% treatment. Investment by objective is approximately 84% for asset preservation, 8% for quality improvement, and 8% for growth. These costs exclude costs associated with potential future regulatory requirements, which are discussed later.

Capital improvements for the regional wastewater system are primarily financed by Metropolitan Council wastewater bonds and Minnesota Public Facilities Authority loans. Bonds and loans are repaid using wastewater fees.

Table 6: Long-Term Capital Improvement Program ($ millions)

Project Name	Purpose	2016-2020	2021-2030	2031-2040
Solid Interceptor System				
Anoka-Coon Rapids Improvements	G, R		200	
Bloomington Improvements	G, R	10	30	
Brooklyn Park LS Relocation	R		80	
Blue Lake System Rehabilitation	R	70	70	100
North Area Rehabilitation	R	70	80	100
Forcemain Rehabilitation	R	40	100	
Interceptor Rehabilitation	R	30	60	100
Lift Station Rehabilitation	R	10	100	150
Maple Plain LS/FM Rehab.	R		20	
Minneapolis Interceptor Rehabilitation	R	100	100	100
Meter Improvements	R	15	50	50
Richfield Interceptor Rehabilitation	R	30	30	
River Crossings Rehabilitation	R	20	100	
Seneca Interceptor System Rehab.	R	60	20	
Roseville Interceptor Rehabilitation	R		40	
St. Bonifacius LS/FM	R	15		
St. Paul Interceptor Rehabilitation	R	50	100	100
Southeast Anoka County	G		20	
Waconia LS/FM	R	10		
Joint Interceptor Rehabilitation	R			800
Sub-Total		530	1,200	1,500
Treatment Plants				
Blue Lake				
Expansion (to 40 mgd)	G, Q		100	
Rehabilitation (Solids)	R		50	
Rehabilitation (Liquids)				50
Crow River WWRF	G, Q, R		100	
Eagles Point Rehabilitation	R	5	30	
East Bethel WWRF Expansion	G			15
Empire				
Effluent Forcemain	G			20
Solids Processing	G, R	15		
Rehabilitation	R			80
Hastings	G, Q, R	0	80	

Table 6. (cont.) Project Name	Purpose	2016-2020	2021-2030	2031-2040
Metropolitan				
Rehabilitation	R	80	120	300
Solids Processing	G, Q	40	80	
New Germany	G, Q			5
Northeast Area WWRF	G, Q		100	
Seneca				
Solids Processing	R	20	40	
Rehabilitation	R		70	30
St. Croix Valley Rehabilitation	R	5	10	
System-wide Wastewater Reclamation and Reuse	Q	5	20	300
Sub-Total		170	800	800
Total		700	2,000	2,300

Key
FM = Forcemain
G = Growth
LS = Lift Station
Q = Quality Improvement
R = Rehabilitation/Replacement
WWRF = Wastewater Reclamation and Reuse Facilities
mgd = million gallons per day

Table 7: Estimated Replacement Value of Regional Wastewater System

Facility	Quantity	Estimated Replacement Value ($ Millions)*
Pipelines	600 miles	3,000
Joint Interceptor	10 miles	400
Lift Stations	60	300
Meter Stations	200	100
Metropolitan Plant	1	1,200
Regional Plants	7	1,000
Total System		6,000

*2011 ENR Construction Cost Index = 9,000