Rum River CWMP
Resource area: Surface Water

Concern #1: Surface water rate and flow, quantity, flooding

Issue Statement:
Human-caused changes to the landscape have modified flow rate and volume and water storage causing flooding, streambank erosion, and low base flow. This risk may be compounded due to the effects of climate change.

Desired Future Condition:
5-year average water rate and volume have not increased at the Anoka Dam on the Rum River.

10-Year Plan Goal	Measure – what, units, and how often	Analysis/Assessment Tool	Notes regarding analysis/assessment	Target
1. **Infiltration and storage will increase proportionate to land use and climate change.**	1) Discharge vs precipitation	1) Use a double mass curve at Saint Francis to compare precipitation vs discharge for the years 1934-2017.Acre feet – track flow volumes over time at main stem and W. Branch monitored stations. Potential Proxy measures: 1) e-Link (Focus on e-link projects) or similar BMP database for acre feet of infiltration and storage. 2) # regulated stormwater projects. 3) # land use planners requiring infiltration per PCA construction stormwater permit.	a. Is acre feet of infiltration and storage a metric that is captured in e-LINK? What kind of reporting is necessary to get this information? (question for BWSR) b. Land use maps are updated infrequently (~ every 10 years). c. Climate change? Avoid too much impractical bean counting.	a. Model current and past watershed runoff to estimate future infiltration need. New development: Integrate infiltration and storage goals
2. **Protect non-contributing (hydrologically landlocked) areas so they continue to not discharge.**	# LGUs with ordinance	Analysis: GIS of non-contributing areas (one time). Development-specific permitting		*RESPEC* – can we map/determine acreage of the non-contributing areas?
3. **No increase in rate and volume from new development.**	# of LGUs that adopt this policy	Policy: survey of LGUs on an X basis that includes approved variance requests.		Possibly tie the double mass curve (for goal 1) in with this goal?

Rum River CWMP
Resource area: Surface Water

Concern #2: Surface water quality.

Issue Statement:
The lakes and streams are threatened or impaired due to excess pollution including E.coli, nutrients, chemicals, and sediment. These excess pollutants can cause low oxygen and eutrophication, impact aquatic life and recreational use opportunities, and degrade downstream resources.

Desired Future Condition:
Lakes and streams are meeting water quality standards "or better" (except mercury.)

10-Year Plan Goal	Measure	Analysis/Assessment Tool	Notes regarding analysis/assessment	Target
1. **__# (to be determined later, or reference wraps, etc.) of currently or nearly impaired lakes and streams meet water quality standards.**	Count of currently or nearly # of lakes and # stream AUIDs.	Analysis, some data is readily available. Lakes: • 10-year WRAPS; MPCA/DNR annual lake spreadsheet – if assessed more frequently. Streams: 10-year WRAPS; EDA? – if assessed more frequently;	The goal states "currently impaired". What if new lakes are added? Should goal be that actual number of lakes and streams at this time, not just those currently impaired? (no new impairments is SW protection goal 3 – what if this goal isn't met)	- *RESPEC* - develops list of eligible lakes (already completed) and streams *(E.coli, nutrients, sediment)* - *RESPEC* -presents to AC potential criteria for prioritizing specific resources (lakes or river reaches); this includes WRAPS, SAM, % loading reduction or subjective criteria such as active lake associations or upstream to downstream impacts. - *RESPEC* - Conduct assessment of eligible lakes & streams against criteria; normalize and rank resources. - *AC* – verifies ranking, creates breakpoints in priority resources (what's grouped as first, second, third, etc.) - *RESPEC* – applies restoration scenarios to specific resource to determine achievable goal.
2. **5% nutrient reduction as measured at the Rum River dam (Rum River currently near impairment, but not impaired, 5% is a margin of safety).**	Amount of nutrients (lbs./%) from the watershed that are delivered to the Rum River at outlet. Change over time (m/y/10 year).	Model or Analysis: a. HSPF SAM calibrated model watershed loading analysis (updated on a 5-10-year frequency). Nutrient concentration/loading at specific monitoring locations on the Rum River; annual or less frequently.	Do nutrients include P, N, and TSS? Or Just N and P? Or just P? If measure is stream concentrations, what locations will be monitored or reported?	Target location for measuring goal has already been determined (Rum River Dam). Draft measurable goal has already been determined. - *RESPEC* – assesses loading and reduction potential that achieves the goal using the strategies determined by the AC and reports back to the AC on achievability and targeted locations to achieve reduction.

Rum River CWMP
Resource area: Surface Water

Concern #3: Surface water protection.

Issue Statement:
There are many high-quality water resources in the Rum River watershed that are threatened by changing land use, changes to the landscape that impact runoff and the ability for water to soak into the ground, and pollution. Protecting these high-quality resources from the threat of degradation is of primary concern.

Desired Future Conditions:

1. Water quality is the same or better in waters that do meet state standards.
2. The Rum River is suitable for use as a public water supply.

10-Year Plan Goal	Measure	Analysis/Assessment Tool	Notes regarding analysis/assessment	Target
1. **No increase in treatment needed for drinking water.**	Units of drinking water treatment measure (lbs. of chemicals; $ of chemicals); change over time (m/y). We couldn't come up with a measure.	Analysis to be determined.	There may not be a way to determine if the City's drinking water treatment levels are directly related to the Rum River's water quality.	???
2. **Maintain or enhance watershed-based ecosystems to maintain water quality (metrics TBD).**	? % land protection in each subwatershed as in Landscape Stewardship Plan	Analysis to be determined.	Potential to analysis the extent to which forests, wetlands, and floodplain areas exist – not sure what else is considered for ecosystem services; quality of surface water for drinking water is already in goal #3.	???
3. **No previously assessed water bodies exceed water quality standards**	No previously assessed water bodies exceed water quality standards (conventional pollutants: lakes - TP, streams - E. Coli, TP, TSS).	Count of # of lakes and # stream AUIDs. Count of waters with declining trend.	Analysis, some data is readily available. Lakes: • 10-year WRAPS; MPCA/DNR annual lake spreadsheet – if assessed more frequently. Streams: 10-year WRAPS; EDA? – if assessed more frequently;	

Rum River CWMP
Resource area: Groundwater

Concern #1: Groundwater and drinking water quality.

Issue Statement:
Groundwater and drinking water quality are negatively impacted by human actions, including manure and nitrogen fertilizer application, use of chlorides from salt, land management, non-compliant septic systems, pesticides, and contaminants of public health concern.

Desired Future Condition:
Groundwater is safe to drink.

10-Year Plan Goal	Measure	Analysis/Assessment Tool	Notes regarding analysis/assessment	Target
1. Increase decision makers and tech staff and citizen knowledge of where drinking water contaminants exist.	Knowledge and awareness	Pre- & post survey	Can be verbal	
2. Decrease nitrates in vulnerable areas by ___.	Change in # above benchmark 5 mg/L	Nitrate testing of well water	-seasonal testing -this is a proxy	
3. Decrease non-compliant septic systems by ___.				
4. Reduce impacts on groundwater from feedlots and municipal waste by ___.	# systems brought into compliance within time window	Review of data and track systems	Differentiate between imminent public health threat and non-compliant	
5. Locally understand and protect vulnerable areas not developed or without land use that negatively impacts GW	Acres – no net loss	GIS & zoning maps		

Rum River CWMP
Resource area: Groundwater

Concern #2: Groundwater availability and quantity.

Issue Statement:
There is an increasing groundwater withdrawal trend resulting from expanding communities, agricultural irrigation, and non-crop irrigation. In addition to this increased demand on drinking water sources, there is also concern about the loss of recharge areas and water retention. These two trends may threaten the future groundwater balance.

Desired Future Condition:
Withdrawals = recharge (sustainable rate) in all aquifers even as climate changes and populations grow.

10-Year Plan Goal	Measure	Analysis/Assessment Tool	Notes regarding analysis/assessment	Target
1. Develop a sustainable groundwater budget by quantifying the amount of water being consumed in the watershed and determine how much water is available for consumption.	Completion of groundwater budgets			
2. Increase to ## the number of aquifer monitoring wells to ensure any negative long-term trends are noticed.	# = count them, some exist already			

Rum River CWMP
Resource area: Groundwater

Concern #3: Knowledge and data regarding groundwater.

Issue Statement:
There is not enough awareness or understanding of groundwater-surface water interaction and the extent to which land management decisions impact groundwater quality and quantity. More information is needed to identify and target vulnerable areas in protecting groundwater resources from pollution, and enable local governments and communities to take action.

Desired Future Condition:
People understand their impact on groundwater.
Every local government has a clear understanding of their local groundwater picture and what is needed to protect groundwater.

10-Year Plan Goal	Measure	Analysis/Assessment Tool	Notes regarding analysis/assessment	Target
1. Increase decision-makers and technical staff knowledge of vulnerabilities of groundwater-surface water interaction (define spectrum of vulnerabilities).	Knowledge and awareness			
2. Develop science-based policies to protect groundwater.	Completion			
3. Support the completion of the Mille Lacs County Geologic Atlas.				

Rum River CWMP
Resource area: natural resources

Concern #1: Degraded aquatic habitat.

Issue Statements:

1. Aquatic habitats are threatened by increasing runoff, pollutant loads, and sedimentation.
2. Shoreland areas lack vegetation and habitat features. There are barriers to fish passage.

Desired Future Condition:

Watershed lakes, streams and wetlands hold connected and quality habitats

10-Year Plan Goal	Measure	Analysis/Assessment Tool	Notes regarding analysis/assessment	Target
1. Identify, protect, and restore critical aquatic and shoreland habitat areas.	Acreage, stream-miles	Stream credit tool, FBI & HBI		
2. Increase connectivity for native aquatic organisms and fish species.	Culvert inventory (# and miles)	Culvert inventory DNR culvert prioritization tool AOP guidance		

Rum River CWMP
Resource area: natural resources

Concern #2: Invasive species.

Issue Statement:
Invasive species threaten the health and quality of upland, wetland, riparian, and aquatic ecosystems and need to be prevented and controlled and their impacts mitigated.

Desired Future Condition:
Minimize by x% OR no new infestations.

10-Year Plan Goal	Measure	Analysis/Assessment Tool	Notes regarding analysis/assessment	Target
1. Reduction of current invasive species populations.	# species present, acres of infestation, # educational events, # inspection sites	Standardized surveys (PI aquatic plant survey)		
2. Reduce new infestations of invasive species.	# infested waters, # of species of concern	County Ag. Inspector reporting and MNDNR inventories Regional map of occurrences		
3. Increase public involvement in reducing the spread of invasive species through understanding and behavior change.				

Rum River CWMP
Resource area: natural resources

Concern #3: Protection, management, and restoration of habitat.

Issue Statement:
Habitat is critical for wildlife, water quality and quality of life. Existing habitat areas have been, or are at risk of being, reduced in size and quality due to fragmentation, pollution, invasive species, intensifying land use, and lack of management. Habitats with high ecological value, particularly those that provide habitat for rare and endangered species, should be protected. Degraded habitats should be restored, especially when water quality benefits could also be achieved.

Desired Future Conditions:

- All current sites of high ecological value are maintained or expanded.
- There are interconnected hubs and corridors of habitat throughout the watershed.

10-Year Plan Goal	Measure	Analysis/Assessment Tool	Notes regarding analysis/assessment	Target
1. Define, identify, rank, and protect high value areas.	# areas, acreage, quality index values	Map of quality areas, FQI		
2. Increase habitat acreage, quality, and connectivity, as well as resilience to changing precipitation and climate patterns.	Acreage/miles, quality index values # tolerant species or habitats % of native composition	IBI or FOI		
3. Restore degraded habitats (wetlands, uplands, forests, etc.) by X.	Acreage, % of natives IBI values	IBI, Forestry or standardized surveys		
4. Create and protect interconnected hubs and corridors of habitat, particularly where water quality will also benefit.				
5. Increase the use of development tools that create or maintain habitat corridors and complexes.	% of open space per new development # CRP acres or other easements # new P.U.D.s	Local zoning authority Development reports?? DNR??		