UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
CHICAGO, IL 60604

July 15, 2026

Mr. Glenn Skuta
Watershed Division Director
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Dear Mr. Skuta:

The U.S. Environmental Protection Agency completed its review of the final Total Maximum Daily Load (TMDL) for the Buffalo River-Upper Red River of the North Watersheds (BR-URRNW) TMDL, including supporting documentation. The BR-URRNW TMDL encompasses parts of Clay, Becker, Otter Tail, and Wilkins counties in west-central Minnesota. The BR-URRNW TMDL addresses impaired aquatic life use and aquatic recreation use due to excessive phosphorus and total suspended solids.

The BR-URRNW TMDLs meet the requirements of Section 303(d) of the Clean Water Act and EPA's implementing regulations set forth at 40 C.F.R. Part 130. Therefore, EPA approves Minnesota's nine TMDLs for total suspended solids and phosphorus. EPA describes Minnesota's compliance with the statutory and regulatory requirements in the enclosed decision document.

EPA acknowledges Minnesota's efforts in submitting this TMDL and look forward to future TMDL submissions by the State of Minnesota. If you have any questions, please contact Mr. David Werbach, at 312-8864242 or Werbach.david@epa.gov.

Sincerely,

7/15/2026

X

Tera L. Fong
Division Director, Water Division
Signed by: TERA FONG

cc: Andrea Plevan, MPCA
Scott Schroeder, MPCA

wq-iw5-26g

TMDL: Buffalo River-Upper Red River of the North Watersheds (2026) sediment and phosphorus TMDLs in portions of Clay, Becker, Otter Tail, and Wilkin Counties in west-central Minnesota
Date: 07/15/2026

DECISION DOCUMENT FOR THE BUFFALO RIVER-UPPER RED RIVER OF THE NORTH WATERSHEDS TMDLS (2026) IN WEST-CENTRAL MINNESOTA

Section 303(d) of the Clean Water Act (CWA) and the EPA's implementing regulations at 40 C.F.R. Part 130 describe the statutory and regulatory requirements for approvable TMDLs. Additional information is generally necessary for the EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and the EPA regulations and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation. Use of the term "should" below denotes information that is generally necessary for the EPA to determine if a submitted TMDL is approvable. These TMDL review guidelines are not themselves regulations. They are an attempt to summarize and provide guidance regarding currently effective statutory and regulatory requirements relating to TMDLs. Any differences between these guidelines and the EPA's TMDL regulations should be resolved in favor of the regulations themselves.

1. Identification of Water body, Pollutant of Concern, Pollutant Sources, and Priority Ranking

The TMDL submittal should identify the water body as it appears on the State's/Tribe's 303(d) list. The water body should be identified/georeferenced using the National Hydrography Dataset (NHD), and the TMDL should clearly identify the pollutant for which the TMDL is being established. In addition, the TMDL should identify the priority ranking of the water body and specify the link between the pollutant of concern and the water quality standard (see Section 2 below).

The TMDL submittal should include an identification of the point and nonpoint sources of the pollutant of concern, including location of the source(s) and the quantity of the loading, e.g., lbs/per day. The TMDL should provide the identification numbers of the NPDES permits within the water body. Where it is possible to separate natural background from nonpoint sources, the TMDL should include a description of the natural background. This information is necessary for the EPA's review of the load and wasteload allocations, which are required by regulation.

The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as:

(1) the spatial extent of the watershed in which the impaired water body is located;
(2) the assumed distribution of land use in the watershed (e.g., urban, forested, agriculture);
(3) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources;
(4) present and future growth trends, if taken into consideration in preparing the TMDL (e.g., the TMDL could include the design capacity of a wastewater treatment facility); and

(5) an explanation and analytical basis for expressing the TMDL through *surrogate measures*, if applicable. *Surrogate measures* are parameters such as percent fines and turbidity for sediment impairments; chlorophyll *a* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

The EPA Review of the Buffalo River-Upper Red River of the North TMDLs:
Location Description/Spatial Extent:
The Buffalo River-Upper Red River of the North Watersheds (BR-URRNW) in west-central Minnesota are part of the Red River of the North basin and covers parts of Clay, Becker, Otter Tail, and Wilkin Counties (Section 1.1 of the final TMDL document).

The BR-URRNW is approximately 1,615 square miles in size and is mainly within the Lake Agassiz Plain (LAP), with small portion in the North Central Hardwood Forest (NCHF)(Section 3.5 of the final TMDL document). The Buffalo River portion of the watershed originates in Becker County and flows westward until it drains into the Upper Red River of the North. The watershed contains a major tributary, the South Branch Buffalo River (Figure 1 of the final TMDL document). The Upper Red River of the North originates at the junction of the Bois de Sioux and Otter Tail rivers at Breckenridge, Minnesota (Figure 1 of the final TMDL document). The river flows northward and the Upper Red River of the North portion ends at the confluence with the Buffalo River. The Red River of the North forms the border between the states of Minnesota and North and South Dakota, eventually flowing onto Canada.

The BR-URRNW TMDL addresses five impaired river segments due to excessive total suspended solids (TSS) and three impaired river segments due to excessive phosphorus as well as one lake impaired due to excessive phosphorus (Table 1 of this Decision Document, and Table 1 and Appendix A of the final TMDL document).

A previous TMDL for the Buffalo River Watershed was approved by the EPA on February 16, 2017. A previous TMDL for the Upper Red River of the North was approved by the EPA on January 28, 2018. The Buffalo River Watershed TMDL (2017) has one water body in common with the BR-URRNW 2026 TMDL; Hay Creek. The earlier 2017 TMDL approved a bacteria TMDL for Hay Creek (-511). In the BR-URRNW 2026 TMDL, MPCA developed a TSS TMDL for Hay Creek in segments -621 and -622. MPCA resegmented Hay Creek (originally -511) to -621 and -622 sometime after 2017. In the Upper Red River of the North (2018) TMDL, a bacteria TMDL was approved for Wolverton Creek (-514). In the BR-URRNW 2026 TMDL, MPCA developed a TMDL for TSS for the lower 3.28 miles of Wolverton Creek (-550). Wolverton Creek was resegmented from -514 to -550 sometime after 2018. To summarize, no TMDL in the BR-URRNW 2026 TMDL replaces or supersedes an existing TMDL from the Buffalo River Watershed TMDL (2017) or the Upper Red River of the North TMDL (2018).

Table 1. Impaired water bodies in the Buffalo River-Upper Red River of the North Watersheds addressed in this 2026 TMDL report.

<table>
<tr><th>WID</th><th>Water body name</th><th>Use class[1]</th><th>Affected desig. use[2]</th><th>Listing parameter</th><th>TMDL pollutant</th><th>Category 4A upon TMDL approval[3]</th></tr>
<tr><td>09020104-516</td><td>Unnamed Creek</td><td>2Bg</td><td>AQL</td><td>Macroinvertebrate bioassessments</td><td>TSS</td><td>Yes[3, 4]</td></tr>
<tr><td rowspan="2">09020104-550</td><td rowspan="2">Wolverton Creek</td><td rowspan="2">2Bg</td><td>AQL</td><td>TSS</td><td rowspan="2">TSS</td><td>Yes</td></tr>
<tr><td>AQL</td><td>Fish bioassessments</td><td>No: inconclusive stressor[4]</td></tr>
<tr><td>09020106-530</td><td>Unnamed creek (Lawndale Cr.)</td><td>1B, 2Ag</td><td>AQL</td><td>Fish bioassessments</td><td>TSS</td><td>Yes</td></tr>
<tr><td rowspan="2">09020106-538</td><td rowspan="2">County Ditch 25 (County Ditch 65)</td><td rowspan="2">2Bm[5]</td><td>AQL</td><td>Fish bioassessments</td><td rowspan="2">TP (DO)</td><td>No: inconclusive stressors[4]</td></tr>
<tr><td>AQL</td><td>Macroinvertebrate bioassessments</td><td>No: TSS stressor[3]</td></tr>
<tr><td rowspan="3">09020106-605</td><td rowspan="3">Buffalo River, South Branch</td><td rowspan="3">2Bg</td><td>AQL</td><td>DO</td><td rowspan="3">TP</td><td>Yes</td></tr>
<tr><td>AQL</td><td>Fish bioassessments</td><td>Yes[3, 4]</td></tr>
<tr><td>AQL</td><td>Macroinvertebrate bioassessments</td><td>Yes[3, 4]</td></tr>
<tr><td rowspan="2">09020106-619</td><td rowspan="2">County Ditch 10</td><td rowspan="2">2Bm[5]</td><td>AQL</td><td>DO</td><td rowspan="2">TP</td><td>Yes</td></tr>
<tr><td>AQL</td><td>Macroinvertebrate bioassessments</td><td>No: inconclusive stressor[4]</td></tr>
<tr><td>09020106-621[6]</td><td>Hay Creek</td><td>2Bm[5]</td><td>AQL</td><td>Fish bioassessments</td><td>TSS</td><td>Yes[3, 4]</td></tr>
<tr><td>09020106-622</td><td>Hay Creek</td><td>2Bg</td><td>AQL</td><td>TSS</td><td>TSS</td><td>Yes</td></tr>
<tr><td>14-0049-00</td><td>Lee</td><td>2B</td><td>AQR</td><td>Nutrients</td><td>TP</td><td>Yes</td></tr>
</table>

1. 1B: domestic consumption; 2Ag: aquatic life and recreation—general cold-water habitat; 2Bg: aquatic life and recreation—general warm water habitat; 2Bm: aquatic life and recreation - modified warm water habitat.
2. Affected designated use: AQL: aquatic life; AQR: aquatic recreation.
3. Impairment will be categorized as 4A (impaired and a TMDL study has been approved by EPA) upon approval of this TMDL and will appear as 4A in the next 303(d) list of impaired waters. For a biological impairment to be categorized as 4A, TMDLs for all pollutant stressors needed to achieve attainment of applicable water quality standards must be approved by EPA. If there are remaining conclusive pollutant stressors, the impairment will remain in category 5 until TMDLs are developed for all conclusive pollutant stressors ("Impairment" here is defined as a WID–listing parameter combination).
4. Impairments with "inconclusive" stressors may require additional water quality or biological response data that either supports or refutes them as stressors to the impaired biotic community before the impairment may be categorized as 4A on the next IWL. For more information see Table 2 or the Stressor Identification Update Report (MPCA 2023a).
5. This WID is currently designated as use class 2Bg. However, the MPCA has reviewed this use class designation and will propose a use class change to 2Bm.
6. This WID is directly upstream of and will be addressed with the TSS TMDL for WID 09020106-622.

The MPCA explained that the BR-URRNW TMDL water bodies are not located within the boundary of any federally recognized Tribal land. No TMDLs developed as part of the 2026 BR-URRNW TMDL allocate any pollutant loads to any federally recognized Indian Tribe (Section 1.3 of the final TMDL document).

Land Use:
Land use in the BR-URRNW is primarily agricultural with limited wetlands/open water in the impaired watersheds (Section 3.5, Figure 7 and Table 6 of the final TMDL document; Table 2 of this Decision Document). The overall land use in the BR-URRNW is approximately 73% cropland, 14% forested land and wetlands, and 4% pasture/grassland with smaller amounts of other land uses.

Table 2. Land cover in the BR-URRNW TMDL subwatersheds

WID	Water body name	Land area (acres)	Percent of land area (%)						
			Open water[1]	Wetlands[2]	Forest[3]	Hay/ Pasture	Cropland	Developed[4]	Other[5]
09020104-516	Unnamed Creek	42,304.3	0.2%	10.9%	0.7%	1.4%	82.7%	4.0%	0.1%
09020104-550	Wolverton Creek	66,323.2	0.2%	0.8%	0.5%	<0.1%	94.4%	4.0%	<0.1%
09020106-530	Unnamed creek (Lawndale Cr)	5,855.5	<0.1%	23.5%	0.8%	3.9%	67.5%	3.8%	0.5%
09020106-538	County Ditch 25	9,914.4	0.0%	2.9%	0.2%	1.2%	92.1%	3.6%	0.0%
09020106-605	Buffalo River, South Branch	25,187.2	0.3%	16.0%	1.0%	2.0%	77.0%	3.5%	0.2%
09020106-619	County Ditch 10	14,757.1	<0.01%	2.3%	0.3%	2.7%	90.9%	3.6%	0.1%
09020106-621 09020106-622	Hay Creek	12,787.1	10.3%	5.5%	7.0%	3.6%	66.9%	5.7%	1.0%
14-0049-00	Lee	4,725.9[6]	11.8%	7.1%	15.2%	8.7%	48.8%	3.4%	5.0%
BRW total land cover		714,221	3.4%	11.1%	6.8%	5.3%	67.5%	4.3%	1.6%
URRW total land cover		319,533[7]	0.8%	4.4%	0.4%	0.6%	86.0%	7.7%	0.1%
BRW and URRW total land cover		1,033,754	2.6%	9.0%	4.8%	3.9%	73.2%	5.4%	1.1%

1. Includes lakes, rivers, and streams.
2. Includes NLCD 2019 woody and emergent herbaceous wetland classes.
3. Includes NLCD 2019 deciduous, evergreen, and mixed forest classes.
4. Includes NLCD 2019 open space, low intensity, medium intensity, and high intensity developed classes.
5. Includes NLCD 2019 shrub/scrub, grassland herbaceous, and barren land (rock/sand/clay) classes.
6. The subwatershed land area for Lee Lake used in this TMDL report differs slightly than what is provided in Table 5 (DNR 2024b) due to minor differences across mapping sources.
7. The provided acreage includes land only in Minnesota.

Problem Identification:

Phosphorus TMDLs: Lakes and stream segments identified in Table 1 of this Decision Document were included on the 2024 Minnesota 303(d) list due to excessive nutrients (phosphorus). Total phosphorus (TP), chlorophyll-*a* (chl-a), Secchi depth (SD) and response variable (e.g., Dissolved Oxygen FLUX, Biochemical Oxygen Demand, etc.) measurements in the BR-URRNW indicated that water bodies addressed via these TMDL efforts were not attaining their designated aquatic recreation uses due to exceedances of nutrient criteria. Water quality monitoring within the BR-URRNW was completed at several locations and the data collected during these efforts was the foundation for modeling efforts completed in this TMDL study.

While TP is an essential nutrient for aquatic life, elevated concentrations of TP can lead to nuisance algal blooms that negatively impact aquatic life and recreation (e.g., swimming, boating, fishing, etc.). Algal decomposition depletes dissolved oxygen levels within the water column. The decreases in dissolved oxygen can stress benthic macroinvertebrates and fish. Depletion of oxygen in the water column can also lead to conditions where phosphorus is released from bottom sediments (i.e., internal loading). Also, excess algae can shade the water column which limits the distribution of aquatic vegetation. Aquatic vegetation stabilizes bottom sediments and also is an important habitat for macroinvertebrates and fish.

Total Suspended Solids (TSS) TMDLs: The segments identified in Table 1 of this Decision Document were included on the final 2024 Minnesota 303(d) list due to excessive sediment (i.e., TSS) within the water column. Water quality monitoring within the BR-URRNW indicated that these segments were not attaining their designated aquatic life uses due to high sediment measurements and the negative impact of those conditions on aquatic life (i.e., fish and macroinvertebrate communities).

TSS is a measurement of the sediment and organic material that inhibits natural light from penetrating the surface water column. Excessive sediment and organic material within the water column can negatively impact fish and macroinvertebrates within the ecosystem. Excess sediment and organic material may create turbid conditions within the water column and may increase the costs of treating surface waters used for drinking water or other industrial purposes (e.g., food processing).

Excessive amounts of fine sediment in stream environments can degrade aquatic communities. Sediment can reduce spawning and rearing areas for certain fish species. Excess suspended sediment can clog the gills of fish, stress certain sensitive species by abrading their tissue, and thus reduce fish health. When in suspension, sediment can limit visibility and light penetration which may impair foraging and predation activities by certain species.

Excessive fine sediment also may degrade aquatic habitats, alter natural flow conditions in stream environments and add organic materials to the water column. The potential addition of fine organic materials may lead to nuisance algal blooms which can negatively impact aquatic life and recreation (e.g., swimming, boating, fishing, etc.). Algal decomposition depletes oxygen levels which stresses benthic macroinvertebrates and fish. Excess algae can shade the water column and limit the distribution of aquatic vegetation. Established aquatic vegetation stabilizes bottom sediments and provides important habitat areas for healthy macroinvertebrates and fish communities.

Priority Ranking:
The MPCA's schedule for TMDL completions, as indicated on the 303(d) impaired waters list, reflects Minnesota's priority ranking of this TMDL. The MPCA has aligned TMDL priorities with the watershed approach and Watershed Restoration and Protection Strategy (WRAPS) cycle. The schedule for TMDL completion corresponds to the WRAPS report completion on the 10-year cycle. Mainstem river TMDLs, which are not contained in major watersheds and thus not addressed in WRAPS, must also be completed. The MPCA developed a state plan, Minnesota's TMDL Priority Framework Report under the EPA's Long-Term Vision for Assessment, Restoration and Protection under the CWA section 303(d) program. As part of these efforts, the MPCA identified water quality-impaired segments that will be addressed by TMDLs by 2032. The waters of the BR-URRNW addressed by this TMDL are part of the MPCA prioritization plan to meet the EPA's national goals.

Pollutants of Concern:
The pollutants of concern are phosphorus and TSS.

Source Identification (point and nonpoint sources):

Point Source Identification: The potential point sources to the BR-URRNW are:

BR-URRNW phosphorus TMDLs (rivers):
MPCA determined that no Concentrated Animal Feedlot Operations (CAFOs), Municipal Separate Storm Sewer System (MS4) communities, or National Pollutant Discharge Elimination Systems (NPDES) permitted municipal facilities are present in the phosphorus TMDL subwatersheds (Section 4.2.3 of the final TMDL document).

Industrial wastewater discharge: MPCA did note the presence of one NPDES discharge permit in a TMDL subwatershed. Xcel Energy was issued a permit to discharge hydrostatic test water for a pipeline in the County Ditch 25 (County Ditch 65) subwatershed (Section 3.7.3.1 and Table 20 of the final TMDL document). MPCA determined that the hydrostatic testing utilizes local groundwater or surface water and does not involve the addition of phosphorus, and therefore, is not considered a source of phosphorus in the watershed. MPCA did not determine a wasteload allocation (WLA) for the discharge (WLA=0).

Stormwater runoff from permitted construction and industrial areas: Construction and industrial sites may contribute phosphorus via sediment runoff during stormwater events. These areas within the BR-URRNW watershed must comply with the requirements of the MPCA's NPDES Stormwater Program and create a Stormwater Pollution Prevention Plan (SWPPP) that summarizes how stormwater will be minimized from the site (Sections 3.7.1.3 and 4.2.3 of the final TMDL document).

BR-URRNW phosphorus TMDL (lake):
MPCA determined that no MS4 communities, or NPDES permitted facilities are present in the Lee Lake TMDL subwatershed (Section 3.7.4.1 of the final TMDL document).

Concentrated Animal Feedlot Operations (CAFOs): MPCA has identified one permitted CAFO and one unpermitted CAFO in the Lee Lake TMDL subwatershed (Section 3.7.4.1 and Table 23 of the final TMDL document). As explained by MPCA, CAFO production areas must be designed to contain all manure, and direct precipitation and manure-contaminated runoff from discharging to surface waters during precipitation events up to the 25-year, 24-hour storm event. In the event of a discharge, the discharge cannot cause or contribute to a violation of a water quality standard (WQS). MPCA noted that any precipitation-caused runoff from the land application of manure where the manure has been land applied at agronomic rates is not considered a point source discharge and is accounted for in the load allocation (LA) of the Lee Lake TMDL.

Stormwater runoff from permitted construction and industrial areas: Construction and industrial sites may contribute phosphorus via sediment runoff during stormwater events. These areas within the Lee Lake watershed must comply with the requirements of the MPCA's NPDES SWPPP that summarizes how stormwater will be minimized from the site (Section 3.7.4.1 of the final TMDL document).

BR-URRNW TSS TMDLs:

MPCA determined that no CAFOs or MS4 communities are present in the TSS TMDL subwatersheds (Section 3.7.4.1 of the final TMDL document).

NPDES permitted facilities: NPDES permitted facilities may contribute TSS loads to surface waters through discharges of treated wastewater. Permitted facilities must discharge wastewater according to their NPDES permit. MPCA determined that there are three WWTPs in the BR-URRNW TSS TMDL subwatersheds which contribute TSS from treated wastewater releases (Table 3 of this Decision Document). MPCA assigned each of these facilities a portion of the TSS WLA.

Table 3. Municipal wastewater facilities located within the subwatersheds of impaired streams addressed by a TSS TMDL

WID	Water body name	BRRW CWMP planning region	Facility name, Designation	Facility type	Permit Number
09020104-516	Unnamed Creek	Upper Red	Rothsay WWTP; SD 001	Municipal	MNG585064
09020104-550	Wolverton Creek	Western	Comstock WWTP; SD 001	Municipal	MN0023116
09020106-621 09020106-622	Hay Creek	Mainstem	Lake Park WWTP; SD 002	Municipal	MNG585157

1. Comstock WWTP is currently permitted under MPCA's general wastewater permit MNG585131. A permit application was submitted to upgrade Comstock WWTP and is being reviewed by MPCA as individual permit number MN0023116.

Stormwater runoff from permitted construction and industrial areas: Construction and industrial sites may contribute TSS via sediment runoff during stormwater events. These areas within the BR-URRNW watershed must comply with the requirements of the MPCA's NPDES Stormwater Program and create a SWPPP that summarizes how stormwater will be minimized from the site (Sections 3.7.1.3 and 4.2.3 of the final TMDL document). MPCA explained that three nonmetallic mining operations are located in two of the TMDL subwatersheds (Table 17 of the final TMDL document). These facilities are regulated under the MPCA General NPDES permit MNG490000 and must comply with those requirements (Section 3.7.2.1 of the final TMDL document).

Individual industrial discharger: MPCA explained that there is one facility (Minn-Dak Farmers Cooperative-Peet Piling Ground (MN0070386, MNR053FKP)) that has an individual NPDES permit for industrial stormwater discharge (Section 3.7.2.1 of the final TMDL document). This facility is used for the temporary storage of sugar beets after harvest and before processing. A WLA for TSS was calculated by MPCA for this discharge.

Nonpoint Source Identification:

The potential nonpoint sources to the BR-URRNW are:

BR-URRNW TP TMDLs (rivers and lake):

The MPCA utilized data from several sources to develop an overall TP source estimate for the BR-URRNW TP TMDL (Section 3.7 of the final TMDL document). The sources are similar for both rivers and lakes.

Internal loading (lake only): The release of phosphorus from lake sediments via physical disturbance from benthic fish (i.e., rough fish such as carp), the release of phosphorus from wind mixing the water column, and the release of phosphorus from decaying curly-leaf pondweed, may all contribute internal phosphorus loading to Lee Lake in the BR-URRNW. Phosphorus may build up in the bottom waters of the lake and may be resuspended or mixed into the water column when the thermocline decreases, and the lake water mixes.

Stormwater runoff from agricultural land use practices: Runoff from agricultural lands may contain significant amounts of nutrients, organic material and organic-rich sediment which may lead to impairments in the BR-URRNW. Manure spread onto fields is often a source of phosphorus, and can be exacerbated by tile drainage lines, which channelize the stormwater. Tile lined fields and channelized ditches enable particles to move more efficiently into surface waters. Phosphorus, organic material and organic-rich sediment may be added via surface runoff from upland areas which are being used for Conservation Reserve Program (CRP) lands, grasslands, and agricultural lands used for growing hay or other crops. Stormwater runoff may contribute nutrients and organic-rich sediment to surface waters from livestock manure, fertilizers, vegetation and erodible soils.

Unrestricted livestock access to streams: Livestock with access to stream environments may add nutrients directly to the surface waters or resuspend particles that had settled on the stream bottom. Direct deposition of animal waste can result in very high localized nutrient concentrations and may contribute to downstream impairments. Smaller animal facilities may add nutrients to surface waters via wastewater from these facilities or stormwater runoff from near-stream pastures.

Stream channelization and stream erosion: Eroding streambanks and channelization efforts may add nutrients, organic material and organic-rich sediment to local surface waters. Nutrients may be added if there is particulate phosphorus bound with eroding soils. Eroding riparian areas may be linked to soil inputs within the water column and potentially to changes in flow patterns. Changes in flow patterns may also encourage down-cutting of the streambed and streambanks. Stream channelization efforts can increase the velocity of flow (via the removal of the sinuosity of a natural channel) and disturb the natural sedimentation processes of the streambed.

Atmospheric deposition: Phosphorus and organic material may be added via particulate deposition. Particles from the atmosphere may fall onto lake surfaces or other surfaces within the BR-URRNW. Phosphorus can be bound to these particles which may add to the phosphorus inputs to surface water environments.

Discharges from Subsurface Sewage Treatment Systems (SSTS) or unsewered communities: Failing septic systems are a potential source of nutrients within the BR-URRNW. Septic systems generally do not discharge directly into a water body, but effluents from SSTS may leach into groundwater or pond at the surface where they can be washed into surface waters via stormwater runoff events. Age, construction and use of SSTS can vary throughout a watershed and influence the nutrient contribution from these systems.

Wetland and Forest Sources: Phosphorus, organic material and organic-rich sediment may be added to surface waters by stormwater flows through wetland and forested areas in the BR-URRNW. Storm events may mobilize phosphorus through the transport of suspended solids and other organic debris.

Wildlife: Wildlife is a known source of nutrients in water bodies as many animals spend time in or around water bodies. Deer, geese, ducks, raccoons, and other animals all create potential sources of nutrients via contaminated runoff from animal habitats, such as urban park areas, forest, and rural areas.

BR-URRNW TSS TMDLs:

The MPCA utilized data from several sources to develop an overall TSS source estimate for the BR-URRNW TSS TMDLs (Section 3.7 of the final TMDL document).

Stormwater runoff from agricultural land use practices: Runoff from agricultural lands may contain significant amounts of sediment which may lead to impairments in the BR-URRNW. Sediment inputs to surface waters can be exacerbated by tile drainage lines, which channelize the stormwater flows. Tile lined fields and channelized ditches enable particles to move more efficiently into surface waters.

Stream channelization and stream erosion: Eroding streambanks and channelization efforts may add nutrients, organic material and organic-rich sediment to local surface waters. Nutrients may be added if there is particulate phosphorus bound with eroding soils. Eroding riparian areas may be linked to soil inputs within the water column and potentially to changes in flow patterns. Changes in flow patterns may also encourage downcutting of the streambed and streambanks. Stream channelization efforts can increase the velocity of flow (via the removal of the sinuosity of a natural channel) and disturb the natural sedimentation processes of the streambed.

Wetland and Forest Sources: Sediment may be added to surface waters by stormwater flows through wetland or forested areas in the BR-URRNW. Storm events may mobilize decomposing vegetation, organic soil particles through the transport of suspended solids and other organic debris.

Atmospheric deposition: Sediment may be added via particulate deposition. Particles from the atmosphere may fall onto surface waters within the BR-URRNW.

Future Growth:
MPCA noted that the TMDL watershed is largely agricultural and contains limited urban areas. MPCA acknowledged that the potential for future growth in the watershed is limited. MPCA did not include a calculation for reserve capacity (RC) for any of the TMDLs. The WLAs and LAs for the BR-URRNW TMDLs were calculated for all current and future sources. Any expansion of point or nonpoint sources will need to comply with the respective WLA and LA values calculated in the BR-URRNW TMDLs.

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the first criterion.

2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target

The TMDL submittal must include a description of the applicable State/Tribal water quality standard, including the designated use(s) of the water body, the applicable numeric or narrative water quality criterion, and the antidegradation policy (40 C.F.R. §130.7(c)(1)). The EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

The TMDL submittal must identify a numeric water quality target(s) – a quantitative value used to measure whether or not the applicable water quality standard is attained. Generally, the pollutant of concern and the numeric water quality target are, respectively, the chemical causing the impairment and the numeric criteria for that chemical (e.g., chromium) contained in the water quality standard. The TMDL expresses the relationship between any necessary reduction of the pollutant of concern and the attainment of the numeric water quality target. Occasionally, the pollutant of concern is different from the pollutant that is the subject of the numeric water quality target (e.g., when the pollutant of concern is phosphorus, and the numeric water quality target is expressed as Dissolved Oxygen (DO) criteria). In such cases, the TMDL submittal should explain the linkage between the pollutant of concern and the chosen numeric water quality target.

The EPA Review of the BR-URRNW TMDLs:
Designated Uses:
Water quality standards (WQS) are the fundamental benchmarks by which the quality of surface waters is measured. Within the State of Minnesota, WQS are developed pursuant to the Minnesota Statutes Chapter 115, Sections 03 and 44. Authority to adopt rules, regulations, and standards as are necessary and feasible to protect the environment and health of the citizens of the State is vested with

the MPCA. Through adoption of WQS into Minnesota's administrative rules (principally Chapters 7050 and 7052), the MPCA has identified designated uses to be protected in each of its drainage basins and the criteria necessary to protect these uses.

Minnesota Rule Chapter 7050 designates uses for waters of the state. The segments addressed by the BR-URRNW TMDLs are designated as either Class 1 or Class 2 waters for aquatic life use (phosphorus and TSS). The Class 1 designated use is described in Minnesota Rule 7050.0140:

> "*Domestic consumption includes all waters of the state that are or may be used as a source of supply for drinking, culinary or food processing use, or other domestic purposes and for which quality control is or may be necessary to protect the public health, safety, or welfare."*

The Class 2 designated use is described in Minnesota Rule 7050.0140:

> *"Aquatic life and recreation includes all waters of the state that support or may support fish, other aquatic life, bathing, boating, or other recreational purposes and for which quality control is or may be necessary to protect aquatic or terrestrial life or their habitats or the public health, safety, or welfare."*

Water use classifications for individual water bodies are provided in Minnesota Rules 7050.0470, 7050.0425, and 7050.0430. This TMDL report addresses the water bodies that do not meet the standards for Class 1 or 2 waters. The impaired streams in this report are classified as noted in Table 1 of this Decision Document.

Standards:

<u>Narrative Criteria:</u>

Minnesota Rule 7050.0150 (3) set forth narrative criteria for Class 2 waters of the State:

> *"For all Class 2 waters, the aquatic habitat, which includes the waters of the state and stream bed, shall not be degraded in any material manner, there shall be no material increase in undesirable slime growths or aquatic plants, including algae, nor shall there be any significant increase in harmful pesticide or other residues in the waters, sediments, and aquatic flora and fauna; the normal fishery and lower aquatic biota upon which it is dependent and the use thereof shall not be seriously impaired or endangered, the species composition shall not be altered materially, and the propagation or migration of the fish and other biota normally present shall not be prevented or hindered by the discharge of any sewage, industrial waste, or other wastes to the waters."*

In the BR-URRNW, one creek (Unnamed Creek (Lawndale Creek; -530)) is noted as Class 1B (Drinking Water and Aquatic Consumption) as well as Class 2A (Table 1 and Section 2.2 of the final TMDL document).

<u>Numeric criteria:</u>

<u>TSS TMDL:</u> The MPCA's criteria for TSS are found in Minnesota Rule 7050.0222 (Section 2.4 of the final TMDL document). The TSS criteria provide water clarity targets for measuring suspended particles in rivers and streams. The criteria are also based upon the nutrient region as designated by the state as well as the use category. Table 4 of this Decision Document contains the water quality criteria applicable to the impaired waters in the BR-URRNW TMDL.

Table 4: Applicable water quality standards for impaired water bodies addressed in the BR-URRNW TMDLs

Pollutant	Eco-region[1]	Use class	Water quality standard[2]	Criteria	Applicable time period
Total suspended solids (TSS)	SRNR	1B, 2Ag	≤ 10 mg/L	Not to be exceeded for more than 10% of the time.	April 1 – September 30
	CRNR	2Bg, 2Bm	≤ 30 mg/L		
	SRNR	2Bg, 2Bm	≤ 65 mg/L		
Dissolved Oxygen (DO)[3]	SRNR	2Bg, 2Bm	≥ 5 mg/L	Not to be exceeded for more than 10% of the time.	May 1 – September 30
River eutrophication[4]					
Phosphorus, total (TP)	SRNR	2Bg, 2Bm	≤ 150 µg/L	Summertime average to be less than or equal to standard.	June 1 – September 30
Chlorophyll-*a* (chl-*a*)			≤ 35 µg/L[5]		
Diel DO flux			≤ 4.5 mg/L[5]		
Biochemical Oxygen Demand (BOD)			≤ 3.0 mg/L[5]		
pH			≥ 6.5 su; ≤ 9.0 su	Not to be exceeded for more than 10% of the time.	
Lake eutrophication[6]					
Phosphorus, total (TP)	NCHF	2B	≤ 40 µg/L	Summertime average to be less than or equal to standard.	June 1 – September 30
Chlorophyll-*a* (chl-*a*)			≤ 14 µg/L		
Secchi disk transparency			≥ 1.4 m		

1. SRNR = south river nutrient region; CRNR – central river nutrient region; NCHF = north central hardwood forest ecoregion
2. mg/L = milligrams per liter; µg/L = micrograms per liter; su = standard units; m = meter
3. Eutrophication is impacting the DO levels for Buffalo River, South Branch (WID 09020106-605) and County Ditch 10 (09020106-619), which have AQL impairments due to low levels of DO. These impairments will be addressed with a TP TMDL developed using the TP water quality standard for class 2B streams in the SRNR.
4. Exceedance of the TP levels and chl-*a,* BOD, DO flux, or pH levels is required to indicate a polluted condition (MPCA 2024f, page 30).
5. Minn R. incorrectly lists water quality standards for chl-*a*, DO flux, and BOD for class 2B streams in the SRNR. Rulemaking is currently underway to address the correction in Minn R. 7050.0222. The RES standards for the SRNR that were approved by EPA are presented in Table 3.
6. Exceedance of the TP and one or both of the chl-*a* or Secchi disk transparency standard is required to indicate a polluted condition (MPCA 2024f, page 60).

<u>TSS TMDL Targets:</u> The MPCA explained that there are five TSS-impaired segments within the BR-URRNW (Section 4.1 of the final TMDL document). Table 5 of this Decision Document identifies the TSS criteria for the impaired stream segment.

Table 5: TSS criteria by water body for the BR-URRNW TSS TMDLs

AUID	Stream Name	TSS target (mg/L)
09020104-516	Unnamed Creek	65
09020104-550	Wolverton Creek	65
09020106-530	Unnamed creek (Lawndale Cr.)	10
09020106-621	Hay Creek	30
09020106-622	Hay Creek	30

***Phosphorus TMDLs*:** Numeric thresholds for phosphorus, chl-*a*, dissolved oxygen flux, biological oxygen demand, and pH are set forth in Minnesota Rules 7050.0222. These parameters form the MPCA eutrophication standard that must be achieved to attain the aquatic life designated use (Section 2.4.2 and Table 3 of the final TMDL document; Table 4 of this Decision Document).

Phosphorus TMDL Target (rivers): MPCA determined that the target for the river TMDLs is total phosphorus (Sections 2.4.2 and 4.2.1 of the final TMDL document). The TMDL target is **150 µg/L** for the BR-URRNW River Eutrophication Standards (RES) TMDLs. For the impaired stream segments, a phosphorus exceedance and at least one response variable outlined in Table 3 of the final TMDL document (Table 4 of this Decision Document) is necessary for the stream reach to be considered impaired.

In developing the eutrophication standards for Minnesota rivers, MPCA evaluated data from a large cross-section of rivers within each of the State's ecoregions. Clear relationships were established between the causal factor (phosphorus), and the response variables (chl-a, dissolved oxygen flux, biological oxygen demand, and pH). MPCA anticipates that by meeting the phosphorus concentrations of Southern River Nutrient Region (SRNR) WQS, the response variables will be attained, and the phosphorus impaired segments in the BR-URRNW will achieve their designated beneficial uses. MPCA noted that the WQS apply to summer mean values, from June 1 to September 30 (Section 2.4.2 of the final TMDL document).

Phosphorus TMDLs (lakes): Numeric thresholds for TP, chl-a, and SD depth are set forth in Minnesota Rules 7050.0222. These three parameters form the MPCA eutrophication standard that must be achieved to attain the aquatic recreation designated use. The numeric eutrophication standards which are applicable to the Lee Lake TMDL are found in Table 4 of this Decision Document (Table 3 of the final TMDL document). MPCA selected a TP target of **40 µg/L** for Lee Lake. MPCA selected TP as the appropriate target parameter to address eutrophication problems because of the interrelationships between TP and chl-a, and TP and SD depth (Section 2.4.3 of the final TMDL document). Algal abundance is measured by chl-a, which is a pigment found in algal cells. As more phosphorus becomes available, algae growth can increase. Increased algae in the water column will decrease water clarity that is measured by SD depth.

In developing the lake nutrient standards for Minnesota lakes, MPCA evaluated data from a large cross-section of lakes within each of the State's ecoregions. Clear relationships were established between the causal factor, TP, and the response variables, chl-a and SD depth. MPCA anticipates that by meeting the TP concentrations of NCHF WQS the response variables chl-a and SD will be attained and Lee Lake will achieve its designated beneficial use. For lakes to achieve their designated beneficial use, the lake must not exhibit signs of eutrophication and must allow water-related recreation, fishing, and aesthetic enjoyment. MPCA views the control of eutrophication as the lake enduring minimal nuisance algal blooms and exhibiting desirable water clarity (Section 2.4.4 of the final TMDL document.

The EPA finds the phosphorus and TSS targets employed for the BR-URRNW TMDLs to be reasonable. The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the second criterion.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

A TMDL must identify the loading capacity of a water body for the applicable pollutant. The EPA regulations define loading capacity as the greatest amount of a pollutant that a water can receive without violating water quality standards (40 C.F.R. §130.2(f)).

The pollutant loadings may be expressed as either mass-per-time, toxicity or other appropriate measure (40 C.F.R. §130.2(i)). If the TMDL is expressed in terms other than a daily load, e.g., an annual load, the submittal should explain why it is appropriate to express the TMDL in the unit of measurement chosen. The TMDL submittal should describe the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In many instances, this method will be a water quality model.

The TMDL submittal should contain documentation supporting the TMDL analysis, including the basis for any assumptions; a discussion of strengths and weaknesses in the analytical process; and results from any water quality modeling. The EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

TMDLs must take into account *critical conditions* for steam flow, loading, and water quality parameters as part of the analysis of loading capacity (40 C.F.R. §130.7(c)(1)). TMDLs should define applicable *critical conditions* and describe their approach to estimating both point and nonpoint source loadings under such *critical conditions*. In particular, the TMDL should discuss the approach used to compute and allocate nonpoint source loadings, e.g., meteorological conditions and land use distribution.

The EPA Review of the BR-URRNW TMDLs:

BR-URRNW TSS TMDLs: The MPCA used the water quality criteria for TSS as noted in Table 5 of this Decision Document to calculate loading capacity values for the TSS TMDLs. The MPCA utilized the Load Duration Curve method to calculate the total loading capacity for the TSS-impaired waters (Section 4.1 of the final TMDL document). A separate flow duration curve (FDC) was created for each of the TSS TMDLs in the BR-URRNW. The BR-URRNW FDCs were developed using flow data generated from Hydrologic Simulation Program-Fortran (HSPF) modeling efforts at the outlet/pour point of the impaired reach as well as data from flow gages in the basin (Section 3 of the final TMDL document). The MPCA focused on daily recorded flow measurements and HSPF modeled flows from approximately 1996 to 2022 and TSS water quality data from 2011-2022. HSPF hydrologic models were developed to simulate flow characteristics within the BR-URRNW, and flow data was for the entire water year. Daily stream flows were necessary to implement the load duration curve (LDC) approach; summer flows were used for the TP (river) TMDLs (Section 3.6.2 of the final TMDL document).

HSPF is a comprehensive modeling package used to simulate watershed hydrology and water quality on a basin scale. The package includes both an Agricultural Runoff Model and a more general nonpoint source model. HSPF parametrizes numerous hydrologic and hydrodynamic processes to determine flow rate, sediment, and nutrient loads. HSPF uses continuous meteorological records to create hydrographs and to estimate time series pollution concentrations.[1] The output of the HSPF process is a model of multiple hydrologic response units (HRUs), or subwatersheds of the overall BR-URRNW.

FDCs graphs have flow duration interval (percentage of time flow exceeded) on the X-axis and discharge (flow per unit time) on the Y-axis. The FDC was transformed into a LDC by multiplying individual flow values by the appropriate TSS WQS and then multiplying that value by a conversion factor. The resulting points are plotted onto a load duration curve graph. A LDC graph for the BR-URRNW TSS TMDLs have flow duration interval (percentage of time flow exceeded) on the X-axis and TSS loads (tons/day) on the Y-axis. The curved line on a LDC graph represents the TMDL of the respective flow conditions observed at that location.

Water quality monitoring was completed in the BR-URRNW and measured TSS concentrations were converted to individual sampling loads by multiplying the sample concentration by the instantaneous flow measurement observed/estimated at the time of sample collection and then by a conversion factor which allows the individual samples to be plotted on the same figure as the LDC (Figures 13-16 of the final TMDL document). A LDC and associated TMDL was calculated for each TSS-impaired water body except for Hay Creek.

The MPCA calculated the LDC and resulting TSS TMDL loads for the two segments of Hay Creek (-621 and -622) as one load. As noted in Section 1.2 of the final TMDL document, Segment -621 flows directly into Segment -622 (Figure 33 of the final TMDL document). The MPCA noted that the land use is similar, the drainage areas are consistent, and therefore it is appropriate to address both segments with a single TMDL calculation. The EPA agrees with this assessment.

The LDC plot was subdivided into five flow regimes; very high flow conditions (exceeded 0–10% of the time), high flow conditions (exceeded 10–40% of the time), mid-range flow conditions (exceeded 40–60% of the time), low flow conditions (exceeded 60–90% of the time), and very low flow conditions (exceeded 90–100% of the time). LDC plots can be organized to display individual sampling loads with the calculated LDC. Watershed managers can interpret LDC graphs with individual sampling points plotted alongside the LDC to understand the relationship between flow conditions and water quality exceedances within the watershed. Individual sampling loads which plot above the LDC represent violations of the WQS and the allowable load under those flow conditions at those locations. The difference between individual sampling loads plotting above the LDC and the LDC, measured at the same flow, is the amount of reduction necessary to meet WQS.

[1] HSPF User's Manual - https://water.usgs.gov/software/HSPF/

The strengths of using the LDC method are that critical conditions and seasonal variation are considered in the creation of the FDC by plotting hydrologic conditions over the flows measured during the recreation season. Additionally, the LDC methodology is relatively easy to use and cost-effective. The weaknesses of the LDC method are that nonpoint source allocations cannot be assigned to specific sources, and specific source reductions are not quantified. Overall, the MPCA believes and the EPA concurs that the strengths outweigh the weaknesses for the LDC method.

Implementing the results shown by the LDC requires watershed managers to understand the sources contributing to the water quality impairment and which Best Management Practices (BMPs) may be the most effective for reducing sediment loads based on flow magnitudes. Different sources will contribute sediment loads under varying flow conditions. For example, if exceedances are significant during high flow events this would suggest storm events are the cause and implementation efforts can target BMPs that will reduce stormwater runoff and consequently sediment loading into surface waters. This allows for a more efficient implementation effort.

The TSS TMDLs for the BR-URRNW were calculated and those results are found in Tables 6-9 of this Decision Document. The load allocation was calculated after the determination of the WLA, and the Margin of Safety (MOS) (10% of the loading capacity). Load allocations (e.g., stormwater runoff from agricultural land use practices, streambank erosion, etc.) were not split among individual nonpoint contributors. Instead, load allocations were combined together into a categorical LA ('Watershed Load') to cover all nonpoint source contributions.

Tables 6-9 of this Decision Document reports five points (the midpoints of the designated flow regime) on the loading capacity curve. However, it should be understood that the components of the TMDL equation could be illustrated for any point on the entire loading capacity curve. The LDC method can be used to display collected TSS monitoring data and allows for the estimation of load reductions necessary for attainment of the TSS water quality standard. Using this method, daily loads were developed based upon the flow in the water body. Loading capacities were determined for the segment for multiple flow regimes. This allows the TMDL to be represented by an allowable daily load across all flow conditions. Tables 6-9 of this Decision Document identifies the loading capacity for the water body at each flow regime. Although there are numeric loads for each flow regime, the LDC is what is being approved for these TMDLs (Figures 13-16 of the final TMDL document).

Tables 6-9: TSS TMDLs in the BR-URRNW are located at the end of this Decision Document

Tables 6-9 of this Decision Document communicate the MPCA's estimate of reductions required for streams impaired due to excessive TSS. Attaining these reduction percentage estimates under the flow conditions which the reductions are prescribed to will allow the impaired segment to meet their water quality targets. This loading reduction was estimated from existing and TMDL load calculations. The MPCA expects that this reduction will result in the attainment of the water quality targets and the stream segment's water quality will return to a level where the designated uses are no longer considered impaired.

The EPA concurs with the data analysis and LDC approach utilized by the MPCA in its calculation of loading capacities, wasteload allocations, load allocations and the margin of safety for the BR-URRNW TSS TMDLs. The methods used for determining the TMDL are consistent with the EPA's technical memos.[2]

<u>BR-URRNW TP TMDLs (river):</u> The language of the MPCA RES explains that the RES must be maintained for the long-term summer concentration of TP, when averaged over all flows (Section 2.4.2 of the final TMDL document). MPCA explained that to align with the language of the RES the loading capacity value was based on the seasonal (June 1 to September 30) average of midpoint flows of five equally spaced flow regimes (0% to 20%, 20% to 40%, 40% to 60%, 60% to 80% and 80% to 100%). Selecting the midpoint flow values from these equally spaced flow regimes avoids weighting certain flow regimes more than other flow regimes when calculating the average flow across all flow regimes. The loading capacity was calculated as the average seasonal flow multiplied by the river eutrophication criteria of 150 µg/L (SRNR Ecoregion)(Section 4.2.1 of the final TMDL document).

MPCA estimated the allocations for construction/industrial stormwater discharges, the MOS, and assigned the remainder of the load to the LA. Load allocations (e.g., stormwater runoff from agricultural land use practices and feedlots, SSTS, wildlife inputs etc.) were not split among individual nonpoint contributors. Instead, these categories were combined into an overall LA (Tables 10-12 of this Decision Document).

The EPA supports the data analysis and modeling approach utilized by the MPCA in its calculation of wasteload allocations, load allocations and the margin of safety for the river phosphorus TMDLs. Additionally, the EPA concurs with the loading capacity calculated by the MPCA in the river phosphorus TMDLs. The EPA finds the MPCA's approach for calculating the loading capacity for the river phosphorus TMDLs to be reasonable and consistent with the EPA's guidance.

Tables 10-12: Phosphorus (river) TMDLs for the BR-URRNW are located at the end of this Decision Document

<u>BR-URRNW phosphorus TMDL (lake)</u>: MPCA used the U.S. Army Corps of Engineers (USACE) BATHTUB model to calculate the loading capacity for the Lee Lake phosphorus TMDL (Section 4.3.1 of the final TMDL document). The BATHTUB model was utilized to link observed phosphorus water quality conditions and estimated phosphorus loads to in-lake water quality estimates. MPCA has previously employed BATHTUB successfully in many lake studies in Minnesota. BATHTUB is a steady-state annual or seasonal model that predicts a lake's growing season (June 1 to September 30) average surface water quality. BATHTUB utilizes annual or seasonal timescales which are appropriate because watershed TP loads are normally impacted by seasonal conditions.

BATHTUB has built-in statistical calculations which account for data variability and provide a means for estimating confidence in model predictions. BATHTUB employs a mass-balance TP model that accounts for water and TP inputs from tributaries, direct watershed runoff, the atmosphere, and sources

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[2] U.S. Environmental Protection Agency. August 2007. *An Approach for Using Load Duration Curves in the Development of TMDLs*. Office of Water. EPA-841-B-07-006. Washington, D.C.

internal to the lake, and outputs through the lake outlet, water loss via evaporation, and TP sedimentation and retention in the lake sediments. BATHTUB provides flexibility to tailor model inputs to specific lake morphometry, watershed characteristics and watershed inputs. The BATHTUB model also allows MPCA to assess different impacts of changes in nutrient loading. BATHTUB allows the user the choice of several different mass-balance TP models for estimating loading capacity.

The BATHTUB modeling efforts were used to calculate the loading capacity for Lee Lake. The loading capacity is the maximum phosphorus load which this water body can receive over an annual period and still meet the shallow and general lake nutrient WQS (Table 13 of this Decision Document). The loading capacity on the annual scale (pounds per year (lbs/year)) as well as on the daily scale (pounds per day(lbs/day)) was calculated by MPCA to meet the WQS during the growing season (June 1 through September 30). The time period of June to September was chosen by MPCA as the growing season because it corresponds to the eutrophication criteria, includes the months that the general public typically uses Lee Lake for aquatic recreation, and is the time of the year when water quality is likely to be impaired by excessive nutrient loading (Section 4.3 of the final TMDL document).

MPCA subdivided the loading capacity among the WLA, LA, and MOS components of the TMDL (Table 13 of this Decision Document). These calculations were based on the critical condition, the summer growing season, which is typically when the water quality in Lee Lake is typically degraded, and phosphorus loading inputs are the greatest. TMDL allocations assigned during the summer growing season will protect the lake during the worst water quality conditions of the year. MPCA assumed that the loading capacities established by the TMDL will be protective of water quality during the remainder of the calendar year (October through May).

Table 13: Total phosphorus TMDL for Lee Lake in the BR-URRNW is located at the end of this Decision Document

Table 13 of this Decision Document communicate MPCA's estimates of the reductions required for Lee Lake to meet the water quality targets. These loading reductions (i.e., the percentage column) were estimated from existing and TMDL load calculations. MPCA expects that these reductions will result in the attainment of the water quality targets and the lake water quality will return to a level where the designated uses are no longer considered impaired.

The EPA supports the data analysis and modeling approach utilized by MPCA in its calculation of wasteload allocations, load allocations and the margin of safety for the BR-URRNW TP TMDLs. Additionally, The EPA concurs with the loading capacities calculated by the MPCA in these TP TMDLs. The EPA finds MPCA's approach for calculating the loading capacity to be reasonable and consistent with EPA guidance.

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the third criterion.

4. Load Allocations (LA)

The EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity attributed to existing and future nonpoint sources and to natural background. Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. §130.2(g)). Where possible, load allocations should be described separately for natural background and nonpoint sources.

The EPA Review of the BR-URRNW TMDLs:
The MPCA determined the LA calculations for each of the TMDLs based on the applicable WQS (Section 4 of the final TMDL document). The MPCA recognized that LAs for each of the individual TMDLs addressed by the BR-URRNW TMDLs can be attributed to different nonpoint sources.

BR-URRNW TSS TMDLs: The calculated LA values for the TSS TMDLs are applicable across all flow conditions. MPCA identified several nonpoint sources which contribute TSS loads to the surface waters in the BR-URRNW. Load allocations were recognized as originating from many diverse nonpoint sources including stormwater contributions from agricultural lands, stream channelization and streambank erosion, wetland and forest sources, and atmospheric deposition. MPCA did not determine individual load allocation values for each of these potential nonpoint source considerations but aggregated the nonpoint sources into one "watershed load" LA calculation (Tables 6-9 of this Decision Document).

BR-URRNW phosphorus TMDLs (rivers and lake): The calculated LA values for the phosphorus TMDLs are applicable across all flow conditions. The MPCA identified several nonpoint sources which contribute phosphorus loads to the impaired segments in the BR-URRNW. Load allocations were recognized as originating from several diverse nonpoint source categories including stormwater contributions from agricultural lands, stream channelization and streambank erosion, natural background, and internal loading for Lee Lake. MPCA did not determine individual load allocation values for each of these potential nonpoint source considerations but aggregated the nonpoint sources into one "watershed load" LA calculation (Tables 10-13 of this Decision Document).

The EPA finds the MPCA's approach for calculating the LAs for TSS and phosphorus to be reasonable. The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the fourth criterion.

5. Wasteload Allocations (WLAs)

The EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to individual existing and future point source(s) (40 C.F.R. §130.2(h), 40 C.F.R. §130.2(i)). In some cases, WLAs may cover more than one discharger, e.g., if the source is contained within a general permit.

The individual WLAs may take the form of uniform percentage reductions or individual mass-based limitations for dischargers where it can be shown that this solution meets WQSs.

The EPA Review of the BR-URRNW TMDLs:
BR-URRNW TSS TMDLs:
Municipal wastewater: MPCA identified three NPDES municipal facilities in the contributing watersheds for the BR-URRNW TSS TMDLs (section 4.1.3.1 of the final TMDL document). The TSS WLAs for the BR-URRNW were calculated based on existing permit concentration limits and the facility design flow (Table 27 of the final TMDL document; Table 14 of this Decision Document). MPCA stated that the existing permit limits are consistent with TSS WLA assumptions. Individual WLAs were calculated by MPCA for each of these individual facilities based on the information in the facilities NPDES permit.

MPCA explained that the WWTFs are all pond systems and are limited by permit to discharge March 1 through June 30 and September 1 through December 31 to avoid the lowest flow during the summer (Section 3.7.2 of the final TMDL document). MPCA also discussed the various permit requirements designed to prevent a “shock load” of TSS/sediment to receiving waters. The EPA also notes that this decision regarding the BR-URRNW TMDL does not consider or opine on any permit nor permit conditions; those will be addressed through the NPDES permit process.

MPCA also noted that the BR-URRNW TSS TMDL is correcting the WLA for the Rothsay WWTF (MNG585064). In the original Upper Red River of the North Watershed TMDL (approved by the EPA in 2017), MPCA calculated a WLA of 0.09 tons/day. MPCA noted that more recent permit information regarding the design flow results in a corrected WLA of 0.098 tons/day (Section 4.1 of the final TMDL document).

The Comstock WWTF is currently permitted under the MPCA general wastewater permit. Comstock has submitted a permit application regarding an upgrade to their facility for larger ponds and an increase in discharge flow (Section 4.1 of the final TMDL document). MPCA calculated the WLA for the Comstock WWTF based upon the proposed design flow.

Table 14. Individual TSS WLAs for municipal WWTPs.

Facility name	Permit number	Surface discharge station	WLA flow (mgd)[1]	Impaired water body WID	Pollutant	Permit limit (mg/L)[2]	WLA (tons / day)	Existing permit consistent with WLA assumptions
Rothsay WWTP	MNG585064	SD 001	0.518	09020104 -516	TSS	45	0.098	Yes
Comstock WWTP	MN0023116	SD 001	0.232	09020104 -550	TSS	45	0.043	Yes
Lake Park WWTP	MNG585157	SD 002	1.312	09020106 -621 & - 622	TSS	45	0.25	Yes

1. mgd: million gallons per day. Estimated assuming a 6-inch per day drawdown rate across the average operational surface area of the facility’s secondary pond(s).
2. Current permitted TSS effluent concentration limits are 65 mg/L as a calendar month average and 45 mg/L as a maximum calendar week average. The WLAs are calculated using the 45 mg/L limits.

Individual industrial discharger: MPCA explained that there is one facility (Minn-Dak Farmers Cooperative-Peet Piling Ground) that has an individual NPDES permit for industrial stormwater discharge (Section 3.7.2.1 of the final TMDL document). This facility is used for the temporary storage of sugar beets after harvest and before processing. A WLA for TSS was calculated for this discharge (Table 15 of this Decision Document). MPCA noted that the effluent limit for the facility is less than the in-stream TSS criteria.

Table 15. Individual TSS WLA for Minn-Dak Farmers Cooperative-Peet Piling Ground.

Permit number	Surface discharge station	WLA flow (mgd)[1]	Impaired water body WID	Pollutant	Permit limit (mg/L)	WLA (tons/day)	Existing permit consistent with WLA assumptions
MN0070386 MNR053FKP	SD 001	0.84	09020104-550	TSS	30	0.11	Yes

1. mgd: million gallons per day. The WLA flow of 0.84 mgd is estimated assuming a 6-inch per day drawdown rate across the average operational surface area of the facility's 5.2 acre secondary pond.

Construction/Industrial stormwater (General Permits): The WLA for construction stormwater was calculated based on the average percent area (0.02%) of the BR-URRNW which was covered under a NPDES/SDS (State Disposal System) Construction Stormwater General Permit during the previous five years (Section 4.1.3 of the final TMDL document). The construction and industrial stormwater WLAs were calculated as the percent area (0.02%) multiplied by the loading capacity (Tables 6-9 of this Decision Document).

Attaining the construction stormwater and industrial stormwater loads described in the BR-URRNW TSS TMDLs is the responsibility of construction and industrial site managers. Local MS4 permittees are required to have a construction stormwater ordinance at least as stringent as the State's NPDES/SDS General Stormwater Permit for Construction Activity (MNR100001). In the final TMDL document MPCA explained that if a construction site owner/operator obtains coverage under the NPDES/SDS General Stormwater Permit (MNR100001) and properly selects, installs and maintains all BMPs required under MNR100001 and applicable local construction stormwater ordinances, including those related to impaired waters discharges and any applicable additional requirements found in Appendix A of the Construction General Permit, the stormwater discharges would be expected to be consistent with the WLA in this TMDL. BMPs and other stormwater control measures which act to limit the discharge of the pollutant of concern (TSS) are defined in MNR100001.

The MPCA is responsible for overseeing industrial stormwater loads which impact water quality to lakes and stream segments in the BR-URRNW. Industrial sites within lake subwatersheds are expected to comply with the requirements of the State's NPDES/SDS Industrial Stormwater Multi-Sector General Permit (MNR050000) or NPDES/SDS General Permit for Construction Sand & Gravel, Rock Quarrying and Hot Mix Asphalt Production facilities (MNG490000). MPCA explained that if a facility owner/operator obtains coverage under the appropriate NPDES/SDS General Stormwater Permit and properly selects, installs and maintains all BMPs required under the permit, the stormwater discharges would be expected to be consistent with the WLA in this TMDL. BMPs and other stormwater control measures which act to limit the discharge of the pollutant of concern (TSS) are defined in MNR050000 and MNG490000.

The NPDES program requires construction and industrial sites to create SWPPPs which summarize how stormwater pollutant discharges will be minimized from construction and industrial sites. Under the MPCA's Stormwater General Permit (MNR100001) and applicable local construction stormwater ordinances, managers of sites under construction or industrial stormwater permits must review the adequacy of local SWPPPs to ensure that each plan complies with the applicable requirements in the State permits and local ordinances. As noted above, MPCA has explained that meeting the terms of the applicable permits will be consistent with the WLAs set in the BR-URRNW TSS TMDLs. In the event that the SWPPP does not meet the WLA, the SWPPP will need to be modified within 18 months of the approval of the TMDL by the EPA. This applies to sites under permits for MNR100001, MNR050000 and MNG490000.

Other NPDES discharges: MPCA determined that no CAFOs or MS4 permitted communities are present in the TMDL subwatershed (Section 3.7.4.1 of the final TMDL document).

BR-URRNW phosphorus (rivers and lake) TMDLs:
MPCA determined that no CAFOs, MS4 communities, or NPDES permitted municipal facilities are present in the phosphorus TMDL subwatersheds (Section 4.2.3 of the final TMDL document).

Industrial wastewater discharge: MPCA did note the presence of one NPDES discharge permit in a phosphorus (river) TMDL subwatershed. Xcel Energy was issued a permit to discharge hydrostatic test water for a pipeline in the County Ditch 25 (County Ditch 65) subwatershed (Section 3.7.3.1 and Table 20 of the final TMDL document). MPCA determined that the hydrostatic testing utilizes local groundwater or surface water and does not involve the addition of phosphorus, and therefore is not considered a source of phosphorus in the watershed. MPCA did not determine a WLA for the discharge (WLA=0).

Construction/Industrial stormwater: Similar to the TSS TMDLs, MPCA calculated a portion of the WLA for construction and industrial stormwater for the phosphorus TMDLs (Tables 10-13 of this Decision Document). This WLA was represented as a categorical WLA for construction and industrial stormwater. The construction and industrial stormwater allocations for the BR-URRNW TP TMDLs were calculated in the same manner as the construction and industrial stormwater allocations for the BR-URRNW TSS TMDLs above. The same average annual average area of 0.02% was utilized for the phosphorus TMDLs (Section 4.3 of the final TMDL document).

MPCA's expectations and responsibilities for overseeing construction and industrial stormwater loads for the phosphorus TMDLs are the same for the TSS TMDLs. Construction and industrial sites are expected to create SWPPPs which summarize how stormwater pollutant discharges will be minimized from construction and industrial sites. Under the MPCA's Stormwater General Permit (MNR100001) and applicable local construction stormwater ordinances, managers of sites under construction or industrial stormwater permits must review the adequacy of local SWPPPs to ensure that each plan complies with the applicable requirements in the State permits and local ordinances.

As noted above, MPCA has explained that meeting the terms of the applicable permits will be consistent with the WLAs set in the TSS TMDLs for the BR-URRNW. In the event that the SWPPP does not meet the WLA, the SWPPP will need to be modified within 18 months of the approval of the TMDL by the EPA. This applies to sites under permits for MNR100001, MNR050000 and MNG490000.

The EPA finds the MPCA's approach for calculating the WLAs for the BR-URRNW TSS and phosphorus TMDLs to be reasonable and consistent with the EPA's guidance. The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the fifth criterion.

6. Margin of Safety (MOS)

The Clean Water Act, § 303(d)(1)(c), and 40 C.F.R. 130.7 (c)(1) require that a TMDL include a margin of safety (MOS) "which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." The EPA's 1991 TMDL Guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified. The MOS may include both explicit and implicit components.

The EPA Review of the BR-URRNW TMDLs:
The final TMDL submittal outlines the determination of the Margin of Safety for the TSS and phosphorus TMDLs.

BR-URRNW TSS and phosphorus (river) TMDLs: The BR-URRNW TSS and phosphorus TMDLs incorporate a 10% explicit MOS applied to the total loading capacity calculation for each flow regime of the LDC (Sections 4.1.4 and 4.2.4 of the final TMDL document). Ten percent of the total loading capacity was reserved for MOS with the remaining load allocated to point and nonpoint sources (Tables 6-12 of this Decision Document). The MPCA explained that the explicit MOS was set at 10% due to the following factors considered during TMDL development for these pollutants:

- Uncertainty in simulated flow data from the HSPF model;
- Environmental variability in pollutant loading and water quality data (i.e., collected water quality monitoring data, field sampling error, etc.); and
- Calibration and validation processes of the LDC modeling efforts, uncertainty in modeling outputs, and conservative assumptions made during the modeling efforts.

MPCA explained that the HSPF model for the Buffalo River watershed was first developed in 2019 and then revised in 2023 based upon additional data (Section 3 of the final TMDL document). Similarly, the HSPF model for the Upper Red River of the North was developed in 2018 and updated in 2023 to account for additional data. The initial and revised HSPF models for both watersheds were calibrated and validated utilizing the latest flow and water quality data (Section 3 of the final TMDL document).

As a result of these ongoing model revisions and updates, MPCA determined that the models accurately represent the flows in the watershed, and therefore the 10% MOS is appropriate.

BR-URRNW phosphorus (lake) TMDL: The phosphorus TMDL for Lee Lake used an explicit MOS of 10% (Table 13 of this Decision Document; Section 4.3.4 of the final TMDL document). The MPCA utilized an explicit MOS of 10% to account for any uncertainties in the BATHTUB and HSPF model utilized in the development of the TMDL.

MPCA explained that the BATHTUB model utilized the updated HSPF model for the Buffalo River watershed to more accurately characterize flows that informed the BATHTUB model. The BATHTUB model output was compared to the existing lake water quality data to further refine the BATHTUB output (Section 4.3.1 of the final TMDL document). As a result of the ongoing model revisions and updates, MPCA determined that the model was an accurate representation of the lake system, and a 10% MOS was appropriate.

The EPA finds that the TMDL document submitted by the MPCA contains appropriate MOS satisfying the requirements of the sixth criterion.

7. Seasonal Variation

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The TMDL must describe the method chosen for including seasonal variations. (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)).

The EPA Review of the BR-URRNW TMDLs:

BR-URRNW TSS TMDLs: In Section 4.2.5 of the final TMDL document, MPCA explained that the TSS WQS applies from April 1 to September 30 which is also the time period when high concentrations of sediment are expected in the surface waters of the BR-URRNW. Sediment loading in the BR-URRNW varies depending on surface water flow, land cover and climate/season. Spring is typically associated with large flows from snowmelt, the summer is associated with the growing season as well as periodic storm events and receding streamflows, and the fall brings increasing precipitation and rapidly changing agricultural landscapes. In all seasons, sediment inputs to surface waters typically occur primarily through wet weather events. Critical conditions that impact the response of BR-URRNW water bodies to sediment inputs may typically occur during periods of low flow. During low flow periods, sediment can accumulate within the impacted water bodies, there is less assimilative capacity within the water body, and generally sediment is not transported through the water body at the same rate it is under normal flow conditions.

Critical conditions that impact loading, or the rate that sediment is delivered to the water body, were identified as those periods where large precipitation events coincide with periods of minimal vegetative cover on fields. Large precipitation events and minimally covered land surfaces can lead to large runoff volumes, especially to those areas which drain agricultural fields. The conditions generally occur in the spring and early summer seasons.

BR-URRNW phosphorus TMDLs: Seasonal variation was considered for the BR-URRNW TMDLs as described in Sections 4.2.5 and 4.3.5 of the final TMDL document. The nutrient targets employed in the TMDLs were based on the average nutrient values collected during the growing season (June 1 to September 30). The water quality target was designed to meet the NCHF eutrophication WQS in Lee Lake and the Southern or Central River Nutrient Region WQS for the river segments (Table 4 of this Decision Document) during the period of the year where the frequency and severity of algal growth and other related impacts are the greatest.

The Minnesota eutrophication standards state that total phosphorus WQS are defined as the mean concentration of phosphorus values measured during the growing season. In the BR-URRNW phosphorus TMDL effort, the LA and WLA estimates were calculated from modeling efforts which incorporated mean growing season total phosphorus values. Nutrient loading capacities were set in the TMDL development process to meet the WQS during the most critical period. The mid to late summer period is typically when eutrophication standards are exceeded and water quality within the BR-URRNW is deficient. By calibrating the modeling efforts to protect the rivers and lake during the worst water quality conditions of the year, it is assumed by MPCA that the loading capacity established by the TMDL will be protective of water quality during the remainder of the calendar year (October through May).

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the seventh criterion.

8. Reasonable Assurance

When a TMDL is developed for waters impaired by point sources only, the issuance of a NPDES permit(s) provides the reasonable assurance that the wasteload allocations contained in the TMDL will be achieved. This is because 40 C.F.R. 122.44(d)(1)(vii)(B) requires that effluent limits in permits be consistent with, "the assumptions and requirements of any available wasteload allocation" in an approved TMDL.

When a TMDL is developed for waters impaired by both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur, the EPA's 1991 TMDL Guidance states that the TMDL should provide reasonable assurances that nonpoint source control measures will achieve expected load reductions in order for the TMDL to be approvable. This information is necessary for the EPA to determine that the TMDL, including the load and wasteload allocations, has been established at a level necessary to implement water quality standards.

The EPA Review of the BR-URRNW TMDLs:

The BR-URRNW TSS and phosphorus TMDLs provide reasonable assurance that actions identified in the implementation section of the final TMDL (i.e., Sections 6 and 8 of the final TMDL document), will be applied to attain the loading capacities and allocations calculated for the impaired reaches within the BR-URRNW. The recommendations made by the MPCA will be successful at improving water quality if the appropriate local groups work to implement these recommendations. Those mitigation suggestions, which fall outside of regulatory authority, will require commitment from state agencies and local stakeholders to carry out the suggested actions.

The MPCA has identified several local partners which have expressed interest in working to improve water quality within the BR-URRNW. Implementation practices will be implemented over the next several years. It is anticipated that staff from Soil and Water Conservation District (SWCDs) (e.g., the Clay County, Becker County, West Otter Tail County, and Wilkin County SWCDs), Buffalo-Red River Watershed District, local Minnesota Board of Water and Soil Resources (BWSR) offices, and other local watershed groups, will work together to reduce pollutant inputs to the BR-URRNW. The MPCA has authored a draft Buffalo River and Upper Red River of the North Watershed Restoration and Protection Strategy (WRAPS) document (2016/2017 and updated in April 2026) which provides information on the development of scientifically supported restoration and protection strategies for implementation planning and action. The MPCA sees the WRAPS document as a starting point for which the MPCA and local partners can develop tools that will help local governments, landowners, and special interest groups determine (1) the best strategies for making improvements and protecting resources that are already in good condition, and (2) focus those strategies in the best places to do work.

County SWCDs, such as those noted above, have a history of implementation efforts in the BR-URRNW. Sections 6.3 and 6.4 of the final TMDL document discuss numerous efforts in the TMDL watershed where local groups have implemented efforts to reduce pollutants. The SWCDs employ various programming, such as shoreline planting programming, native plant, tree and seed planting programming, cost-share opportunities, equipment rentals and other technical services to ensure that efforts are made to improve water quality and conserve water resources in the BR-URRNW. Other county SWCDs in the BR-URRNW have similar programming efforts which locals can utilize. Section 6.3 of the final TMDL document also contains information on the various county-scale watershed plans developed and implemented by the counties in the TMDL watershed that are designed to control and reduce pollutants in the watersheds. This includes the *Buffalo-Red River Watershed Comprehensive Watershed Management Plan* (2020)

Section 6.5 of the final TMDL document describes the previous and ongoing funding made available to landowners in the BR-URRNW. Examples of some of the major funding sources include Watershed-based Implementation Funding (WBIF), Clean Water Fund Competitive Grants (e.g., Projects and Practices), and conservation funds from Natural Resources Conservation Service (NRCS) (e.g., Environmental Quality Incentives Program (EQIP) and Conservation Stewardship Program (CSP)). Figure 18 of the final TMDL document shows the funding amounts and sources per years within the TMDL watershed. Over $149 million has been spent since 2004 in the watershed.

Continued water quality monitoring within the basin is supported by the MPCA in Section 7.1 of the final TMDL document. Additional water quality monitoring results could provide insight into the success or failure of BMP systems designed to reduce bacteria and nutrient loading into the surface waters of the watershed. Local watershed managers would be able to reflect on the progress of the various pollutant removal strategies and would have the opportunity to change course if observed progress is unsatisfactory.

The MPCA regulates the collection, transportation, storage, processing and disposal of animal manure and other livestock operation wastes at State registered animal feeding operation (AFO) facilities. The MPCA Feedlot Program implements rules governing these activities and provides assistance to counties and the livestock industry. The feedlot rules apply to most aspects of livestock waste management including the location, design, construction, operation and management of feedlots and manure handling facilities.

Reasonable assurance that the WLA set forth will be implemented is provided by regulatory actions. According to 40 CFR 122.44(d)(1)(vii)(B), NPDES permit effluent limits must be consistent with assumptions and requirements of all WLAs in an approved TMDL. The MPCA's stormwater program and the NPDES permit program are the implementing programs for ensuring WLA are consistent with the TMDL. The NPDES program requires construction and industrial sites to create SWPPPs which summarize how stormwater will be minimized from construction and industrial sites. Under the MPCA's Stormwater General Permit, managers of sites under construction or industrial stormwater permits must review the adequacy of local SWPPPs to ensure that each plan meets WLA set in the BR-URRNW TMDLs. In the event that the SWPPP does not meet the WLA, the SWPPP will need to be modified. This applies to sites under the MPCA's General Stormwater Permit for Construction Activity (MNR100001) and its NPDES/SDS Industrial Stormwater Multi-Sector General Permit (MNR050000) or NPDES/SDS General Permit for Construction Sand & Gravel, Rock Quarrying and Hot Mix Asphalt Production facilities (MNG490000).

The Clean Water Legacy Act (CWLA) was passed in Minnesota in 2006 for the purposes of protecting, restoring, and preserving Minnesota water. The CWLA provides the protocols and practices to be followed in order to protect, enhance, and restore water quality in Minnesota. The CWLA outlines how the MPCA, public agencies and private entities should coordinate in their efforts toward improving land use management practices and water management. The CWLA anticipates that all agencies (i.e., the MPCA, public agencies, local authorities and private entities, etc.) will cooperate regarding planning and restoration efforts. Cooperative efforts would likely include informal and formal agreements to jointly use technical, educational, and financial resources.

The CWLA also provides details on public and stakeholder participation, and how the funding will be used. In part to attain these goals, the CWLA requires the MPCA to develop WRAPS. The WRAPS are required to contain such elements as the identification of impaired waters, watershed modeling outputs, point and nonpoint sources, load reductions, etc. (*Chapter 114D.26*; CWLA). The WRAPS also contain an implementation table of strategies and actions that are capable of achieving the needed load reductions, for both point and nonpoint sources (*Chapter 114D.26*, Subd. 1(8); CWLA). Implementation plans developed for the TMDLs are included in the table, and are considered "priority areas" under the WRAPS process (*Watershed Restoration and Protection Strategy Report Template*, MPCA). This table includes not only needed actions but a timeline for achieving water quality targets, the reductions needed from both point and nonpoint sources, the governmental units responsible, and interim milestones for achieving the actions. The MPCA has developed guidance on what is required in the WRAPS (*Watershed Restoration and Protection Strategy Report Template*, MPCA).

The Minnesota Board of Soil and Water Resources administers the Clean Water Fund as well, and has developed a detailed grants policy explaining what is required to be eligible to receive Clean Water Fund money (*http://bwsr.state.mn.us/cwf_programs*).

The EPA finds that this criterion has been adequately addressed.

9. Monitoring Plan to Track TMDL Effectiveness

The EPA's 1991 document, *Guidance for Water Quality-Based Decisions: The TMDL Process* (EPA 440/4-91-001), recommends a monitoring plan to track the effectiveness of a TMDL, particularly when a TMDL involves both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur. Such a TMDL should provide assurances that nonpoint source controls will achieve expected load reductions and, such TMDL should include a monitoring plan that describes the additional data to be collected to determine if the load reductions provided for in the TMDL are occurring and leading to attainment of water quality standards.

The EPA Review of the BR-URRNW TMDLs:

The final TMDL document outlines the water monitoring efforts in the BR-URRNW (Section 7 of the final TMDL document). Progress of TMDL implementation will be measured through regular monitoring efforts of water quality and total BMPs completed. The MPCA anticipates that monitoring will be completed by local groups (e.g., the Clay County, Becker County, West Otter Tail County, and Wilkin County SWCDs) and volunteers, as long as there is sufficient funding to support the efforts of these local entities. At a minimum, the BR-URRNW will be monitored once every 10 years as part of the MPCA's Intensive Watershed Monitoring cycle.

Water quality monitoring is a critical component of the adaptive management strategy employed as part of the implementation efforts utilized in the BR-URRNW. Water quality information will aid watershed managers in understanding how BMP pollutant removal efforts are impacting water quality. Water quality monitoring combined with an annual review of BMP efficiency will provide information on the success or failure of BMP systems designed to reduce pollutant loading into water bodies of the BR-URRNW. Watershed managers will have the opportunity to reflect on the progress or lack of progress and will have the opportunity to change course if progress is unsatisfactory. Review of BMP efficiency is expected to be completed by the local and county partners.

The EPA finds that this criterion has been adequately addressed.

10. Implementation

The EPA policy encourages Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired by nonpoint sources. Regions may assist States/Tribes in developing implementation plans that include reasonable assurances that nonpoint source LAs established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. In addition, the EPA's policy recognizes that other relevant watershed management processes may be used in the TMDL process. The EPA is not required to and does not approve TMDL implementation plans.

The EPA Review of the BR-URRNW TMDLs:

The findings from the BR-URRNW TMDLs will be used to inform the selection of implementation activities as part of the Buffalo-Red River of the North WRAPS process. The purpose of the WRAPS report is to support local working groups and jointly develop scientifically supported restoration and protection strategies to be used for subsequent implementation planning.

The TMDL outlined some implementation strategies in Section 8 of the final TMDL document. The MPCA outlined the importance of prioritizing areas within the BR-URRNW, education and outreach efforts with local partners, and partnering with local stakeholders to improve water quality within the watershed. The BR-URRNW WRAPS document (updated in June 2026) includes additional detail regarding specific recommendations from the MPCA to aid in the reduction of TSS and phosphorus to surface waters of the BR-URRNW. Additionally, the MPCA referenced the Statewide Nutrient Reduction Strategy (https://www.pca.state.mn.us/water/nutrient-reduction-strategy) for focused implementation efforts targeting phosphorus nonpoint sources in BR-URRNW. The reduction goals for the TSS and phosphorus TMDLs may be met via components of the following strategies:

Pasture management/livestock exclusion plans: Reducing livestock access to stream environments will lower the opportunity for direct transport of sediment and nutrients to surface waters. The installation of exclusion fencing near stream and river environments to prevent direct access of livestock, installing alternative water supplies, and installing stream crossings between pastures, would work to reduce the influxes of pollutants and improve water quality within the watershed. Additionally, introducing rotational grazing to increase grass coverage in pastures, and maintaining appropriate numbers of livestock per acre for grazing, can also aid in the reduction of pollutant inputs.

Manure Collection and Storage Practices: Manure has been identified as a source of TSS and nutrients. These pollutants can be transported to surface water bodies via stormwater runoff. Pollutant laden water can also leach into groundwater resources. Improved strategies for the collection, storage and management of manure can minimize impacts of TSS and nutrients entering the surface and groundwater system. Repairing manure storage facilities or building roofs over manure storage areas may decrease the amount of pollutants in stormwater runoff.

Feedlot runoff controls: Treatment of feedlot runoff via diversion structures, holding/storage areas, and stream buffering areas can all reduce the transmission of bacteria and nutrients to surface water environments. Additionally, cleaner stormwater runoff can be diverted away from feedlots so as to not liberate pollutants.

Septic Field Maintenance: Septic systems are believed to be a source of nutrients to BR-URRNW. Failing systems are expected to be identified and addressed via upgrades to those SSTS not meeting septic ordinances. The MPCA explained that SSTS improvement priority should be given to those failing SSTS adjacent to streams within the watersheds. The MPCA aims to greatly reduce the number of failing

SSTS in the future via local septic management programs and educational opportunities. Educating the public on proper septic maintenance, finding and eliminating illicit discharges, and repairing failing systems could lessen the impacts of septic derived nutrient and bacteria inputs into the BR-URRNW.

Improved Agricultural Drainage Practices: A review of local agricultural drainage networks should be completed to examine how improving drainage ditches and drainage channels could be reorganized to reduce the influx of sediment to the surface waters in the BR-URRNW. The reorganization of the drainage network could include the installation of drainage ditches or sediment traps to encourage particle settling during high flow events. Additionally, cover cropping, and residue management is recommended to reduce erosion and thus siltation and runoff into streams.

Reducing Livestock Access to Stream Environments: Livestock managers should be encouraged to implement measures to protect riparian areas. Managers should install exclusion fencing near stream environments to prevent direct access to these areas by livestock. Additionally, installing alternative watering locations and stream crossings between pastures may aid in reducing sediments to surface waters.

Identification of Stream, River, and Lakeshore Erosional Areas: An assessment of stream channel, river channel, and lakeshore erosional areas should be completed to evaluate areas where erosion control strategies could be implemented in the BR-URRNW. Implementation actions (e.g., planting deep-rooted vegetation near water bodies to stabilize streambanks) could be prioritized to target areas which are actively eroding. This strategy could prevent additional sediment inputs into surface waters of the BR-URRNW and minimize or eliminate degradation of habitat.

Riparian Area Management Practices: Protection of streambanks within the watershed through planting of vegetated/buffer areas with grasses, legumes, shrubs or trees will mitigate pollutant inputs into surface waters. These areas will filter stormwater runoff before the runoff enters the main stem or tributaries of the BR-URRNW.

Bioinfiltration of stormwater: Biofiltration practices rely on the transport of stormwater and watershed runoff through a medium such as sand, compost or soil. This process allows the medium to filter out sediment and therefore sediment-associated nutrients. Biofiltration/bioretention systems are vegetated and are expected to be most effective when sized to limit overflows and designed to provide the longest flow path from inlet to outlet.

The EPA finds that this criterion has been adequately addressed. The EPA reviews but does not approve implementation plans.

11. Public Participation

The EPA policy is that there should be full and meaningful public participation in the TMDL development process. The TMDL regulations require that each State/Tribe must subject calculations to establish TMDLs to public review consistent with its own continuing planning process (40 C.F.R.

§130.7(c)(1)(ii)). In guidance, the EPA has explained that final TMDLs submitted to the EPA for review and approval should describe the State's/Tribe's public participation process, including a summary of significant comments and the State's/Tribe's responses to those comments. When the EPA establishes a TMDL, the EPA regulations require the EPA to publish a notice seeking public comment (40 C.F.R. §130.7(d)(2)).

Provision of inadequate public participation may be a basis for disapproving a TMDL. If the EPA determines that a State/Tribe has not provided adequate public participation, the EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by the EPA.

The EPA Review of the BR-URRNW TMDLs:
The public participation section of the TMDL submittal is found in Section 9 of the final TMDL document. Throughout the development of the BR-URRNW TMDLs the public was given various opportunities to participate. As part of the strategy to communicate the goals of the TMDL project and to engage with members of the public, the MPCA worked with the White Earth Band of Ojibwe and other potentially interested Tribal organizations, county, and SWCD staff in the BR-URRNW to promote water quality, to gain input from landowners via surveys and interviews and to better understand the social dynamics of stakeholders in the BR-URRNW. The MPCA's goal was to create civic engagement and discussion which would enhance the content of the TMDL, WRAPS and BWSR's One Watershed, One Plan (1W1P) documents.

The MPCA posted the draft TMDL online at (http://www.pca.state.mn.us/water/tmdl) during its public comment period of April 6, 2026, to May 21, 2026. MPCA did not receive any comments on the draft TMDL.

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of this eleventh element.

12. Submittal Letter

A submittal letter should be included with the TMDL submittal, and should specify whether the TMDL is being submitted for a *technical review* or *final review and approval*. Each final TMDL submitted to the EPA should be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under Section 303(d) of the Clean Water Act for the EPA review and approval. This clearly establishes the State's/Tribe's intent to submit, and the EPA's duty to review, the TMDL under the statute. The submittal letter, whether for technical review or final review and approval, should contain such identifying information as the name and location of the water body, and the pollutant(s) of concern.

The EPA Review of the BR-URRNW TMDLs:
The EPA received the final Buffalo River-Upper Red River of the North Watershed TMDL document (2026), submittal letter and accompanying documentation from the MPCA on June 24, 2026. The

transmittal letter explicitly stated that the final TMDLs referenced in Table 1 of this Decision Document were being submitted to the EPA pursuant to Section 303(d) of the Clean Water Act for the EPA review and approval. The letter clearly stated that this was a final TMDL submittal under Section 303(d) of CWA. The letter also contained the name of the watershed as it appears on Minnesota's 303(d) list, and the causes/pollutants of concern. This TMDL was submitted per the requirements under Section 303(d) of the Clean Water Act and 40 CFR 130.

The EPA finds that the TMDL transmittal letter submitted for the Buffalo River-Upper Red River of the North Watershed TMDLs by the MPCA satisfies the requirements of this twelfth element.

13. Conclusion

After a full and complete review, the EPA finds that the five TSS TMDLs and the four phosphorus TMDLs satisfy all elements for approvable TMDLs. This BR-URRNW TMDL approval is for **nine TMDLs,** addressing segments for aquatic recreational and aquatic life use impairments (Table 1 of this Decision Document).

The EPA's approval of these TMDLs extends to the water bodies which are identified above with the exception of any portions of the water bodies that are within Indian Country, as defined in 18 U.S.C. Section 1151. The EPA is taking no action to approve or disapprove TMDLs for those waters at this time. The EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities under the CWA Section 303(d) for those waters.

TSS TMDL summary tables for the BR-URRNW TMDL Report (2026)

Table 6. Unnamed Creek (09020104-516) TSS TMDL summary.

- Listing year: 2022
- Baseline year: 2019 (end of year)
- Numeric standard used to calculate TMDL: 65 mg/L TSS
- TMDL and allocations apply April 1 through September 30
- Flow used to develop TMDL: HSPF simulated flow from April through September for HSPF reach 203 (2011 through 2022)

TMDL parameter		TMDL TSS load (tons/day) by flow zone				
		Very high	**High**	**Mid**	**Low**	**Very low**
WLA	Construction stormwater	0.032	0.0059	0.0012	0.000086	*
	Industrial stormwater	0.032	0.0059	0.0012	0.000086	*
	Rothsay WWTP (MNG585064)	0.098	0.098	0.098	0.098	*
LA		158.40	29.18	5.80	0.33	*
MOS		17.62	3.25	0.66	0.048	0.0016
TMDL		176.18	32.54	6.56	0.48	0.016
Existing 90th percentile concentration (mg/L)		76				
Overall estimated percent reduction[1]		24%				

* The permitted wastewater design flows exceed the stream flow in the indicated flow zone. These allocations are expressed as an equation rather than an absolute number: allocation = (flow contribution from a given source) x 65 mg/L (or MNG585064 permit limit of 45 mg/L). See Section 4.1.3 for more detail.

1 This estimate includes an additional 10% reduction to account for the MOS (see Section 4.1.8).

Table 7. Wolverton Creek (09020104-550) TSS TMDL summary.

- Listing year: 2020 (TSS and fish bioassessments)
- Baseline year: 2018 (end of year)
- Numeric standard used to calculate TMDL: 65 mg/L TSS
- TMDL and allocations apply April 1 through September 30
- Flow used to develop TMDL: HSPF simulated flow from April through September for HSPF reach 154 (2011 through 2022)

TMDL parameter		TMDL TSS load (tons/day) by flow zone				
		Very high	**High**	**Mid**	**Low**	**Very low**
WLA	Construction stormwater	0.043	0.0079	0.0014	0.00011	*
	Industrial stormwater	0.043	0.0079	0.0014	0.00011	*
	Comstock WWTP (MN0023116)	0.043	0.043	0.043	0.043	*
	Minn-Dak Farmers Cooperative – Peet Piling Ground (MN0070386; MNR053FKP)	0.11	0.11	0.11	0.11	*
LA		215.06	39.18	6.90	0.39	*
MOS		23.92	4.37	0.78	0.060	0.0025
TMDL		239.22	43.72	7.84	0.60	0.025
Existing 90th percentile concentration (mg/L)		94				
Estimated percent reduction (mg/L)[1]		41%				

* The permitted wastewater and industrial stormwater design flows exceed the stream flow in the indicated flow zone. These allocations are expressed as an equation rather than an absolute number: allocation = (flow contribution from a given source) x 65 mg/L (or MNG585131 or MN0070386 permit limits of 45 mg/L or 30 mg/L, respectively). See Section 4.1.3 for more detail.

1 This estimate includes an additional 10% reduction to account for the MOS (see Section 4.1.8).

Table 8. Unnamed Creek (Lawndale Creek) (09020106-530) TSS TMDL summary.

- Listing year: 2020
- Baseline year: 2019 (end of year)
- Numeric standard used to calculate TMDL: 10 mg/L TSS
- TMDL and allocations apply April 1 through September 30
- Flow used to develop TMDL: HSPF simulated flow from April through September for HSPF reach 196 (2011 through 2022)

TMDL parameter		TMDL TSS load (tons/day) by flow zone				
		Very high	High	Mid	Low	Very low
WLA	Construction stormwater	0.00012	0.000028	0.000011	0.0000036	0.0000012
	Industrial stormwater	0.00012	0.000028	0.000011	0.0000036	0.0000012
LA		0.58	0.14	0.055	0.018	0.0062
MOS		0.064	0.016	0.0061	0.0020	0.00069
TMDL		0.64	0.16	0.061	0.020	0.0069
Existing 90th percentile concentration (mg/L)		21				
Estimated percent reduction (mg/L)[1]		62%				

1 This estimate includes an additional 10% reduction to account for the MOS (see Section 4.1.8).

Table 9. Hay Creek (09020106-621 and 09020106-622) TSS TMDL summary.

- Listing year: 2020 (09020106-621 fish bioassessments) 2022 (09020106-622 TSS)
- Baseline year: 09020106-621: 2019 (end of year) 09020106-622: 2020 (end of year)
- Numeric standard used to calculate TMDL: 30 mg/L TSS
- TMDL and allocations apply April 1 through September 30
- Flow used to develop TMDL: HSPF simulated flow from April through September for HSPF reach 155 (2011 through 2022)

TMDL parameter		TMDL TSS load (tons/day) by flow zone				
		Very high	High	Mid	Low	Very low
WLA	Construction stormwater	0.00062	0.00017	0.000067	*	*
	Industrial stormwater	0.00062	0.00017	0.000067	*	*
	Lake Park WWTP (MNG585157)	0.25	0.25	0.25	*	*
LA		2.87	0.61	0.087	*	*
MOS		0.35	0.095	0.037	0.013	0.0027
TMDL		3.47	0.96	0.37	0.13	0.027
Existing 90th percentile concentration (mg/L)		36 (09020106-621) 28 (09020106-622)		34 (WIDs combined)		
Estimated percent reduction (mg/L)[1]		27% (09020106-621) 3% (09020106-622)		21% (WIDs combined)		

* The permitted wastewater design flows exceed the stream flow in the indicated flow zones. These allocations are expressed as an equation rather than an absolute number: allocation = (flow contribution from a given source) x 30 mg/L (or MNG585157 permit limit of 45 mg/L). See Section 4.1.3 for more detail.

1 This estimate includes an additional 10% reduction to account for the MOS (see Section 4.1.8).

TP (river) TMDL summary tables for the BR-URRNW TMDL Report (2026)

Table 10. County Ditch 25 (County Ditch 65) (09020106-538) TP TMDL summary.

- Listing year: 2020 (fish and macroinvertebrate bioassessments)
- Baseline year: 2019 (end of year)
- Numeric standard used to calculate TMDL: 150 µg/L TP
- TMDL and allocations apply June 1 through September 30
- Flow used to develop TMDL: HSPF simulated flow from June through September for HSPF reach 114 (2011 through 2022)

TMDL parameter		TMDL TP load (lbs/day)
WLA	Construction stormwater[1]	0.001
	Industrial stormwater[1]	0.001
	Total WLA	0.002
MOS		0.291
Total LA[1]		2.614
TMDL		2.907
Existing summer mean TP concentration (µg/L)[2]		264
Estimated percent reduction[3]		53%

[1] The daily WLAs for construction and industrial stormwater and the total LA (i.e., nonpermitted watershed runoff) equate to a mean summer TP runoff concentration target of 135 µg/L (150 µg/L water quality standard minus 10% MOS). This target is for the outlet of this impaired stream and therefore includes losses of phosphorus in the impaired reach and stream network upstream of the impaired reach.

[2] Water quality monitoring station used to estimate reductions: S011-136.

[3] This estimate includes an additional 10% reduction to account for the MOS (see Section 4.2.7).

Table 11. Buffalo River, South Branch (09020106-605) TP TMDL summary.

- Listing year: 2012 (DO); 2020 (fish and macroinvertebrate bioassessments)
- Baseline year: 2019 (end of year)
- Numeric standard used to calculate TMDL: 150 µg/L TP
- TMDL and allocations apply June 1 through September 30
- Flow used to develop TMDL: HSPF simulated flow from June through September for HSPF reach 197 (2011 through 2022)

TMDL parameter		TMDL TP load (lbs/day)
WLA	Construction stormwater[1]	0.001
	Industrial stormwater[1]	0.001
	Total WLA	0.002
MOS		0.553
Total LA[1]		4.975
TMDL		5.530
Existing summer mean TP concentration (µg/L)[2]		170
Estimated percent reduction[3]		22%

[1] The daily WLAs for construction and industrial stormwater and the total LA (i.e., nonpermitted watershed runoff) equate to a mean summer TP runoff concentration target of 135 µg/L (150 µg/L water quality standard minus 10% MOS). This target is for the outlet of this impaired stream and therefore includes losses of phosphorus in the impaired reach and stream network upstream of the impaired reach.

[2] Water quality monitoring station used to estimate reductions: S003-148.
[3] This estimate includes an additional 10% reduction to account for the MOS (see Section 4.2.7).

Table 12. County Ditch 10 (09020106-619) TP TMDL summary.

- Listing year: 2022 (DO); 2020 (macroinvertebrate bioassessments)
- Baseline year: 2020 (end of year)
- Numeric standard used to calculate TMDL: 150 µg/L TP
- TMDL and allocations apply June 1 through September 30
- Flow used to develop TMDL: HSPF simulated flow from June through September for HSPF reach 105 (2011 through 2022)

TMDL parameter		TMDL TP load (lbs/day)
WLA	Construction stormwater[1]	0.001
	Industrial stormwater[1]	0.001
	Total WLA	0.002
MOS		0.434
Total LA[1]		3.902
TMDL		4.338
Existing summer mean TP concentration (µg/L)[2]		138
Estimated percent reduction[3]		1%

[1] The daily WLAs for construction and industrial stormwater and the total LA (i.e., nonpermitted watershed runoff) equate to a mean summer TP runoff concentration target of 135 µg/L (150 µg/L water quality standard minus 10% MOS). This target is for the outlet of this impaired stream and therefore includes losses of phosphorus in the impaired reach and stream network upstream of the impaired reach.
[2] Water quality monitoring station used to estimate reductions: S005-610.
[3] This estimate includes an additional 10% reduction to account for the MOS (see Section 4.2.7).

TP (lake) TMDL summary table for the BR-URRNW TMDL Report (2026)

Table 13. Lee Lake (14-0049-00) TP TMDL summary.

- Listing year: 2012
- Baseline year: 2010 (end of year)
- Numeric standard used to calculate TMDL: 40 µg/L TP
- TMDL and allocations apply January 1 through December 31

TMDL parameter		Existing TP load		TMDL TP load		Estimated load reduction	
		lbs/year	lbs/day	lbs/year	lbs/day	lbs/year	%
WLA	Construction stormwater	0.2	0.001	0.2	0.001	0.0	0
	Industrial stormwater	0.2	0.001	0.2	0.001	0.0	0
	Total WLA	**0.4**	**0.002**	**0.4**	**0.002**	**0.0**	**0**
LA	Watershed runoff	1,437.0 [1]	3.937	831.0 [2]	2.277	606.0	42
	SSTS	38.8	0.106	34.8	0.095	4.0	10
	Atmospheric deposition	36.8	0.101	36.8	0.101	0.0	0
	Total LA	**1,512.6**	**4.144**	**902.6**	**2.473**	**610.0**	**40**

MOS	**–**	**–**	**100.3**	**0.275**	**–**	**–**
Total load	**1,513.0**	**4.146**	**1,003.3**	**2.750**	**610.0 [3]**	**40**

1 Existing annual watershed runoff TP load was estimated using HSPF model (reach 164) model years 2003 through 2022 (full calendar year loads, Jan-Dec). The existing watershed runoff predicted by HSPF assumes a mean watershed runoff volume to Lee Lake of 2,230 acre-ft per year and a mean runoff TP concentration of 237 µg/L.

2 The TMDL watershed runoff LA assumes a mean annual watershed runoff volume of 2,230 acre-ft per year and a mean annual (Jan-Dec) TP runoff concentration target of 137 µg/L after the MOS is applied.

3 Net reduction from existing load to TMDL load is 509.7 lbs/yr; but the gross load reduction from all sources must accommodate the 10% MOS as well, and therefore 509.7 + 100.3 = 610.0 lbs/yr.