REGION 5
CHICAGO, IL 60604

August 3, 2026

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

Dear Mr. Skuta:

The U.S. Environmental Protection Agency completed its review of the final Total Maximum Daily Load (TMDL) for the Duluth Urban Area Watershed (DUAW) Chloride TMDL Report 2026, including supporting documentation. The DUAW chloride TMDLs address aquatic life use impairments due to excessive chloride. Minnesota's DUAW chloride TMDLs encompass subwatersheds in St. Louis County in northeastern Minnesota.

The DUAW chloride TMDLs meet the requirements of Section 303(d) of the Clean Water Act and the EPA's implementing regulations set forth at 40 C.F.R. Part 130. Therefore, the EPA approves Minnesota's five (5) chloride TMDLs. The EPA describes Minnesota's compliance with the statutory and regulatory requirements in the enclosed decision document.

The EPA acknowledges Minnesota's efforts in submitting these TMDLs and looks forward to future TMDL submissions by the State of Minnesota. If you have any questions, please contact Mr. Paul Proto, at proto.paul@epa.gov.

Sincerely,

8/3/2026

X

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

cc: Andrea Plevan, MPCA
Tom Estabrooks, MPCA

Document Number: wq-iw10-21g

TMDL: Duluth Urban Area Watershed Chloride TMDLs in portions St. Louis County in northeastern Minnesota
Date: August 3, 2026

DECISION DOCUMENT FOR THE DULUTH URBAN AREA WATERSHED CHLORIDE TMDLS IN NORTHEASTERN MINNESOTA

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. Part 130 describe the statutory and regulatory requirements for approvable Total Maximum Daily Loads (TMDLs). Additional information is generally necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and 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 EPA to determine if a submitted TMDL is approvable. The guidelines provided under each heading in this decision document are an attempt to summarize and provide information regarding currently effective statutory and regulatory requirements relating to TMDLs, but are not a substitute for statutory requirements or EPA's regulations.

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 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.

EPA Review of the Duluth Urban Area Watershed chloride TMDL:

Location Description/Spatial Extent:

The Duluth Urban Area Watershed (DUAW) chloride TMDLs address five stream segments (Table 1 of this Decision Document) that are impaired due to excessive chloride. Water quality monitoring within the DUAW indicated that these segments were not attaining their designated aquatic life uses due to high chloride measurements and the negative impact of those conditions on aquatic life (i.e., fish and macroinvertebrate communities).

The DUAW is in northeastern Minnesota in St. Louis County and includes portions of two United States Geological Survey (USGS) Hydrologic Unit Code (HUC) eight scale (HUC-8) subbasins, the St. Louis River watershed HUC-8 (04010201) and the Lake Superior South watershed HUC-8 (04010102). The project area for the DUAW chloride TMDLs includes the immediate subwatersheds that drain to those five impaired stream segments which MPCA estimates is 39 square miles (24,960 acres). Surface waters in these five impaired stream segments flow from the southwest to the southeast and into the St. Louis Estuary (for Keene Creek, Kingsbury Creek and Miller Creek) or into Lake Superior (Chester Creek and Tischer Creek).

Table 1: Duluth Urban Area Watershed chloride impairments addressed by this TMDL

Water body name	Assessment Unit ID	Affected Use	Pollutant or stressor	TMDL
Tischer Creek	04010102-544	Aquatic Life	chloride	chloride
Chester Creek	04010102-545	Aquatic Life	chloride	chloride
Miller Creek	04010201-512	Aquatic Life	chloride	chloride
Kingsbury Creek	04010201-626	Aquatic Life	chloride	chloride
Keene Creek	04010201-627	Aquatic Life	chloride	chloride
			TOTAL TSS TMDLs	**5**

Land Use:

MPCA compiled land use and land cover information for each of subwatersheds in the DUAW chloride TMDLs. MPCA investigated land use & land cover data from the C-CAP Regional Land Cover (NOAA 2021) data and compiled different land use categories and the percentages of those categories in each impaired reach segment (Table 2 of this Decision Document).

Table 2: Direct Drainage land cover in each subwatershed of the Duluth Urban Area Watershed chloride TMDLs

Land Cover	Kingsbury Creek (-626)		Keene Creek (-627)		Miller Creek (-512)	
	Acres	Watershed Area %	Acres	Watershed Area %	Acres	Watershed Area %
Water	19	0.3%	3	0.1%	9	0.1%
Developed - Open Space	391	6.9%	214	5.8%	869	13.6%
Developed - Low Intensity	585	10.4%	359	9.7%	890	13.9%
Developed - Medium Intensity	266	4.7%	167	4.5%	757	11.9%
Developed - High Intensity	86	1.5%	46	1.2%	459	7.2%
Barren	27	0.5%	8	0.2%	23	0.4%
Deciduous Forest	1657	29.4%	1501	40.5%	1349	21.1%
Evergreen Forest	147	2.6%	48	1.3%	46	0.7%
Mixed Forest	221	3.9%	157	4.2%	157	2.5%
Shrub / Scrub	326	5.8%	198	5.3%	418	6.6%
Grassland	16	0.3%	19	0.5%	79	1.2%
Pasture / Hay	109	1.9%	11	0.3%	13	0.2%
Palustrine Emergent Wetland	183	3.2%	120	3.2%	247	3.9%
Palustrine Forested Wetland	965	17.1%	605	16.3%	645	10.1%
Palustrine Shrub / Scrub Wetland	647	11.5%	253	6.8%	419	6.6%
TOTAL	5645		3709		6380	

Land Cover	Chester Creek (-545)		Tischer Creek (-544)	
	Acres	Watershed Area %	Acres	Watershed Area %
Water	3	0.1%	17	0.4%
Developed - Open Space	468	10.9%	789	17.0%
Developed - Low Intensity	499	11.6%	731	15.7%
Developed - Medium Intensity	269	6.2%	224	4.8%
Developed - High Intensity	87	2.0%	71	1.5%
Barren	26	0.6%	2	0.0%
Deciduous Forest	1474	34.2%	1436	30.9%
Evergreen Forest	75	1.7%	112	2.4%
Mixed Forest	177	4.1%	325	7.0%
Shrub / Scrub	286	6.6%	234	5.0%
Grassland	32	0.7%	41	0.9%
Pasture / Hay	14	0.3%	--	0.0%
Palustrine Emergent Wetland	152	3.5%	150	3.2%

Palustrine Forested Wetland	508	11.8%	363	7.8%
Palustrine Shrub / Scrub Wetland	236	5.5%	159	3.4%
TOTAL	4306		4654	

Problem Identification:
Chloride TMDLs: Chloride impaired segments identified in Table 1 of this Decision Document were included on the Minnesota 303(d) list due to excessive chloride and are included as Category 5 waters on the 2024 Minnesota 303(d) list. Water quality monitoring within the DUAW indicated that these segments were not attaining their designated aquatic life uses due to high chloride measurements and the negative impact of those conditions on aquatic life (i.e., fish and macroinvertebrate communities).

Low levels of chloride can be found naturally in the DUAW lakes and streams. Chloride is essential for aquatic life to carry out a range of biological functions. However, high concentrations of chloride in the surrounding water can harm cellular osmotic processes in aquatic life. Excessive dissolved chlorides in water may stress aquatic species and prohibit the transport of needed molecules into the cell. If elevated concentrations of chloride persist in the water, aquatic life such as fish, invertebrates and even some plant species may become stressed and/or die.

Excessive dissolved chloride can also alter the density of water in lake environments. Density changes can impact seasonal mixing patterns of lake waters, especially in deeper lakes. Seasonal mixing in lake environments distributes oxygen and nutrients throughout the water column and is necessary for healthy aquatic communities. Mixing pattern disruptions may also impact nutrient cycling, phytoplankton and zooplankton community composition and productivity and fish and macroinvertebrate health.

High levels of salt can also negatively affect infrastructure, vehicles, plants, soils, pets, wildlife and groundwater and drinking water supplies. MPCA acknowledged that groundwater derived drinking water is a vital resource for many Minnesotans and the potential for chlorides to contaminate shallow drinking water wells is a concern in the DUAW.

Priority Ranking:
MPCA's schedule for TMDL completions, as indicated on the 303(d) impaired waters list, reflects Minnesota's priority ranking of this TMDL. 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 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 DUAW addressed by this TMDL are part of the MPCA prioritization plan to meet EPA's national goals.

Pollutants of Concern:
Aquatic Life Use: The pollutant of concern for aquatic life use is chloride.

Source Identification (point and nonpoint sources):
Point Source Identification: The potential point sources to DUAW are:

Municipal Separate Storm Sewer System (MS4) communities: There are a number of MS4 communities (Table 3 of this Decision Document & Table 18 of the final TMDL document) which can contribute stormwater flow to waters in the DUAW. MPCA notes that the five impaired segment subwatersheds are entirely covered by MS4 community areas and any chloride loading attributed to surface water runoff is included as stormwater runoff covered by MS4 communities (Figure 44 of the final TMDL document).

MPCA estimates that the application of de-icing and/or anti-icing agents to paved surfaces accounts for 42% of the chloride load generated in Minnesota (Section 3.5.2.9 of the final TMDL document). Road salt usage via municipal operators and private applicators (e.g. private citizens and commercial contractors salting parking lots, sidewalks and other pedestrian/automobile usage areas) are some of the main sources of chloride which impact chloride loading contributions in the DUAW. Chloride from these sources is carried into surface waters during snowmelt or rainfall runoff events via impervious surfaces (e.g., highways, roads and other paved areas) connected to MS4 stormwater infrastructure.

Table 3: MS4 & Other NPDES permittees that were given wasteload allocations (WLAs) in the Duluth Urban Area Watershed chloride TMDLs

MS4 / Permittee Name	Permit #	MS4 receiving a WLA in these impaired segments
City of Duluth	MS400086	Kingsbury Creek (04010201-626), Keene Creek (04010201-627), Miller Creek (04010201-512), Chester Creek (04010102-545) & Tischer Creek (04010102-544)
City of Hermantown	MS400093	Kingsbury Creek (04010201-626), Keene Creek (04010201-627) & Miller Creek (04010201-512)
Midway Township	MS400146	Kingsbury Creek (04010201-626)
MNDOT - Outstate District	MS400180	Kingsbury Creek (04010201-626), Keene Creek (04010201-627), Miller Creek (04010201-512), Chester Creek (04010102-545) & Tischer Creek (04010102-544)
City of Proctor	MS400114	Kingsbury Creek (04010201-626),
St. Louis County	MS400158	Kingsbury Creek (04010201-626), Keene Creek (04010201-627), Miller Creek (04010201-512), Chester Creek (04010102-545) & Tischer Creek (04010102-544)
Lake Superior College	MS400225	Miller Creek (04010201-512)
City of Rice Lake	MS400151	Miller Creek (04010201-512), Chester Creek (04010102-545) & Tischer Creek (04010102-544)
University of Minnesota - Duluth	MS400214	Miller Creek (04010201-512), Chester Creek (04010102-545) & Tischer Creek (04010102-544)
Industrial Stormwater: Wisconsin Central Ltd. - Proctor Rail Yard	MN0000361	Kingsbury Creek (04010201-626)
Industrial Stormwater (General Permit)	MNR050000	Kingsbury Creek (04010201-626), Keene Creek (04010201-627), Miller Creek (04010201-512), Chester Creek (04010102-545) & Tischer Creek (04010102-544)

Industrial Stormwater: MPCA explained that several industrial facilities are authorized to discharge industrial stormwater through a general NPDES permits (Section 3.5.2.2 of the final TMDL document).

Industrial facilities may have roads, parking lots, sidewalks and other pedestrian/automobile usage areas with impervious surfaces on their property and deicing and or anti-icing activities for those areas could be a source of chloride for stormwater runoff from those impervious surfaces.

MPCA identified the Wisconsin Central Limited-Proctor Rail Yard (MN0000361) as an individual industrial permittee in the Kingsbury Creek (04010201-626) subwatershed and assigned this permittee an individual wasteload allocation (WLA). MPCA explained that this facility has applied chloride-based dust suppressants to unpaved roads on their property in 2022-2024 (Section 3.5.2.2 of the final TMDL document).

Nonpoint Source Identification: The potential nonpoint sources to DUAW are:
Winter road maintenance activities (i.e., application of de-icing and/or anti-icing agents) to areas not connected to MS4 infrastructure: Stormwater (rain or snowmelt) can transport these anti-icing agents to surface waters of the DUAW. Stormwater runoff from areas outside the boundaries of MS4 areas, such as non-permitted urban, residential, commercial or industrial areas, can contribute chloride to surface waters of the DUAW. Non-regulated stormwater may flow over impervious surfaces and add any residual chlorides from those surfaces to surface waters in the DUAW.

Chloride contributions from agricultural lands: Chloride may be added via use of fertilizers containing chloride anions (ex. potassium chloride (KCl)) and biosolids which are spread onto agricultural areas (Section 3.5.2.4 of the final TMDL document). Chloride may be liberated from farm fields within stormwater runoff which can be exacerbated by tile drainage lines, which channelize the stormwater flows.

Discharges from Subsurface Sewage Treatment Systems (SSTS) or unsewered communities: Septic systems are a potential source of chloride within the DUAW. 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 chloride contribution from these systems. Water softening systems which are in areas not connected to municipal sewer lines likely discharge to septic fields and chloride contributions from those septic systems may ultimately mix with groundwater or surface water near the septic field.

Atmospheric sources: Chloride from the atmosphere can be deposited in the DUAW via wet deposition (e.g., chloride in precipitation) or dry deposition (e.g., wind-blown chloride particulates) (Section 3.5.2.1 of the final TMDL document).

Dust suppressants: Dust suppressants, often composed of chloride solutions (e.g., calcium chloride or magnesium chloride), are applied to unpaved roads (e.g., gravel roads, dirt roads, parking areas) during the warmer, windier time periods to prevent dust forming along roadways (Section 3.5.2.2 of the final TMDL document). Dust suppressants applied to gravel roads in unregulated areas (i.e., non-MS4 areas) or private roads are considered to be a nonpoint source of chloride. MPCA estimated chloride loads in each of the five TMDL subwatersheds and presented that information in Table 17 of the final TMDL document.

Natural background chloride load: Chloride is present in soil and minerals and is added to groundwater due to natural weathering processes of minerals and rock. MPCA estimated the natural background concentration of chloride in the DUAW was set to 3.5 mg/L (Section 4.2.2 of the final TMDL document).

Other nonpoint sources: MPCA cited chloride as a portion of landfill leachate, anthropogenic chloride sources in shallow groundwater (Section 3.5.2.5 of the final TMDL document) and as a chemical byproduct of alum chloride treatments for lake sediments or ferric chloride treatments for stormwater.

Future Growth:
MPCA examined population growth in the DUAW over the past two decades and found, in general, population growth in the DUAW increased slightly in some areas and decreased in other areas. Overall, the population in St. Louis county has remained fairly constant over the past 20 years. Land use within the DUAW has not changed significantly over time (Section 5 of the final TMDL document). The wasteload allocation and the load allocation (LA) were calculated for all current sources. Any expansion of point or nonpoint sources will need to comply with the respective WLA and LA values in the TMDL.

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

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)). 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.

EPA Review of the Duluth Urban Area Watershed chloride TMDL:
Designated Uses:
Water quality standards (WQS) are the fundamental benchmarks by which the quality of surface waters are 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), MPCA has identified designated uses to be protected in each of its drainage basins and the criteria necessary to protect these uses.

Standards:
Narrative Criteria: Chester, Keene, Kingsbury, Miller, and Tischer Creeks are designated class 2Ag for general coldwater aquatic life and habitat. Each of the five stream supports coldwater species. Minnesota adopted numeric criteria for class 2A waters in Minn. R. 7050.0222b, subp. 2 (Section 2.4 of the final TMDL document).

Class 2A waters (Minn. R. 7050.0218, subp. 3.Q.) – The chronic standard is defined as "…the highest water concentration or fish tissue concentration of a toxicant or effluent to which aquatic life, humans, or wildlife can be exposed indefinitely without causing chronic toxicity."

Numeric criteria: The chronic standard for chloride to protect for 2A uses is **230 mg/L**. The chronic standard is defined in Minn. R. 7050.0218, subp. 3.l., as '*the highest water concentration of a toxicant to which organisms can be exposed indefinitely without causing chronic toxicity*.'

The 230 mg/L value is based on a 4-day exposure of aquatic organisms to chloride. The maximum (acute) standard to protect for 2B uses is 860 mg/L. The maximum standard is defined in Minn. R. 7050.0218, subp. 3.JJT., as, "…*the highest concentration of a toxicant in water to which organisms can be exposed for a brief time with zero to slight mortality*." The 860 mg/L value is based on a 24-hour exposure of aquatic organisms to chloride. Table 2 of the final TMDL document also includes the final acute value for Class 2A streams, 1,720 mg/L (Table 4 of this Decision Document). These criteria are adopted from the EPA's recommended water quality criteria for chloride.

Table 4: Chloride Water Quality Standard Applicable in the Duluth Area Urban Watershed chloride TMDLs

Parameter	Water body Type	Water Quality Standard	Numeric Standard
Chloride	Class 2A streams	Chronic standard: 230 mg/L	**230 mg/L**
		Maximum standard: 860 mg/L	
		Final acute value: 1,720 mg/L	

TMDL Target:
The chloride TMDL target for the DUAW chloride TMDLs is the chronic standard of **230 mg/L**.

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

3. Loading Capacity - Linking Water Quality and Pollutant Sources

A TMDL must identify the loading capacity of a water body for the applicable pollutant. 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)). 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. 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.

EPA Review of the Duluth Urban Area Watershed chloride TMDL:
Chloride TMDLs were calculated for impaired stream segments in the DUAW. All TMDLs were calculated to meet the chloride water quality target of 230 mg/L (i.e., the chronic water quality criterion). MPCA developed the DUAW chloride TMDLs via a similar TMDL development process that it had previously employed for the Twin Cities Metro Area Chloride TMDL (February 2016)[1]. This TMDL development process uses a holistic watershed approach employing a zero-dimensional, steady-state model for its calculation of DUAW chloride TMDLs.

MPCA explained (Section 4.1 of the final TMDL document) that its DUAW chloride TMDL development approach is based on the following assumptions:

- Chloride is a conservative substance and is in a dissolved phase in water, therefore, complex fate and transport assessments were deemed to be unnecessary;
- A determination of the time for a system to respond to reduced chloride loads was deemed to be unnecessary for informing the TMDL; and
- Limited water quality data are available, this prohibits more complex modeling approaches;
- There is still uncertainty regarding the length of time which chloride remains in aquatic systems and uncertainty regarding the interaction of surface water and groundwater with respect to chloride transport.

These assumptions encouraged MPCA to employ a more simplified modeling approach for developing the DUAW chloride TMDLs.

The DUAW chloride TMDL loading capacity calculations were based on the chronic chloride standard (230 mg/L) and the amount of winter season runoff. The winter season runoff estimate was based on precipitation data and runoff coefficient (Figure 41 of the final TMDL document). MPCA explored long-term precipitation datasets in the Duluth area and decided that the precipitation data from the National Climatic Data Center (NCDC) was the best suited for the DUAW chloride TMDLs. MPCA pulled

[1] Twin Cities Metropolitan Area Chloride Total Maximum Daily Load (February 2016), MPCA, (https://www.pca.state.mn.us/sites/default/files/wq-iw11-06e.pdf, last visited 7/24/26).

NCDC precipitation data from 1948 to 2023 and used this as its baseline for precipitation data for the DUAW.

A long-term average winter season precipitation value (based on the NCDC data) multiplied by a runoff coefficient (for frozen ground) yields a winter season runoff estimate (Section 4.1.2 of the final TMDL document). MPCA estimated that the winter seasonal runoff value for the five DUAW impaired stream subwatersheds to be 7.11 inches and the long-term average winter seasonal precipitation was 7.26 inches for those same watersheds. MPCA estimated the runoff coefficient to be 0.98.

$R = P * R_v$

Where R = The winter season runoff (November 1st to March 31st)
P = The long-term average winter season precipitation (inches) -> **7.26 inches**
R_v = The runoff coefficient for frozen ground (unitless) -> **0.98**

Once the winter season runoff (R) is calculated, MPCA could then calculate the winter season runoff volume (Q_v) (acre-feet) based on (R) and the area of the TMDL subwatershed (A). Once Q_v was determined, Q_v was multiplied by the chloride concentration (230 mg/L) to set the loading capacity for each impaired subwatershed (Sections 4.1.3 and 4.1.4 of the final TMDL document).

$Q_v = A * (R/12)$

Where Q_v = The winter season runoff volume (acre-feet)
A = The area of the TMDL subwatershed (acres)
R = The winter season runoff (equation above, $R = P * R_v$)

And then,

Loading Capacity = Q_v * chloride concentration (230 mg/L) * 2.72

Chloride TMDLs for the DUAW were calculated and those results are found in Table 5 of this Decision Document. All TMDLs were calculated for a daily time step (lbs/day). MPCA calculations focused on winter seasonal stream loading, which was determined by dividing the total allowable runoff load (i.e., the TMDL) by 151 days (i.e., the 'winter season' November 1st to March 31st).

Table 5: Chloride TMDLs for the Duluth Urban Area Watershed TMDL Report

Allocation	Source	Chloride *(lbs/day)*
Kingsbury Creek (04010201-626)		
Wasteload Allocation	MS4 - City of Duluth (MS400086)	1769
	MS4 - City of Hermantown (MS400093)	3529
	MS4 - Midway Township (MS400146)	3434
	MS4 - MNDOT - Outstate District (MS400180)	147
	MS4 - City of Proctor (MS400114)	2391
	MS4 - St. Louis County (MS400158)	145
	Wisconsin Central Ltd. - Proctor Rail Yard (MN0000361)	381

	Industrial Stormwater (MNR050000)	13.9
	WLA Totals	**11810**
Load Allocation	Nonpermitted aggregate	472
	Natural background	211
	LA Totals	**683**
	Margin Of Safety (10%)	1388
	Loading Capacity (TMDL)	**13881**
Estimated Load Reduction (%) needed to achieve chloride standard		**59%**
Keene Creek (04010201-627)		
Wasteload Allocation	MS4 - City of Duluth (MS400086)	3048
	MS4 - City of Hermantown (MS400093)	4580
	MS4 - MNDOT - Outstate District (MS400180)	61.1
	MS4 - St. Louis County (MS400158)	57.8
	Industrial Stormwater (MNR050000)	9.12
	WLA Totals	**7756**
Load Allocation	Nonpermitted aggregate	310
	Natural background	139
	LA Totals	**449**
	Margin Of Safety (10%)	912
	Loading Capacity (TMDL)	**9117**
Estimated Load Reduction (%) needed to achieve chloride standard		**74%**
Miller Creek (04010201-512)		
Wasteload Allocation	MS4 - City of Duluth (MS400086)	8240
	MS4 - City of Hermantown (MS400093)	3157
	MS4 - Lake Superior College (MS400225)	107
	MS4 - MNDOT - Outstate District (MS400180)	307
	MS4 - City of Rice Lake (MS400151)	596
	MS4 - St. Louis County (MS400158)	138
	MS4 - University of Minnesota - Duluth (MS400214)	15.4
	Industrial Stormwater (MNR050000)	784
	WLA Totals	**13344**
Load Allocation	Nonpermitted aggregate	533
	Natural background	239
	LA Totals	**772**
	Margin Of Safety (10%)	1569
	Loading Capacity (TMDL)	**15685**
Estimated Load Reduction (%) needed to achieve chloride standard		**80%**
Chester Creek (04010102-545)		
Wasteload Allocation	MS4 - City of Duluth (MS400086)	8491
	MS4 - MNDOT - Outstate District (MS400180)	6.09
	MS4 - City of Rice Lake (MS400151)	191
	MS4 - St. Louis County (MS400158)	304
	Industrial Stormwater (MNR050000)	10.6
	WLA Totals	**9003**
Load Allocation	Nonpermitted aggregate	360
	Natural background	161
	LA Totals	**522**
	Margin Of Safety (10%)	1058

	Loading Capacity (TMDL)	**10582**
Estimated Load Reduction (%) needed to achieve chloride standard		**17%**
Tischer Creek (04010102-544)		
Wasteload Allocation	MS4 - City of Duluth (MS400086)	6173
	MS4 - MNDOT - Outstate District (MS400180)	2.90
	MS4 - City of Rice Lake (MS400151)	3124
	MS4 - St. Louis County (MS400158)	150
	MS4 - University of Minnesota - Duluth (MS400214)	271
	Industrial Stormwater (MNR050000)	11.4
	WLA Totals	**9732**
Load Allocation	Nonpermitted aggregate	389
	Natural background	174
	LA Totals	**563**
Margin Of Safety (10%)		1144
	Loading Capacity (TMDL)	**11439**
Estimated Load Reduction (%) needed to achieve chloride standard		**49%**

Table 5 of this Decision Document communicates MPCA's estimate of chloride reductions necessary for the impaired segment to meet its water qualtiy target. Attaining these reduction percentage estimates, under the flow conditions which the reductions are prescribed, will allow the impaired segment to meet its water quality target. This loading reduction (i.e., *the Estimated Load Reduction (%) needed to achieve chloride standard*) was estimated from existing chloride loading estimates and TMDL load calculations. 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 supports the data analysis and the approach utilized by MPCA in its calculation of WLAs, LAs and the MOS for the DUAW chloride TMDLs. Additionally, the EPA concurs with the loading capacities calculated by the MPCA for the chloride TMDLs. The EPA finds the MPCA's approach for calculating the loading capacity for the DUAW chloride TMDLs to be reasonable and consistent with EPA guidance.

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

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.

EPA Review of the Duluth Urban Area Watershed chloride TMDL:
MPCA allocated a portion of the LA to current or future nonpermitted chloride sources and natural background sources (Section 4.2 of the final TMDL document).

The LA calculation for nonpermitted sources was set at 3.4% of the loading capacity value. MPCA attributed the 3.4% value to contributions from residential SSTS in the five chloride impaired subwatersheds that are on lands outside the boundaries of the Western Lake Superior Sanitary District (WLSSD). Other nonpoint contributions to the nonpermitted LA include subsurface chloride loading from inflow and infiltration and subsurface chloride loading from leaky sewer infrastructure (Section 4.2.1 of the final TMDL document).

MPCA identified several nonpoint sources which contribute chloride to the nonpermitted source LA estimate (e.g., contributions from SSTS, subsurface chloride loading to shallow groundwater etc.) but MPCA did not determine individual load allocation values for each of these potential nonpoint source considerations. Instead MPCA aggregated the nonpoint sources into one "nonpermitted aggregate" LA value in the TMDL tables (Table 5 of this Decision Document).

The LA calculation for natural background was based on the multiplication of the natural background concentration of chloride in the DUAW (3.5 mg/L) by the estimate of winter seasonal runoff volume for that subwatershed. The winter seasonal runoff volume was calculated based on an estimate of the winter seasonal runoff (inches) multiplied by the drainage area of the TMDL subwatershed (Section 4.1.3 of the final TMDL document). Table 25 of the final TMDL document presents the LA for natural background for each of the five impaired segment subwatersheds.

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

5. Wasteload Allocations (WLAs)

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.

EPA Review of the Duluth Urban Area Watershed chloride TMDL:
MS4 WLAs: MPCA allocated a portion of the WLA to nine permitted MS4 communities (Table 3 of this Decision Document and Table 26 of the final TMDL document). The MS4 WLA was calculated using an area-ratio approach based on the jurisdictional area of each permitted MS4 and an iterative reduction calculation that subtracted the summation of the natural background load, the nonpermitted load, and the MOS. The remaining loading capacity was apportioned between MS4 permittees using a ratio of jurisdictional areas (Table 26 of the final TMDL document and Section 4.3.1 of the final TMDL document).

Industrial stormwater: A categorical WLA was used for industrial stormwater operations covered under Minnesota's General Permit (MNR050000). This calculation was based on the ratio of the area of operations authorized under the General Permit vs. the total area of the impairment subwatershed

(Section 4.3.2 of the final TMDL document). For the Chester Creek (04010102-545), Keene Creek (04010201-627), Kingbury Creek (04010201-626) and Tischer Creek (04010102-544) subwatersheds this ratio was less than 0.1% and thus, the industrial stormwater WLA was set as 0.1% multiplied by the loading capacity. For the Miller Creek (04010201-512) subwatershed, the ratio was 5%, thus, the industrial stormwater WLA was 5% multiplied by the loading capacity (Table 27 of the final TMDL document and Table 5 of this Decision Document).

An individual WLA was calculated for the Wisconsin Central Ltd. Proctor Rail Yard (MN0000361) in the Kingsbury Creek (04010201-626) subwatershed. This WLA was calculated using an area-ratio approach based on the regulated stormwater area for the Proctor Rail Yard (approx. 182 acres) and the total area of the Kingsbury Creek subwatershed. MPCA completed an iterative reduction calculation that subtracted the summation of the natural background load, the nonpermitted load, and the MOS from the loading capacity, similar to its process deployed in the MS4 WLA calculation. The remaining capacity was multiplied by the area ratio (i.e., area of Proctor Rail Yard vs. total area of the Kingsbury Creek subwatershed) (Table 5 of this Decision Document).

The EPA finds the MPCA's approach for calculating the chloride WLAs to be reasonable.

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

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." 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.

EPA Review of the Duluth Urban Area Watershed chloride TMDL:
The final TMDL submittal outlines the determination of the Margin of Safety (MOS) for the DUAW chloride TMDLs in Section 4.4 of the final TMDL document. MPCA employed an explicit 10% MOS applied to the total loading capacity calculation for the stream segments of the DUAW chloride TMDLs. MPCA explained that the explicit MOS was set at 10% due to the following factors discovered during the development of the DUAW chloride TMDLs:

- The potential variability of the monitored parameters from spatial, temporal and seasonal changes seen within each stream;
- Variability in water quality data (i.e., field sampling error, etc.);
- Uncertainty in modeling outputs (e.g., calculation of long-term average winter season precipitation and runoff estimates); and
- Environmental variability in the chloride loading.

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

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)).

EPA Review of the Duluth Urban Area Watershed chloride TMDL:
Seasonal variation is discussed in Section 4.5 of the final TMDL document. MPCA explained that chloride loading to the stream segments addressed via the DUAW chloride TMDLs vary across all seasons since chloride is added to the system on a seasonal basis as well as an annual basis. Spring snowmelt and subsequent runoff contribute chloride to local water bodies during the spring time period, summer storms may contribute chlorides via stormwater runoff and continuous year-round sources of chloride are present in the DUAW due to contributions from water softening systems in areas which are not tied into municipal sanitary sewer systems.

Stream water quality responds to loadings on a seasonal basis and MPCA explained that the period of the year that sees the greatest chloride loading is the November to March time period. Therefore, MPCA calculated the DUAW chloride TMDLs to achieve the chloride WQS during this same time period (November to March).

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

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, 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 EPA to determine that the TMDL, including the load and wasteload allocations, has been established at a level necessary to implement water quality standards.

EPA Review of the Duluth Urban Area Watershed chloride TMDL:
The DUAW chloride TMDLs provide reasonable assurance that actions identified in the implementation section of the final TMDL (i.e., Section 8 of the final TMDL document), will be applied to attain the

loading capacities and allocations calculated for the impaired reaches within the DUAW. The recommendations made by MPCA in the final TMDL document will be successful at improving water quality if the appropriate city and municipal partners, private applicators, and local watershed groups work to implement these practices.

MPCA explained that approximately, permitted sources were allocated approximately 85% of the loading capacity; nonpermitted sources, 3.4%; MOS, 10%; and natural background, 1.6% (Section 6.1 of the final TMDL document) in the five chloride impaired segments. As the five impairment subwatersheds are completely covered by regulated MS4s, much of the chloride load reductions will need to be from regulated stormwater.

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. MPCA's stormwater program and the NPDES permit program are some of the implementing programs for ensuring WLA are consistent with the TMDL. The NPDES program requires construction and industrial sites to create Stormwater Pollution Prevention Plans (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 DUAW TMDLs. In the event that the SWPPP does not meet the WLA, the SWPPP will need to be modified.

MPCA is responsible for applying federal and state regulations to protect and enhance water quality within the TMDL study area. MPCA oversees all regulated MS4 entities (e.g., The City of Duluth MS4) in stormwater management accounting activities. MS4 permits require permittees to implement best management practices (BMPs) to reduce pollutants in stormwater runoff to the Maximum Extent Practicable (MEP).

All regulated MS4 communities are required to satisfy the requirements of the MS4 general permit which requires the permittee to develop a SWPPP which addresses all permit requirements, including the following six minimum control measures:

- Public education and outreach;
- Public participation;
- Illicit Discharge Detection and Elimination (IDDE) Program;
- Construction-site runoff controls;
- Post-construction runoff controls; and
- Pollution prevention and municipal good housekeeping measures.

MPCA requires MS4 applicants to submit their application materials and SWPPP documentation to MPCA for review. Prior to extension of coverage under the general permit, all application materials are placed on 30-day public notice by the MPCA, to ensure adequate opportunity for the public to comment on each permittee's stormwater management program. Upon extension of coverage by the MPCA, the permittees are to implement the activities described within their SWPPP and submit annual reports to MPCA by June 30 of each year. These reports document the implementation activities which have been completed within the previous year, analyze implementation activities already undertaken, and outline any changes within the SWPPP from the previous year.

The DUAW chloride TMDLs will employ a performance-based implementation approach which will ensure that waters in the DUAW will ultimately attain the water quality targets of the DUAW chloride TMDLs. This approach focuses implementation efforts on generating water quality improvements via an iterative deployment of BMPs in the DUAW. Progress toward attaining water quality targets of the TMDL will be measured by; documentation of existing winter maintenance BMPs, setting and meeting goals for implementing improved chloride usage practices, schedules, and reporting on progress made (e.g., estimates of reduced salt usage as a result of improved practices). MPCA's Winter Maintenance Assessment Tool (WMAT) will be used to track stakeholder progress toward chloride reduction practices.

Cities and stakeholders which have been designated within the DUAW as receiving a chloride WLA are expected to use the MPCA's WMAT to select specific BMPs and then reflect those choices within their updated SWPPP. The WMAT includes 200 different BMPs, from small scale BMPs to large scale BMPs. SWPPP and MS4 reporting requires the stakeholders to include detail on their BMPs. After a stakeholder has used the WMAT to select BMPs it can update its SWPPP with those selections. The stakeholder could use that same information in its MS4 reporting to MPCA. MS4s must comply with the MPCA permit program. Once an MS4 is assigned a WLA, that MS4 must update its SWPPP and complete 'MS4 reporting' on an annual basis. MPCA expects that MS4 partners should continue to build on their portfolio of salt reduction BMPs for each permit cycle.

Continued water quality monitoring within the basin is supported by MPCA. Additional water quality monitoring results will provide understanding of the success or failure of BMP systems designed to reduce chloride loading into the surface waters of the watershed. Local watershed managers will be able to reflect on the progress or lack of progress of the various pollutant removal strategies and will have the opportunity to change course if observed progress is unsatisfactory.

Various funding mechanisms can be utilized to execute the recommendations made in Section 8 of the DUAW TMDL document. The Clean Water Legacy Act (CWLA) was passed in Minnesota in 2006 for the purpose 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 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., 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 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. 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 the TMDL document submitted by MPCA satisfies the requirements of this eighth element.

9. Monitoring Plan to Track TMDL Effectiveness

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.

EPA Review of the Duluth Urban Area Watershed chloride TMDL:
The final TMDL document outlines the water monitoring efforts in the DUAW (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 St. Louis County South SWCD) and volunteers, as long as there is sufficient funding to support the efforts of these local entities. At a minimum, the DUAW 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 DUAW. 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 DUAW. 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.

MPCA describes potential future monitoring efforts in the Kingsbury Creek subwatershed and other targeted winter maintenance monitoring efforts in the DUAW that could be pursued in order to improve the overall understanding of chloride sources impacting the surface waters of the five chloride impaired stream segments (Section 7.2 of the final TMDL document). This information would be beneficial for identifying areas in the DUAW with higher chloride loads that could then be targeted for BMP implementation efforts.

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

10. Implementation

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, EPA policy recognizes that other relevant watershed management processes may be used in the TMDL process. EPA is not required to and does not approve TMDL implementation plans.

EPA Review of the Duluth Urban Area Watershed chloride TMDL:
Water quality improvements are an important consideration for the purposes of implementation efforts of the DUAW chloride TMDLs, but MPCA also highlights the potential for long-term cost-savings as a result of smarter and more efficient use of salt/de-icing resources. The key challenge in reducing salt/de-icing usage is balancing the need for public safety with the growing expectation for clear, dry roads, parking lots, and sidewalks throughout the mix, severity, and duration of winter conditions in the DUAW.

The DUAW chloride TMDL outlined implementation strategies in Section 8 of the final TMDL document. The findings from the DUAW chloride TMDLs will be used to inform reasonable scenarios of BMP combinations that attain pollution reduction goals. MPCA can use these recommendations to update the Duluth Urban Area Watershed Restoration and Protection Strategy (October 2020) document (https://www.pca.state.mn.us/sites/default/files/wq-ws4-42a.pdf). The purpose of the DUAW WRAPS report is to support local working groups and jointly develop scientifically supported restoration and protection strategies to be used in subsequent implementation planning.

MPCA outlined the importance of prioritizing areas within the DUAW, education and outreach efforts with local partners, and partnering with local stakeholders to improve water quality within the watershed. Additionally, MPCA referenced the Minnesota Statewide Chloride Management Plan (2020) (https://www.pca.state.mn.us/sites/default/files/wq-s1-94.pdf) for focused implementation efforts targeting chloride point and nonpoint sources to the surface waters in the five chloride impaired subwatersheds of the DUAW. Local partners, such as the St. Louis County South SWCD and other local partners will bear the responsibility for assisting in the management of lands and waters within the DUAW. These partners will also be tasked with finding creative adaptive management strategies to meet changing water quality conditions within the watershed.

The reduction goals for the DUAW chloride TMDLs may be met via components of the following strategies:

Reducing city/municipality chloride footprint: Implementation efforts should focus on improving winter maintenance practices (i.e., reducing the amount of salt used) of municipal and private applicators.

Cover salt storage facilities/infrastructure: City/municipal partners can cover their salt storage resources and contain any runoff from salt storage areas.

Anti-icing and de-icing agents: City/municipal partners can purchase and deploy trucks with capability to spray anti-icing liquids and brines.

Calibrate and maintain salt spreading equipment: City/municipal partners can reduce overall usage of salt by calibrating spreaders to only spread the appropriate amount of salt/de-icing agent for each winter precipitation event. This approach helps cities and municipalities save money as a result of smarter and more efficient use of salt resources.

Pre-treatment of roads: City/municipal partners can apply brine to surfaces prior to a forecast snowstorm in order to inhibit snow and ice from binding to the surface. The application of brine, under the right conditions (e.g., dry pavement, temperatures at least 15 degrees Fahrenheit, no forecast of rain to wash brine off) can make snow and ice removal easier, thus, reducing the need for additional anti-icing and de-icing agents.

Staff Training: Enroll city/municipal staff in MPCA's Smart Salting training course (https://www.pca.state.mn.us/business-with-us/smart-salting-training) where staff will be exposed to: how and why to calibrate equipment, how to use weather condition information more efficiently, determining application rates, best practices for plowing and physical removal, best practices for storing materials, success stories, etc. There are also Road Certification and Parking Lots and Sidewalk certification training sessions that inform participants of BMPs for utilizing anti-icing agents.

Public Education Efforts: Public programs will be developed to provide guidance to the general public on chloride reduction efforts and their impact on water quality. These educational efforts could also be used to inform the general public about what they can do to protect the overall health of the DUAW. Local watershed partners (e.g., the City of Duluth, along with others) could assume additional responsibilities in communicating chloride reduction strategies to stakeholders, via mailing annual newsletters or updating their website with chloride reduction strategies.

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

11. Public Participation

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, EPA has explained that final TMDLs submitted to 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.

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

EPA Review of the Duluth Urban Area Watershed chloride TMDL:
The public participation section of the TMDL submittal is found in Section 9 of the final TMDL document. MPCA assembled a 'Core Team' of local representatives that assisted in the development of the TMDL project and reviewed early drafts of the TMDL document. The Core Team was composed of representatives from the Minnesota Department of Natural Resources, the Minnesota Department of Transportation, university partners (e.g., University Minnesota-Duluth, Lake Superior College), St. Louis County, the South St. Louis County Soil and Water Conservation District, and partners in the City of Duluth, City of Hermantown, City of Proctor and the City of Rice Lake. Throughout the development of the DUAW TMDLs MPCA met with representative of its Core Team to discuss updates to the project and seek their input. Additionally, the general public was given various opportunities to participate. MPCA hosted meetings in 2024, 2025 and 2026 in order to promote water quality and gain input from stakeholders in the watershed. MPCA's goal was to foster civic engagement and discussion which would enhance the content of the TMDL.

The MPCA posted the draft TMDL online at (http://www.pca.state.mn.us/water/tmdl) during its public comment period of February 17, 2026, to March 19, 2026. MPCA received six comments from stakeholders, including the Minnesota Department of Transportation (MNDOT). Some of the commenters shared their experiences regarding excessive salt left on roadways, sidewalks, parking lots etc. and made recommendations to local municipalities to consider spreading less salt. Other commenters made recommendations on employing Low Salt Design strategies to inform/educate stormwater professionals, engineers and urban designers/architects. MPCA shared these comments with the City of Duluth and the Regional Stormwater Protection Team.

The MNDOT provided feedback and comments on the pre-public notice draft DAUW TMDL related to data considered in the development of the chloride TMDLs, MS4 permit requirements, providing additional information on BMPs and MPCA's Smart Salting Tool, right-of-way assumptions employed in the development of the DUAW TMDLs and other topics. MPCA reviewed MNDOT's comments and made changes to the early draft DUAW TMDL document where appropriate. MPCA summarized its updates to the draft DUAW TMDL in its May 27, 2026, response to the MNDOT.

Where appropriate in the draft and final DUAW TMDL document, MPCA addressed comments shared, added clarifying language and updated the final DUAW TMDL document. The EPA believes that MPCA adequately addressed these requests for additional clarification within the TMDL document and where necessary updated the final TMDL document. All public comments and MPCA responses to publicly submitted comments were shared with EPA.

The EPA finds that the TMDL document submitted by 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 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 EPA review and approval. This clearly establishes the State's/Tribe's intent to submit, and 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.

EPA Review of the Duluth Urban Area Watershed chloride TMDL:
The EPA received the final Duluth Urban Area Watershed TMDL document, submittal letter and accompanying documentation from MPCA on July 23, 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 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 by the requirements under Section 303(d) of the Clean Water Act and 40 C.F.R. Part 130.

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

13. Conclusion

After a full and complete review, the EPA finds that the five (5) chloride TMDLs for the Duluth Urban Area Watershed satisfy all elements of an approvable TMDL. This TMDL approval is for **five TMDLs**, addressing segments for aquatic life use impairments (Table 1 of this Decision Document).

The EPA's approval of this TMDL extends to the water bodies that are identified above with the exception of any portions of the water body that are within Indian Country, as defined in 18 U.S.C. Section 1151, and as further discussed in our Decision Document. 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.